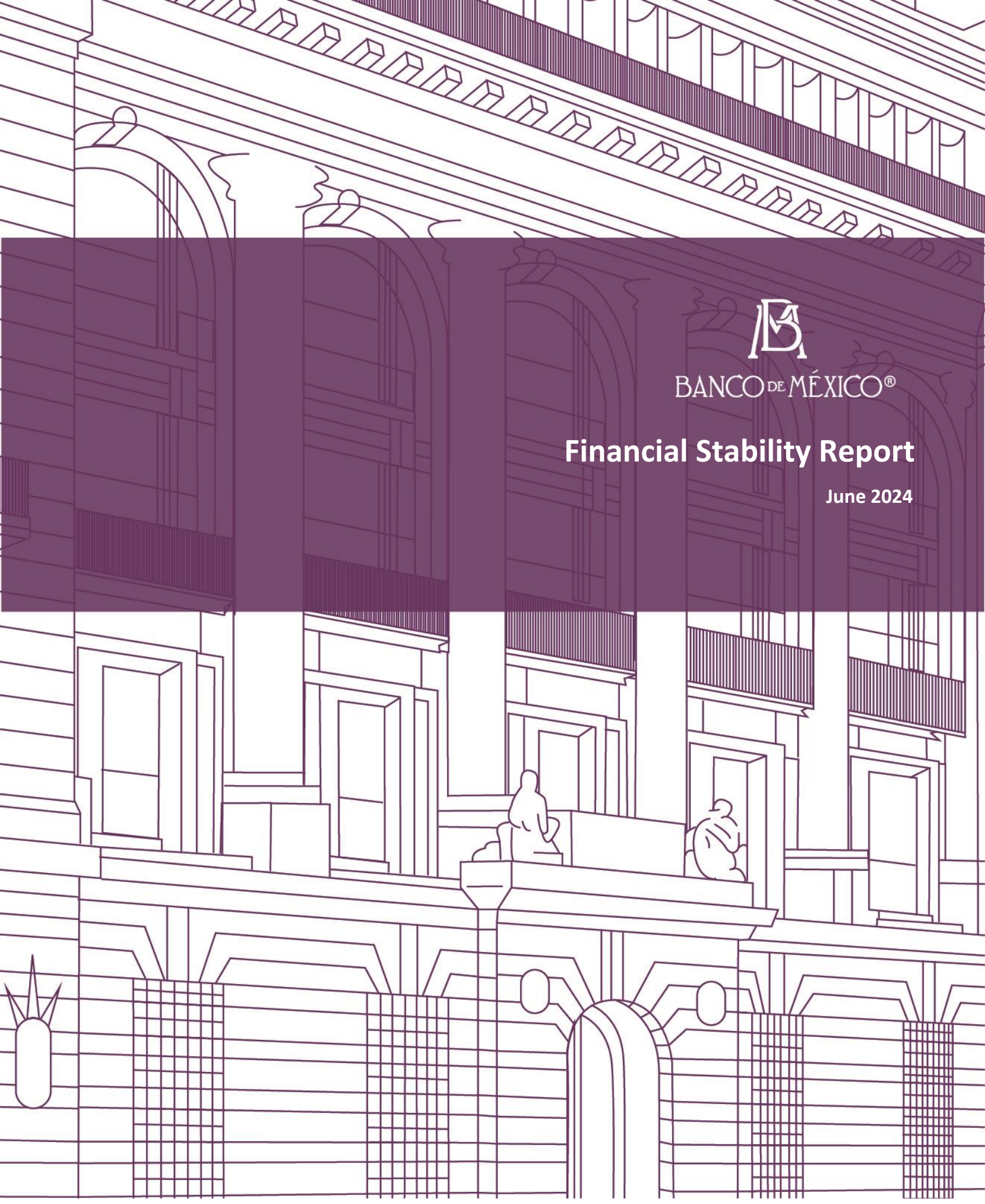


BANCO DE MÉXICO®

Financial Stability Report

June 2024

Public Use
Publicly accessible information

BOARD OF GOVERNORS

Governor

VICTORIA RODRÍGUEZ CEJA

Deputy Governors

GALIA BORJA GÓMEZ

IRENE ESPINOSA CANTELLANO

JONATHAN ERNEST HEATH CONSTABLE

OMAR MEJÍA CASTELAZO

NOTICE

This text is provided for the reader's convenience only. Discrepancies may possibly arise between the original document and its translation to English. For this reason, the original and unabridged Financial Stability Report in Spanish remains the only official document.

Unless otherwise specified, this document has been drafted using information available as of the first quarter of 2024 for the macroeconomic and financial institutions' variables, and as of June 10, 2024, for the market information. Data is preliminary and subject to review.

USE OF ACRONYMS, ABBREVIATIONS AND CONVENTIONS

In this *Report*, initials and acronyms that correspond to names in Spanish and the references to this Report have been written in italics, whereas those that correspond to names in English appear in regular Roman characters. The meanings of all acronyms are presented at the end of the document. The term 'billion' is used in the English-language sense, i.e., a thousand million (1,000,000,000). The term 'trillion' is used in the English language sense, i.e., a thousand billion (1,000,000,000,000).

CONTENTS

Executive summary *1*
Introduction *5*
I. Macro-financial conditions *5*
I.1. International economic outlook 5
I.2. Domestic economic outlook 6
I.3. Financial markets 7
I.3.1. Foreign exchange market 8
I.3.2. Fixed-income market 9
I.3.3. Equity market 10
I.3.4. Derivatives market 10
I.3.5. Risk premiums 12
I.4. Macro-financial risks 15
II. Update on challenges of the economic environment *17*
III. Policy measures implemented to preserve the sound development of the financial system *19*
IV. Financial system risks *25*
IV.1. Aggregate risk indicators 25
IV.2. Credit to households, private non-financial sector and public sector 29
IV.2.1. Households 33
IV.2.2. Private non-financial companies 39
IV.2.2.1. Federal Government 45
IV.2.2.2. State-owned companies 46
IV.2.2.3. States 47
IV.2.3. External sector and capital flows 49
IV.3. Institutions 52
IV.3.1. Commercial banks 53
IV.3.2. Development banks and other financial institutions 75
IV.3.2.1. Infonavit and Fovissste 79
IV.3.3. Siefores and investment funds 81
Siefores 81
IV.3.4. Broker-dealers 85
IV.3.5. Insurance companies and bonding institutions 86
IV.3.6. Other-Non-bank Financial Intermediaries (OIFNB, its acronym in Spanish) 87
IV.4. Financial markets infrastructures 95
IV.5. Other risks to the financial system 96
IV.5.1. Operating continuity risks 96
IV.5.2. Cybersecurity risks 97
IV.5.3. Environmental risks and investment sustainability 99
V. Stress testing and recovery plans *115*
V.1. Credit stress tests 117
V.2. Liquidity stress tests 121
V.3. Stress tests of physical risks associated with climate change. 123
V.4. Recovery plans 124
Final considerations *125*
Annex 1 ..... *127*
List of acronyms *and abbreviations* *128*

BOXES

Box 1: Amendments to the Securities Market Law and the Investment Funds Law 12
Box 2: Rules for repurchase agreements: modifications to incorporate international standards and practices 20
Box 3: Gender credit gap: widening or narrowing with uncertainty? 39
Box 4: Credit risk heat map of the Mexican banking sector 57
Box 5: Implementation of the Large Exposures regulation and the Net Stable Funding Ratio in Mexico in compliance with international standards 65
Box 6: Analysis of the effect of a measure of aggregate interbank risk perception on financing decisions in the interbank market 70
Box 7: Water scarcity and corporate credit exposure 105
Box 8: Disclosure of risks related to sustainability 111
Box 9: The Network of Central Banks and Supervisors for Greening the Financial System (NGFS) and scenarios defined by such network 115

Definition of Financial Stability and scope of the Financial Stability Report

Banco de México, considering its purposes of promoting the sound development of the financial system and fostering the proper functioning of the payments system, monitors the performance of the Mexican financial system and its participants, as well as the main risks and vulnerabilities that could affect its stability and, therefore, its proper functioning.

A stable financial system is one in which financial institutions, markets and their infrastructures facilitate the exchange of funds between savers, borrowers, and investors, with adequate risk management, thus contributing to the proper functioning of the economy and achieving sustainable economic growth. Financial stability also implies that the financial system is able to withstand shocks while it also contributes to maintain an environment of macroeconomic stability and growth. An adequate functioning of the financial system also contributes to Banco de México's primary objective of ensuring price stability since it promotes a more efficient operation of monetary policy´s transmission channels.

A stable financial system is a necessary but not sufficient condition for achieving a more balanced and sustainable growth, since, as international experience confirms, periods of financial instability have a very high cost for society. Therefore, it is necessary for financial authorities to remain vigilant of developments in the financial system and its interaction with economic activity, as well as its risks, in order to avoid the accumulation of vulnerabilities that could generate systemic problems, or amplify or cause negative shocks in the economy. The analysis and monitoring carried out by Banco de México regarding the stability of the financial system is made known to the public every six months through the Financial Stability Report. The identification and monitoring of risks that could affect the stability of the financial system, as well as their timely disclosure, are essential to mitigate them and, thereby, to reduce vulnerabilities and enhance the resilience of the system.

Executive summary

During the period covered by this *Report*, the Mexican financial system maintained a solid and resilient position. This was despite an environment in which global financial conditions remained relatively stable during the period, as they tightened in April. Moreover, given that in major developed and some emerging economies, inflation continues to show persistence and remains above central banks' targets.

International financial markets exhibited periods of volatility due to greater risk aversion amid the intensification of geopolitical conflicts in the Middle East. This has negatively affected the performance of some financial assets in emerging economies.

In its most recent outlook, the International Monetary Fund (IMF) revised its global economic growth forecasts for 2024 slightly upwards and left those for 2025 unchanged. Regarding economic activity in Mexico, the latest data indicate that Mexico's GDP continued slowing in the first quarter of 2024 continuing the slowdown that began in the fourth quarter of 2023.

Regarding the monitoring of Mexico's financial system carried out in this *Report*, data on the evolution of the main risks to financial stability are highlighted, as their materialization could affect the proper functioning of the economy.

The analyzed risks are divided into two main categories. The first set comprises possible macrofinancial risks, which consist of risks that could result from the deterioration of financial and macroeconomic variables, both domestically and internationally. The second category addresses the risks that affect the main segments participating in the financial system: specifically, households, firms, the public sector, the banking sector, and the non-bank financial sector. This analysis also includes disruptions and risks that may arise in financial markets and payment systems.

Regarding the category of macro-financial risks, four main risks are identified that, if realized, could affect the stability of the Mexican financial system: i) tighter financial conditions for a longer period than previously anticipated; ii) downward pressures on economic activity and a more volatile market environment due to heightened geopolitical tensions and/or trade conflicts; iii) a systemic event that affects the global financial system; and iv) unexpected adjustments of credit ratings for either the Mexican government or Pemex.

The analysis of risks pertaining to the second category is based on a series of quantitative and qualitative indicators. Aggregate risk indicators, as the Financial Conditions Index (ICF, its acronym in Spanish), shows that aggregate financial conditions in Mexico remained restrictive, although less than in the previous *Report.* Additionally, the Mexican Financial Markets Stress Index (IEMF, its acronym in Spanish) decreased from December 2023 to May of this year, although it rose slightly in April, mainly due to the escalation of geopolitical conflicts. At the beginning of June, the IEMF increased again due to the performance of the domestic foreign exchange, debt and equity markets. This index thus ended above the level recorded in the previous *Report.* On the other hand, overall risk in the financial system, as illustrated by the heat map, remained at a similar level to that observed in the previous *Report*. Taken together, the above indicators suggest that the aggregate risk of the Mexican financial system, under the expected trajectory and in the absence of shocks, remains contained. Banco de México continues to monitor its evolution.

During the first quarter of 2024, total financing to the Mexican economy increased in real annual terms and, as a share of GDP, it remains at levels similar to those observed in 2015. However, the financing gap has registered negative values in twelve consecutive quarters.

Data as of the end of March 2024, show households' financial positions increased in comparison to the level presented in the previous *Report*. While household leverage, measured as the ratio of monthly income available to pay down debt, generally remained at levels similar to those of last year, with higher leverage observed for lower-income borrowers. Consumer credit granted by commercial banks and their related sofomes continued increasing. In addition, non-performing rates of consumer loans granted by commercial banks began declining in 2024, in all segments, except for automotive loans. Furthermore, risks associated with

consumers remain limited as newly granted credits for most types of loans, show stable regulatory default probabilities. Total housing financing grew at a slightly higher annual real rate compared to the previous *Report*, with the Infonavit housing portfolio registering positive growth for the first time in two years. Additionally, banks' non-performing loans in this segment are at historical lows.

With respect to non-financial private firms, their total financing decreased slightly in real annual terms, albeit at a slower pace compared to the previous *Report*. Regarding domestic financing, credit granted by commercial banks remain the most relevant source of credit and, this showed positive growth. In contrast, external financing to this sector has contracted for fourteen consecutive quarters, due to a decline in both foreign bank credit and in international corporate debt issuance. The non-performing loan ratio for the portfolio of credit granted by commercial banks to firms, started to decline as of November 2023, driven by large companies. Additionally, the non-performing ratio for loans granted by non-bank financial intermediaries in the regulated and non-regulated sectors, decreased compared to the last *Report*. The Listed Companies Vulnerability Index (IVEL, its acronym in Spanish), which measures the vulnerability of publicly listed companies as a group and by economic sector, increased as compared to the previous *Report*. However, the IVEL remained in the low vulnerability zone. And, the exposure of Mexican banks to private non-financial listed companies with some vulnerability, remains low relative to banks' regulatory capital.

Regarding the public sector's financial position, at the end of 2023, the federal public balance registered a deficit lower than projected in the government's Economic Package for that year. However, the Public Sector Financial Requirements (RFSP) were 4.3% of GDP. Then from January to March 2024, the public sector balance had a larger deficit than anticipated, and the RFSP are expected to reach 5.9% of GDP by the end of 2024, with the fiscal deficit reaching 50.2% of GDP. On the other hand, the debt levels of state and municipal governments, according to the warning system indicators of the Ministry of Finance (SHCP, its acronym in Spanish), remain at sustainable levels.

Regarding the external sector, based on data from the balance of payments, capital inflows were strong in the first quarter of 2024. Notably, portfolio flows from non-residents continued consolidating the recovery exhibited since the last *Report*, with strong inflows in December 2023 and March 2024. However, our own estimates suggest that there is still a substantial margin for these flows to continue recovering.

Regarding the banking sector, this is the largest in terms of financial assets, and continues to show abundant liquidity and capital, well above the regulatory minima. These capital levels allow banks to have the capacity to absorb shocks or manage unexpected events that could materialize in the short and medium term. Also, the analysis of banking sector vulnerabilities shows that these remain limited. Credit risk remained at relatively stable levels during the period covered by this *Report*. Looking ahead, its evolution is expected to continue to be determined by the performance of economic activity in the country. As for market risk, it decreased slightly with respect to the last *Report*, because of adjustments in portfolio positions, particularly in instruments sensitive to interest rate movements.

Commercial banks as a whole are resilient based on the results of solvency and liquidity stress tests that assume adverse but plausible scenarios that institutions could face. The main objectives of the analyses are: i) to identify and analyze vulnerabilities of the banking system as a whole, ii) to evaluate the resilience and loss absorption capacity of Mexican banking institutions in the designed scenarios; and iii) to evaluate the liquidity position of commercial banks if faced with stress episodes similar to those experienced in the past, as well as to estimate cash outflows that could take place under certain severe scenarios.

The results of the credit stress tests show that the capitalization ratio of Mexican banking institutions would allow the financial system, in the scenarios considered, to conclude the three-year simulation horizon at capitalization levels well above the regulatory minimum, including capital buffers. However, at the individual level, there are certain banking institutions, representing a low percentage of the system's total assets, which could experience a

greater impact on their capitalization levels in some of the simulated scenarios. In liquidity stress tests, the results show that banks, overall, could manage high stress episodes and that banks as a whole would maintain a liquidity surplus.

Development banks and other development financial institutions, remain financially sound, both in their capitalization and liquidity levels. Despite reducing their credit exposures and registering a real annual decline in loan loss reserves, both the main items of the balance sheet and income statement have evolved favorably for this group of institutions.

The regulated and non-regulated non-bank financial intermediaries' sector (OIFNB, its acronym in Spanish) showed a slight recovery in its funding and market financing conditions at the end of 2023 and beginning of 2024. These institutions are vulnerable to a downturn in economic activity for the population segment and the firms they cater for, and therefore an abrupt slowdown could lead to a significant deterioration in non-performing rates and thus threaten their credit rating and hamper generation of net interest margin income. These institutions do not represent a risk to financial stability since they are small and have few interconnections within the country's banking system.

In addition to the aforementioned risks, the *Report* also monitors business continuity risks of financial institutions, as well as the performance of financial market infrastructure and payment systems managed and operated by Banco de México due to their systemic importance. At the end of April 2024, the operability levels of financial markets and payment systems' infrastructure remained high and payment systems did not experience any interruption in their services as a result of an incident.

Cyber risk remains one of the major risks for the global financial system. In particular, cyber risks to the stability of the financial system associated with the growth in the use and sophistication of Artificial Intelligence (AI) stand out. In this regard, Banco de México monitors and is incorporating into its institutional risk management the risks associated with AI that, due to their nature, call for specialized attention. The indicators developed by Banco de México to measure cybersecurity levels in the Mexican financial system indicate that cybersecurity is adequate.

In addition, Banco de México monitors climate-related risk by analyzing banks' corporate, mortgage and consumer loan portfolios exposure to potential losses that could arise from the materialization of hydro-meteorological phenomena. The objective is to encourage financial system participants to internalize the economic and financial impact associated with physical risks due to climate change, as it could represent a risk to the stability of the system as a whole. The analysis identifies banks whose loan portfolios are not well diversified because they are simultaneously exposed to climate-related problems caused by heat waves, droughts, and tropical cyclones. These banks have a greater vulnerability to liquidity risk shocks.

This *Report* also presents the results of stress tests for physical risks associated with climate change. This simulation exercise evaluates the resilience of the banking system to the occurrence of extreme hydro-meteorological events. The most severe hurricanes observed in recent years, with similar economic effects are used to identify the magnitude of the impact on the capital adequacy ratio. The results show that although the impact on capitalization is not insignificant, it does not represent a risk to the banking system's solvency. This exercise also identifies additional losses that could arise in the event of simultaneous macro-financial and climate-related shocks.

Regarding the monitoring of the evolution of sustainable financial assets, in the first three months of 2024, the issuance of thematic bonds by domestic private and public issuers was higher than in the same period of 2023. Finally, as part of its efforts to contribute to the continuous improvement of the regulatory framework, in order to keep it robust and updated as well as to promote the adoption of best practices and international standards, during the period covered by this *Report*, Banco de México implemented measures related to repurchase agreements, derivative transactions, reference rates, liquidity provision to commercial banks, sustainable financial assets, and facilities for borrowers affected by Hurricane Otis. Looking ahead, it will monitor the evolution of risks and vulnerabilities that could

negatively impact financial stability, in order to implement actions to mitigate them and preserve both the stability of the financial system and the proper functioning of payment systems. The above will be done, according to its constitutional and legal authority, in strict compliance with the legal framework, and in coordination with other financial authorities.

Introduction

One of Banco de México's goals is promoting the sound development of the financial system and fostering the proper functioning of the payment systems. To achieve this, it monitors financial institutions and other participants in the Mexican financial system and constantly evaluates their performance. It also focuses on identifying risks and vulnerabilities that could represent a risk to the stability of this system and, therefore, its proper functioning.

A well-functioning financial system is essential for Banco de México's priority objective of procuring the stability of the national currency's purchasing power. Monetary policy transmission mechanisms are more effective when the financial system functions properly. Likewise, having a stable financial system can help the economy achieve balanced and sustained growth, since episodes of financial instability can have a significant cost for society in terms of activity, employment and income levels, as has been demonstrated throughout history.

Banco de México communicates its analysis and monitoring of financial stability in this biannual *Financial Stability Report.* With the publication of this *Report*, Banco de México aims to identify the possible vulnerabilities in the financial system and the risks it could face, in order to communicate them in a timely manner and, thus, strengthen its stability and resilience.

Since the last *Report*, global financial conditions remained relatively stable. However, during April there was a tightening in response to some persistence of inflation in the United States and data indicating that both employment and economic activity in that country remain strong, as well as the possibility of an escalation of the geopolitical conflict in the Middle East. Subsequently, as new information became available, during May there was an improvement that practically reversed said tightening.

On the one hand, inflation has been persistent in some countries, particularly in the United States, in a context of resilient economic activity and employment. As a result, expectations for the reference rate in the U.S. are currently higher than they were at the end of 2023, and financial conditions may tighten or, at least, remain tight for a period longer than previously anticipated. On the other hand, in Mexico, annual headline inflation increased since the publication of the last *Report*. This increase took place in a context of declining core inflation. Nevertheless, going forward, the disinflationary process is expected to continue, although it is anticipated to be more gradual, in line with the revision of headline and core inflation forecasts, which present marginal adjustments in some quarters. We must remember, however, that these forecasts are subject to risks that are currently biased to the upside.

Against this backdrop, the Mexican financial system maintains a solid and resilient position. In general, potential vulnerabilities are considered limited, supported to a large extent by commercial banks with capital and liquidity levels comfortably above regulatory minimums. However, it should be noted that unexpected or severe events could affect its proper functioning, so it is important to pay due attention and monitor the risks that could be faced in a complex and uncertain global macro-financial environment such as the current one.

This *Report* is divided into five sections. Section I reviews macro-financial conditions in detail. Section II updates the challenges of the economic environment with respect to the last *Report*. Section III describes the policy measures implemented to preserve the healthy development of the financial system. Section IV presents the risks for the financial system; it not only identifies the aggregate risk indicators, but also studies the positioning of the economic agents participating in the Mexican financial system and, in addition, delves into the diagnosis of commercial banks. Section V presents the stress tests developed internally and the recovery plans of commercial banks. Lastly, final considerations are presented.

I. Macro-financial conditions

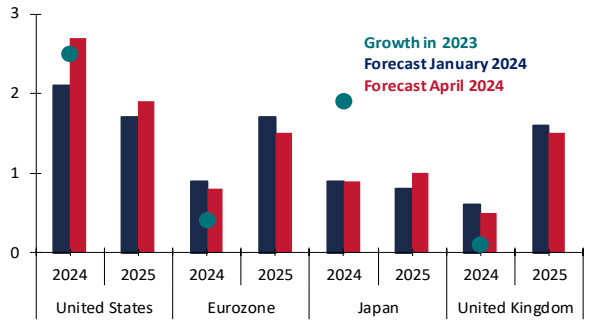
I.1. International economic outlook

Global economic activity showed a slowdown in the fourth quarter of 2023. In the first quarter of 2024, it recovered, albeit heterogeneously across countries. This recovery was explained by greater dynamism in the main emerging economies, contrasting with weak

growth in most advanced economies, with the United States being the exception. This performance took place despite high interest rates to contain inflation and growing geopolitical tensions at the global level.

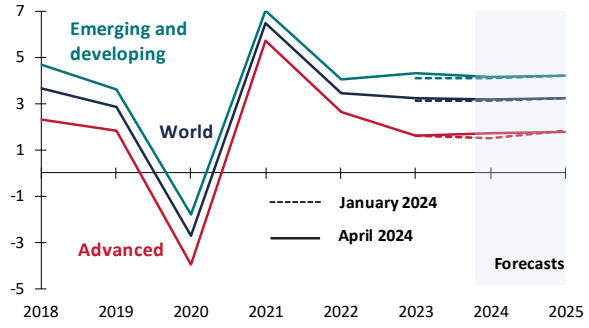
In April, the International Monetary Fund (IMF) revised slightly upward its global economic growth projections for 2024 and kept them unchanged for 2025. The IMF noted that growth in these projections is low by historical standards, due to still tight financial conditions, lower fiscal support in several countries, the lagged effects of COVID-19, geopolitical tensions, weak productivity growth and geo-economic fragmentation (Graph 1 and Graph 2).

Graph 1
Growth in 2023 and forecasts for 2024 and 2025
Annual variation in percent



Data as of April 2024.
Source: IMF, World Economic Outlook January and April 2024.

Graph 2
GDP growth forecasts
Annual percentual change



Data as of April 2024.
Source: IMF, World Economic Outlook, January and April 2024.

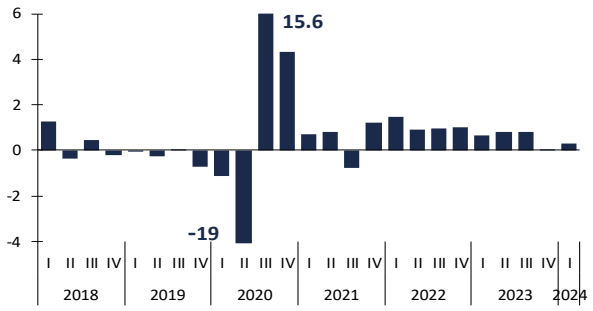
In the fourth quarter of 2023 and the first quarter of 2024, global inflation declined in most major advanced and emerging economies. This was due to lower food price pressures and, to a lesser extent, the core component. Nevertheless, some economies have shown increases in inflation in recent months, mainly due to higher energy price pressures and, in some cases, a slight increase in core inflation. Moreover, in most countries, inflation continues to be above the targets of their respective central banks.

During the period covered by this *Report*, the Federal Reserve maintained the target range for the federal funds rate between 5.25 and 5.50% at its December 2023, January, March and May 2024 meetings. In addition, in its latest monetary policy statement, the Federal Reserve emphasized its willingness to maintain its interest rate target at current levels for as long as necessary. It also mentioned that it would consider a wide range of information when assessing its monetary policy stance, including that related to labor market conditions, inflationary pressures, inflation expectations, financial markets and the international environment. In addition, it announced a slower pace of balance sheet reduction.

I.2. Domestic economic outlook

In the fourth quarter of 2023, economic activity exhibited a significant slowdown, with a quarterly seasonally adjusted growth of 0.01%, due to a weakening of the three sectors of the economy (Graph 3). In the first quarter of 2024, GDP expansion continued to show low dynamism, with a quarterly growth of 0.28%, due to the weakening of the secondary sector, and despite the good performance of the services and agricultural sectors.

Graph 3
Gross Domestic Product [s.a./]
Quarterly variation in percent

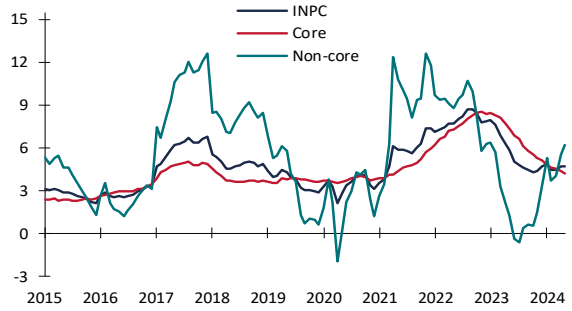


Data as of first quarter of 2024.
Source: INEGI.
s.a./ Seasonally-adjusted figures.

Annual headline inflation averaged 4.41% during the fourth quarter of 2023 and increased to 4.57% in the first quarter of this year. This increase took place in a context of declining core inflation, and is attributed

to the increase in non-core inflation. In May, the indicator registered a slight increase, reaching 4.69% (Graph 4). Going forward, the disinflationary process is expected to continue, albeit more gradually.

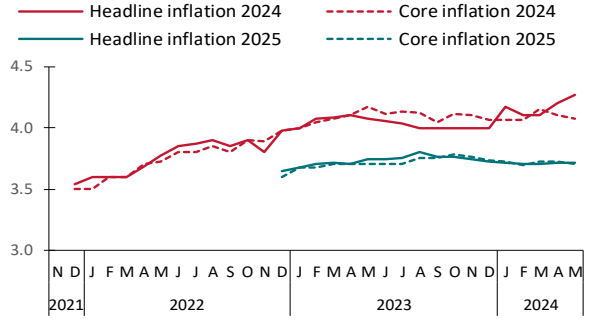
Graph 4
National consumer price index
Annual variation in percent



Data as of May 2024.
Source: INEGI.

The Banco de México's headline inflation projections, published in the Quarterly Report, January-March 2024, were 4% and 3% for the end of 2024 and 2025. In the May Survey of Private Sector Specialists' Expectations, the medians of headline inflation expectations were 4.27% and 3.71% for year-end 2024 and 2025, respectively (Graph 5).

Graph 5
Inflation expectations [1/]
Percent



Data as of May 2024.
Source: Banco de Mexico, Survey of Private Sector Economic Specialists' Expectations.
1/ Median of annual inflation expectations.

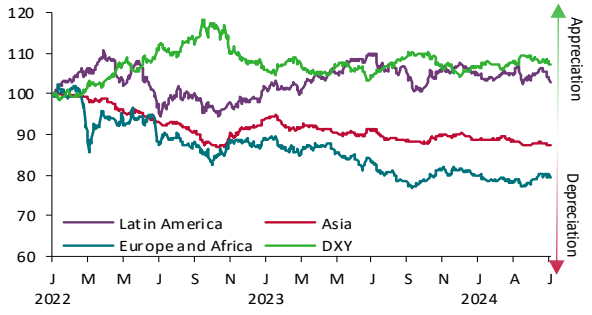
During the period covered by this *Report*, the Banco de México's Board of Governors kept the reference rate at 11.25% in its December 2023 and February 2024 meetings, reduced it by 25 basis points in its March meeting and left it unchanged at 11% in its May meeting. In its latest Monetary Policy Statement, the Board of Governors reiterated that the actions implemented would be such that the reference rate is congruent, at all times, with the path required to promote the orderly and sustained convergence of headline inflation to the 3% target in the foreseen term.

I.3. Financial markets

The performance of international financial markets has been determined since December 2023 by a disinflationary dynamic that, although it continues in its underlying and non-core components, has been slower than anticipated, which has caused a delay in the convergence of inflation to the targets established by central banks. This, combined with the resilience observed in economic data, has generated expectations of a restrictive monetary policy stance for a longer period in the main developed economies and some emerging countries.

Given this environment, emerging countries financial markets have exhibited increased volatility, which has intensified in recent weeks. The dynamic of risk aversion generated by the intensification of geopolitical conflicts has also contributed unfavorably to the performance of some financial assets, including those of emerging economies. Since December 2023, the currencies of these countries have had a negative trend, while the US dollar continues to be strong (Graph 6).

Graph 6
Foreign exchange indexes performance [1/2/]
Index (January 2022 = 100)



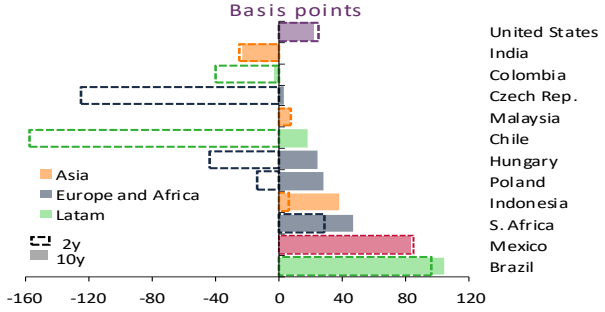
Data as of June 2024.
Source: Calculations by Banco de México with data from
1/ Latin America incluides Peru, Brazil, Colombia, Chile and Mexico. Asia includes Philippines, South Korea, China, Malaysia and India. Europe and Africa includes a Poland, Hungary, Russia, Czech Republic and South Africa.
2/ DXY refers to the US Dollar Index calculated by the Intercontinental Exchange (ICE) as a weighted average of the nominal exchange rates of six currencies: Euro, Japanese Yen, British Pound, Canadian Dollar, Swedish Krona and Swiss Franc.

Interest rates have shown differentiated movements, with an upward bias in the long term in line with U.S. rates, while in the short term, movements are due to the different stages of the monetary policy cycle in each country (Graph 7). On the other hand, most equity indexes reflect significant gains, due to the greater strength reflected in the economic publications, that have reduced the probability of an economic recession scenario (Graph 8).

Graph 7

Change in 2 and 10-year rates of emerging economy sovereign bonds denominated in local currencies

Basis points

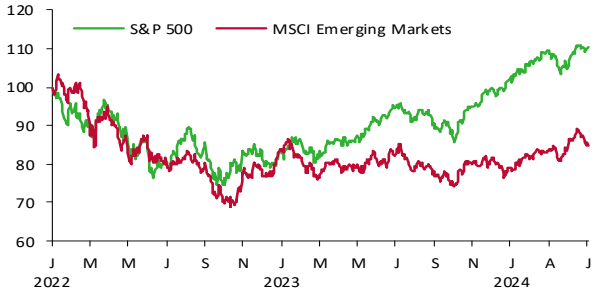


Data as of June 2024.
Source: Bloomberg.

Graph 8

Performance of equity indexes

Index (January 2022 = 100)



Figures as of June 2024.
Source: Calculations by Banco de México with data from Bloomberg.

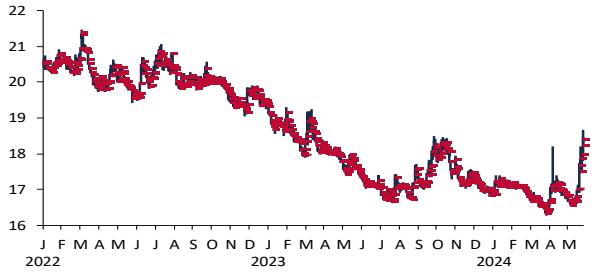
I.3.1. Foreign exchange market

The Mexican peso has depreciated since the publication of the last *Report*. The currency had maintained a markedly positive trend until mid-April 2024, reaching a minimum level of 16.26 pesos per dollar, driven by factors such as Banco de México's prudent conduct of monetary policy; the balance of external accounts; the expectation of greater foreign investment due to the relocation of production chains; significant flows of remittances; and the high interest rate differential compared to other economies. However, the peso has experienced some episodes of greater volatility in recent months associated with the intensification of geopolitical conflicts in the Middle East, and the delay in the date for the first rate cut by the Federal Reserve, as well as idiosyncratic factors. As a result, the peso has adjusted to levels close to 18.24 pesos per dollar (Graph 9).

Graph 9

Mexican peso daily trading range [1/]

Foreign exchange mexican peso-US dollar



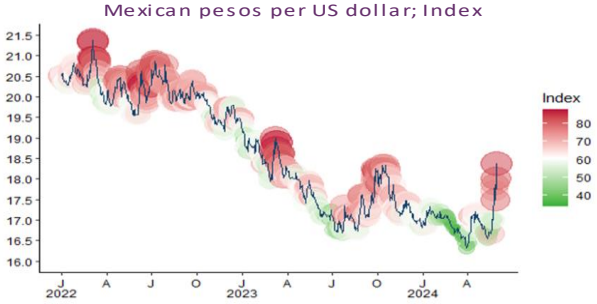
Data as of May 2024.
Source: Bloomberg.
1/ The red lines indicate the closing exchange rate, while the blue bars indicate the trading range

The foreign exchange market showed good trading conditions for liquidity, depth as well as agile transactionality (Graph 10). In addition, information embedded in options also showed improvement during most of the period, particularly highlighting the decrease in implied volatility in all maturities, a factor that was fundamental for the construction of risk-adjusted carry trade strategies (Graph 11). However, this metric has deteriorated significantly in recent weeks, in line with the depreciation experienced by the currency during April, as well as the first weeks of June.

Graph 10

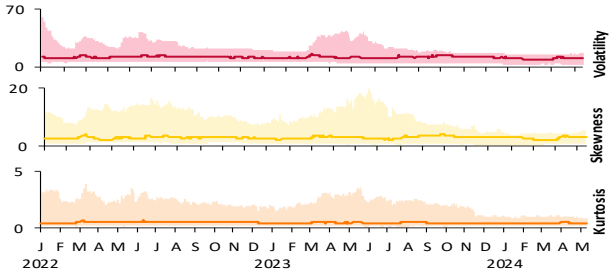
Mexican peso trading conditions index [1/]

Mexican pesos per US dollar; Index



Data as of June 2024.
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.

Graph 11
3-month implicit trading conditions on FX options for Mexico and selected emerging economies 1/
Percent

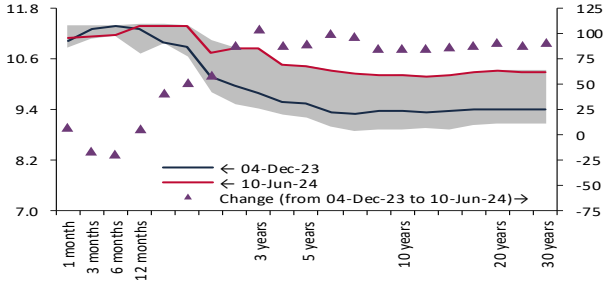


Data as of May 2024.
Source: Bloomberg.
1/ The emerging countries included in the shaded area (range between the maximum and minimum values) are Brazil, Chile, Colombia, the Philippines, Hungary, India, Indonesia, Malaysia, Poland, South Africa, and Turkey. The solid line represents the value of Mexico. The implicit skewness is measured through Risk Reversal strategies at 25 deltas. Kurtosis is measured with Butterfly strategies at 25 deltas.

I.3.2. Fixed-income market

In Mexico, since the publication of the last *Report*, the yield curve of M bonds has observed significant increases in all maturities, with adjustments up to 100 basis points in short-term M bonds (Graph 12). Thus, the yield curve accentuated its negative slope between the 30 and 3-year maturities. This behavior continues to be explained by several factors, such as: the expectation that interest rates in developed countries will remain at high levels; the delay in expectations for the beginning of the monetary easing cycle in the United States; the fact that the reference rate by Banco de México is expected to remain at restrictive levels for longer than expected at the beginning of the year; the increase in the SHCP's financing program; and recently, the increase in risk premiums associated with these securities.

Graph 12
M Bonds' yield curve 1/
Left axis: Percent
Right axis: Basis points

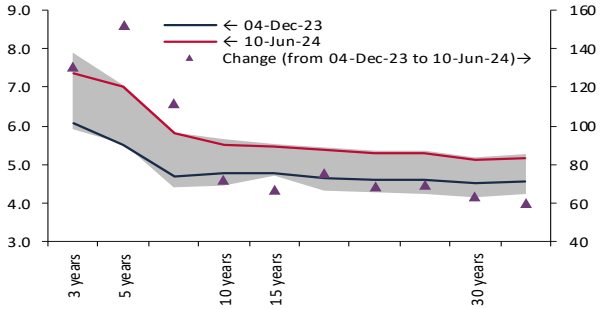


Figures as of June 2024.
Source: Calculations by Banco de México with data from PIP.
1/ The grey area is the yield curve range since December 06, 2023.

The generalized increases in the Bonos M yield curve occurred in a context in which the trading conditions of this market continued to deteriorate. Trading volume remained stable; nevertheless, liquidity conditions were reduced by the rise in interest rates and greater volatility of U.S. Treasury instruments, as well as by the capacity of the local investor base to absorb the increase in government debt issuance.

On the other hand, the real yield curve also showed increases. These were of greater magnitude than nominal rate instruments, causing some benchmark nodes to reach multi-year highs (since 2001 for the 3-year term; and since 2008 for the 10- and 30-year terms, Graph 13). Thus, breakevens decreased in all maturities during the period.

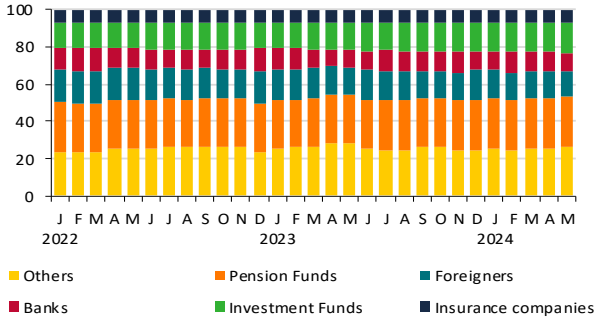
Graph 13
Inflation-linked Bonds' yield curve
Left axis: Percent
Right axis: Basis points



Figures as of June 2024.
Source: Calculations by Banco de México with data from PIP.
1/ The grey area is the yield curve range since December 6th, 2023.

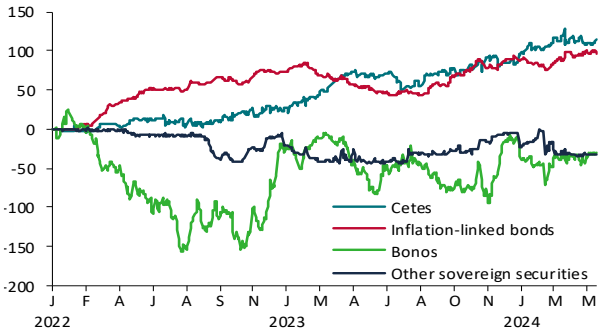
Flows into peso-denominated assets from the external sector continued to show modest inflows during the period covered by this *Report* (Graph 14). In particular, it is worth noting that during the first half of 2024, foreign investors increased their interest in building positions in treasury certificates (Cetes, its acronym in Spanish), given the attractive yield level of these securities. In particular, during the second and third weeks of December 2023, a significant inflow in Bonos M was observed, while during 2024, outflows have been moderate (Graph 15).

Graph 14
Mexican sovereign debt holdings by sector, as a percentage of the total amount outstanding 1/
Percentage



Data as of May 2024.
Source: Calculations by Banco de México with data from Indeval.
1/ Securities considered are Cetes, M Bonds, Inflation-linked bonds, and Bondes. The sector "Others" include securities purchased by Banco de México, repos with Banco de México, guarantees received by Banco de México, and other national residents.

Graph 15
Sovereign securities' investment flows by foreigners since 2022
Billion pesos

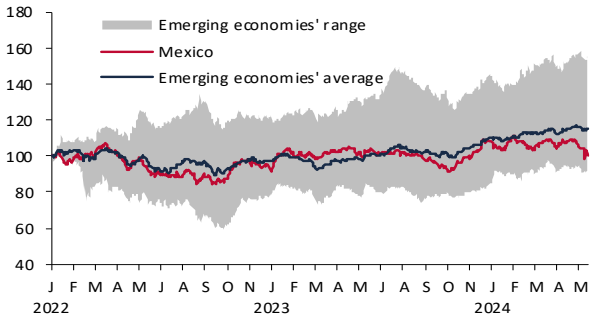


Figures as of May 2024.
Source: Calculations by Banco de México with data from Indeval.

I.3.3. Equity market

Since the last publication of this *Report,* equity markets in Mexico presented moderate negative performance with some periods of volatility. The Mexican stock market index (IPYC) had shown moderate gains during most of the period, in line with the performance of this asset class at the global level (Graph 16), given the strength in the publication of economic data and quarterly corporate reports that continue to show significant increases in terms of revenues and earnings. However, this behavior reversed in recent days. The sector with the most favorable performance has been communication services, while companies in the financial sector have presented a negative performance.

Graph 16
Equity indexes' cumulative performance for selected emerging economies 1/
Index (January 2020 = 100)



Figures as of June 2024.
Source: Calculations by Banco de México with data from Bloomberg.
1/Emerging countries included are Brazil, Chile, Colombia, Philippines, Hungary, India, Indonesia, Malaysia, Poland, and South Africa.

During the period, there was little activity in initial public offerings (IPOs) of Mexican companies. In addition, the listing observed took place on the New York Stock Exchange (NYSE), given the characteristics offered by that market, such as a broader investor base, greater availability of capital, and better valuation conditions.

Finally, regarding the positioning in this market by foreign investors, during the first half of 2024 there was an accumulated outflow focused on companies in certain sectors, such as the industrial sector.

I.3.4. Derivatives market

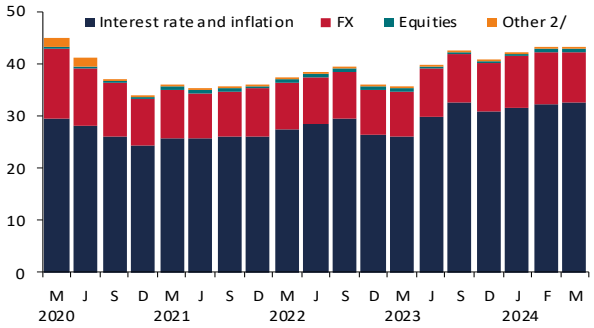
At the end of the first quarter of 2024, the Mexican derivatives market presented an increase in the outstanding amount of its transactions at notional value, with respect to September 2023, due to a higher level of *Cross Currency Swaps* (*CCS*) transactions.[1] On the other hand, interest rate *swaps* operations (*IRS*, for its initials) referenced to the 28-day Equilibrium Interbank Interest Rate (TIIE) showed a lower level of operations (Graph 17).

[1] *Cross Currency Swaps* are financial derivatives in which the parties agree to exchange cash flows denominated in different currencies. Thus, the notional reference values, as well as the interest rates to be applied to determine such flows, are referenced to the corresponding currencies. These transactions are often used to manage the foreign exchange risk associated with cross-border commercial or financial activities.

Graph 17

Outstanding notional amount by type of underlying 1/

Trillions of pesos



Data as of March 2024.

Source: Banco de México.

1/ As of the Financial Stability Report June 2021, Cross Currency Swaps (CCS) are clasificated as Foreign Exchange underlying asset.

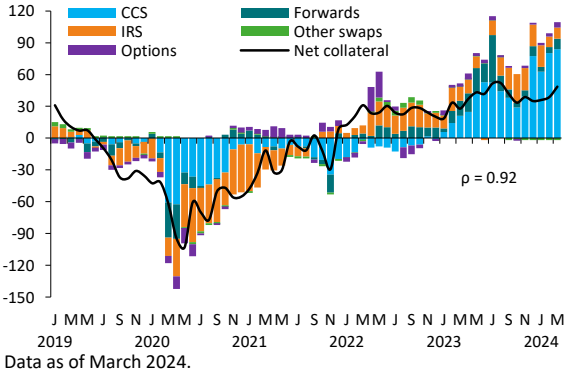
2/ Includes debt, other derivatives and commodities.

Against this backdrop, there was an increase in the market value of *CCS* transactions and, as a consequence, a higher level of collateral related to these transactions. In contrast, there was a decrease in the market value of *IRS* transactions, which resulted in a lower amount of collateral related to this type of transaction. As a net result, the ratio of total collateral exchanged to the notional amount of derivative transactions showed an increase at the end of the first quarter of 2024 (Graph 18 and Graph 19).

Graph 18

Relationship between the net value of the derivatives portfolio and the net value of collateral

Billions of pesos



Data as of March 2024.

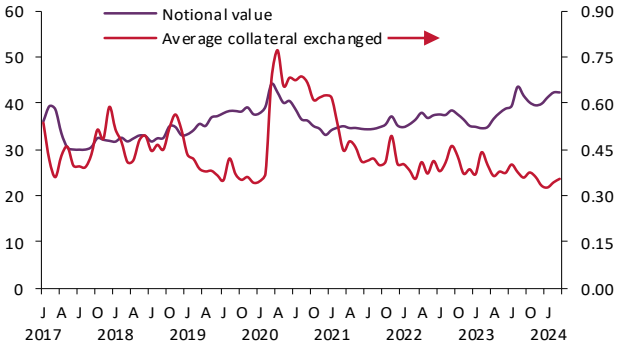
Source: Banco de México.

Graph 19

Portfolio notional value and collateral amount divided by the outstanding notional amount

Left axis: Trillions of pesos

Right axis: Percent



Data as of March 2024.

Source: Banco de México.

Box 1: Amendments to the Securities Market Law and the Investment Funds Law

I. Background

The securities markets play a vital role in the financial system of any economy, as they allow savers and investors to channel their resources to productive sources for new projects, while earning returns. In Mexico, the stock market is shallow in relation to the size of the economy, which has led to smaller companies not having access to sources of financing that would help them expand in an orderly manner.

In this context, in December 2023 the Mexican government issued amendments to the Securities Market Law (LMV) and the Investment Funds Law (LFI), whose purpose is to facilitate the securities issuance process and provide investors with a structured and flexible investment tool through specialized funds. In particular, the category of "simplified issuers" was created, which will apply to companies that can register securities and shares in the Mexican stock exchanges under a simplified scheme. The reforms also allow the incorporation of *Hedge Funds*,[1] as a new type of investment fund.

This box will detail the main elements of the aforementioned reforms and provide a context of the current size of the Mexican securities market.

II. Current situation of the securities market

Currently, the Mexican business sector only partially uses the potential financing generated by the securities market. Since this financing could be greater according to the size of the economy, it can be considered that this market is underdeveloped or still incipient. In countries with a GDP at current prices similar to Mexico's, as well as in other emerging countries, the number of issuers is greater than in Mexico (Table 1). It is noteworthy that foreign markets with a larger number of issuers tend to have a wide range of investment products and participants, which naturally leads to greater market depth. In this vein, the aforementioned reforms will contribute to increase the supply of products and fostering investor demand for them.

Table 1

Equity issuers in economies:
GDP comparables and emerging economies

Number of issuers

Country	2023	2022	2021	2020	2019
China	5,107	4,917	4,615	4,154	3,777
Canada	3,537	3,534	3,455	3,344	3,358
Rep. of Korea	2,536	2,446	2,383	2,318	2,262
India	2,370	2,168	2,053	1,958	1,955
Australia	1,914	1,976	1,977	1,902	1,952
Indonesia	903	825	766	713	668
Spain	773	1,472	2,558	2,711	2,870
Brazil	345	361	381	345	324
Chile	191	192	194	194	203
Peru	180	186	189	199	196
Mexico	**133**	**135**	**138**	**141**	**139**

Data as of December 2023.

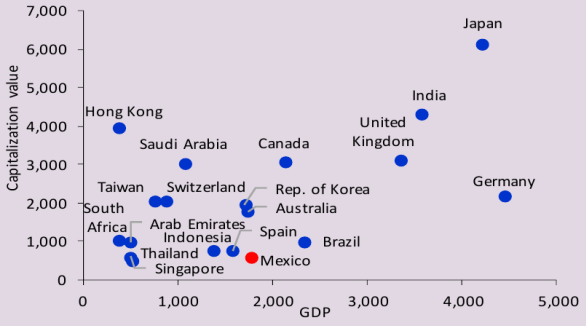
Source: Banco de México with data from Asociación Mexicana de Intermediarios Bursátiles (Market Precision Bulletins).

Another indicator of the size of the stock market is the capitalization value, which estimates the value of shares issued in the market. In December 2023, the capitalization value of the Mexican stock market was US$578 billion, which was around 31% of GDP. However, there are countries with a lower GDP and a higher capitalization, such as Australia (106% of GDP), Spain (49% of GDP) and the Republic of Korea (115% of GDP) (Graph 1).

Graph 1

Capitalization value in securities market
on stocks versus GDP at current prices

Billions of dollars



Data as of December 2023.

Source: Banco de México with data from Asociación Mexicana de Intermediarios Bursátiles (Market Precision Bulletin) and International Monetary Fund.

Although the Mexican market has seen companies entering and exiting it, in net terms the number of issuers of shares has not changed significantly since 2019. Thus, since it is considered that the Mexican securities market has room to grow, it was necessary

[1] Hedge funds offer to manage the resources of high net worth investors with a certain level of sophistication, as well as institutional investors. They invest in a variety of assets, such as stocks, bonds and derivative instruments, and use different investment strategies, which usually involve taking long and short positions.

to adapt the legal framework to generate the conditions that encourage more domestic companies to issue in Mexico.

III. Changes to the LMV and the LFI

Changes to the LMV

The Mexican securities market is currently regulated mainly by the LMV and the *Circular Única de Emisoras* (CUE). The LMV indicates the type of companies allowed to operate in the securities market, and regulates the registration and offering of securities, which, in turn, contemplates both public offerings and non-public offerings.

The LMV establishes a series of obligations for issuers before the Comisión Nacional Bancaria y de Valores (CNBV) and the stock exchange on which they list their securities through various reports. The law also establishes rules for investment advisors; stock exchange and over-the-counter trading systems (stock exchanges, companies that manage systems to facilitate securities transactions and individuals or companies that develop over-the-counter trading systems); and market infractions and prohibitions and offenses.

The changes to the LMV propose a new mechanism called "simplified modality" for registration in the *Registro Nacional de Valores* (RNV) that facilitates the procedures, time and costs for companies to obtain financing in the securities market. In particular, the amendments contemplate:

1) that the issuing companies comply with the characteristics established by the CNBV in the general provisions;

2) that the amount per issue and the cumulative amount of all issues does not exceed the maximum amount defined in such provisions;

3) that the issuances under the simplified modality can only be offered to institutional or qualified investors, which represent and aggregate the capital of several investors;

4) that the CNBV carries out the simplified registration if the issuer, together with the stock exchange, requests the registration and attaches a prior favorable opinion from the stock exchange, stating that the list of requirements set forth in its regulations is complied with.

The purpose of this modality is to encourage public issuances of securities or capital of companies that may consider that the non-simplified issuance process is too costly or time-consuming. It is noteworthy that, in order for the companies that currently participate in the securities market to continue under the current ordinary issuance regulations, they will not be able to use the simplified issuance figure.

The simplified registration will provide the portfolio of investors with shares and securities that involve a different level of risk than those of ordinary registration, so that the offering of securities of the simplified registration will only be made to institutional or qualified investors. Regarding the information for promotion, marketing or advertising purposes of the securities subject to simplified registration, the approval of the CNBV is not required.

In addition to the incorporation of the simplified modality, other amendments were made to the LMV. In particular, several requirements for the registration of investment advisors were incorporated, such as certifications to provide portfolio management services, making investment decisions on behalf of and for the account of third parties, and the possibility of requesting authorization for those advisors that are corporations to act as founding partners of investment funds.

In this way, the reform aims to provide the Mexican stock market with greater tools and flexibility and to generate adequate incentives to promote access to more targeted participants, mainly new and smaller companies. The particular characteristics that companies issuing under the simplified scheme must comply with and the securities they may issue will be determined by the secondary regulation issued by the CNBV for such purpose.

Changes to the LFI

On the other hand, in recent years, hedge funds have become very relevant players in the global financial market. In particular, the amount of resources they manage reached US$7 trillion in 2021.[2] These resources are invested considering different strategies and instruments such as equities, derivatives and other financial markets, which allow them to deepen and expand these markets. The purpose of the amendments to the LFI is to widen the range of collective investment mechanisms offered in the country, in order to be able to compete internationally in attracting investments from other markets.

In particular, the figure of limited purpose investment funds, whose purpose was to invest in assets of a preponderant activity, was eliminated, and the figure of hedge funds was incorporated, in order to seek new investment and financing alternatives. It is considered that hedge funds could be holders of the simplified issuances, since they are considered qualified investors; they usually make alternative investments and change the position of their portfolio more frequently compared to equity or debt instrument investment funds. Thus, resources may be channeled to investment projects financed through the issuance of debt or equity.

With this, hedge funds will be able to carry out the following operations:

1) acquisition or disposal of assets subject to investment;

2) repurchase and securities lending, and derivative financial instruments;

3) acquisition of the shares issued;

4) purchase or sale of shares representing the capital stock of other investment funds;

[2] Financial Stability Board (*FSB*) (2023). *The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation*. https://www.fsb.org/wp-content/uploads/P060923-2.pdf

5) obtaining loans and credits;

6) issuance of debt securities at its own expense.

Hedge funds, as well as other investment funds, must comply with the general provisions issued by the Banco de México regarding repurchase agreements, securities lending, loans and credits, and the execution of derivative and foreign currency transactions.[3] The amendments to the LFI state that the Central Bank may establish maximum limits on the amounts of the aforementioned transactions that investment funds, including hedge funds, may carry out.

The investment funds operating companies will have a new function to provide management services to the investment funds. This function consists of evaluating at least once a year the performance of the contracted service providers, establishing the mechanisms for notifying the results of such evaluation to the shareholders of the investment funds and, if applicable, the replacement of the service providers. On the other hand, investment advisors that are corporations, and are authorized to act as founding partners, may be founding partners of hedge funds.

IV. Final considerations

It is important to deepen the Mexican stock market by simplifying registration and maintenance requirements to incorporate new participants, and by incorporating new investment mechanisms. However, the flexibility of the issuance process must be balanced with the risks involved. This can be done by professionalizing the companies' corporate governance structure and disclosure of information in order to ensure financial stability. Banco de México will seek that, in the general provisions associated with repurchase agreements, securities lending and derivative transactions, conditions are established that favor a balance between the flexibility that hedge funds may have to carry out different investment strategies and the controls or restrictions imposed on them, in order to limit, reduce or mitigate the risks associated with their strategies. In this vein, in order to encourage demand for issuances made under this simplified scheme, secondary regulation will seek to provide as much information on such issuers and establish requirements on their corporate governance, without this representing an additional cost for them.

References

Bussière, M. et. al. (2015). Commonality in hedge fund returns: Driving factors and implications. Elseiver.

FSB (2023). *The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation.* https://www.fsb.org/wp-content/uploads/P060923-2.pdf

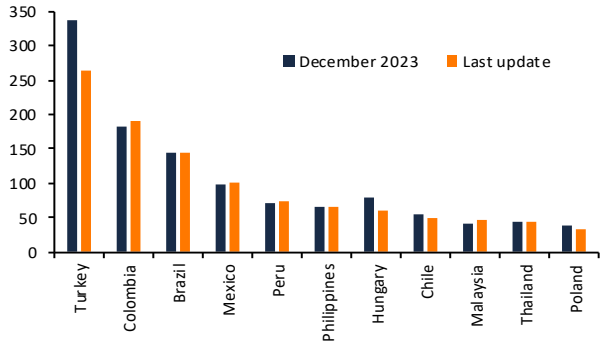
Senate of the Republic. LXV Legislature (2023) Initiative with draft decree reforming, repealing and adding various provisions of the Securities Market Law and the Investment Funds Law.

[3] In the case of other transactions, investment funds, including hedge funds, must comply with the general provisions issued by the CNBV.

I.3.5. Risk premiums

Mexico's credit risk premiums, as measured by the price of the credit default *swap* (*CDS*), have been stable during the period covered by this *Report*, in line with the rest of the emerging countries (Graph 20).

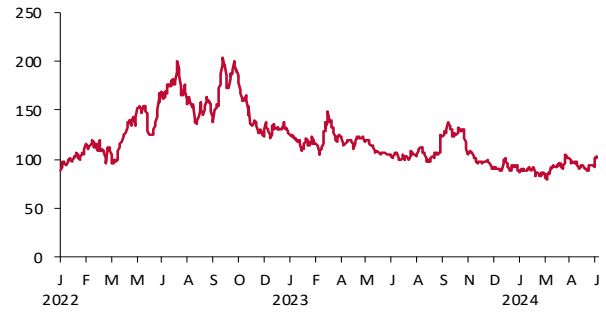
Graph 20
5 year CDS for selected emerging economies
Basis points



Data as of June 2024.
Source: Bloomberg.

Thus, the 5-year *CDS* of Mexico's sovereign debt has fluctuated around 100 basis points (Graph 21).

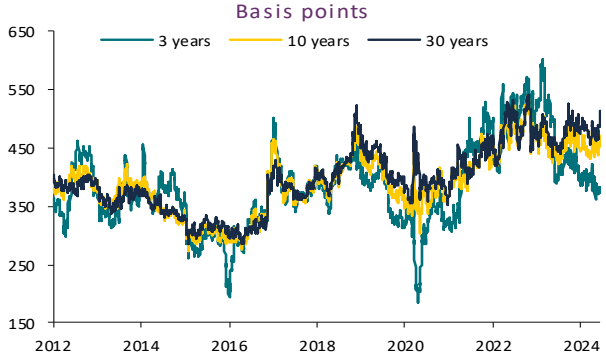
Graph 21
5-year Mexico's CDS
Basis points



Data as of June 2024.
Source: Bloomberg.

In terms of inflation, both, compensation for inflation and inflationary risk have shown favorable dynamics, especially in the medium and long term, and are close to 480 basis points. On the one hand, short-term breakevens have consolidated at levels below 400 basis points (Graph 22).

Graph 22
Sovereign breakeven inflation rate
Basis points



Data as of June 2024.
Source: Calculations by Banco de México with data from PIP.

I.4. Macro-financial risks

Global financial conditions remained relatively stable during the first quarter of the year. However, there was a tightening during April in response to some persistence in U.S. inflation and information indicating that employment and economic activity remain strong in that country, as well as the possibility of an escalation of the geopolitical conflict in the Middle East. Subsequently, as new information became available, there was an improvement during May that almost reversed this tightening.

Against this backdrop, the Mexican financial system maintains a solid and resilient position. In general, its potential vulnerabilities are considered to be limited, supported to a large extent by a commercial banking sector with levels of capital and liquidity that exceed regulatory minimums. However, unexpected or severe events could affect the proper functioning of the Mexican financial system, and therefore it is important to monitor the risks that could be faced in the current complex and uncertain global macro-financial environment.

Financial conditions more restrictive and/or for longer than expected

Given the persistence of inflation in some countries, particularly in the United States, in a context of resilient economic activity and employment, the expected trajectory for its reference rates at present is higher than the one anticipated at the end of 2023, thus it is possible that financial conditions may tighten or, at least, remain restrictive for a longer period than previously anticipated.

Likewise, abrupt changes in expectations for global monetary policy, without orderly adjustments in the financial markets, could generate periods of high volatility and other challenges that affect their proper functioning and have an impact on the state of financial conditions.

The materialization of this risk could have adverse implications for the global economy and the stability of its financial system. In the first instance, the increase in financing costs would aggravate certain pre-existing vulnerabilities in some countries, including high levels of indebtedness, both public and private, and others present in some institutions or segments of the financial system derived from their exposure to certain higher-risk economic sectors. Furthermore, in high indebtedness conditions, the permanence of high interest rates for a longer period of time could increase financial institutions' credit risks, including for those operating in the country. Likewise, an environment of high interest rates for a longer period than expected could have adverse implications for the balance sheet of some financial institutions, given the downwards pressures that this would generate on the market valuations of some of their assets.

A worsening of geopolitical tensions and/or trade conflicts

The expected performance of the global economy and financial markets could be influenced by a number of factors. Among them, the possible escalation of geopolitical tensions, including those related to the war in the Middle East, as well as the war between Russia and Ukraine. Furthermore, given the political and electoral situation in some jurisdictions, including the upcoming elections in the United States, the possibility of trade conflicts continuing or even worsening in the short term cannot be ruled out.

In addition to the downwards pressure on economic activity and upward pressure on inflation that these shocks would generate, risk aversion could also increase in international financial markets and, therefore, contribute to a volatile and uncertain macro-financial environment. In this case, increases in the associated risk premiums and, consequently, generalized increases in the cost of financing would be expected. This would lead to higher non-performing loan ratios and lower credit growth, deteriorating the soundness and strength of the national financial system.

Occurrence of a systemic event with implications for the global financial system

Given the characteristics of the current political, geopolitical, economic and financial situation, it is possible that the probability of a global systemic event has increased during the last six months. If such an event were to materialize, it would have significant effects in several areas, with potential implications for global financial stability.

In particular, financial conditions would deteriorate immediately following the ensuing peaks in volatility and risk aversion in financial markets. These effects could be transmitted and even amplified through the financial system and markets in a context of pre-existing vulnerabilities, including high levels of indebtedness, both public and private, and the high exposure of some financial institutions or sectors to riskier economic sectors.

Unanticipated adjustments in credit ratings for the sovereign or Pemex debt

Since the publication of the last *Report*, the main rating agencies ratified their Mexican sovereign debt ratings, as well as their outlook. In contrast, Pemex's debt rating was downgraded by two notches, maintaining its negative outlook by one of the main agencies, while another upgraded its outlook from negative to stable (Graph 23).

As for the sovereign, the agencies highlight that factors like a prudent macroeconomic framework, robust economic growth, lower inflationary pressures and, in general, a stable economy, as well as opportunities to benefit from the structural process of nearshoring, support its investment grade. However, according to the same agencies, the sovereign credit rating still faces some important challenges, among which stand out those related to the possible need for fiscal consolidation after a higher deficit this year, especially in a context of continued financial support to Pemex, as well as unexpected setbacks in macroeconomic management or in relations between T-MEC partners given the uncertainty associated with the electoral process in the United States.

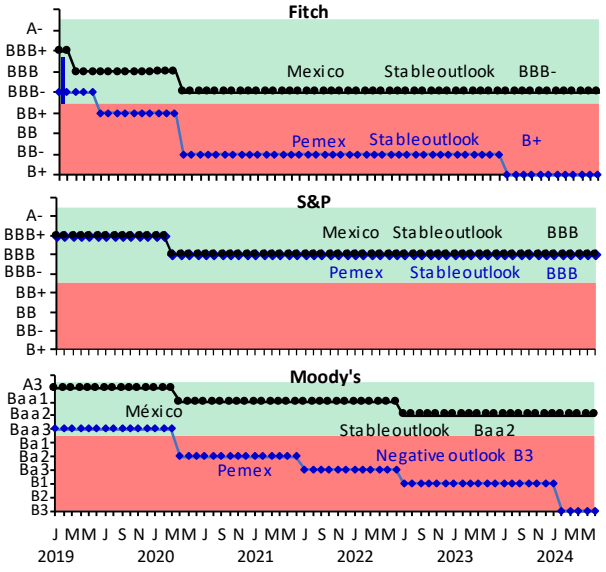
With respect to Pemex, the rating agencies highlight two aspects that explain the change in outlook and rating during the period. On the one hand, they underline the commitment to inject capital into the company; while, on the other hand, they point out the challenges it faces derived from the increase in its business risk as the company continues to expand its refining and production capacity, the lack of measures to reduce its exposure to environmental, social and corporate governance (ESG) risks, as well as its current financial difficulties.

In a scenario in which unexpected adjustments to national ratings occurred, risk premiums associated with Mexico would be expected to increase, which could lead to a decrease in net capital flows to the country and, more generally, a deterioration in its macro-financial risks profile.

Graph 23

Mexico and Pemex's foreign currency rating performance 1/

Fitch, S&P and Moody's scales



Data as of June 2024.

Source: Fitch, S&P, and Moody's scale.

1/ The green areas show investment-grade ratings, while the red areas show speculative-grade credit ratings.

II. Update on challenges of the economic environment

Tax on carbon dioxide (CO_2) intensive imports into Europe and credit risk for companies

In some regions of the world, mainly in advanced economies, there have been discussions about the possibility of implementing a tariff on imports with a high content of CO_2. The objectives are to prevent the relocation of companies from these economies and their loss of competitiveness, as well as to discourage the emission of CO_2 by countries with less restrictive environmental regulations.[2]

This debate is more advanced in the European Union (EU), where there have been important changes in recent months. In May 2023, the regulation of the Carbon Border Adjustment Mechanism (*CBAM*) was approved, and in October the transition phase began. During this phase, member countries must report the carbon emissions of imported goods, which will conclude in 2025. From January 2026, *CBAM* certificates will have to be purchased for imports. At the same time, other advanced economies, such as the United Kingdom, are discussing the precise list of products that would be included in a tariff with similar characteristics.

Tariffs on imports with a high content of CO_2 could have an unanticipated impact on companies' costs and revenues. This could increase the risk of credit default, generating transition risks for the financial system of countries exporting to the EU. Therefore, the exposure of Mexican corporate credit to transition risks related to the tariff is being analyzed.

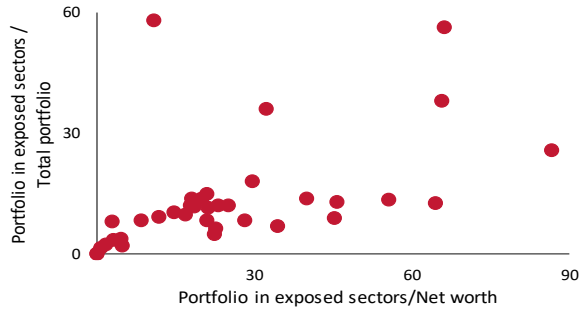
Credit exposure is considered for sectors that meet two requirements: (a) they directly or indirectly generate high levels of CO_2 and are therefore exposed to transition risks in a generic way, regardless of *CBAM*; and (b) they export to the EU and would therefore be affected by the tariff. To identify the sectors that comply with (a), the same three groups of economic sectors considered in the transition risks

[2] Box 8 "Tax on carbon-intensive imports and transition risks in Mexico" in the Financial Stability Report, December 2021, provides a more detailed conceptual explanation of the reasons that could be behind the tariff. This box explains that policies such as the tariff may increase production costs in the countries that adopt them, thereby inducing a substitution of domestic products for goods produced in countries with cheaper but more polluting technologies. Also, it mentions that higher costs may encourage the relocation of companies to regions with less strict environmental policies (a problem known as "carbon leakage"). Thus, greenhouse gas (GHG) emissions could shift from those countries that adopt policies to those that do not, reducing the impact on GHG emissions on a global scale.

section of this *Report* are used:[3] (i) sectors directly exposed because they generate high emissions of CO_2 (Group 1); (ii) sectors exposed indirectly because they use inputs that generate high emissions (Group 2); and (iii) sectors exposed indirectly because their demand largely depends on polluting sectors (Group 3).[4]

For the total commercial banking sector, the portfolio exposed to tariffs is limited, representing approximately 12.3% of the total corporate portfolio and 20% of net capital. However, there is a group of banks with a high portfolio exposure, both as a percentage of their net capital and as a percentage of their total corporate portfolio (Graph 24). The participation of these banks in the system is small. Their exposure to the tariff comes, to a greater extent, from the credit they grant in sectors directly exposed to transition risks (Group 1).

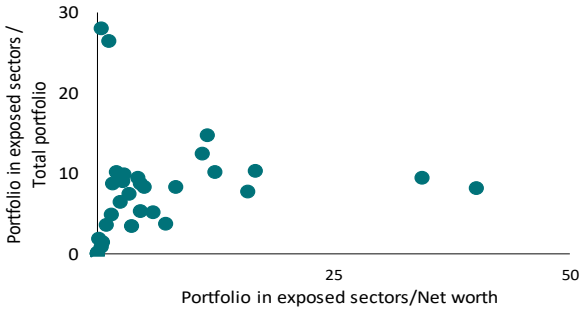
Graph 24
Tax on imports with high carbon dioxide content in Europe and credit risk to companies: all companies
Percent



Data as of December 2023.
Source: Banco de Mexico, Comtrade, CNBV and INEGI.

There is another group of banks with high portfolio exposure, as a percentage of their net capital, but not as a percentage of their total corporate portfolio. Among these intermediaries, there are banks with higher participation in the system. In addition, in the portfolio of most of them, there is a high representation of small and medium-sized enterprises (SMEs), which tend to have fewer resources to cope with shocks and transition, in general, and could therefore be more affected if transition risks materialize (Graph 25).[5] The exposure of these banks comes mainly from the credit they grant in Group 2 sectors, such as agriculture and forestry, whose production requires a lot of energy. In other words, this exposure comes mainly from companies exposed to transition risks, but only indirectly. In addition, their exposure decreases when considering that, although some of the companies they lend to export to the EU, and would therefore be affected by tariff, this region is not their main export destination.[6]

Graph 25
Tax on imports with high carbon dioxide content in Europe and credit risk to companies: SMEs
Percent



Data as of December 2023.
Source: Banco de Mexico, Comtrade, CNBV and INEGI.

Evolution of uncertainty

In the first half of 2024, there was little change in the level of uncertainty associated with economic policy, according to the timely index prepared with information from news *websites.* This index, although with some variations, remains at levels close to those observed at the end of 2023 (Graph 26).

[3] Three groups of sectors with different types of exposure to transition risks are considered based on the scopes of the Greenhouse Gas Protocol (GHG Protocol). The definition of Group 2 is related to Scopes 2 and 3 of the GHG Protocol, as these scopes consider that companies can generate emissions even when they are physically located in the plant that produces the inputs and not in the company that consumes them. In other words, they can emit indirectly through the use of inputs. The definition of Group 1 is directly related to the definition of Scope 1. This grouping of sectors appeared for the first time in the December 2020 version of this Financial Stability Report.

[4] To identify the sectors that export to the EU, the 2022-2023 period from Comtrade is used (for sectors where INEGI records information for 2022-2023 but Comtrade does not, 2015-2020 is used).

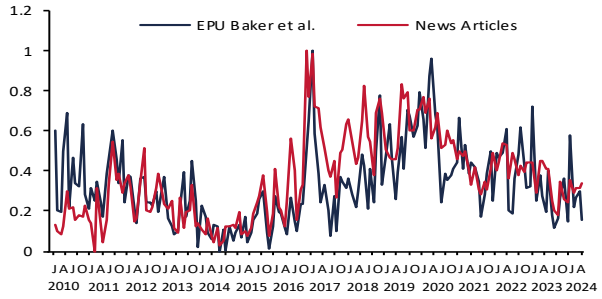
[5] Evidence from Eggers (2020) and Gourinchas, Kalemli-Özcan, Penciakova and Sander (2020), among others, suggests that SMEs tend to be less prepared to face economic shocks because they have fewer internal resources and more limited access to credit.

[6] In an additional exercise, the quartile of sectors that, although they export to the EU, rely less on this region as a destination for their exports is excluded from the exposed portfolio. In this exercise, the banks' exposure decreases more than that of the rest.

Graph 26

Economic Policy Uncertainty Index[1/]

Uncertainty level



Data as of May 2024.
Source: Banco de México.

1/ The methodology proposed by Baker et al. (2016), was used to calculate the Economic Policy Uncertainty index based on publications from news websites. In particular, the aggregated number of news articles including terms related to uncertainty, policy, and economy, is calculated. This series is divided by the total number of news released in each period and then is rescaled between 0 and 1, based on January 2010 to May 2024 period. The articles considered are extracted from various newspaper websites, in sections related to economics, finance, markets and business: Capital México (Economía), Diario 24 horas (Negocios), EFE Noticias (México), El Economista (Economía, Finanzas, Mercados), El Financiero (Economía, Mercados), El Heraldo (Economía), El Sol De México (Finanzas), El Universal (Cartera), Excélsior (Economía, Mercados), Forbes México (Economía, Finanzas, Negocios), Reporte Índigo (Economía), La Crónica (Negocios), La Jornada (Economía), La Razón (Negocios), Milenio (Negocios), Reforma (Negocios) and SDP Noticias (Negocios).

During the period, among the main factors that contributed to the level of the indicator was the slight increase in inflation in Mexico and the United States observed during March, which generated expectations of interest rates remaining at high levels for a longer period. Also noteworthy is the reduction in economic growth expectations for Mexico due to a potential slowdown in the U.S., as well as the deterioration in the perception of security within the country. On the international front, the primary factors of uncertainty are the geopolitical conflicts around the world, mainly in the Middle East.

III. Policy measures implemented to preserve the sound development of the financial system

The following actions were carried out as part of the work of the financial authorities to continuously improve the regulatory framework, in order to keep it robust and up to date, as well as to adopt the best practices and international standards.

Regulation under the aegis of Banco de México

Regarding the rules applicable to repurchase agreements (repos), in May 2024 Banco de México updated its rules to incorporate international standards and practices for these transactions. The aforementioned, in order to foster the development of the domestic repo market, by expanding the types of transactions that could be carried out, including: the substitution of securities; the possibility of contracting tri-party agent's post-trade services; forward starting repo; open repo; evergreen repo; and the recognition of state-owned companies and legal entities with an investment grade rating as authorized counterparties to carry out repo repurchase agreements (See Box 2).[7]

In May 2024, an amendment to Circular 4/2012 was issued for public consultation with the purpose of allowing Banco de México to deliver or directly exchange information on derivatives transactions with foreign trade repositories (TR). This will contribute to strengthen international cooperation in terms of risk identification and aggregation of exposures. With this amendment, Banco de México seeks to continue addressing the recommendations of the Financial Stability Board (FSB) regarding the elimination of barriers that prevent or limit the cross-border flow of information with trade repositories on derivative transactions settled in central counterparties. This will help establish better conditions to receive information on derivative transactions carried out by domestic counterparties registered in such *TR*. With this proposal, Banco de México may only exchange information with *TR* whose regulatory framework produces similar or equivalent results to those of the Principles applicable to financial market infrastructures issued in 2012 by the Committee on Payment and Settlement Systems of the Bank for International Settlements and the Technical Committee of the International Organization of Securities Commissions (*IOSCO*) or those principles that, as the case may be, replace them. Among other aspects, said Principles contemplate the information protection and confidentiality measures to be observed by the *TR*.

[7] Circular 7/2024 of Banco de México, published in the Official Gazette of the Federation on May 16, 2024.

Box 2: Rules for repurchase agreements: modifications to incorporate international standards and practices

I. Background

The repurchase market in Mexico represents an important source of short-term financing for banks and brokerage houses.[1] In particular, during the first quarter of this year, transactions for an average amount of 2.8 billion pesos were carried out daily. In this context, 95% of repurchase transactions carried out by credit institutions and brokerage houses, in which these entities receive financing, are carried out with a maturity of one business day. The instruments most used as collateral are high credit quality securities, such as government securities and securities issued by IPAB, which guarantee 93% of repurchase transactions.

The repurchase agreement is a cheaper source of financing, since the financial entity that receives financing (seller) grants a collateral or guarantee that reduces the credit risk for the granting party (buyer), collateral which, as previously mentioned, in most cases is a high credit quality asset. It also allows the buyer to diversify its credit risk, since it receives a guarantee constituted in securities issued by a third party whose risk is not correlated with that of the seller. This allows the repo rate to be very close to the monetary policy target rate.

The repurchase market also makes it easier for central banks to grant financing to credit institutions secured by a collateral.

In this context, in order to align national regulations with international practices and standards for the execution of repurchase agreements, as well as to foster the development of this market in Mexico, on May 16, 2024 Banco de México issued amendments to the Rules applicable to repurchase agreements (Rules).[2] Thus, this box is intended to provide a summary of the objectives of the new repurchase agreement regulations, and a description of the new types of transactions that are intended to be encouraged.

II. Amendments to the Repurchase Agreement Rules

The amendments to the Rules seek to: i) increase the depth of the repurchase transactions market in Mexico; ii) increase the time horizon in which repurchase transactions are carried out; iii) allow new participants to become part of this market; and iv) include new types of repurchase transactions that help to make operating processes more flexible.

Inclusion of new repurchase agreement modalities

When the amendments to the regulation come into force, the following repurchase agreements will be allowed:

i) Open repo. In accordance to international practice, these transactions have no repurchase date, and either party has the right to terminate them by notifying its counterparty. Usually, the period between the notice date and the termination date of the repurchase agreement does not exceed two business days, as agreed in the corresponding contract. During the life of the repurchase agreement, it is not necessary for the parties to exchange the financing and the collateral of the transaction, such exchange takes place only at the beginning and at the repurchase date of the transaction.

For purposes of the Mexican Rule, in order to keep the possible risks of this type of transaction under control, it was decided that the participants in these transactions must agree a repurchase date of no more than three hundred and sixty-five days.

This type of operation will allow financial institutions to manage financing and collateral received and delivered more efficiently, since it reduces operating costs by eliminating the need to exchange cash and collateral on a daily basis. This reduction in the operating cost of collateral management will allow repurchase agreements to be carried out for longer terms than those currently observed.

ii) Evergreen repo. This refers to operations that are automatically extended, but for which any of the participants has the right to terminate it in advance, prior notice to its counterparty. Unlike open repos, in this modality the period between the date of notice and the maturity date is usually more than thirty days.

It should be noted that in international practice, the parties agree on a specific repurchase date.

This repurchase agreement will provide entities with options to manage their liquidity positions more efficiently, as well as guaranteeing the financing term.

[1] One way to define repurchase transactions is through the description of their operation. Thus, Article 259 of the General Law of Credit Instruments and Transactions establishes that in a repurchase transaction, "the buyer acquires for a sum of money the ownership of debt instruments, and undertakes to transfer to the repurchased party the ownership of as many other instruments of the same kind, within the agreed term and against reimbursement of the same price plus a premium. The premium remains for the benefit of the buyer, unless otherwise agreed."

[2] Rules to be followed by credit institutions, broker-dealers, investment funds, specialized retirement fund investment companies, general deposit warehouses, insurance companies, surety companies and regulated multiple purpose financial companies that maintain equity links with a credit institution and the Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero, in their repurchase transactions.

iii) Forward starting repo. The previous regulation established that when a repurchase transaction was agreed, the exchange of the securities and the financing had to take place no later than the fourth business day after the transaction date. As of the entry into force of the amendment to the Rules, the parties may agree that such exchange can be made after the fourth business day, with no maximum term for such delivery, which is intended to allow participants to manage more efficiently the financing received or granted.

In order for financial institutions to adequately manage the financial and operational risks that could arise from these transactions, they must comply with the requirements for derivative transactions established in Banco de México Circular 4/2012.

Other amendments to the Rules

Previously, the Rules recognized repurchase agreements only as transactions in which the ownership of securities was transferred in exchange for a cash amount, and therefore considered that the same securities originally agreed as collateral would be held during the life of the transaction. It was also established that only one type of securities could be used as collateral. The amendments to the Rules recognize, as in the international practice, that repurchase agreements can also be considered as a secured financing transaction, in which the collateral may be modified according to the terms agreed between the parties, as long as it covers at all times the exposure of the buyer to the risk of default. These practices are recognized in the Rules through the following amendments:

i) Substitution of securities. Previously, the regulation established that during the term of a repurchase transaction, it had to be guaranteed by the same security, which could restrict the term for which such transactions were agreed, since the financial entities could not use such security in another transaction.

The amendments to the Rules consider the possibility that financial institutions may agree by contract that during the term of the repurchase agreement, the entity receiving the financing may substitute the securities delivered as collateral at the beginning of the transaction. In this way, repurchase agreements may use collateral with a shorter term than the agreed repurchase agreement, which means that longer term repurchase agreements may be executed without being limited by the maturity of the collateral securities.

The contract must also establish the characteristics of the securities that may be used for substitution.

Finally, when the financial entities carry out open and evergreen repos, they can substitute the securities during the term of such agreements.

ii) Use of tri-party agents. In order to make the operating processes involved in the management of repurchase agreements more flexible and efficient, particularly those agreed with longer terms, the amendments to the Rules include the possibility for financial institutions to contract the services of domestic or foreign credit institutions or securities depositories, known as tri-party agents. Such tri-party agents can carry out custody and administration services of the securities under repurchase agreements, which include: substituting the securities when it has been agreed between the parties, managing the additional guarantees for margin calls and the settlement of the transactions. [3]

iii) Recognition of state owned companies and legal entities with an investment grade credit rating as counterparties authorized to carry out repurchase agreements. This amendment to the Rules will allow this type of companies to expand their financing possibilities in an orderly manner, since in order to keep limited the credit risk that this type of transactions could generate to the financial system, the Rules establish that the financing received by these companies must be guaranteed by government securities.

V. Final considerations

Repurchase agreements are used by credit institutions and brokerage houses in order to have different financing options. Thus, the amendments to the Rules seek to broaden these financing possibilities through practices that improve efficiency in the execution of transactions, as well as to expand their use to other economic agents. The aforementioned amendments may help repurchase agreements to be agreed for longer terms, since they seek to reduce collateral management costs.

References

Banco de México (2024). "Reglas a las que deberán sujetarse las instituciones de crédito, casas de bolsa, fondos de inversión, sociedades de inversión especializadas de fondos para el retiro, almacenes generales de depósito, instituciones de seguros, instituciones de fianzas, y sociedades financieras de objeto múltiple reguladas que mantengan vínculos patrimoniales con una institución de crédito y la Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero, en sus operaciones de reporto."

[3] The methodology for the constitution of additional guarantees for margin calls is described in section 8.1 of the Rules.

ICMA Frequently Asked Questions on Repo https://www.icmagroup.org/market-practice-and-regulatory-policy/repo-and-collateral-markets/icma-ercc-publications/frequently-asked-questions-on-repo/

ICMA ERCC Guide to Best Practice in the European Repo Market, Zurich, 2023. https://www.icmagroup.org/assets/ERCC-Guide-to-Best-Practice-November-2023-FINAL-2-Nov.pdf

Regarding reference interest rates, Banco de México began to publish the Compounded in advance Equilibrium Interbank Interest Rate (TIIE) in local currency (terms of 28, 91 and 182 days), so that financial institutions can use it as a reference for loans denominated in local currency and liabilities denominated in local currency. Likewise, at the end of 2023, this central institute published the calculation methodology to determine such rates and made modifications to some of its provisions so that financial institutions may use it as a reference in loans denominated in local currency and in domestic currency deposit transactions.[8]

In order to provide greater clarity and certainty on the application of certain elements of the rules for derivative transactions and harmonize their treatment with international practices, Banco de México modified some guidelines used in the determination of bilateral initial and variation margin requirements for derivative transactions that are not centrally cleared. Among others, it established the counterparties and transactions that are not required exchange margins; the characteristics that the internal model must fulfill; the calculation of variation margins; and the minimum amounts per type of asset. Banco de México also extended the adoption dates of this requirement so that institutions subject to its compliance have the appropriate conditions for the proper implementation of this international standard in the derivatives market in Mexico.[9]

Regarding the requirements to be met by entities that intend to carry out derivative transactions, Banco de México modified the management, operation and internal control requirements. These modifications address various aspects identified in the exercise of supervisory powers, and incorporate the recommendations and principles on risk management and control of the Basel Committee on Banking Supervision (BCBS). The amendments will come into effect in two phases: the first in December 2024 and the second in June 2025.[10]

With respect to central bank funding that may be granted to commercial banks with liquidity needs, Banco de México issued new rules through which the Permanent Liquidity Facility (FPL, its acronym in Spanish) was implemented. The FPL replaced the Additional Ordinary Liquidity Facility (FLAO, its acronym in Spanish). The objectives of the new rules are to speed up the granting of funds, consider a broader set of collateral, include a longer maturity to cover different liquidity needs and, at the same time, promote an adequate risk management scheme and limit the risk for Banco de México (Table 1).[11] It is noteworthy that the FPL is not an alternative to market funding for commercial banks, but rather seeks to address temporary liquidity needs.

[8] Circular 15/2023 and Circular 16/2023 of Banco de México, published in the Official Gazette of the Federation on December 13, 2023.

[9] Circular 17/2023 of Banco de México, published in the Official Gazette of the Federation on December 13, 2023.

[10] Circular 19/2023 of Banco de México, published in the Official Gazette of the Federation on December 21, 2023.

[11] Circular 1/2024 of Banco de México, published in the Official Gazette of the Federation on February 12, 2024.

Table 1

Comparative of the main characteristics between FLAO and FPL

Characteristic	FLAO	FPL
Name	Ordinary Additional Liquidity Facility (FLAO).	Permanent Liquidity Facility (FPL).
Process	Requires the signature of the general manager.	Requires only the signature of a legal representative with powers to carry out administrative acts.
Eligible assets	Monetary Regulation Deposit, deposits at Banco de México (MXN and USD); Debt securities[1] in MXN or UDIS with a rating greater than or equal to MXAA; Debt securities denominated[2] in eligible currencies[3] with a rating greater than or equal to BBB.	Adds the collateral accepted for Open Market Operations; Adds F and G Bonds and MS Bonds; Eliminates certain restrictions on trusts associated with trust certificates to be eligible; Adds the rights over mortgage loan portfolios granted by INFONAVIT and ISSSTE; Increases the set of accepted issuers in eligible currencies.
Cost	Interest rate of 1.1 times the target for the monetary policy interest rate.	Interest rate of 1.06 times the target for the monetary policy interest rate.
Term	1 bank business day.	30 calendar days with prepayment option.

Source: Banco de México.
1/ Securities must be issued by: parastatal entities; Federal Government; development banks; international multilateral organizations; securities issued by states and municipalities; non-financial legal entities outside the group of the requesting bank; securities backed by mortgage loans or rights of parastatal companies; commercial banks other than the requesting bank; and securitized instruments of the above.
2/ The securities must be issued by: Foreign governments or central banks and other persons indicated in the preceding paragraph.
3/ Eligible currencies are: AUD, CAD, USD, NZD, EUR, GBP and JPY.

Banco de México, in its capacity as financial agent of the Federal Government, in order to comply with the Sustainable Development Goals included in the 2030 Agenda approved by the United Nations General Assembly and to encourage sustainable investments in national territory, modified the "Rules for the swap of government securities" to include debt instruments issued by the Federal Government, such as Bondes G and Bonds MS, denominated in national currency, at fixed and variable interest rates, aligned with ESG criteria, in the set of eligible securities for swap transactions.[12]

Consistent with the extension of the facilities granted by the National Banking and Securities Commission (CNBV, its acronym in Spanish) to financial institutions to continue supporting customers affected by Hurricane Otis, Banco de México extended until October 31, 2024, the term of suspension on the minimum payment requirement for customers residing in the affected areas.[13]

Regulation under the aegis of other authorities

Between December 2023 and March 2024, amendments were made to the Single Banking Circular (CUB, its acronym in Spanish) of the CNBV to:

i. Simplify the categories of banking licenses in order to make the operation of commercial banking institutions in the financial system more efficient; expand the catalog of operations that commercial banks may carry out in accordance with the corresponding minimum subscribed and paid-in capital, as well as to avoid asymmetries within the financial sector. In particular, the categories of banking licenses were simplified with respect to the relationship between minimum capital requirements and the operations that may be carried out by other financial institutions.[14]

ii. Clearly identify the entry and exit of foreclosed assets within the reporting regulatory returns of foreclosed assets that institutions send to the CNBV.

iii. To clarify, in the calculation of Tier 1 equity applicable to commercial banks, the treatment for certain elements that must be subtracted, such as prepayments or expenses whose recognition in equity is deferred in time and whose remaining term is equal to or less than one year. The modification is consistent with the accounting criteria established in the Financial Reporting Standards (FRS) C-5 "Prepaid expenses".[15]

[12] Circular 2/2024 of Banco de México, published in the Official Gazette of the Federation on February 15, 2024.
[13] Circular 5/2024 of Banco de México, published on April 30, 2024.
[14] RESOLUTION amending the General Provisions applicable to credit institutions, published in the Official Gazette of the Federation on February 9, 2024.
[15] RESOLUTION amending the General Provisions applicable to credit institutions, published in the Official Gazette of the Federation on February 7, 2024.

iv. Exempt the financing granted to central governments of foreign countries and their central banks from the Large Exposures limits, as long as such governments have a risk grade of 1 according to the credit rating.[16]

In addition, the Securities Market Law (LMV, its acronym in Spanish) and the Investment Funds Law were amended to simplify and make more flexible certain provisions related to the issuance and registration of securities (See Box 1). This will provide an incentive for new companies to enter the securities market through the issuance of debt or shares and will create a new investment vehicle for portfolio management strategies that generate higher yields than the market average. Although the regulation on the characteristics of simplified issuers has not been published, the LMV established the basis for the framework called Simplified Registration, which would allow the issuer to request the issuance through its placement broker (after receiving a favorable opinion from the corresponding stock exchange), without requiring authorization from the CNBV. The simplified issuance must obtain and maintain its registration by complying with the following: i) issued by simplified issuers; ii) not exceeding the maximum amount established; and iii) placement and trading must be restricted exclusively to institutional or qualified investors. Likewise, the regime applicable to the Stock Market Investment Promotion Corporations (SAPIB, its acronym in Spanish) was modified so that they could maintain this status indefinitely without having to adopt the Stock Market Corporation (SAB, its acronym in Spanish) status after ten years. In addition, restrictions for differentiated shares will be allowed so that issuers can maintain control, in amounts that may exceed the previous 25% limit of equity for this type of shares. In this context, the characteristics of the new Simplified Registration regime will be incorporated into the secondary regulation issued by the CNBV.

Regarding Investment Funds, a framework was established to introduce Hedge Funds, the investments in which will be restricted exclusively to institutional and qualified investors. These funds will not be required to establish maximum holding limits.[17] Hedge Funds will be subject to the general provisions for repurchase agreements, securities lending and derivative transactions issued by Banco de México. In such provisions, Banco de México may establish maximum limits on the amounts of such transactions based on the characteristics of the investments and those of the fund itself, as well as the market situation.

With respect to the Pension Funds System, in order for the fund managers to have the necessary tools to face possible events that may jeopardize their operations in the investment processes and to allow a better protection of workers' resources, the regulatory guidelines that the Business Continuity Plan (BCP) and the Disaster Recovery Plan (DRP) must comply with were specified, by including new concepts to the "Criteria for selecting the Taxonomy and Methodology to determine the Alignment Metrics".[18]

In the area of Financial Reporting Standards (FRS), the CNBV postponed the effective date of certain FRS applicable to other financial brokers to January 1, 2025.[19] The purpose of the extension of the effective date is to allow entities to adapt their accounting information systems in order to converge the entry into force of the aforementioned FRS with the accounting criteria, loan portfolio rating, regulatory reports, and approval, dissemination and content of the financial statements.[20]

[16] RESOLUTION amending the General Provisions applicable to credit institutions, published in the Official Gazette of the Federation on December 27, 2023.

[17] Decree amending the Securities Market Law and the Investment Funds Law, published in the Official Gazette of the Federation on December 28, 2023.

[18] AMENDMENTS and additions to the General Provisions on Financial Matters of the Retirement Savings Systems, published in the Official Gazette of the Federation on February 16, 2024.

[19] The FRS that will postpone their entry into force are: B-17 "Determination of fair value"; C-3 "Accounts receivable"; C-9 "Provisions, contingencies and commitments"; C-16 "Impairment of financial instruments receivable"; C-19 "Financial instruments payable"; C-20 "Financial instruments receivable for principal and interest"; D-1 "Revenue from contracts with customers"; D-2 "Costs from contracts with customers" and D-5 "Leases".

[20] Resolution amending the General Provisions applicable to the activities of savings and loan cooperative societies, published in the Official Gazette of the Federation on December 27, 2023.

IV. Financial system risks

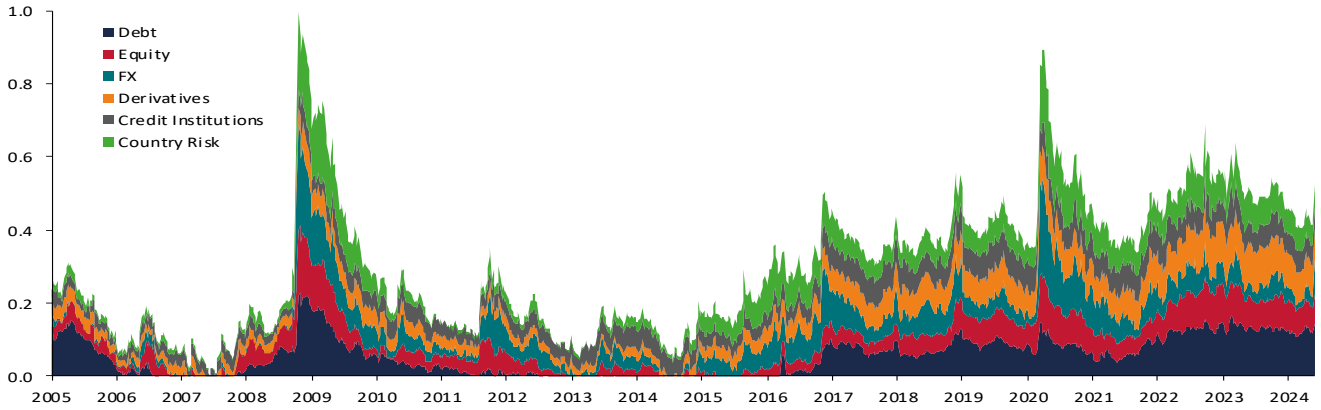
IV.1. Aggregate risk indicators

The Financial Market Stress Index (IEMF, its acronym in Spanish) decreased between December 2023 and the end of May 2024, although it observed some short episodes of stress in April due to the intensification of global geopolitical conflicts. At the beginning of June, the indicator showed a new peak due to the behavior of the foreign exchange, debt and domestic stock markets, which caused it to reach a slightly higher value than the one observed in the previous *Report* (Graph 27).

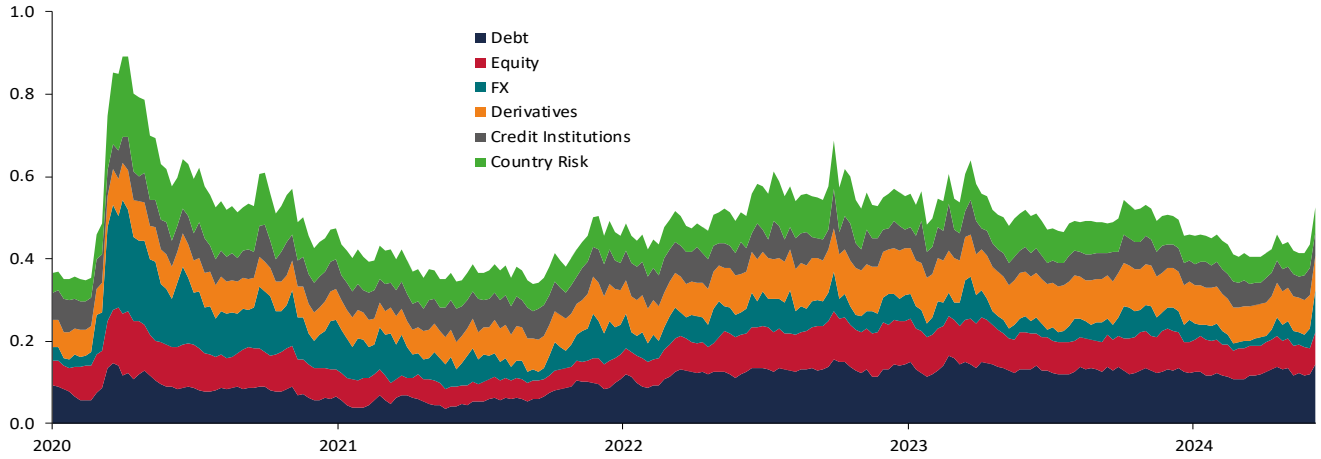
Graph 27

The Financial Market Stress Index [1/]

a) Stress level 2005-2024



b) Stress level 2020-2024



Data as of June 7, 2024.
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,securities 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.

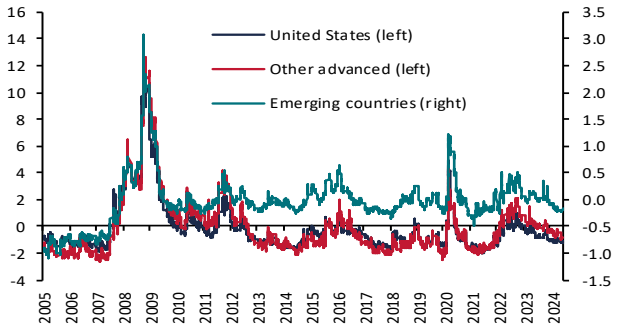
Amendments to the Resolution that modifies the General Provisions applicable to general deposit warehouses, exchange houses, credit unions and regulated multiple purpose financial companies, published in the Official Gazette of the Federation on December 27, 2023.
RESOLUTION Amending the Resolution that modifies the General Provisions applicable to popular savings and credit institutions, integration organizations, community financial companies and rural financial integration organizations, referred to in the Popular Savings and Credit Law, published in the Official Gazette of the Federation on December 27, 2023.

Other stress indices in financial markets also decreased, and showed a similar behavior to the Mexican index up to May (Graph 28).

Graph 28

Financial Stress Index for others countries or regions[1/]

No unit



Data as of June 5, 2024.

Source: Office of Financial Research (OFR).

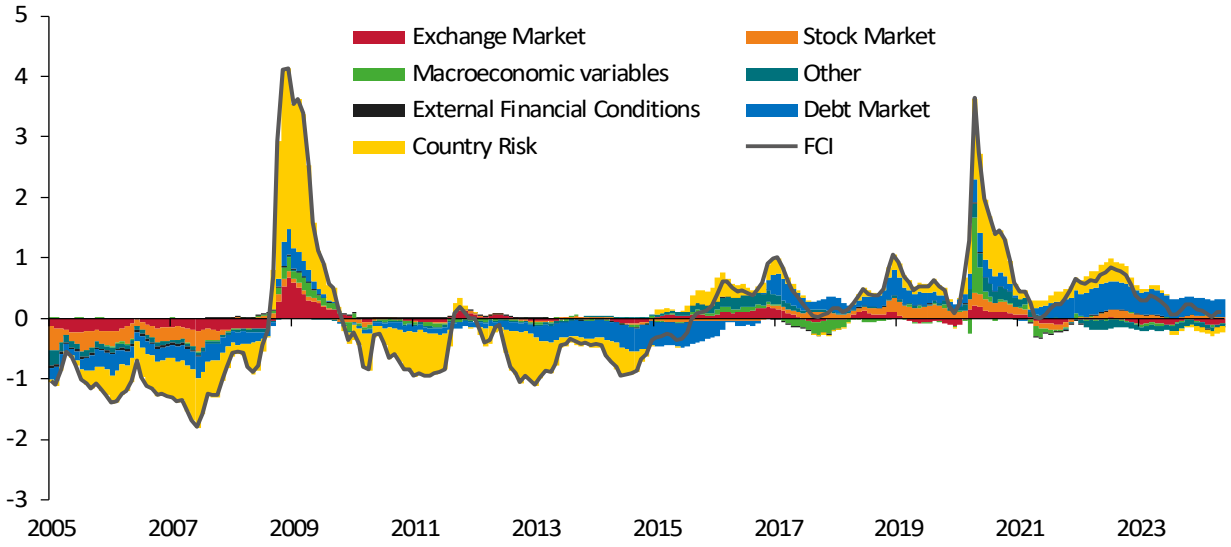
1/ The Financial Stress Index is a daily market-based snapshot of stress in global financial markets. The FSI shows stress contributions by three regions: United States, other advanced economies, and emerging markets.

As of May 2024, financial conditions in Mexico, as measured by the Financial Conditions Index (ICF, its acronym in Spanish), became less restrictive since the last *Report*, but remain in the tightening zone. Although in March the index was at its lowest level since May 2021, in April and May it registered a tightening in the foreign exchange market, debt, and macroeconomic variables (Graph 29). Financial conditions in advanced and emerging countries also eased during 2023, as shown by the financial conditions indexes published by the IMF for various countries. Investor optimism regarding the beginning of the downwards cycle in interest rates, the growth of stock markets and corporate bonds, as well as lower volatility in exchange rates, explain this trend.[21]

Graph 29

Financial Conditions Index[1/,2/]

Standard deviations



Data as of May 2024.

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.

[21] See IMF Global Financial Stability Report, April 2024, chapter 1, available here.

Regarding the main results of the Systemic Risk Perception Survey,[22,23] the results are described below. Regarding the main sources of risk for the financial system, as in the previous semester, the most frequently mentioned external financial risks are: higher than expected inflation and deterioration in the growth prospects of the global economy. Similarly, among internal financial risks, higher-than-expected inflation is the most mentioned risk, followed by the deterioration in public finances; while for non-financial risks, the most mentioned were political, geopolitical and social risks, and cybersecurity risks and technological risks (Table 2).

Table 2

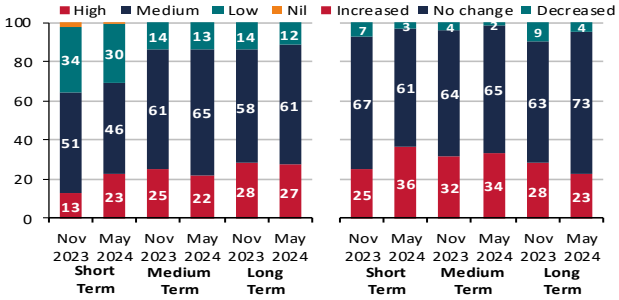
Main sources of financial system risks Percent of total institutions		
	May 2024[1/]	November 2023[2/]
External financial risks		
Inflation higher than expected	88	86
Deterioration of global economic growth outlook	73	79
Volatility in commodity prices	66	54
Deterioration of foreign market conditions*	64	71
Deterioration of foreign market conditions*	61	54
Domestic financial risks		
Inflation higher than expected	77	73
Deterioration of public finances	73	71
Deterioration of the domestic economic growth outlook	71	68
Deterioration of sovereign credit rating	63	58
Fiscal, financial and economic policies	55	48
Non-financial risks		
Political, geopolitical and social risks	94	93
Cybersecurity and IT risks	81	79
Climate risk	73	49
Violence and insecurity	67	71
Deterioration of the rule of law and impunity	49	49

1/ In the last survey 113 institutions participated.
2/ In the previous survey 107 institutions participated.
* Exchange rate volatility, depreciation and lack of liquidity.

In the section of the survey that refers to the probability of the occurrence of an event affecting financial stability in the short, medium and long term (0 to 6 months, 6 to 12 months, 1 year or more, respectively)[24] the following is highlighted (Graph 30):

- The proportion of institutions that consider the probability of the event occurring in the short term to be high increased; for the medium and long term it decreased.
- This semester, for the short and medium term, a greater proportion of institutions consider that the probability of occurrence increased; while in the long term this proportion decreased.

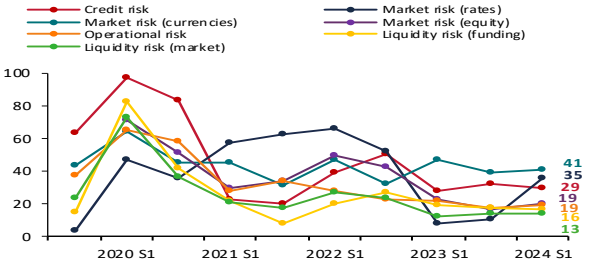
Graph 30
Probability of occurrence of a Systemic Event
Percentage of responses [1/]



Source: Banco de México.
1/ Certain figures may not add up to 100% due to rounding up.

For the next six months, expectations for market risk (rates, currency and equity) and operational risk increased with respect to the previous six-month period. On the one hand, expectations regarding credit risk and liquidity risks (funding and market) decreased (Graph 31). [25]

Graph 31
Expectations regarding the evolution of risks in the following six months [1/]
Percent



Data as of May 2024.
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.

The aggregate risk of the financial system, illustrated through the heat map, remained at a similar level to that observed in the previous *Report*. It should be

[22] The survey is conducted by Banco de México among risk management directors of several financial institutions. This semester was conducted from April 24 to May 20, 2024. For more information see Box 6 "Semiannual Systemic Risk Perception Survey", from the Financial Stability Report, December 2019.

[23] The survey consists of a series of questions grouped into four blocks: i) main sources of financial (internal and external) and non-financial risks; ii) the perception of the occurrence of a high impact event that could affect the proper development of the financial system in different terms; iii) the institutions' expectations regarding the main idiosyncratic risks they face; and iv) aspects related to their risk management. The survey was sent to 133 financial institutions (afores, insurance companies, commercial banks, development banks, broker-dealers and investment funds).

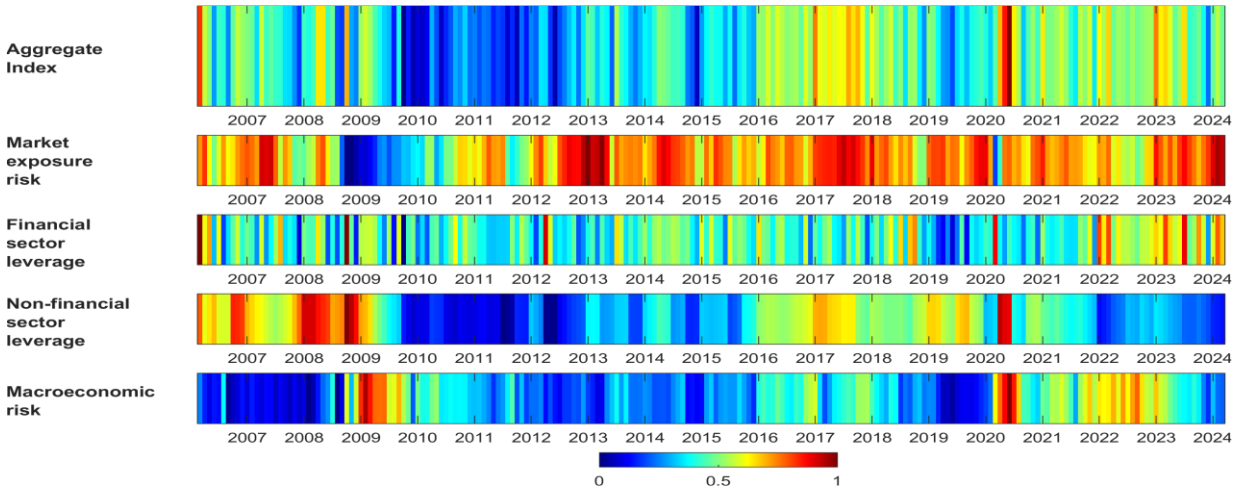
[24] Institutions were asked whether the probability of occurrence was high, mean, low or zero for each time frame.

[25] A diffusion index is calculated as the difference between the percentage of institutions that expect risk to increase and the percentage of institutions that expect it to decrease. An increase in the level of the index is interpreted as a higher expectation of risk.

noted that the market exposure risk category, which represents risk appetite, increased and remains high. This is explained by the decrease in risk premiums in fixed-income instruments and the low level of volatility in the financial markets. The leverage of the financial sector increased slightly, while that of the non-financial sector decreased. The macroeconomic risk category also showed a reduction due to the appreciation of the exchange rate and a decrease in the perception of sovereign risk (Graph 32).

Graph 32

Mexican Financial System Risks Heat Maps[1/ 2/]



Data as of March 2024.
Source: Banco de México.
1/ Refer to Box 3 for a description of the methodology: Mexican Financial System Risks Heat Maps, Financial System Report 2018. The Exposure to Markets category relates to the Risk Appetite category of the Financial System Report 2018.
2/ The disaggregated map is provided in Annex 1.

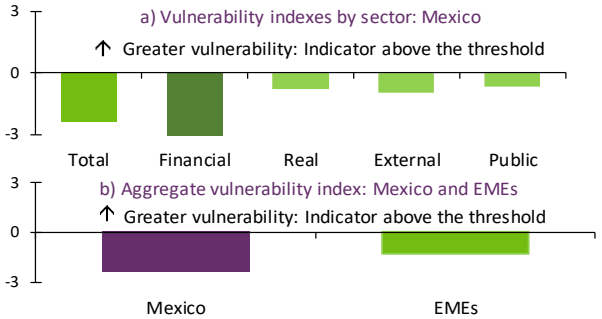
Macrofinancial Vulnerabilities Index

National authorities and international organizations such as the *FSB* and IMF use early warning indicators to detect macrofinancial vulnerabilities.[26] These indicators make it possible to identify characteristics of an economy that, in an adverse economic environment, may end up triggering a macro-financial crisis. Therefore, these tools help to manage risks in advance.

Early warning indicators are calculated for the financial, real, external and public sectors of Mexico.[27] In all four sectors, the value of the indicator is below its respective threshold (Graph 33), reflecting that currently, these indicators do not detect substantial vulnerabilities in Mexico.

Graph 33

Macrofinancial vulnerability indexes



Source: Banco de México, Haver Analytics, IMF (*World Economic Outlook* and *Financial Soundness Indicators*). The group of emerging economies includes Brazil, Colombia, Indonesia, South Africa, Thailand, the Philippines, and Turkey.

[26] See IMF Methodological Manual (2012). Strategy, Policy, and Review Department. The IMF-FSB Early Warning Exercise: Design and Methodological Toolkit of the International Monetary Fund (IMF). The following are considered macrofinancial crises: abrupt capital outflows, financial stress, and abrupt fiscal adjustments. The definitions of the IMF Methodological Toolkit (2012) are used for abrupt capital outflows and abrupt fiscal adjustments, and the definitions from Laeven and Valencia (2012) for financial stress.

[27] Eleven variables are used as indicators for emerging economies with the latest available information: current account balance, reserve coverage, export growth, real effective exchange rate, fiscal balance, government revenues growth, Capital Adequacy Ratio (CAR), Return on Assets (ROA), Non-performing Loans (NPL), loan-to-deposit ratio and real GDP growth. The aggregate indicators are obtained by averaging the weighted distance of each indicator with respect to a threshold, taking into account the importance of each indicator in the crisis prediction.

The real and public sectors show a slight deterioration with respect to the previous *Report*, while the external and financial sectors show an improvement.[28] The slight deterioration in the real sector is due to the current forecasts for the end of the year, indicating that economic activity in Mexico will slow down with respect to 2023. In the public sector, the higher revenue growth partially offset a lower fiscal balance. On the one hand, the improvement in the financial sector is largely attributed to an increase in banks' capitalization (CAR) and profitability (ROA).

This greater solvency of the Mexican financial sector largely explains the improvement shown by the aggregate indicator. This indicator captures the vulnerabilities faced by an economy as a whole and gives more weight to the financial sector, given that this is the sector in which vulnerabilities are more likely to precede crises.

Thus, the Mexican economy as a whole continues to show less vulnerabilities than the average of other emerging economies, which behaves similarly to the last *Report*.

When interpreting the indicators, it should be considered that crises are usually preceded by vulnerabilities, not in a single sector, but in several sectors. Moreover, the occurrence of a crisis usually depends not only on the vulnerabilities of an economy, but also on the size of the adverse shock it faces.

IV.2. Credit to households, private non-financial sector and public sector

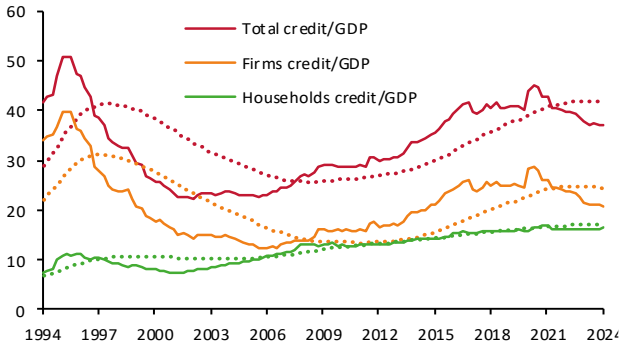
The credit-to-GDP ratio had a marginal decrease to levels similar to those seen in September 2023, when the last *Report* was published. Both total credit and credit to the private non-financial sector (firms) remain at levels to those in 2015 (Graph 34a). The credit-to-GDP gap, as well as the credit gaps for firms and households, remain at negative levels (Graph 34b).

Graph 34

Credit to non-financial system private sector [1/]

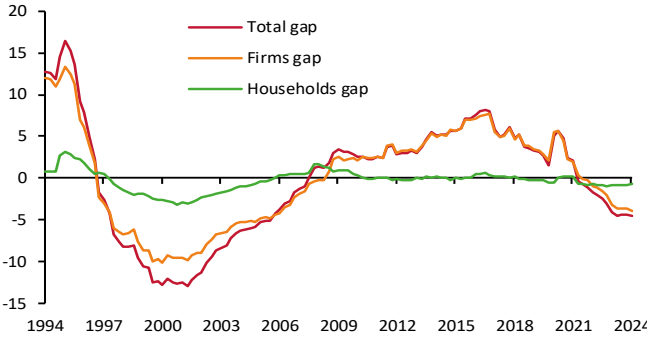
a) Share of GDP

Percent



b) Credit-to-GDP gap [1/]

Percent



Data as of March 2024

Source: Banco de México

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

The financial position of households increased with respect to the level shown in the previous *Report.* Savings showed an increase, mainly in M2 holdings[29] and mandatory savings, while financing to households grew more slowly (Graph 35a and Graph 35b). This increase is due to a faster growth in savings than in credit.

[28] The previous *Report* referred to 2023 vulnerabilities and, therefore, 2024 macrofinancial stability, while the current version of the *Report* refers to 2024 vulnerabilities and, therefore, 2025 macrofinancial stability.

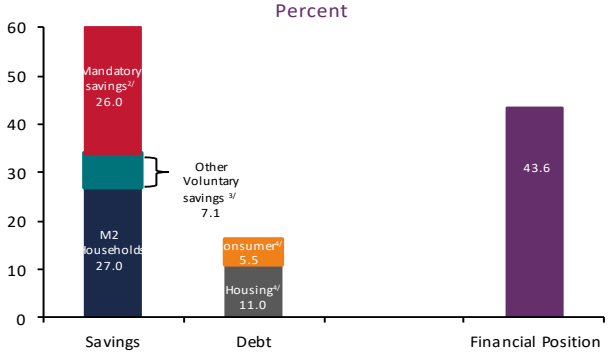
[29] M2 is the monetary aggregate that includes banknotes and coins held by the public, demand deposits, and monetary instruments held by residents, such as term deposits in banks and other non-bank institutions, debt investment funds shares and securities repurchase creditors.

Graph 35

Households financial position[1/]

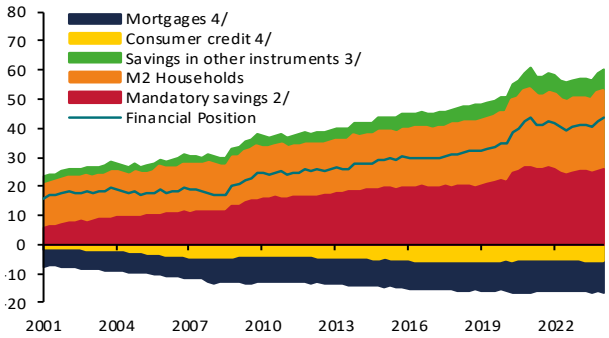
a) Share of GDP

Percent



b) Share of GDP

Percent



Data as of March 2024.

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.

The financing gap has been negative for twelve quarters. Although there has been a recovery in credit growth, as of March 2024, the gap maintained a downward trend and is at levels comparable to those of 2005. On the other hand, the total financing to GDP ratio IS at similar levels to those observed in 2015.

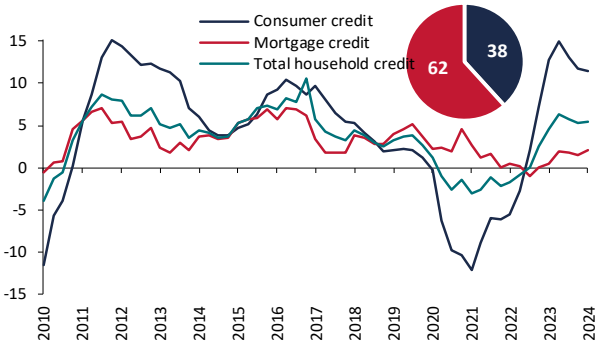
Total financing to the Mexican economy increased in real annual terms during the first quarter of 2024 and reached a level of 92% of GDP, of which 50% corresponds to the public sector, 24% to non-financial companies and the rest (18%) to households (consumption and housing).

Total financing to the Mexican economy increased in real annual terms during the first quarter of 2024 (Table 3). In particular, financing to the public sector increased and substituted external for domestic sources. On the other hand, total financing to the non-financial private sector increased slightly: while financing to companies contracted, mainly from external sources, financing to households increased, especially that granted to consumption (Graph 36).

Graph 36

Household credit growth [1/]

Real annual percent change



Data as of March 2024.

Source: Banco de México, BMV and Condusef.

Note: The percentages shown here consider the figures relating to non-regulated entities that grant financing and that are included at the bottom of Table 3 (Memo); therefore, the differ from those registered in the upper part of the same table. In addition, we exclude non-regulated entities figures for which data from stock echange is not available as they are in debt restructuring or liquidation processes.

1/ Includes the loan portfolio of commercial banks and regulated non-bank entities such as regulated sofomes, socaps, sofipos and credit unions, as well as non-bank non-regulated entities such as non-regulated sofomes and debt-issuing financial companies such as financial leasing companies or financial arms of automotive companies. For mortgages it also includes those granted by Infonavit and Fovissste and for consumer credit includes credit granted by Infonacot. The growth series are adjusted to consider the beginning of availability of the data on financing by non-regulated entities and regulated sofomes that issue debt in the period in which they appear in the sample (2015-2016).

Table 3

Total Financing to Non-Financial Sectors of the Mexican Economy

a) Figures at March 2024

	Thousands of million Mexican Pesos	Per cent of sector	Per cent of GDP	Real annual percent change [Real annual percent change of balance in USD]		Per cent of financing denominated in Mexican pesos
				1Q24 vs 1Q23	1Q24 vs 1Q22	
Public sector [1/]	**15,986**	**100**	**49.8**	**4.6**	**-1.5**	**76.7**
Securities	**14,570**	**91.1**	**45.4**	**6.6**	**-0.1**	**80.4**
Issued in Mexico	11,721	73.3	36.5	11.9	6.4	100.0
Issued abroad	2,849	17.8	8.9	-10.7 [1.8]	-16.6 [-1.7]	0.0
Bank credit	**346**	**2.2**	**1.1**	**-12.6**	**-14.0**	**20.3**
Commercial bank	127	0.8	0.4	8.6	-12.3	55
Foreign banks	219	1.4	0.7	-21.5 [-10.5]	-14.7 [0.6]	0.0
Other [2/]	**1,070**	**6.7**	**3.3**	**-12.7**	**-12.1**	**44.5**
Private sector	**11,737**		**36.6**	**0.9**	**-1.9**	**79.4**
Non-financial companies	**6,381**	**100**	**19.9**	**-2.3**	**-5.5**	**62.2**
Securities	**2,011**	**31.5**	**6.3**	**-7.5**	**-12.7**	**37.8**
Issued in Mexico	728	11.4	2.3	9.2	6.8	98.4
Issued abroad	1,283	20.1	4.0	-14.9 [-3.1]	-19.2 [-4.7]	3.5
Bank credit	**4,141**	**64.9**	**12.9**	**-0.1**	**-2.1**	**76.6**
Commercial bank [3/]	3,206	50.3	10.0	2.2	2.9	78.2
Development bank	472	7.4	1.5	3.1	0.5	65.4
Foreign credit [4/]	463	7.3	1.4	-15.7 [-3.9]	-24.6 [-11.1]	0.0
Other [5/]	**229**	**3.6**	**0.7**	**7.6**	**11.8**	**98**
Households	**5,356**	**100**	**16.7**	**4.9**	**3.2**	**100**
Consumer credit	**1,815**	**33.9**	**5.7**	**11.2**	**10.0**	**99**
Commercial bank [3/]	1,490	27.8	4.6	11.4	10.2	100
Development bank	46	0.9	0.1	0.1	-7.4	100
Other [5/]	**278**	**5.2**	**0.9**	**11.6**	**12.8**	**100**
Mortgages	**3,541**	**66.1**	**11.0**	**2.0**	**0.3**	**100**
Commercial bank	1,377	25.7	4.3	3.9	4.0	100
Development bank	11	0.2	0.0	-8.0	-9.6	100
Other [6/]	**2,153**	**40.2**	**6.7**	**0.9**	**-1.7**	**100**
Memo: Non-regulated financial entities that grant financing by destination sector [7/]	**1,539**	**100**	**4.8**	**3.5**	**4.4**	**88.7**
Non-financial companies	1,100	71.5	3.4	0.8	-0.3	87.3
Consumer credit	400	26.0	1.2	12.9	27.1	96.6
Mortgages	17	1.1	0.1	10.9	35.4	100.0
Public Sector	22	1.4	0.1	-18.0	-33.9	5.5
Memo: Crowdfunding financing [8/]	0.5	n.d.	0.0	13.4	65.1	n.d.
TOTAL	**29,262**		**91.2**	**3.0**	**-1.4**	**78.4**

Data as of March 2024.

Source: Banco de México (CF 297), CNBV, SHCP, Condusef and BMV.

Note: in order to use comparable data in annual growth figures, they exclude loans from non-regulated entities for which data is not available, as they are in debt restructuring or liquidation processes.

1/ Considers the gross debt balance of the public sector based on the SHCP methodology. Includes financing received by the Federal Government, public enterprises and the development bank.

2/ Includes financing granted by international financial bodies, Pidiregas, the SAR savings fund,ISSSTE, Pemex and CFE obligations.

3/ Includes the portfolios of regulated sofomes for having equity links with banking institutions.

4/ Excludes financing from foreign suppliers.

5/ Includes financing granted by the Infonacot, as well as by regulated non-banking financial entities, such as socaps, sofipos, regulated sofomes for issuing debt, bonded warehouses and credit unions.

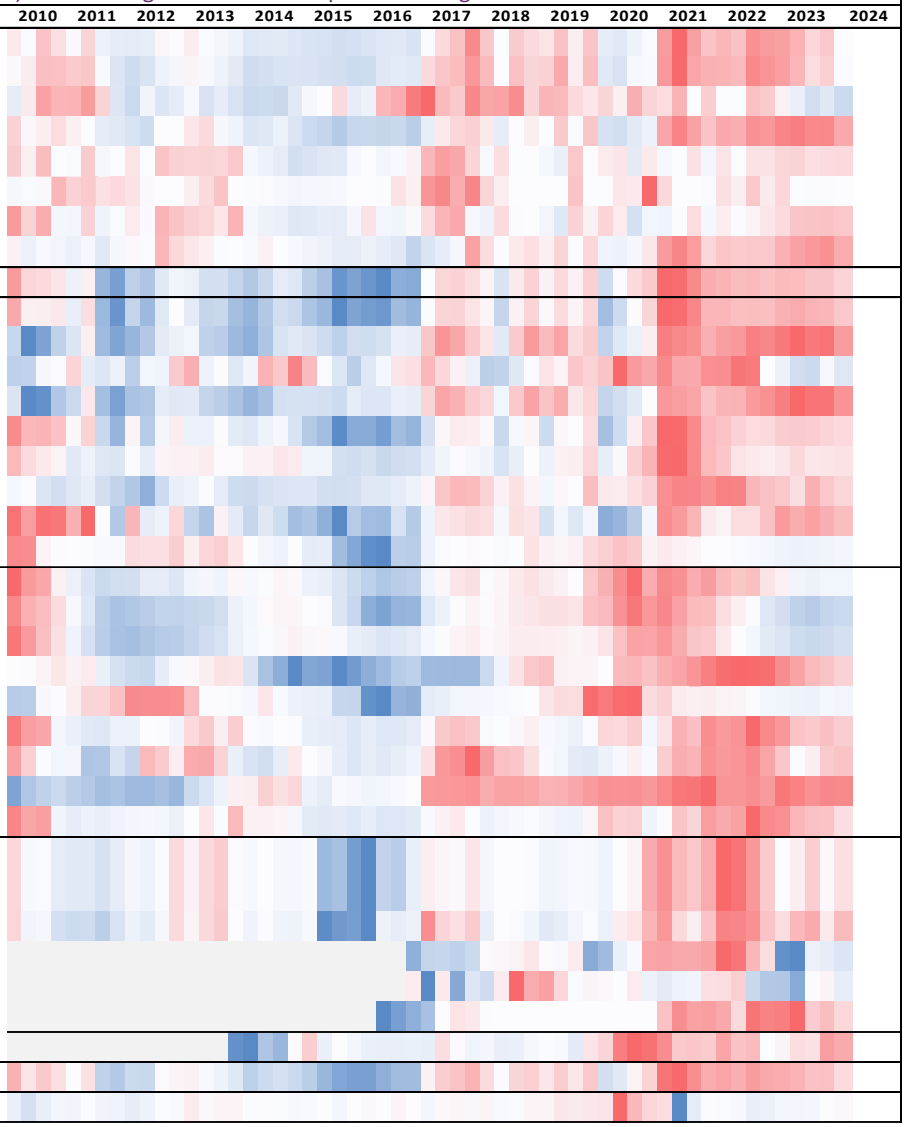
6/ Includes financing granted by the Infonavit, the Fovissste, as well as by regulated non-banking entities.

7/ Includes financing granted by non-regulated sofomes, corporate debt issuers engaged in granting financing (e.g., automotive), credit granted by listed department stores to their customers and in the case of private non-financial companies, financing from suppliers (listed companies only).

8/ Includes financing granted by regulated crowfunding institutions.

Total Financing to Non-Financial Sectors of the Mexican Economy

b) Historical figures: real annual percent change



Data as of March 2024.

Source: Banco de México (CF 297), CNBV, SHCP, Condusef and BMV.

Note: The heat map shows the percentiles of the distribution of the real annual growth rate of financing. The highest percentiles are shown in blue and the lowest in red. The color of each indicator or row is based on the history of each series, which covered from Jan 07 to Mar 24, with the exception of those shown in gray, whose history is not available. In addition, in order to use comparable data in annual growth figures, they exclude loans from non-regulated entities for which data is not available, as they are in debt restructuring or liquidation processes.

1/ Considers the gross debt balance of the public sector based on the SHCP methodology. Includes financing received by the Federal Government, public enterprises and the development bank.

2/ Includes financing granted by international financial bodies, Pidiregas, the SAR savings fund,ISSSTE, Pemex and CFE obligations.

3/ Includes the portfolios of regulated sofomes for having equity links with banking institutions.

4/ Excludes financing from foreign suppliers.

5/ Includes financing granted by the Infonacot, as well as by regulated non-banking financial entities, such as socaps, sofipos, regulated sofomes for issuing debt, bonded warehouses and credit unions.

6/ Includes financing granted by the Infonavit, the Fovissste, as well as by regulated non-banking entities.

7/ Includes financing granted by non-regulated sofomes, corporate debt issuers engaged in granting financing (e.g., automotive), credit granted by listed department stores to their customers and in the case of private non-financial companies, financing from suppliers (listed companies only).

8/ Includes financing granted by regulated crowfunding institutions.

IV.2.1. Households

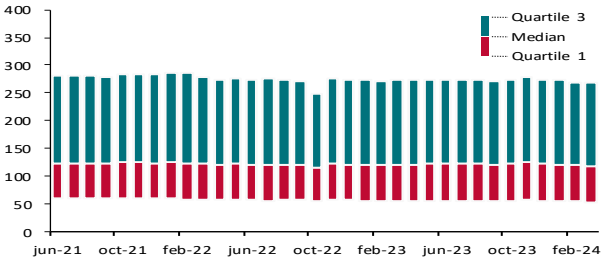
Total borrower debt balances, at constant prices, have remained at the same levels over the last two quarters (Graph 37a), while leverage as of March 2024, measured as the proportion of monthly income devoted to debt repayment, remained at similar levels to those prevailing a year earlier, with higher leverage in the borrowers with lower incomes[30] (Graph 37a and Graph 37b).[31]

Graph 37

Distribution of leverage of a sample of households

a) Outstanding debt amount of borrowers with at least one bank loan [1/,2/]

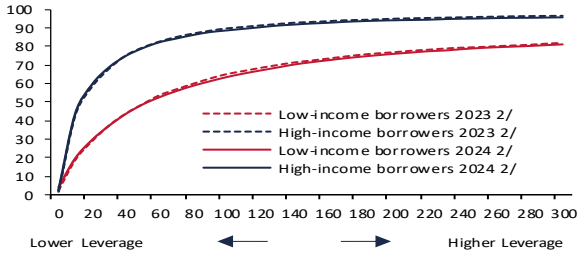
Thousands of pesos



Data as of March 2024.
Source: Credit Bureau.
1/ Estimate using information from a sample of Credit Bureau files.
2/ Constant prices (March 2024 base).

b) Monthly payments to monthly income ratio of borrowers with at least one bank loan [1/]

Vertical axis: percent of the number of borrowers
Horizontal axis: monthly payments as a percentage of income reported



Data as of March 2024.
Source: Credit Bureau.
1/ Estimate using information from a sample of Credit Bureau files.
2/ "Low-income borrowers" and "high-income borrowers" are considered as those whose income is lower than the median income and greater than median income, respectively.

Consumer credit

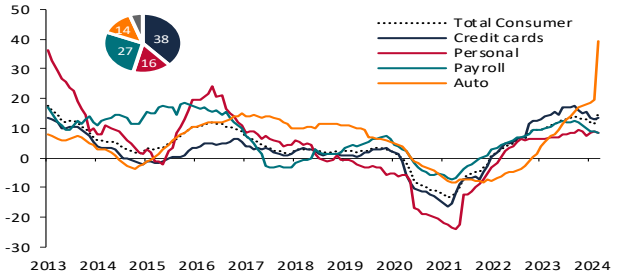
Although total consumer financing showed significant annual growth in real terms, it was slightly lower than in the previous *Report.* Both the portfolio granted by commercial banks and their related sofomes, as well as that of other-Non-bank Financial Intermediaries (OIFNB, its acronym in Spanish), showed a slight slowdown. The growth in financing granted by the non-bank sector was high and similar in magnitude to that of banks, driven by the growth in departmental credit cards, as well as by the increase in auto loan financing.

During the last quarter of 2023 and the first quarter of 2024, consumer credit granted by banks and their multi-purpose financial institutions (sofomes) continued to increase. Although the growth rate of the portfolio of the two segments with the highest participation (credit cards and payroll credit) was lower, the real annual growth rate of the total consumer portfolio in March 2024 was higher than that registered in September 2023, which is explained by the growth of the auto loan portfolio, which became the fastest growing segment due to the recovery of the sector and the recent acquisition of a sofom's portfolio by a banking institution (Graph 38).[32]

Graph 38

Consumption portfolio of the banking system [1/]

Real annual change in percent



Data as of March 2024.

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

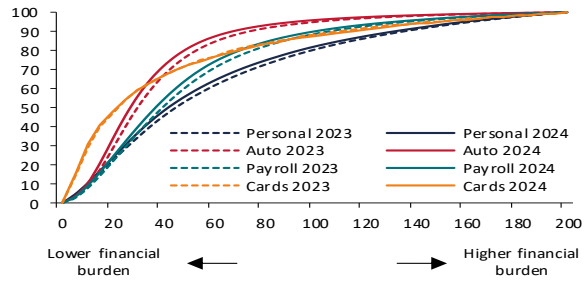
[30] Income is obtained from disaggregated regulatory reports on mortgage loans and consumer loans, provided by the CNBV and Banco de México, respectively. To separate higher-income borrowers from lower-income borrowers, a threshold of 20,000 pesos was used, which approximates the median monthly income of the sampled files.

[31] Balances and leverage were estimated with a panel sample of the total number of files registered in Credit Bureau that have at least one bank loan, with historical information on all loans contracted by the person associated with the sampled file; the information includes the evolution of their balances and due payments with sample sizes close to 5,000, 16,000 and 19,000 observations for loans associated with mortgage loans, auto loans, personal loans and credit cards, respectively. Ninety-six percent of bank loans are granted by banks that repurchase from the Credit Bureau.

[32] GF Inbursa's Q1 2024 BMV information, pp. 10: GFI-BMV-1TRIM-2024.pdf (inbursa.com).

The financial burden of commercial banks' borrowers with consumer credit[33] registered from February 2023 to February 2024 a shift towards lower levels in all segments of the non-revolving portfolio; in the case of credit cards, the financial burden remained at similar levels during that period (Graph 39).

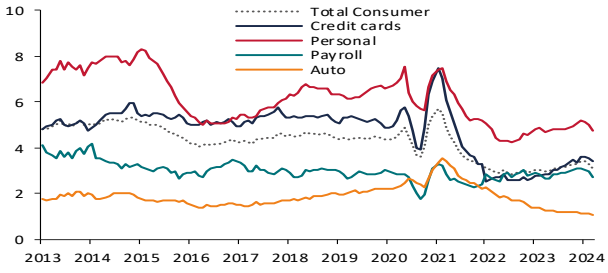
Graph 39
Household financial burden by type of consumer bank credit
Vertical axis: Percent of cumulative portfolio
Horizontal axis: Household financial burden as a percentage of income reported



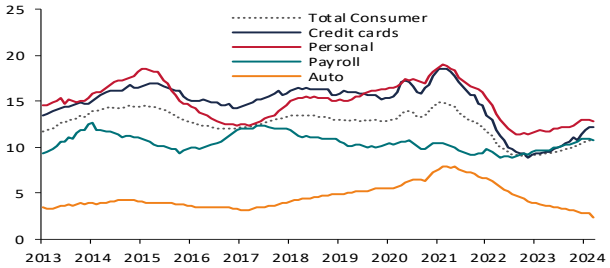
Data as of February 2024.
Source: Banco de México.

The non-performing loan ratio (NPL ratio) of commercial banks and their related sofomes showed a downward trend starting in 2024 in almost all segments, with the exception of auto loans,[34] trend that is explained by the decrease in the non-performing portfolio and that was generalized in banks with the largest share of portfolio in each segment. However, the decrease in non-performing ratio levels in recent months is barely perceptible if we include the credit write-offs within the non-performing ratio levels indicator (Graph 40a and Graph 40b).

Graph 40
Non-performing loan ratio and adjusted non-performing loan ratio of consumer loan portfolio
a) Non-performing loan ratio
Percent



b) Adjusted non-performing loan ratio
Percent

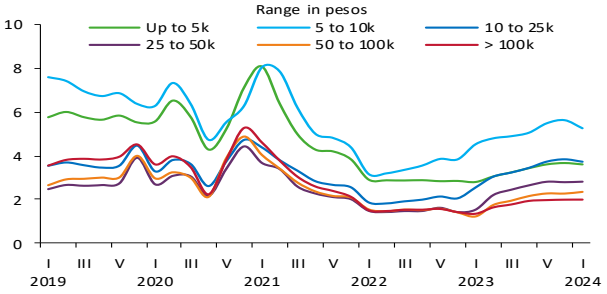


Data as of March 2024.
Source: CNBV.

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

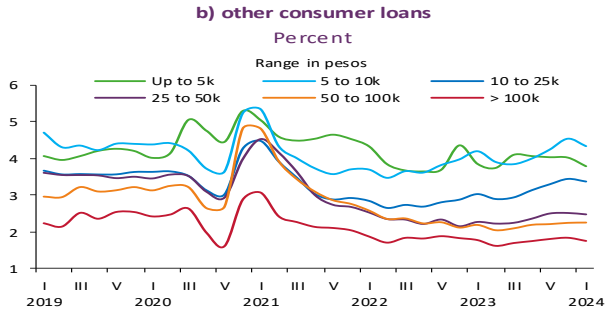
Although the different bank segments of consumer credit showed an increasing trend during 2023, in the first months of 2024 a reduction in the non-performing ratio levels of consumer credit given by banks was observed, mainly in those loans granted to people with monthly incomes below 25 thousand pesos, as well as in loans to people with incomes over 100 thousand pesos (Graph 41a and Graph 41b).

Graph 41
Non-performing loan ratio of consumer loans by income level of the borrower
a) credit cards
Percent



[33] The financial burden is measured as the proportion of income that goes to cover the payment due on all loans that an individual has registered with credit reporting companies. This analysis is performed using the income information available in the regulatory reports for revolving and non-revolving consumer bank loans.

[34] Automotive portfolio non-performing ratio levels continued their downwards trend that began in 2021.

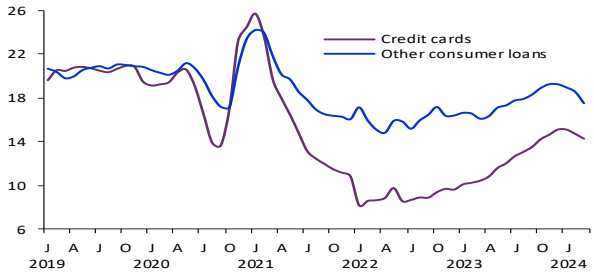


Data as of first two-month period 2024.
Source: Banco de México.
1/ Includes banks loans and linked sofomes loans.

In particular, although in the first quarter of 2024 there was an increase in lending, the decrease in non-performing loan ratio in the consumer credit portfolios was mainly due to portfolio write-offs by some institutions that led to a reduction in loans classified as stage 3 (Graph 42). Thus, consumer credit non-performing loan ratios are at moderate levels.

Graph 42

Consumer loans of stage 3 (non-perfoming loans)

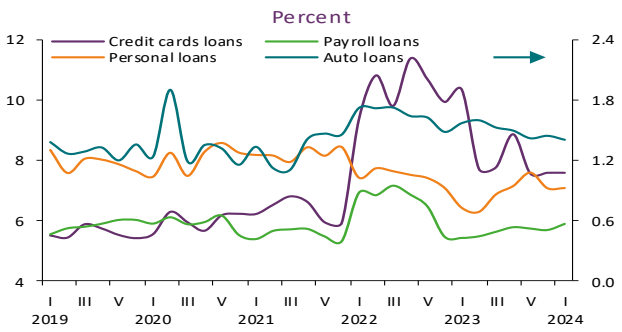


Data as of March 2024.
Source: Banco de México
1/ Includes banks loans and linked sofomes loans.

Against this backdrop, the risks of new consumer loans remain bounded. In particular, the regulatory probability of default of new loans, in the majority of the different types of credit, remained relatively stable (Graph 43).

Graph 43

Probability of default for newly originated consumer loans 1/

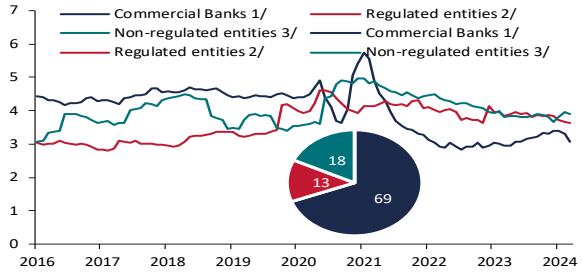


Data as of first two-month period 2024.
Source: Banco de México.
1/ Includes banks loans and linked sofomes loans.

The NPL ratio levels of consumer credit granted by non-bank financial intermediaries and the National Fund for Employee Consumption (Infonacot, its acronym in Spanish), as a whole, decreased slightly since the last *Report*. The decrease is observed in regulated sources of financing and is explained by the generalized increase in credit granting. In the case of Infonacot, the drop in NPL ratio in March 2024 is largely attributable to the adoption of new accounting criteria that implied a portfolio reclassification to a classification based on risk stages (Graph 44).[35]

[35] The adjustments made to the accounting criteria as part of the process of adopting the international standard known as IFRS9 adjust, among other aspects, the classification of the loan portfolio according to the perceived risk and level of impairment of the loans, as well as the creation of reserves related to the remaining term of the assets that present certain impairment. These changes implied a decrease in Infonacot's past-due portfolio, which in turn caused its Imor to decrease. See the regulatory change here.

Graph 44
Non-Performing Loan ratio of Consumer Portfolio
Per cent



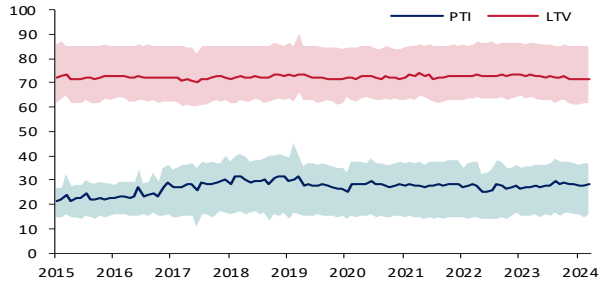
Data as of March 2024.
Source: Banco de México (SIE), CNBV, BMV and Condusef.
1/ Includes the loan portfolio of regulated sofomes having an equity linked with a bank, whether subsidiaries of the latter or not.
2/ Includes the credit portfolios of the development bank and of non-banking regulated financial intermediaries, such socaps, sofipos and sofomes regulated for issuing debt and the Infonacot.
3/ Includes credit portfolio of non-regulated sofomes, debt-issuing financial companies such as financial leasing companies or financial arms of automotive companies, as well as credit cards granted by listed department stores. The Credit Bureau is the information source of the delinquency ratio for department stores credit cards. The fall observed in June 2018 is due to that a sofom changed from a regulated entity to a regulated entity.

Mortgage loans

Total housing finance at the end of March 2024 showed slightly higher real annual growth than in the previous *Report.* By type of lender, financing from commercial banks and their related sofomes, as well as from Institute of Security and Social Services of the Governmental Workers (Fovissste, its acronym in Spanish), registered growth, although slightly lower than in the last *Report.* In the case of National *Fund for Workers' Housing* (Infonavit, its acronym in Spanish), its housing portfolio registered positive growth for the first time in two years.

As for newly granted bank mortgage loans, during the last two quarters, the proportion of income allocated to the mortgage payment (PTI) remained generally at the same levels, with a value in March 2024 slightly higher than that prevailing in September 2023, while the ratio of the loan amount to the value of the property (LTV) decreased marginally (Graph 45).

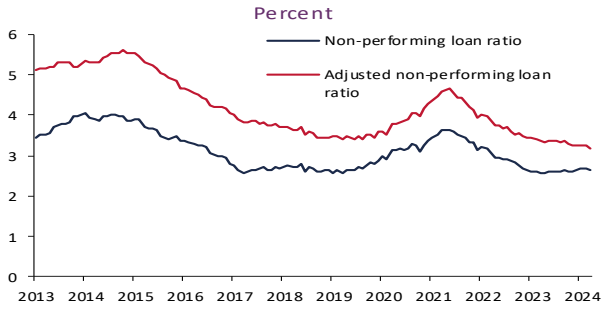
Graph 45
Loan-To-Value (LTV) and Payment-To-Income (PTI) of Mortgage Loans 1/, 2/
Percent



Data as of March 2024.
Source: CNBV.
1/ Recently-granted commercial bank mortgage loans.
2/ The shaded area represents the interquantile range of the respective metric.

The NPL ratio increased slightly since October 2023 due to the growth of the non-performing mortgage balance. In addition, its adjusted NPL ratio decreased in this period, mainly explained by lower credit write-offs (Graph 46). Current non-performing ratio values are at historically low levels, which are largely explained by the decrease in defaults within the vintages in recent years.

Graph 46
Non-performing loan ratio and adjusted non-performing loan ratio on bank mortgage loans 1/
Percent

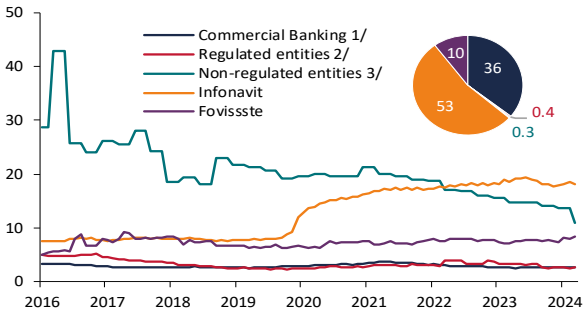


Data as of March 2024.
Source: CNBV.
1/ Total commercial bank mortgage loans.

The NPL ratio of the Infonavit and Fovissste mortgage portfolio increased slightly since the last *Report.* After decreasing in both cases during the fourth quarter of 2023, these indicators increased during the first quarter of 2024. This is explained, in part, by the adoption of new accounting criteria by development agencies, which implied a reclassification of portfolios to categories based on risk stages; this resulted in the reclassification of previously

performing portfolios to stage 3 or past-due portfolios.[36]

Graph 47
Non-Performing Loan ratio of Mortgage Portfolio
Per cent



Data as of March 2024.

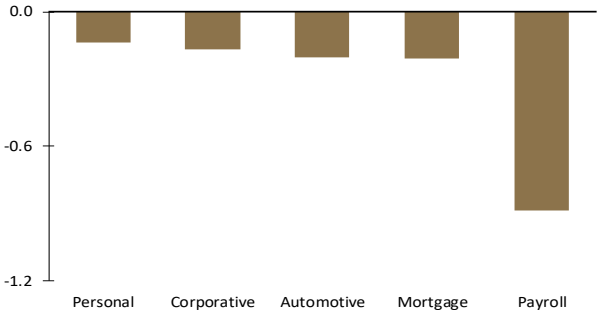
Source: Banco de México (SIE), CNBV, BMV and Condusef.

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.

Decomposition of change in non-performing ratio levels and gender

There is evidence that women often face more barriers to access the credit market than men.[37] This suggests that women might face stricter criteria to obtain financing and that those who do access the credit market have a less risky credit profile. In fact, these women present lower credit default rates than men under similar financing conditions (Graph 48; see Box 3). This section analyzes the contribution to changes in the non-performing ratio levels of women and men.

Graph 48
Difference between the non-performing ratio of women and men according to the credit portfolio
Percentage points



Data as of December 2022.
Source: Banco de Mexico.

In particular, annual changes in non-performing ratio levels are attributed to three types of changes:[38] 1) changes in the share of women. Since women have lower credit default rates, an increase in their participation contributes to reduce the non-performing ratio levels of a portfolio (*participation effect*); 2) changes in the non-performing ratio of women and men, keeping their participation in each portfolio fixed (*behavior effect*); and 3) changes in financing conditions that do not depend on the gender of the borrowers (*composition effect*).

In the payroll credit portfolio, the participation of women increased, which reduced the non-performing ratio levels of this portfolio (Graph 49a). This is the third consecutive *Report* showing this increase, indicating that there is already an upward trend in the participation of women in the payroll portfolio. Furthermore, in this portfolio, non-performing ratio levels are notably lower for women than for men (Graph 48), so their higher participation further reduces non-performing ratio levels.

In contrast, the participation of women decreased in personal, corporate, automotive, and mortgage credit, resulting in an increase in the non-performing ratio levels of these portfolios. It is noteworthy that the number of portfolios in which women's

[36] The adjustments introduced in the accounting criteria as part of the adoption process of the international standard known as IFRS 9 adjust, among other aspects, the classification of the loan portfolio according to the risk perception and level of impairment of loans, as well as the creation of reserves related to the remaining term of the obligations that present certain impairment. See the regulatory change here.

[37] Buvinic and Berger (1990) show that women have less access to credit due to structural and social barriers. Mascia and Rossi (2017) show that women face more difficulties accessing bank credit for SMEs in Europe. Ongena and Popov (2016) show that women entrepreneurs have lower credit approval rates. See also Demirgüç-Kunt et al. (2013).

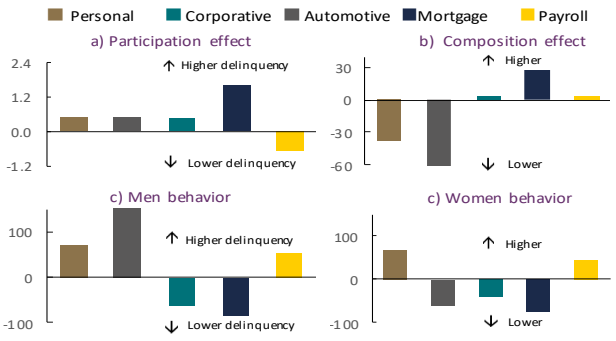
[38] In corporate credit, natural persons with business activities are considered, for whom gender can be identified.

participation increased already reflects a downward trajectory with respect to previous versions of this *Report*. Therefore, opportunities seem to have increased for greater inclusion of women to reduce credit defaults and non-performing ratio levels in commercial banks. These opportunities have expanded most clearly in the non-revolving consumer credit, corporate loans and mortgage portfolios.

The *behavior effect* was similar for women and men in four of the five portfolios (Graph 49c). In mortgage loans and auto loans, non-performing ratio levels decreased for women and men, and in personal and payroll loans, they increased for both. In contrast, in corporate loans, the behavior was uneven between genders, with an increase in non-performing ratio levels for men and a reduction for women. This could be due to the fact that men have a higher credit participation in sectors that showed a worse economic performance during 2023, such as professional services.

The *composition effect* had a more pronounced impact on corporate and mortgage loans (Graph 49b). In corporate, the increase in the term of loans granted contributed to lower non-performing ratio levels. On the other hand, in mortgage credit, slight increases in financing costs contributed to higher non-performing ratio levels.

Graph 49
Change in non-performing ratio distinguishing between men and women
Percentage



Source: Banco de Mexico.

Note: Difference in non-performing loan (NPL) ration between December 2023 and December 2022. Negative values imply downward pressure on delinquency.

Box 3: Gender gap in credit: widening or narrowing with uncertainty?

I. Introduction

Gender gaps refer to the disparities that exist between women and men in different areas. In economics, the field of labor is the one in which gender gaps have traditionally been studied the most. The evidence indicates that there are gender gaps in labor participation and wages due to a number of factors, such as the greater flexibility men have to comply with more rigid work schedules or the "motherhood penalty" that women face, which diminishes their opportunities of being promoted after having children.[1] In addition, the study of gender gaps has recently been extended to the field of finance, including the analysis of differences between women and men in the granting and conditions of financing.

Recent studies indicate that, as in the labor market, gender gaps also exist in the credit market.[2] The evidence shows that women have less access to credit, suggesting that they may face more demanding requirements for accessing financing and that those who do access the credit market have a less risky credit profile.[3] In fact, these women have lower default rates under similar credit conditions.[4] However, they tend to face higher financing costs and obtain lower loan amounts.[5] In other words, women could have less access to credit and obtain less favorable credit conditions than those that would correspond to their credit risk. This is relevant, since, if this is the case, a greater participation of women into credit could improve financial inclusion and, at the same time, reduce default.

This box therefore analyzes whether gender gaps in Mexican firm's credit widen in an environment of greater macrofinancial uncertainty in which perceptions of credit risk are more important. To this end, the COVID-19 pandemic is taken as a case study.

There are several reasons why gender gaps could widen in an environment of greater uncertainty. In such an environment, calculating probabilities of credit default becomes a more complex and volatile process. To mitigate this challenge, banks make use of resolution mechanisms, for example, the provision of collateral becomes more important because it mitigates the loss in the event of default. In addition, other characteristics such as the time the borrower has had to build her credit record and to establish a relationship of trust with their bank, which can reduce the bank's perceptions of default, tend to become more relevant. Therefore, if, due to a series of historical and cultural factors, women have fewer resources to overcome these resolution mechanisms, gender gaps in the credit market could widen in an environment of uncertainty.

Thus, with greater uncertainty, gender gaps could increase because women have fewer assets that can be used as collateral. The lack of collateral reduces the opportunities for women-led companies to obtain credit, especially smaller ones.[6] Moreover, the assets that women own to a lesser extent are precisely those that are most frequently used as collateral in emerging economies, such as real estate.[7] Gender gaps may also widen because women have traditionally been less integrated into the credit market. As a result, they have had less time to build their credit record and to establish a relationship of trust with their bank, both of these mechanisms reduce the perception of default, especially in uncertain environments.[8]

There are also two other reasons why gender gaps might increase in a context of uncertainty. It has been argued that women may be more risk averse, which may cause them to exclude themselves from the credit market in uncertain environments.[9] However, women might exclude themselves for different reasons. According to these hypotheses, some economic agents could use gender as a decision variable, regardless of other considerations related to the economic-financial performance of individuals. This could be linked to gender bias and discrimination, and lead women, anticipating these behaviors, to exclude themselves from the credit market.[10]

II. Gender gaps

International evidence suggests that there are gender gaps in access to credit and financing conditions. Using information from the World Bank's Global Financial Inclusion Database, Demirgüç-Kunt et al. (2013) showed that there were significant differences between women and men in terms of ownership and use of savings and credit products in 98 developing economies. In particular, they found that, in these economies, the percentage of women who had a bank account and used formal financial savings and credit products was only 37%, 29%, and 32%, respectively, while for men these percentages were 46%, 33%, and 37%.[11] According to this study, the gender gaps remained significant even when the effects of differences in employment status, income, education, age and place of residence between women and men were excluded from the results.[12]

---

[1] Other reasons for these gaps include occupational segregation, possible bias and discrimination, and lack of representation in leadership positions (Goldin, 2014).
[2] Regarding evidence on gender gaps at the international level, see the references in section II of this box. Additionally, Alesina, Lotti and Mistrulli (2013) show that there are gender gaps in Italy and link them to historical and cultural factors.
[3] For evidence on the existence of barriers to women's access to credit at the international level, see footnote 11 in this Box.
[4] See the "Decomposition of change in non-performing ratio levels and gender" section in this Report.
[5] See Table I in Section II of this Box.
[6] Coleman (2002) shows that the lack of collateral reduces women's credit in the United States.
[7] Buvinic and Berger (1990) highlight the lack of residential properties as one of the reasons for women's lack of access to financing in Peru.
[8] Demirgüç-Kunt et al. (2013) and Li (2018) argue that this shorter credit history is one of the reasons why women have lower credit scores and lower approval rates.
[9] Croson and Gneezy (2009) show that women are generally more risk averse. Carter et al. (2017) and Morsy (2020) show that this increases self-exclusion.
[10] The results of Ongena and Popov (2016) suggest that discrimination discourages women from taking out loans, especially in countries with more gender bias. Muravyev et al. (2009) argue that financial institutions discriminate against women entrepreneurs in Eastern Europe. Moro et al. (2017) do not reject the idea that women may exclude themselves from the credit market due the presumption that they might be discriminated.
[11] In addition to this evidence, other studies suggest that women face more obstacles to accessing credit and have less access than men. For example, Buvinic and Berger (1990) show that the existence of structural and social barriers decreases women's access to credit. Mascia and Rossi (2017) show that women face more difficulties in accessing bank credit for SMEs in Europe. Similarly, Ongena and Popov (2016) show that women entrepreneurs have lower credit approval rates than men.
[12] The latest version of the database (World Bank, 2021) confirms that women's participation in credit remains lower in Latin America and the Caribbean.

Similarly, the results of the Financial Access Survey (*FAS*) conducted by the International Monetary Fund (IMF) reveal that while bank account ownership has increased for both men and women in 2021 and 2022, the gap between the two genders remains significant in several countries. The survey shows that, on average, men have 55% more deposit accounts than women and a significantly higher value of deposits. These differences between women and men are even more significant for ownership and value of credit accounts. [13]

As in other parts of the world, gender gaps in credit markets also exist in Mexico. In the case of firm's credit, which is the one studied in this box, the gender gaps are particularly significant in several dimensions of financing.[14]

Table 1
Differences between women and men in business credit variables

Characteristic	Men (1)	Women (2)	Gender Gap (2) - (1)
Borrower firms[1/] (% of total)	69.4	30.6	
Outstanding amount[2/] (% of total)	76	24	
Credit amount (millions of pesos)	1.111	0.882	-0.229***
Financing costs[3/] (percentage points)	7.6	8.2	0.6***

1/ Refers to the proportion of the total number of individuals entrepreneurs (individuals with business activities) who obtained at least one loan.
2/ Refers to the proportion of the total balance of the total corporate portfolio of loans to individuals with business activities.
3/ Refers to the spread between the average credit rate and the Interbank Equilibrium Interest Rate (TIIE).
*** indicates that the estimated effect is statistically significant at 1%.
Source: Banco de Mexico and CNBV.

In this type of credit, there is a lower representation of women in the group of borrowers. While female entrepreneurs represent only 30.6% of the total number of borrowers, men represent 69.4% (Table 1). In terms of the outstanding amount, there are also significant gender gaps: women's loans represent 24%, while men's loans represent about three-quarters of the total.[15]

In addition, on average, loans granted to women have a significantly smaller amount and higher costs than loans granted to men, with the differences in these cases being 0.299 million 2018 pesos and 0.6 percentage points, respectively, in favor of men. Given these differences between women and men both in access, as well as in financing conditions, the following section analyzes whether the gender gaps in these variables widen in a context of greater macrofinancial uncertainty.

III. Gender gaps in a context of uncertainty

To estimate the response of gender gaps in a context of macro-financial uncertainty, data on firm's credit for the period of the COVID-19 pandemic and for a previous period is used.[16] In particular, data on the three variables considered in Section II that refer to credit conditions, i.e., the number of accredited firms for women and men, the average amount of their loans, and financing costs, are obtained from Banco de México.[17] Specifically, a panel data model with the following statistical specification is used:

$$y_{fset} = \alpha_f + \gamma_{st} + \delta_{et} + \varepsilon_{fset}$$
$$+ \beta F * 1\,(t \geq Pandemic_{COVID19})$$

where y_{ftse} can denote each of the three outcome variables reflecting credit conditions (representation in the total number of accredited firms, average loan amount and financing costs) and which refer to the loans granted to a firm f that belongs to the economic sector s in state e during period t; F is an indicator variable that takes the value of 1 if the firm to which the credit is granted belongs to a woman and 0 if it belongs to a man; $1\,(t \geq Pandemic_{COVID19})$ is another indicator variable that takes the value 1 if the period considered t belongs to the COVID-19 pandemic and the value 0 if it does not; α_f is a firm-level fixed effect; γ_{st} is a sector-time fixed effect; δ_{et} is a state-time fixed effect . In this specification, the coefficient β is the one of interest, as it captures how the COVID-19 pandemic changed credit conditions for women compared to men and, therefore, how gender gaps responded in a context of more uncertainty.[18]

The inclusion of the firm fixed effect α_f, together with the variable $1\,(t \geq Pandemic_{COVID19})$, allows the estimation to compare the financing costs paid by a firm during the pandemic with those paid by the same firm during a period of less uncertainty (or other dimensions of credit, for example, to compare the amount of credit granted to the firm in each of the periods). Furthermore, the inclusion of the variable F allows this same comparison to be made for men on the one hand and for women on the other, so that if financing costs increased more during the pandemic for women than for men, the gender gap is said to have increased in this dimension of credit in an environment of greater uncertainty.

In addition, the inclusion of sector-time and state-time fixed effects (γ_{st} y δ_{et}) allows to exclude from the estimation the differential negative economic impacts that the pandemic had on certain sectors and states and that could confound the results.

[13] The FAS is a database on access to and use of financial services, including digital services and disaggregated data by gender. It covers 191 economies, with 121 data series and data since 2004. See IMF (2023).
[14] For example, the gaps in representation in the credit balance are among the largest, along with those in the mortgage loans portfolio. In this analysis and in the rest of the box, we consider the credit of individuals with business activity, which is that for which the gender of the borrower can be identified. In addition, as in Section III, when comparing a pandemic and non-pandemic period, the analysis in this section also uses a two-year sample for each of these periods.
[15] Barrios, Becerra-Ornelas, Hernández, Jaume, and Tobal (2024) provide additional evidence on the existence of gender gaps in the Mexican credit market.
[16] Since the empirical identification consists of comparing the credit performance of the same firm in a period of macrofinancial uncertainty with its performance in another period with less uncertainty, the sample includes information on December 2018 and 2019 (non-COVID period), on the one hand, and December 2020 and 2021, on the other.
[17] Strictly speaking, the information comes from the regulatory reports by the National Banking and Securities Commission (CNBV) and is subsequently processed by Banco de Mexico.
[18] This statistical specification incorporates the effect of the inclusion of the indicator variables *F* and $1\,(t \geq Pandemic_{COVID19})$ separately in the regression. In particular, the effect of including these variables is incorporated in the fixed effects. The firm-level fixed effect captures the effect of including the *F* variable, since this allows us to compare the same company over time and, therefore, to compare people of the same gender (which would be equivalent to including the *F* variable separately in the regression). The sector-time and state-time fixed effects capture the effect of including the F variable in the regression. $1\,(t \geq Pandemic_{COVID19})$The sector-time and state-time fixed effects capture the effect of including the variable F in the regression, as they capture the idiosyncratic impacts of each year, including whether or not there was a COVID-19 pandemic.

For example, the pandemic affected more the economic activity of leisure and temporary accommodation and food and beverage preparation services, which, if women were more represented in these sectors, could have led to their having a higher credit risk and this, in turn, modified their financing conditions. However, the objective of the analysis is not to identify the effects of the pandemic through its impact on economic activity and the real sector, but rather through the changes in risk appetite that could have been generated by an environment of uncertainty, considering that, according to their financing conditions, women could be perceived as subjects of greater credit risk.

IV. Results

The results indicate that gender gaps widen in a context of macro-financial uncertainty, as the differences between women and men increase in terms of their representation in the total number of borrowers, loan amounts and financing costs.

Regarding the representation of women and men in the total number of borrowers firms, the statistical analysis reports on the probability that an entrepreneur obtained refinancing or a new loan during the pandemic. The results show that the probability that a borrower obtained refinancing or a new loan declined by about 1.1% more for women than for men (Table 2); that is, the proportion of borrowers who were dropped out of the firm's credit market during the COVID-19 pandemic was considerably greater for women than for men. This reduced their representation in the total number of borrowers firms.

The result on the probability of obtaining refinancing confirms that the credit situation of women worsens more in periods of uncertainty than that of men and suggests, therefore, that women may be perceived as subjects of greater credit risk. It also highlights that the estimated response of 1.1% represents a significant difference, as between two periods without uncertainty, the probability of women obtaining refinancing decreases more than that of men, but only by about 0.6%.

Table 2
Changes in gender gaps of selected variables during the COVID-19 pandemic.

Characteristic	Representation in number of borrower firms[1/]	Credit amount	Financing costs
Change in gender gap (standard errors)	-1.075*** (0.247)	-0.029*** (0.009)	0.402*** (0.038)
Observations	767,972	452,568	452,568
R^2	0.44	0.83	0.86

1/In this analysis, the representation in number of borrower firms refers to the probability that an entrepreneur, whether female or male, will obtain refinancing or new credit during the COVID-19 pandemic.
*** indicates that the estimated effect is statistically significant at 1%.
Standard errors refer to the standard errors of the coefficient linked to the corresponding estimated effect.
Source: Banco de Mexico and CNBV.

In terms of loan amount, gender gaps also widened during the COVID-19 pandemic. Relative to men, the amount of credit granted to women declined 2.9 percentage points more. Considering that the average loan amount of women was 20.7% lower than that of men before the pandemic, this decline implies a widening of the gender gap by 23.6%. This finding reflects that the differences between men and women in the amount of their loans are exacerbated in a context of uncertainty, where risk perceptions become more important.

Similar results are obtained for the financing costs of firm's credit. During the COVID-19 pandemic, the difference between the interest rates paid on this type of credit and the reference rates increased, reflecting the higher perceived credit risk during that period. However, the increase was greater for women, such that the gender gap in financing costs increased by 0.402 percentage points during the uncertainty period.

Given the increase in the gender gaps for the probability of obtaining refinancing, the amount of credit and the costs of credit, a relevant question is whether during the pandemic there was a more significant increase in credit defaults by women than by men. To answer this question, the same exercise is performed for the non-performing ratio levels as for the three firm's credit variables analyzed above. The results indicate that there is no evidence that the non-performing ratio levels of women entrepreneurs have increased more than those of men (Table 3). Therefore, in this case, the uncertainty generated by the COVID-19 pandemic did not generate differences between women and men, nor did it increase the gender gap.

Table 3
Changes in gender gaps in non-performing ratio levels during the COVID-19 pandemic.

Variable	Non-performing ratio levels (IMOR)
Gap response (standard errors)	0.006 (0.004)
Remarks	452,568
R^2	0.57

*** indicates that the estimated effect is statistically significant at 1%.
Standard errors refer to the standard errors of the coefficient linked to the corresponding estimated effect.
Source: Banco de Mexico and CNBV.

V. Final considerations

Women have lower default rates than men under similar credit conditions. However, they pay higher financing costs and obtain lower loan amounts, suggesting that women may be perceived as borrowers with higher credit risk than they actually have. In a context of macrofinancial uncertainty, in which risk perceptions become more important, it is relevant to evaluate the behavior of these gaps. The results suggest that in an uncertain environment, gender gaps worsen in terms of the probability of obtaining credit, the amount of credit granted and financing costs.

These results could be related to several factors, such as the fact that women tend to own fewer assets that can be used as collateral, have less credit history and have had less time to build trust relationships with their banks. In addition, according to some authors, these findings could indicate that women exclude themselves from the credit market in contexts of uncertainty, due to greater risk aversion or because, aware of the existence of gender biases, they anticipate rejections in their credit applications or less favorable financing conditions.

The results underscore the importance of continuing to adopt public policies that reduce gender gaps in the Mexican credit

market. From the above analysis, the following conclusions can be drawn. First, it is crucial to implement policies that allow for the continued preservation of a stable economic environment, with price stability, financial stability and sound public finances. A stable macrofinancial framework is a factor that promotes equity by reducing uncertainty and thereby preventing gender gaps from widening.

Second, given the significant gender gaps that currently exist, it is necessary to continue to implement policies that specifically target the reduction of gender gaps in the credit market. These policies should be designed to identify and eliminate the specific barriers faced by women. This includes, for example, the direct provision of credit to women under specific conditions, the provision of guarantees, or regulatory policies that provide incentives for private financial brokers to provide credit themselves, such as those that have, in fact, already been implemented in the recent past.[19]

Third, it is important to emphasize that gender gaps in the credit market cannot be interpreted in isolation from the gaps that exist in other dimensions of the economy. Gender equity policy must continue to be implemented in an integrated manner. Thus, for example, a public policy that promotes equity in the labor market will also tend to close the gaps in the financial system.

References

Alesina, A. F., Lotti, F., and Mistrulli, P. E. (2013). "Do women pay more for credit? evidence from Italy." *Journal of the European Economic Association*, 11, 45-66.

Barrios, O., Becerra-Ornelas, A., Hernandez, T., Jaume, D., and Tobal, M. (2024) "Is There a Gender Premium? Financial Frictions and Credit to Female Entrepreneurs." *Unpublished manuscript*.

Becerra-Ornelas, A., Hernandez, T., Jaume, D. and Tobal, M. (2023). "Can Regulatory Policies Foster Women's Financial Inclusion? The Role of Loan Loss Provisioning." Available at: https://we-fi.org/wp-content/uploads/2023/11/RC_Presentation-Can-Regulatory-Policies-Foster-Womens-Financial-Inclusion_-The-Role-of-Loan-Loss-Provisioning-Alejandro-Becerra.pdf

Buvinic, M., and Berger, M. (1990) "Sex differences in access to a small enterprise development fund in Peru". *World Development*, Volume 18, Issue 5, 695-705.

Carter, M. E., Franco, F., & Gine, M. (2017). "Executive gender pay gaps: The roles of female risk aversion and board representation." *Contemporary Accounting Research*, 34(2), 1232-1264.

Coleman, S. (2002). "Constraints faced by women small business owners: Evidence from the data." *Journal of Developmental Entrepreneurship*, 7(2), 151.

Croson, R., and Gneezy, U. (2009). "Gender differences in preferences." *Journal of Economic Literature*, 47(2), 448-474.

Demirgüç-Kunt, A., Klapper, L. F., and Singer, D. (2013). "Financial inclusion and legal discrimination against women: evidence from developing countries." *World Bank Policy Research*. Working Paper, (6416).

IMF (2023). "IMF Releases the 2023 Financial Access Survey Results." IMF Press Release no. 23/332.

Goldin, C. (2014). "A grand gender convergence: Its last chapter." *American Economic Review*, 104(4), 1091-1119.

Li, G. (2018). "Gender-related differences in credit use and credit scores." FEDS Notes. Washington: Board of Governors of the Federal Reserve System, June 22, 2018.

Mascia, D. V., and Rossi, S. P. (2017). "Is there a gender effect on the cost of bank financing?". *Journal of Financial Stability*, 31, 136-153.Moro, A., Wisniewski, T. P., & Mantovani, G. M. (2017). "Does a manager's gender matter when accessing credit? Evidence from European data." *Journal of Banking & Finance*, 80, 119-134.

Morsy, H. (2020). "Access to finance - Mind the gender gap". *The Quarterly Review of Economics and Finance*. Volume 78, pp 12-21, 1062-9769.

Muravyev, A., Talavera, O. and Schäfer, D. (2009) "Entrepreneurs' gender and financial constraints: Evidence from international data". *Journal of Comparative Economics*, Volume 37, Issue 2, pp 270-286.

Ongena, S., and Popov, A. (2016). "Gender Bias and Credit Access." *Journal of Money, Credit and Banking*, 48(8), 1691-1724.

Word Bank (2021). "The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19".

[19] There are currently programs of this type, such as "Mujeres, fuerza del sureste"; "Mujeres RIF Crezcamos Juntas"; "Mujeres PYME;" or "MujerES Bancomext", among others. Regulatory policies have also been implemented to provide incentives to private institutions. An evaluation of these policies can be found in Becerra-Ornelas et al. (2023).

IV.2.2. Private non-financial companies

Total financing to the country's private non-financial companies decreased slightly in real annual terms with respect to the previous *Report*, although the contraction rate was lower. By type of source, the external component now shows fourteen consecutive quarters of contraction and is explained by both lower foreign bank credit and lower international debt issuance by companies. On the other hand, domestic financing registered positive growth in its three main sources (bank, non-bank and debt issuance), although it slowed down slightly (Graph 50). Although the cost of issuing debt continues to be high, it was lower than in previous months following the pause in the cycle of rate hikes in Mexico and the United States. During the first quarter of 2024, companies took advantage of lower interest rates to refinance their debt, both in Mexico and abroad.[39] As a result, companies' debt maturity structure for 2024 provides them with some leeway, as few companies face significant debt maturities.

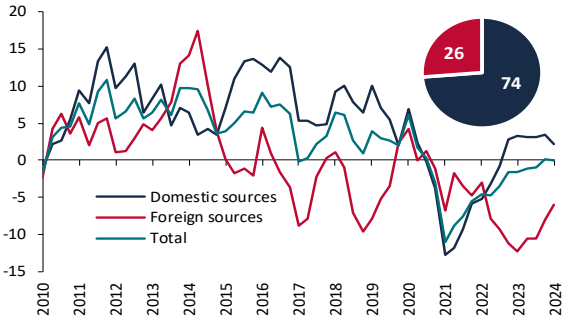
As of January 1, 2025, issuers will no longer be able to use the 28-day TIIE as a reference rate and instead will have to adopt the 1-day funding TIIE; however, its adoption as a reference rate is still low, so the potential risks associated with the transition to its widespread use will have to be monitored.

Banks are the main providers of financing to companies. During the period covered by this *Report*, the bank loan portfolio grew at a slower pace, explained by the decrease in the portfolio balance of large companies, whose effect was greater than the sustained growth of the portfolio balance of smaller companies (Graph 51).

Graph 50

Total financing to Private Non-Financial Companies 1/

Real annual percentage change



Data as of March 2024.

Source: Banco de México, BMV and SHCP.

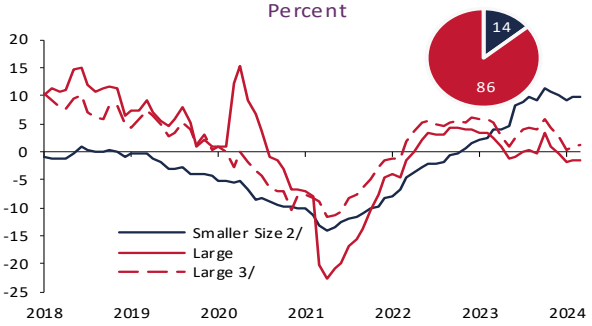
Note: The percentages shown here consider the figures relating to non-regulated entities that grant financing and that are included at the bottom of Table 3 (Memo); therefore, the differ from those registered in the upper part of the same table. In addition, figures exclude non-regulated entities for which data stock echange is not available as they are in debt restructuring or liquidation processes.

1/ Includes the loan portfolio of commercial banks and regulated non-bank entities such as regulated sofomes, socaps, sofipos and credit unions, ase well as non-bank non-regulated entities such as non-regulated sofomes and debt-issuing financial companies such as financial leasing companies or financial arms of automotive companies. Includes also debt securities issued both domestically and abroad. Also includes financing from suppliers for listed companies. The growth series is adjusted to take into account the start of availability of financing figures for non-regulated entities (2015-2016). The external financing figures are adjusted for FX effects.

Graph 51

Real annual portfolio growth by company size 1/

Percent



Data as of March 2024

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.

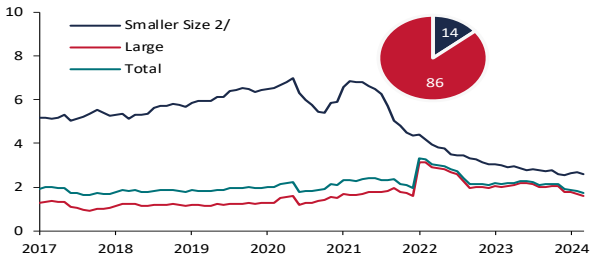
3/ Large companies excluding those that had a monthly increase in their balances of greater than 15% in March 2020, which represent 30% of the outstanding loan portfolio and 16% of the large companies as of the latest reporting period.

The NPL ratio of the commercial banking credit portfolio has decreased since November 2023. This behavior is explained by the decrease in the NPL ratio

[39] In particular, one company placed debt in international markets in Mexican pesos for an amount that represented 30% of the amount placed in international markets in the first quarter of 2024.

levels of large companies; in contrast, the NPL ratio levels of smaller companies increased during the first quarter of 2024, due to the increase in their non-performing portfolio balance (Graph 52).

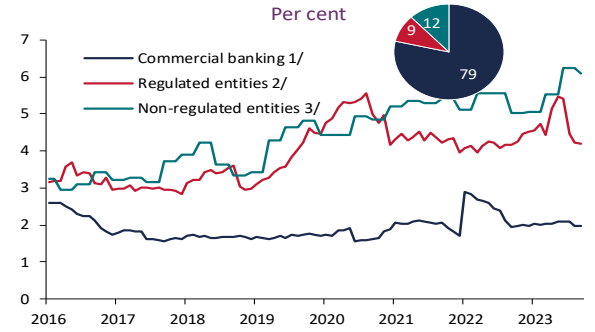
Graph 52
Non-performing loan ratio by company size[1/]
Percent



Data as of March 2024
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 as of March 2024.

The NPL ratio of the credit portfolio to companies granted by non-banking financial intermediaries decreased with respect to the previous *Report*; both in the regulated and non-regulated sector (Graph 53).

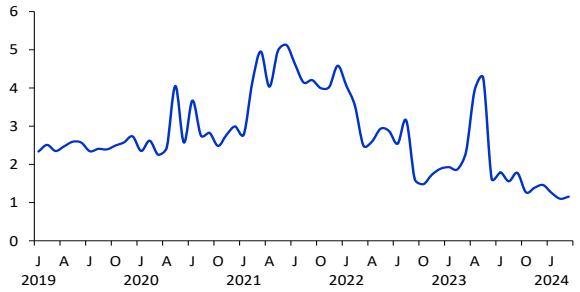
Graph 53
Non-Performing Loan ratio of Corporate Loans Portfolio
Per cent



Data as of March 2024.
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 potfolios 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.

Likewise, this portfolio recorded low levels of risk in the granting of new loans, which is reflected in the downward trend in the probability of default that started in the second half of 2023 (Graph 54).

Graph 54
Probability of default for loans granted to private companies [1/]
Percent

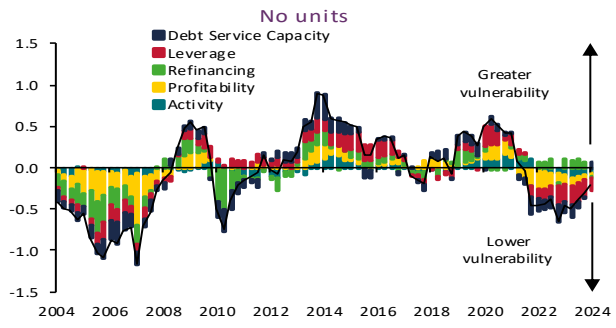


Data as of March 2024.
Source: CNBV.
1/ Includes banks loans and linked sofomes loans. Regulatory probability of default.

Listed private non-financial companies[40]

The Listed Companies Vulnerability Index (IVEL, its acronym in Spanish),[41] which measures vulnerabilities for companies as a whole and can be broken down by economic sector, showed an increase during the first quarter of 2024 with respect to the previous *Report.* However, it is still in the low vulnerability zone. The increase in the level of the indicator is explained by the increase observed in the variables associated with in-debt-service, and to a lesser extent, with leverage and profitability (Graph 55).

Graph 55
Listed Companies Vulnerability Index
No units



Data as of March 2024.
Source: Own calculations with data from Bloomberg.

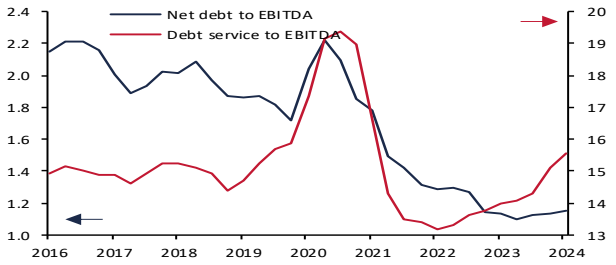
Annual operating cash flow generation (EBITDA),[42] for all listed private non-financial companies as a whole,

[40] Includes information on companies in the BMV and BIVA.
[41] For a description of the methodology see Box 2: Vulnerability Index of Listed Companies, Financial Stability Report June 2023.
[42] The initials EBITDA refer to Earnings Before Interest, Taxes, Depreciation and Amortization.

declined in real annual terms during the first quarter of 2024 for the seventh consecutive quarter.

Although the debt balance of the listed companies contracted slightly, both the leverage indicator and the debt-service cost of interest payments increased, partly due to the contraction of EBITDA, a lower cash reserve and higher interest payments (Graph 56). In addition, the proportion of debt due in the next 12 months decreased, so the companies' liquidity position improved and is sufficient to face such debt maturities. Finally, the use of cash for capital expenditure (capex) by companies increased slightly. This was mainly due to the behavior of companies in the industrial sector. Some companies recorded a lower operating cash flow related to the impact of foreign exchange in some regions.

Graph 56
Listed private non-financial companies' Leverage and Debt Service [1/]
Left axis: times EBITDA
Right axis: percent of EBITDA



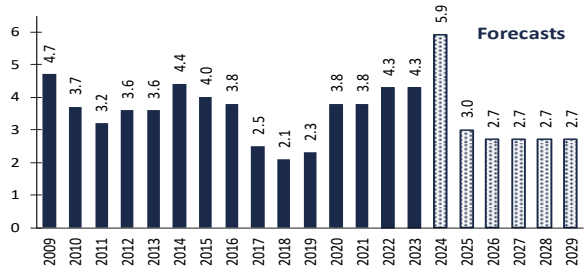
Data as of March 2024.
Source: BMV and BIVA.
1/ EBITDA refers to earnings before interest, taxes, depreciation and amortization.

Some listed companies have financial indicators whose levels suggest vulnerabilities. In turn, a greater number of downgrades are observed, in contrast to the number of upgrades registered by rating agencies during the period under analysis. However, banks' exposure to these companies is very low in relation to their regulatory capital.

IV.2.2.1. Federal Government

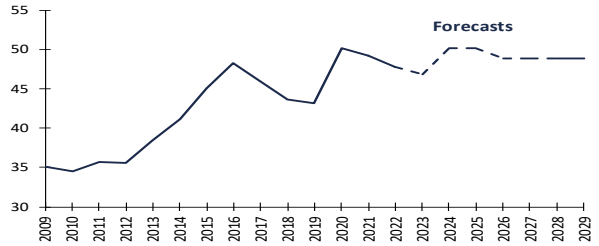
At the end of 2023, the public sector balance showed a deficit lower than that programmed in the Economic Package for that year. Within this balance, budgetary revenues and budgetary expenditures were lower than those foreseen in the Federal Revenue Law (LIF, its acronym in Spanish) 2023 and the Federal Expenditure Budget (PEF, its acronym in Spanish) 2023. Thus, the Public Sector Financial Requirements (RFSP, its acronym in Spanish) recorded a deficit of 1.37 trillion pesos, equivalent to 4.3% of GDP. The Public Sector Financial Requirements Historical Balance (SHRFSP, its acronym in Spanish) stood at 14.9 trillion pesos, equivalent to 46.8% of GDP (Graph 57 and Graph 58).

Graph 57
Public Sector Financial Requirements[1/]
Percent of GDP



Data as of April 2024.
Source: SHCP.
1/ Corresponds to the RFSP without a Banco de México operating surplus. The data observed for 2009-2022 and the estimates for 2024-2025 are taken from the Reports on the Economic Situation, Public Finances and Public Debt | First Quarter 2024. The estimates for 2025-2029 are from the General Economic Policy Criteria 2024.

Graph 58
Public Sector Financial Requirements Historical Balance[1/]
Percent of GDP



Data as of April 2024.
Source: SHCP.
1/ Corresponds to the RFSP historical balance without a Banco de México operating surplus. The data observed for 2009-2022 and the estimates for 2024-2025 are taken from the Reports on the Economic Situation, Public Finances and Public Debt | First Quarter 2024. The estimates for 2025-2029 are from the General Economic Policy Criteria 2024.

In the first quarter of 2024, the Public Sector balance had a lower deficit than anticipated in the 2024 Economic Package. In this balance, both budgetary revenues and budgetary expenditures were below what was programmed in the LIF 2024 and in the PEF 2024. On the other hand, the RFSP registered a deficit of 505.7 billion pesos and the SHRFSP was 15.43 trillion pesos (45.5% of GDP). At the end of April, the public sector balance was -33.3 billion pesos. Budgetary revenues were 2,621.2 billion pesos and total net expenditure was 2,998.7 billion pesos. In one respect,

the RFSP were -425.3 billion pesos, while the SHRFSP stood at 15.4 trillion pesos.[43]

By the end of 2024, the Federal Government anticipates a public balance deficit of 5.0% of GDP. To achieve this, it expects budgetary revenues in 2024 will be higher than expected in the LIF 2024 by 114 billion pesos and that budgetary expenditure in 2024 will be higher than that established in the PEF 2024 by 121.3 billion pesos. Thus, it is estimated that the RFSP will represent 5.9% of GDP and that the SHRFSP will be 50.2% of GDP (Graph 57 and Graph 58).

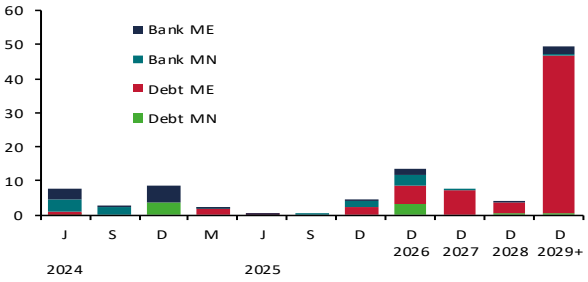
IV.2.2.2. State-owned companies

Petróleos Mexicanos (Pemex)

At the end of March 2024, Pemex recorded a slight quarterly net profit, which contrasts with the net loss observed in September 2023. These quarterly earnings were lower than those recorded during the same quarter of the previous year. On a cumulative twelve-month basis, net income was higher, which is explained by lower cost of sales and other expenses (investment expense, taxes) even though total revenues decreased.[44]

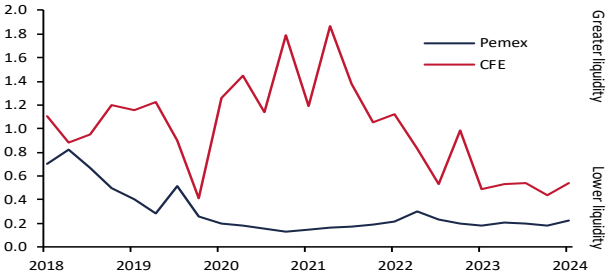
The peso balance of Pemex's total debt (which includes suppliers) decreased 4% with respect to September 2023, mainly due to lower debt contracted with foreign creditors. The reduction is explained by the decree that granted greater fiscal stimulus, together with support from the Federal Government.[45] As of March 2024, the company's debt maturities for the next twelve months represented 21% of its debt without suppliers, of which 29% corresponds to local and foreign debt securities (Graph 59). In addition, short-term debt was also reduced, which contributed to an improvement in the liquidity indicator (Graph 60), while debt with suppliers increased. An analysis of Pemex's suppliers shows that few of them have bank debt; large suppliers are current with the banks and few of the small suppliers are in a situation of overdue debt. Likewise, banks' exposure to these suppliers is low relative to their net capital.

Graph 59
Pemex debt maturities[1/]
Percent of the total debt



Data as of March 2024.
Source: BMV.
1/ Debt maturities reported prior to the first quarter of 2024 (1.3% of total debt) are included in the second quarter of 2024.

Graph 60
Liquidity position of Pemex and CFE [1/]
Times

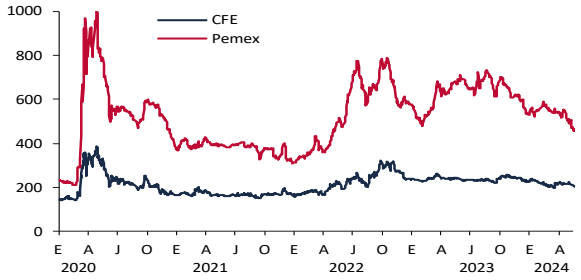


Data as of March 2024.
Source: BMV.
1/ It is defined as the result of dividing short-term cash and accounts receivable by the sum of 12-month liabilities with suppliers and 12-month financial debt.

Regarding the company's credit profile, in December 2023 one rating agency changed Pemex's rating outlook from negative to stable, while another downgraded its rating by two notches and maintained its negative outlook in February 2024. Subsequently, on April 1, 2024 another rating agency published a report that is not considered a rating action.[46] Additionally, in March 2024 Pemex published its Sustainability Plan, which was approved by its board of directors.[47] Finally, at the beginning of June, Pemex's five-year *CDS* was reduced with respect to the previous *Report* (Graph 61).

[43] See 'Public Finance and Public Debt Information, January-April 2024' from the SHCP.
[44] See the company's 1Q24 quarterly financial report, available here.
[45] See the decree published in the DOF on February 13, 2024, available here.
[46] See the document here.
[47] This plan establishes medium and long-term goals for the reduction of greenhouse gas emissions and energy transition. In addition, on the social aspect, commitments are established to improve industrial safety performance and actions to generate positive impacts, and to strengthen its relationship with the communities. See press release here.

Graph 61
USD 5-year Credit Default Swap of Pemex and CFE
Basis points



Data as of June 10, 2024.
Source: Markit.

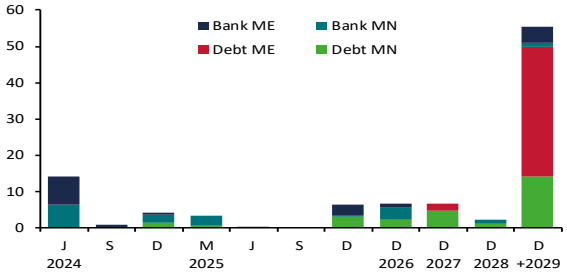
Thus, the risks in commercial banks' direct exposure to Pemex remain limited. In particular, between September 2023 and March 2024, this exposure showed a reduction, going from a level of around 11% of the net capital of these institutions at the end of the third quarter of 2023 to one close to 10% in March 2024. Against this backdrop, development bank financing to this state-owned company increased from a level of around 34% of net capital in September 2023 to close to 36% in March 2024.

Federal Electricity Commission (CFE)

At the end of March 2024, CFE (its acronym in Spanish) recorded a slight quarterly net profit that contrasts with the net loss observed in September 2023, although such quarterly earnings were lower than those recorded during the same quarter of the previous year. On a cumulative twelve-month basis, net income was lower due to lower revenues from electricity sales.[48]

The company's peso-denominated debt balance decreased slightly between March 2024 and September 2023, mainly due to the appreciation of the peso against the U.S. dollar. In addition, there was a rebalancing of CFE's debt from international bonds to foreign bank loans. Moreover, short-term debt increased slightly, so that the liquidity indicator decreased (Graph 60). As of March 2024, the company's debt maturities for the next twelve months represented 22% of its debt without suppliers, of which 9% corresponds to local and foreign stock market debt (Graph 62). Finally, at the beginning of June 2024, CFE's five-year *CDS* was slightly reduced with respect to the previous *Report* (Graph 61).

Graph 62
CFE debt maturities[1/]
Percent of the total debt



Data as of September 2023
Source: BMV

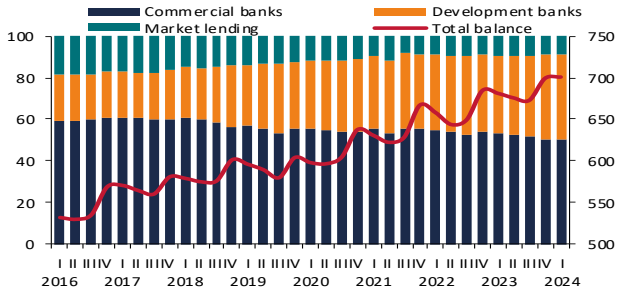
1/ Debt maturities reported prior to the first quarter of 2024 (0.6% of total debt) are included in the second quarter of 2024.

Although commercial banks' exposure to CFE increased between September 2023 and March 2024, the risks of this exposure remain limited, representing around 8% of the net capital of these institutions, in comparison with the 7% level recorded in September 2023. Likewise, banks' exposure to CFE decreased between the third quarter of 2023 and the first quarter of 2024, going from a level of around 19% of their net capital to close to 16% in that period.

IV.2.2.3. States

At the end of the first quarter of 2024, financing to sub-national governments registered an increase, compared to the level of financing observed at the end of the third quarter of 2023, thus maintaining a positive trend (Graph 63).

Graph 63
Subnational government financing
Right axis: Billions of pesos
Left axis: Percent



Data as of first quarter 2024.
Source: SHCP.

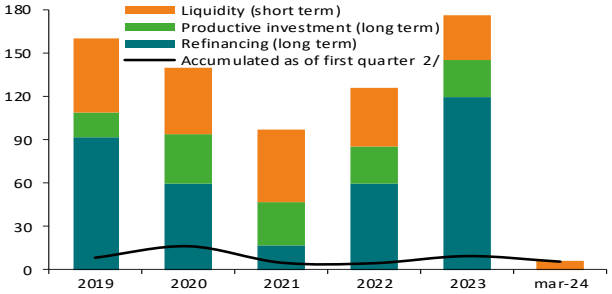
[48] See the company's 1Q24 quarterly financial report, available here.

In particular, during the first quarter of 2024, state governments did not contract new long-term bank loans, while short-term financing showed less dynamism (Graph 64).

Graph 64

Loans granted to state governments [1/]

Billions of pesos



Data as of March 2024.

Source: Prepared from state government released information.

1/ Posted information as of June 3rd 2024 by state governments.

2/ Accumulated as of first quarter per year considering liquidity and productive investment loans.

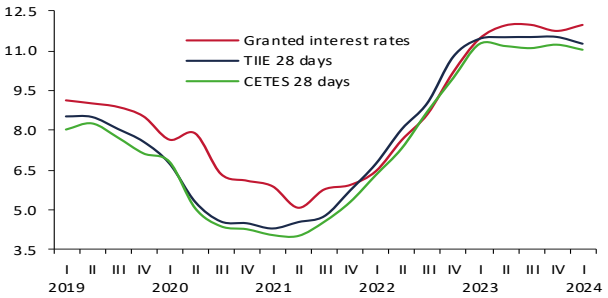
The Financial Discipline Law of the Federal Entities and Municipalities provides that, short-term obligations contracted by sub-national governments must be fully paid no later than three months before the end of the corresponding administration's term of office, and new short-term loans may not be contracted during the latter period. In this regard, between September 2023 and March 2024, according to information from the SHCP, most of the state governments of the nine states that held gubernatorial elections in 2024 refrained from contracting short-term bank loans. [49]

Regarding the source of financing for sub-national governments, as of the first quarter of 2024, commercial banks are their main creditors, with nearly 51% participation of total financing, while development banks continued to increase their participation and represented around 40% (Graph 63). In this regard, in the first quarter of 2024, the level of concentration of commercial banks' credit to these governments remained unchanged, while in the case of development banks its concentration is higher, as a result of the participation of few institutions in this portfolio segment. In parallel, the concentration of bank credit per federal entity remained low. At the end of the first quarter of 2024, state governments registered an interest rate for bank credit similar to that observed in the third quarter of 2023 (Graph 65).

Graph 65

Weighted average interest rate on offers of bank loan to state governments [1/]

Percent



Data as of first quarter 2024.

Source: Prepared from state government released information.

1/ The Federal Entities and Municipalities Financial Discipline Law establishes that, for the sustainable management of public finances, federal entities must conduct competitive processes for public debt bidding and, once the related legal instruments have been executed, the public entity must post the results of such instruments on its official website.

2/ Posted information as of June 3rd 2024 by state governments.

Between October 2023 and March 2024, the rating agencies revised the credit risk perception of sub-national governments: for state governments, three entities showed an improvement and one entity presented a deterioration. In particular, the state government of Durango, which since October 2021 maintained the lowest rating among sub-national governments, resolved the default of some of its obligations in February 2024, so that its credit rating registered an improvement.[50] Regarding municipal governments, the rating agencies revised upwards the credit ratings of twenty-one municipalities, while six revisions were downwards. In this context, one

[49] Only one state contracted a short-term loan, although this does not contravene the provisions of the Financial Discipline Law for Federal Entities and Municipalities, given its contract term.

[50] In this regard, the Government of Durango recorded a default in October 2021, related to its short-term debt. In July 2023, an improvement in its credit rating was recorded, reflecting the regularization of the corresponding payments of such debt, although the change in rating was limited due to the fact that the State assumed in discount obligations, which were in default, of three decentralized state agencies and of a public university of that entity. On February 16, 2024, the Government of Durango completed settlement of the outstanding balance of the discounted obligations. Additionally, the improvement in the management of its finances due to the implementation of collection policies contributed to the strengthening of its own revenue collections, the good dynamism of federal transfers and expenditure containment policies. For further details, please refer to Fitch's press released March 5, 2024: "Fitch Upgrades to 'BB(mex)' and Removes Durango's State Rating" (fitchratings.com).

municipality fully paid the overdue balance of a short-term loan, thus its rating was upgraded.[51]

As of March 2024, debt maturity risks and potential pressures on sub-national governments' revenues remain limited. According to the SHCP's alert system, which consists of three indicators that reflect different aspects of debt sustainability, debt has remained stable for most state governments in recent quarters.[52] In this regard, as of the first quarter of 2024, only one state government recorded a level of debt under observation (Figure 1a).

As of the second half of 2023, twenty-four municipal governments recorded levels of debt under observation and two municipalities recorded levels of high debt (Figure 1b).

Figure 1

Subnational government debt sustainability 1/

a) State governments, quarterly information 2/



b) Municipal governments, half-yearly information

	2022-2	2023-2
SUSTAINABLE DEBT	579 municipalities 3/	568 municipalities 3/
OBSERVATION DEBT	32 municipalities: Chihuahua (3), Coahuila (3), Durango (6), Jalisco (2), México (4), Morelos (3), Nayarit, Puebla, Quintana Roo, San Luis Potosí, Sonora (2), Tlaxcala, Veracruz (4)	24 municipalities: Chihuahua (3), Coahuila (2), Durango (3), Guerrero, Jalisco (2), México (3), Morelos, Nayarit, San Luis Potosí, Sonora (3), Veracruz (4)
HIGH DEBT	3 municipalities: Mapimí, Tlahualilo (Durango), Puerto Peñasco (Sonora)	2 municipalities: Mapimí, Tlahualilo (Durango)

Data as of first quarter 2024 for state governments and as of second half-yearly 2023 for municipal governments.

Source: Prepared from SHCP information.

1/ The result of the alert system, for its calculation, considers three indicators: i) Debt and obligations over unrestricted revenues; ii) Debt service and obligations over unrestricted revenues; iii) Short-term obligations, suppliers and contractors minus cash, banks and temporary investments over total revenues. The methodology can be found on the SHCP website: https://www.disciplinafinanciera.hacienda.gob.mx/es/DISCIPLINA_FINANCIERA/Entidades_Federativas_2023

2/ The state of Tlaxcala has no loans and obligations since 2019.

3/ As of second half-yearly 2022, 126 municipalities had failed to provide information and 48 entitites had not been rated, while as of second half-yearly 2023, 123 municipalities had failed to provide information and 71 entitites had not been rated.

IV.2.3. External sector and capital flows

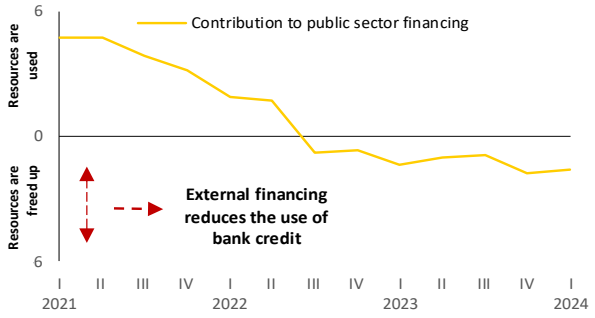
The public sector, among other sectors that have access to external financing, can obtain resources from abroad due to capital inflows. External resources allow this sector to reduce its dependence on domestic bank credit and free up domestic resources for other sectors of the economy to access this financing. In the first quarter of this year, the balance of payments recorded strong inflows of capital that more than compensated for the outflows observed in the last quarter of the previous year. As

[51] The municipality of Los Cabos in Baja California Sur, after seven months of default on its short-term debt, on October 11, 2023, settled the entire past-due of a short-term loan. For further details, see *Standard & Poor's* press release from October 30, 2023: "S&P Global Ratings raised Los Cabos' rating to 'mxCCC+' from 'SD' after curing the default on a short-term loan; placed at Special Review under Development" (spglobal.com)

[52] The indicators considered in the alert system are: i) Debt and obligations over unrestricted revenues; ii) Debt service and obligations over unrestricted revenues; and iii) Short-term obligations, suppliers and contractors minus cash, banks and temporary investments over total revenues. Details of the methodology are available for consult at the SHCP's website: Disciplina Financiera de Entidades Federativas y Municipios (hacienda.gob.mx).

a result, the public sector continued to release domestic bank credit, making more resources available to finance other sectors of the economy. In fact, this release of resources was greater than in the previous edition of this *Report* (Graph 66).

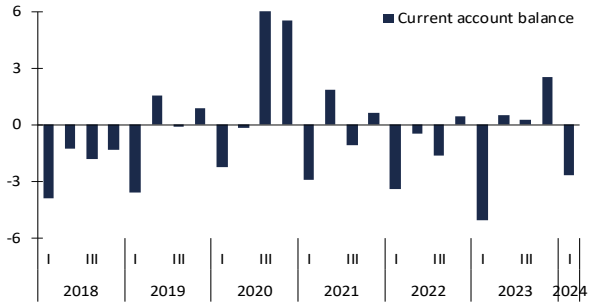
Graph 66
Contribution of net capital flows to real domestic financing growth of the Public Sector[1/]
Percentage points



Data as of first quarter 2024.
Source: Banco de Mexico and CNBV.
1/The contribution of capital flows to financing is obtained as the difference between the annual growth rate of real financing and the rate that would have been observed in the absence of these flows. The latter rate is obtained by assuming, in a vector autoregressive (VAR) model, that the coefficients associated with capital flows and the shocks to them are equal to zero. The model uses data from Q1 2010 to Q1 2024 and a moving window of 31 quarters. Capital flows are defined as the sum of net direct, portfolio and other investment flows.

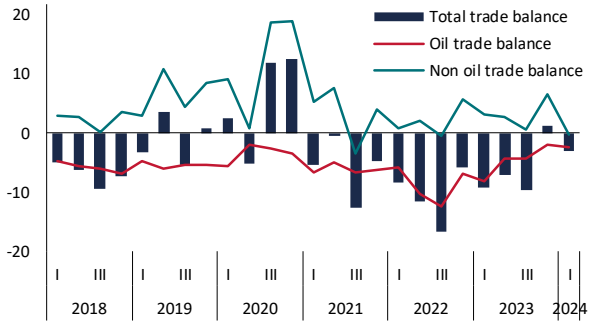
The current account recorded a surplus of 2.5% of GDP in the last quarter of 2023 and a deficit of 2.7% in the first quarter of 2024 (Graph 67). Within this account, the oil trade balance was in deficit in both quarters, while the non-oil trade balance was in surplus in the last quarter of 2023, but in deficit in the first quarter of 2024 (Graph 68). On the other hand, the financial account recorded net lending from abroad in the fourth quarter of 2023, largely due to capital outflows in the categories of other investment and derivatives and, to a lesser extent, to slight portfolio outflows. On the contrary, the first quarter of 2024 reflected net borrowing with strong capital inflows, mostly in the portfolio and direct investment categories.

Graph 67
Current account
Percent of GDP



Data as of first quarter 2024.
Source: Banco de Mexico and INEGI.

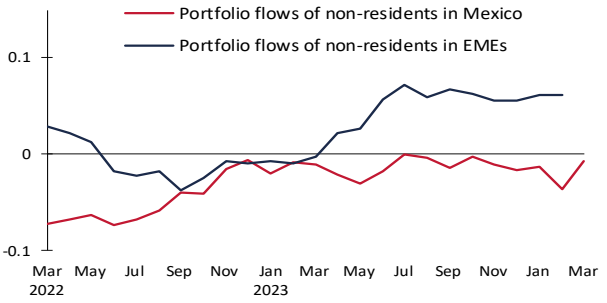
Graph 68
Trade balance
Billions of dollars



Data as of first quarter 2024.
Source: Banco de Mexico and INEGI.

Timely information from the Institute of International Finance (*IIF*) indicates that emerging economies continued to exhibit inflows of non-resident portfolio capital in the last quarter of 2023 and the first months of 2024, consolidating the recovery they had been showing since the end of 2022, after the beginning of the conflict between Russia and Ukraine (Graph 69). According to timely information, in Mexico, non-resident portfolio flows increased since the last version of this *Report*, implying also a recovery. This was due to the portfolio inflows in December 2023 and, more significantly, the strong inflows recorded in March 2024.

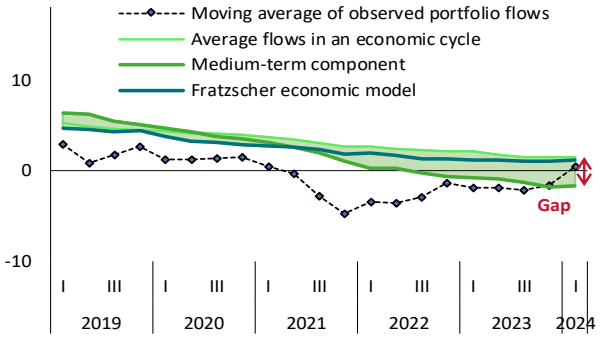
Graph 69
Non-resident portfolio flows to Mexico and EMEs[1/]
Percent of 2022 GDP, 1-year moving average



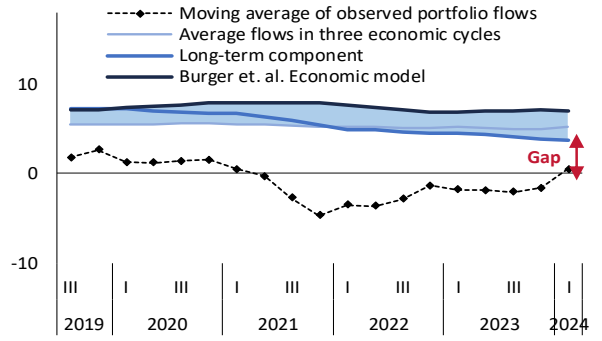
Data as of March 2024.
Source: Institute of International Finance (IIF).
1/The measure of portfolio flows from emerging economies included those countries considered in the monetary policy and international financial markets sections of the Quarterly Report January-March 2021 for which information was 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.

Thus, it is important to understand how much room remains for non-resident portfolio flows to continue recovering in the future. For this purpose, an estimate of the range of the natural value of these flows is used (see Box 3 "Range of the natural value of portfolio flows", in the *Financial Stability Report*, June 2023).[53] The recovery of portfolio flows that Mexico has been showing, more pronounced in the first quarter of 2024, has placed these flows within the range of their natural value in the short and medium term. Therefore, the margin for these flows to continue increasing due to temporary and persistent factors has narrowed (Graph 70a). Nevertheless, the difference between flows and their long-term natural value remains significant. This suggests that there is still a considerable margin for portfolio flows to continue entering Mexico due to structural factors, more linked to the long-term performance of its economy, such as the positive effects that could be generated by the consolidation of the nearshoring process in the country (Graph 70b).

Graph 70
Range of natural flows [1/]
a) Medium-term
Billion dollars



b) Long term
Billion dollars

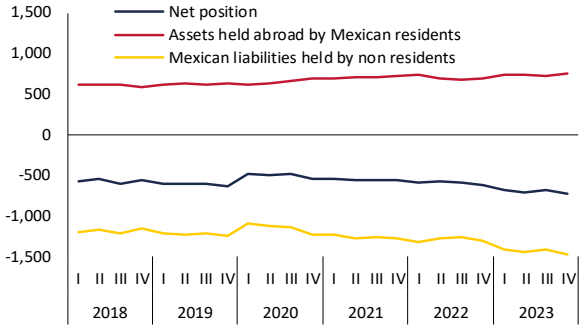


Figures as of first quarter of 2024.
Source: Banco de Mexico, Bloomberg, CreditSuisse, IIF and IMF.
1/ One year moving average.

Mexico's international investment debit (net) position increased in the fourth quarter of 2023, compared to the same quarter of the previous year. On the assets abroad side, investments by Mexican residents increased by 7.4%, and on the liabilities side, investments from abroad decreased by 12.2% (Graph 71).

[53] This value measures the portion of flows that is not subject to temporary factors and, instead, is affected only by persistent and structural factors. See Box 3 "Range of the natural value of portfolio flows," from the Financial Stability Report, June 2023.

Graph 71
International investment position[1/]
Billions of dollars



Data as of Q4 2023.
Source: Banco de Mexico.
1/ It refers to the international investment position at the end of the period. The net international position is estimated by substracting liabilities from asssets and then adding the international derivative position. Mexican liabilities in the hands of non.residents have the sign changed with respect to how they are mesured in the international investment position statistics of the balance of payments to obtain the calculation of the country's net creditor position.

The global outlook faces several relevant risks, such as a high interest rate environment that could be further prolonged by recent inflationary surprises in advanced and emerging economies. In addition, recent geopolitical tensions could intensify, setting up higher trade and capital barriers. In the face of this, the strength of Mexico's macrofinancial fundamentals has been critical to maintaining investor confidence and attracting foreign investments. As a result, the adverse effects of a reduction in external financing have been mitigated.

IV.3. Institutions

Total assets of the financial system increased at the end of March 2024 at higher rates than those recorded in previous quarters. Popular Finance Corporations (sofipos, its acronym in Spanish), Investment Funds and unregulated Sofomes posted double-digit growth in total assets, which explains why their share of total financial system assets increased. In contrast, in the case of General Deposit Warehouses, assets decreased.

On the other hand, the participation of commercial banks continues to be the most important in terms of total assets within the financial system. In terms of the number of institutions in the sector, there has been a greater dynamism in applications for banking licenses and authorizations due to the new business models with a completely digital approach. However, the share of assets of commercial banks has decreased marginally in total assets due to the lower growth of these institutions with respect to other financial institutions (Table 4).

Table 4

Mexican Financial System Structure [1/]

	Number of entities in operation[2/]	Share of total assets		Real annual growth rate of assets	Share of Top 5 largest entities[3/]
		in the Fin. Syst.	in GDP		
	No units	Per cent	Per cent	Per cent	Per cent
Commercial banks [4/ 5/]	50	43.8	43.1	2.2	65.2
Siefores (afores)[6/ 7/]	118 (10)	19.7	19.4	6.7	70.9
Investment Funds (Managers)[8/]	627 (30)	10.8	10.6	14.3	67.8
Development Institutions[9/]	9	9.6	9.4	3.3	89.2
Insurance Companies	113	7.8	7.7	7.6	42.3
Broker dealers	36	3.6	3.6	8.7	58.5
Non-regulated sofomes[10/]	1,522	2.1	2.1	12.8	21.6
Regulated sofomes[11/]	24	1.0	1.0	8.6	74.8
Savings and Loan Cooperatives (socaps)	154	0.8	0.8	4.3	54.5
Popular Finance Corporations (sofipos)[12/]	36	0.4	0.4	76.8	80.5
Credit Unions	68	0.2	0.2	3.3	50.1
Bond warehouses	15	0.1	0.1	-13.7	92.2
Total System	**2,067**	**100.0**	**98.3**	**5.5**	**n.a.**
Memo: Infonavit, Fovissste and Infonacot	*3*	*8.4*	*8.3*	*4.6*	*n.a.*

Preliminary figures as of March 2024. The figures for Investment Funds (Managers) and Development Trusts are as of December 2023.

Source: BMV, CNBV, CNSF, Consar & Condusef.

1/ This table includes the direct financing granted by the financial institutions mentioned here and may not match the direct and induced financing reported in the Development Banking section.

2/ It refers to the number of entities that are actually in operation and report positive assets, which may differ from the number of entities authorized to operate.

3/ The five largest entities by assets within each sector are:
Commercial Banks: BBVA, Santander, Banorte, Citibanamex &HSBC.
Siefores: XXI Banorte, Profuturo, Citibanamex, SURA & Coppel.
Investment Funds (Managers): BBVA Bancomer Gestión, Impulsora de Fondos Banamex, Sam Asset Management, Operadora de Fondos Banorte & HSBC Global Asset Management.
Development Institution: Banobras, Nafin, Bancomext, Banjército & FIRA.
Insurance Companies: Pensiones Banorte, Seguros BBVA, Grupo Nacional Provincial, Pensiones BBVA & Citibanamex Seguros.
Broker dealers: Banorte-Ixe, Goldman Sachs, Finamex, Actinver & Invex.
Non-Regulated sofomes: Binmtec, Crédito Real, BMW Financial Services México, Marverde Infraestructura, Préstamos Felices en 15 Minutos & Marverde Infraestructura.
Regulated sofomes: GM Financial, Cetelem, Arrendadora y Factor Banorte, Ford Credit & Operadora de Servicios Mega.
Socaps: Caja Popular Mexicana, Caja de Ahorro de los Telefonistas, Caja Morelia Valladolid, Acrimex & Coopdesarrollo.
Sofipos: Nu México Financiera, Libertad Servicios Financieros, Financiera Sustentable, Klar (previously SEFIA) & Consejo de Asistencia al Microemprendedor (CAME).
Credit Unions: Ficien, Unión de Crédito para la Contaduría Pública, Unión de Crédito Agricultores de Cuauhtémoc, Unión Crédito Industrial y Agropecuario de la Laguna & Unión de Crédito Alpura.
Bond warehouses: Afirme, Mercader, Sur, Banorte & Accel.

4/ Total assets of commercial banks include those of regulated SOFOMES that consolidate with the respective bank if they are subsidiaries. Additionally, there are three banks authorized by the authorities in 2023 and 2024 that are not yet in operation.

5/ In July 2023, the CNBV approved the revocation of the authorization granted to American Express Bank (Mexico) to organize and operate as a multiple banking institution.

5/ The set of pension funds managers (afores) are 10 and they manage 118 Siefores.

6/ An increase in the number of siefores has been observed since January 2020 due to the Siefores' new Investment Regime based on Generational Funds, in accordance with the modifications to the rules issued by the Consar on December 16th, 2019. Available here: https://www.gob.mx/cms/uploads/attachment/file/517105/BP-32-2019_TDF_transicio_n_VF_2_.pdf

7/ The set of Investment Fund Managers (30) manage 627 Investment Funds.

8/ Includes Development banks (6) and development public trusts (FIRA, FOVI and FIFOMI). In April 2023, the Senate approved the decree for the extinction of the FND, with June 23 being the last month with available information.

10/ The figures referring to the number of non-regulated sofomes come from the Registry of Commissions - RECO (Condusef). Only those Sofomes that present a positive portfolio are considered for the purposes of the number. The credit portfolios of those non-regulated sofomes that grant credit only to related entities or subsidiaries are not taken into account as they are not credit intermediaries in the strict sense. As of June 2023 (latest date available), the Bureau of Financial Entities has information on 2,116 Sofom E.N.R. with operating status, including those that grant credit only to related entities or subsidiaries. The asset figures refer to the total credit portfolio granted by these entities reported to Condusef.

11/ Sofomes regulated for having equity links with a bank, but are not subsidiaries of said bank and therefore do not consolidate their assets, are considered. Some belong to a financial group. Other sofomes are regulated because they issue debt securities and also are included here. In April 2023, the CNBV responded to the request to cancel the registration in the RNV of the "ADAMFIN07" Stock Certificates; therefore, Proyectos Admantine is deregulated.

12/ In December 2022, Nu México, a Fintech entity specialized in credit cards, merged its business with a sofipo that was no longer operating, and which it acquired in December 2021. As of December 2022, its assets are counted in the sector of sofipos and becomes the largest entity in the sector, with a share of assets of 40% of the total, increasing the concentration of the five largest entities in the sector to 79%. Before this migration, there is no information about this entity as it is a non-public financial company and therefore it was not incorporated in any statistics

IV.3.1. Commercial banks

Between September 2023 and March 2024, commercial banks' assets, in real terms, continued to expand at a similar pace to that recorded in the first half of 2023. In particular, this performance was mainly due to the expansion of positions in securities and the loan portfolio, specifically of consumer loans, given that positions in derivative financial instruments were less dynamic.

On the liability side of the balance sheet, liabilities also registered an annual growth rate in real terms, although at a slower pace than in the first half of 2023. This growth was due to higher levels of term deposits and, to a lesser extent, demand deposits, given that there was a slow-down in derivative instruments. As a result, term deposits recorded an increase their participation in the structure of commercial banks' liabilities.

Against this backdrop, it is noteworthy that the financial margin of banking institutions exhibited higher levels in real terms during the period from September 2023 to March 2024, compared to what was observed in the first half of 2023.

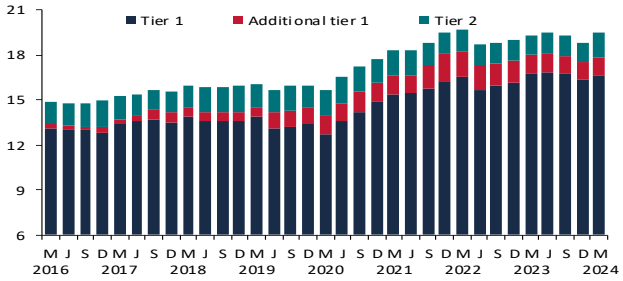
Solvency

Between September 2023 and March 2024, commercial banks increased their capitalization levels. In particular, the capital adequacy ratio (CAR) went from a level of 19.30% in September 2023 to 19.49% in March of this year, which strengthened its capacity to face potential risks in its operations (in the aggregate). This performance derived from an expansion of regulatory capital, which more than offset an increase in risk-weighted assets. In this context, the evolution of regulatory capital mainly reflected growth in earned capital, as well as the issuance of subordinated debentures, which were partially offset by the payment of dividends by some institutions at the end of 2023 (Graph 72). On the one hand, the higher level of risk-weighted assets originated fundamentally from an increase in the credit risk component, as a result of the growth registered in the credit portfolio (Graph 73).

Graph 72

Structure of banks' Capital Adequacy Ratio (CAR) 1/

Percent



Data as of March 2024.

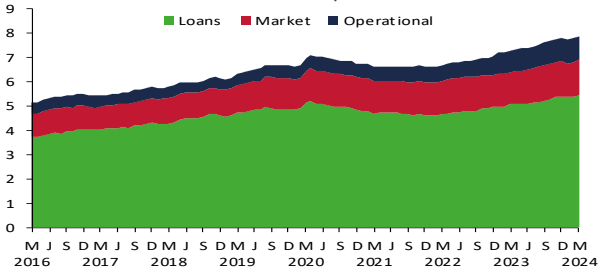
Source: Banco de México.

1/ Capital Adequacy Ratio, is calculated by dividing net capital by risk weighted assets. Net capital is the regulatory capital thtat includes the Tier 1, Additional tier 1, and the Tier 2 capital. Tier 1 includes earned capital and shareholder contributions, and has the major ability to absorb potenial losses. Additional tier 1 includes perpetual subordinated bonds and surplus reserves, and therefore has a lower ability to abosorb potential losses, while Tier 2 includes specif term subordinated bonds, and therefore has a lowest ability to absorb possible losses.

Graph 73

Risk weighted assets 1/

Trillions of pesos



Data as of March 2024.

Source: Banco de México.

1/ Credit Risk weighted assets reflect the associated risk of the loan portfolio and other credit exposures. Market risk weighted assets are a risk measure that a banking institution holds due to market factors to which are their assets exposed; while operational risk weighted assets are a risk measure for possible losses due to inadequacies or failures in internal processes, personal and internal systems or due to external factors.

As a result of the CNBV's periodic review, that financial authority approved increasing from six to seven the number of banking institutions that, due to their characteristics and relationship with the banking system, should be considered of local systemic importance and, therefore, are required to constitute additional capital buffers.[54]

Profitability

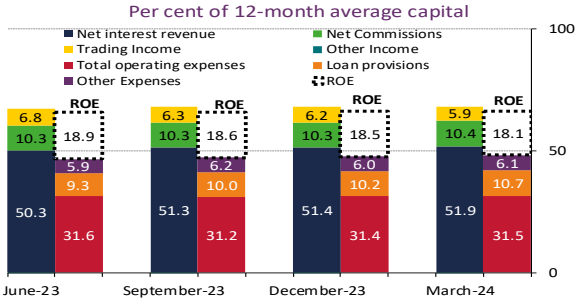
Commercial banks' profitability, measured with the Return on Equity (*ROE*),[55] declined slightly from the level reported in the last *Report*. Nevertheless, the financial margin increased whereas the other income components remained stable. In addition, on the expenditure side, both loan-loss provisioning and administrative expenses also increased slightly (Graph 74). The increase in loan-loss reserve expenses was observed in both the consumer and corporate portfolios, although to a lesser extent in the latter. However, the financial margin adjusted for credit risks recorded a slight increase, despite the fact that the financial intermediation margin -the difference between lending and deposit rates- decreased. The heterogeneity in profitability levels among banks in the system implies that those with higher profitability will be in a better position to accumulate capital if necessary.

[54] The CNBV decided to consider Banco Inbursa as a local systemically important bank again, after it ceased to consider it as such in July 2020. For more information see press release: https://www.gob.mx/cnbv/prensa/comunicado-no-10-instituciones-de-banca-multiple-de-importancia-sistemica-local-363751

[55] It is calculated as the ratio of twelve-month net income to average stockholders' equity for the period.

Publicly accessible information

Graph 74
Commercial Banks Profitability Components (12-month flow)
Per cent of 12-month average capital



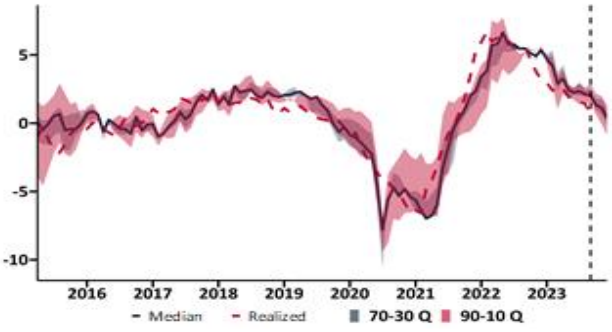
Data as of March 2024.
Source: CNBV.

Financial indicators at risk

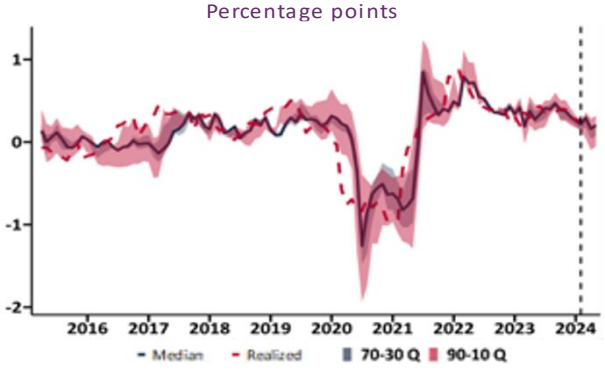
The projection of some financial indicators show that they are returning to their pre-pandemic behavior. These projections are made by applying the methodology described in Box 6 of the June 2022 Financial Stability Report. Different quantiles are estimated with which it is possible to construct a distribution that reveals which indicators present greater uncertainty in their estimates, which often translates into an increase in risk levels.[56]

The profitability indicators show that both the *ROE* and the financial margin (Graph 75a and Graph 75b) maintain a decreasing trend, returning to levels close to their historical averages, after some oscillations caused by the pandemic.

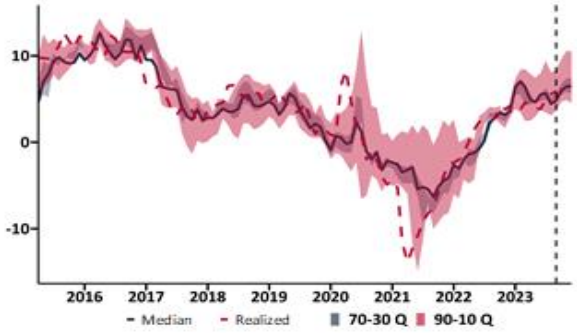
Graph 75
Three month horizon out of sample forecast
a) ROE
Percentage points



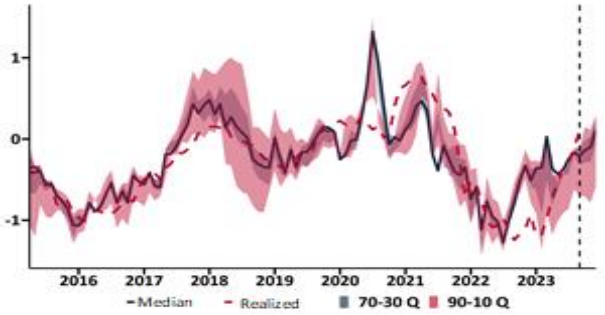
b) Net interest margin
Percentage points



c) Real credit growth
Percentage points



d) Adjusted non-performing ratio
Percentage points



Date up to February 2024 and forecasts through May 2024.
Source: Banco de México

The projection for portfolio growth indicates a slowdown, despite a significant degree of uncertainty.

Finally, the indicators of the rate of increase of the portfolio's adjusted non-performing loans rate (IMORA) are shown. This indicator shows uncertainty and an acceleration in growth (Graph 75d).

[56] For each of the indicators, forecasts are presented for a three-month horizon based on quantile regressions.

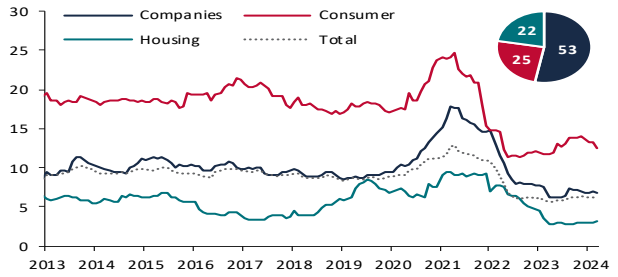
Credit risk

Banks' credit risk, as measured by conditional value at risk (*CVaR*) at the 99.9% confidence level as a proportion of the credit portfolio, remained relatively stable during the period of this *Report*, with a slight decrease as of November 2023 (Graph 76a).[57,58] This decrease is mainly explained by the downwards behavior of the risk of the consumer loan portfolio, which is due to a decrease in the default correlation of this segment (Graph 76b).[59]

Graph 76

a) Conditional Value at Risk (CVaR) by type of portfolio[1/]

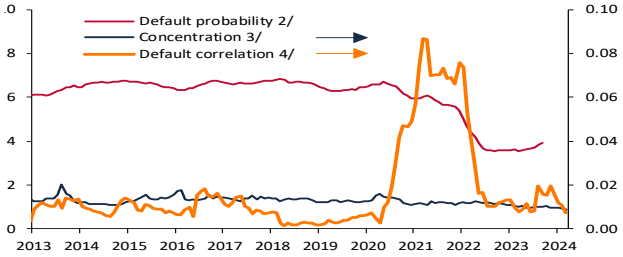
Percent of portfolio



Data as of March 2024.
Source: Banco de Mexico, 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.

b) Portfolio concentration, probabilities and default correlation[1/]

Percent



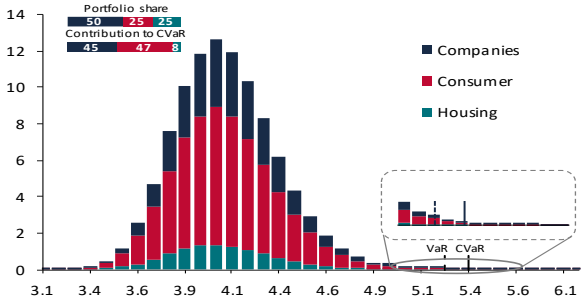
Data as of March 2024.
Source: Banco de México, CNBV and Credit Bureau.
1/ Components used as inputs to compute the CVaR of the portfolio.
2/ Average default probability of the portfolio on annual horizon.
3/ Portfolio concentration measured using the Herfindahl-Hirschman Index.
4/ Average default correlation of the portfolio on annual horizon.

When considering all banks' exposures and their distribution of potential credit losses,[60] shows that, although the consumer portfolio is more atomized, it has a relatively higher probability of default than the other portfolios, which makes its contribution to *CVaR* considerably higher than its share of the total portfolio balance (47% vs. 25%). In addition, this portfolio has presented the highest contribution to total *CVaR* levels in the last quarter (Graph 77).

Graph 77

Simulated credit loss distribution of the system

Horizontal axis: Percent of portfolio[1/]
Vertical axis: Percent



Data as of March 2024.
Source: Banco de Mexico, CNBV, and Credit Bureau.
1/ The percentage of loss for each portfolio is relative to the total loss, within each interval. The VaR and CVaR levels are

[57] The conditional value at risk (*CVaR*) allows the analysis of losses in the tail of the distribution, since it represents the expected value of the loss when it is greater than the *VaR*, which, in turn, represents the percentile corresponding to a given confidence level in a loss probability distribution of a portfolio of assets subject to credit risk.

[58] Credit *VaR* is calculated using the "Capitalization and Credit Risk" (CYRCE) model. The main elements of this model are the probability of default for each loan, the structure of variances and covariances of potential defaults, and the structure and concentration level of the loans in the portfolio. An explanation of the model can be found in Banco de México (2006), Report on the Financial System May 2007, pp. 64- 67, and in Javier Márquez Diez-Canedo, *Una nueva visión del riesgo de crédito*, third edition, Limusa (2024).

[59] The probabilities and correlations of default used in the model are estimated through the observed historical default rates of loans, whose reference can be found in Banco de México (2006). "Estimation of Probabilities and Correlations of Default". Report on the Financial System May 2007, Box 10, pp 66.

[60] This distribution is generated using the loss simulation methodology for a loan portfolio. Available from Banco de México (2022). "Measuring the credit risk of a portfolio through Monte Carlo simulation." Financial Stability Report June 2022, Box 7, pp 74.

Box 4: Credit risk heat map of the Mexican banking sector

I. Introduction

Credit risk refers to the potential losses that a bank may incur in the event of default by its debtors. Credit losses can deteriorate banks' capital and lead to their insolvency. Consequently, an adverse event affecting several debtors simultaneously could increase bank credit risk and affect the stability of the financial system. Thus, for example, defaults in the U.S. mortgage market gave rise to the 2008 financial crisis (Mian and Sufi, 2009; Foote and Willen, 2018). In Mexico, the identification and monitoring of bank credit risk is relevant because the amount of the commercial banks' loan portfolio as of February 2024 represents around 50% of banks' total assets;[1]

There are indicators that measure different dimensions of banks' credit risk. In order to summarize the information contained in these indicators, this box presents a bank credit risk heat map that encompasses them. This heat map is a qualitative tool for identifying and monitoring the accumulation of vulnerabilities and the materialization of credit risks.

II. Methodology and indicators used

The bank credit risk heat map is computed based on the methodology of Aikman et al. (2017). This methodology is also used to make the Heat maps of the Mexican financial system risks (see Graph 32).[2]

The heat map groups the bank loan portfolio into three segments: corporate, consumer and housing. For each of these segments, information from 2006 is used for the indicators listed in Table 1.[3] Some of these indicators are *retrospective* because they measure the materialization of credit risk, such as: (i) the adjusted NPL ratio (IMORA, its acronym in Spanish), which measures the amount of the portfolio loss as a percentage of the total portfolio, making an adjustment for the portfolio's write offs; (ii) the default rate, which measures the percentage of the number of borrowers that have defaulted; and (iii) the flow of credit reserves constituted in the last year relative to the performing portfolio,[4] which makes it possible to evaluate the losses that banks expect to incur given the risk profile of their portfolios. For example, at the beginning of the 2020 pandemic, banks increased their reserves due to the perception of higher corporate credit risk.

In contrast, other indicators are *prospective*, since they measure the vulnerability of the banks' loan portfolio to adverse events, such as: (i) excess growth in credit granting, defined as the difference between the real annual growth of the performing portfolio and its historical average, (ii) the spread between the lending rates charged and the risk-free rate, which may be associated with greater risk appetite of banks; (iii) the allowance coverage ratio (ICOR, its acronym in Spanish), which measures the adequacy of the amount of allowances for loan losses to face credit defaults; iv) the CVaR, which measures the amount of extreme losses that institutions could face in adverse scenarios; v) the Herfindahl index, which measures whether the loan portfolio is concentrated in a few borrowers, which would increase the probability of observing extreme losses in the portfolio (Márquez, 2002). Finally, for the housing portfolio, the payment-to-income ratio (PTI) and the loan-to-value (LTV) ratio at the time of origination are included. High levels of these ratios cause borrowers to be unable or disincentivized to repay their debt in the face of adverse shocks (Geraldi et al., 2018).

Table 1
Risk indicators

Risk indicator	Sign 1/
Retrospective indicators	
Adjusted NPL ratio (IMORA) 2/	+
Average default rate 3/	+
12-month flow of allowances for loan losses / Performing portfolio	+
Forward-looking indicators	
Real annual growth of the performing portfolio	+
Spread of the average implicit credit rate with respect to government securities rate 4/	+
Allowance coverage index (ICOR) 5/	-
CVaR of credit at 99.9% / Portfolio	+
Herfindahl Index 6/	+
Mortgage payment amount / Borrower's income (PTI)*.	+
Amount of outstanding mortgage loans / LTV	+

1/ A positive (negative) sign indicates that a high value of the indicator reflects more (less) risk.
2/ IMORA is calculated as: (amount of past-due portfolio + write-offs for the last 12 months) / (total portfolio + write-offs over the last 12 months).
3/ The default rate is the percentage of the number of loans that defaulted in the past 12 months.
4/ The average implicit rate is calculated as the interest income for the past 12 months on the average outstanding portfolio for the past 12 months. The government securities rate is the average of the past 12 months of the 1-year Cetes rate for the corporate and consumer portfolio, and the 10-year Bonos M rate for the housing portfolio.
5/ Coverage ratio is calculated as: amount of allowance for loan losses / total amount of past-due portfolio.
6/ To calculate the Herfindahl index, the share of the balance of each loan in the portfolio is obtained, squared and the sum is calculated.
* Applies only to the mortgage portfolio.

For the construction of the heat map, each variable is standardized and, if necessary, its sign is modified so that a higher level of the variable reflects greater vulnerability as shown in Table 1. Subsequently, the variables in each category are averaged, the standard normal distribution function accumulated in the average of the variables is evaluated, and its value is assigned to an interval [0,1]. The resulting indexes are mapped using a color scale. To construct the aggregate credit risk index, the average of the indexes of the three segments is calculated, weighting by the size of each segment's portfolio.

[1] Calculations made with publicly available information from the CNBV.
[2] See also Box 3 "Heat maps of the Mexican financial system Risks," from the Report on the Financial System, October 2018.
[3] Data on the flow of precautionary estimates are available since 2007, those on default rate, credit CVaR and Herfindahl index are available since 2012, while PTI and LTV data are available since 2015.
[4] In accordance with current regulations, banks establish a reserve called *allowance for loan losses* to cover expected losses on their loan portfolio. If the risk of default on a loan increase, for example, because it is overdue, the bank must increase its allowance for loan losses. This movement is recorded as a loss in the income statement and as a decreasing asset account in the balance sheet. If the bank eventually recognizes the loan loss, both the portfolio balance and the allowance balance are decreased. Banks may establish additional allowances for loan losses based on their projected credit indicators or at the request of supervision.

III. Results

Graph 1 shows the credit risk heat map of the Mexican banking sector, whereas Graph 2 shows the same map broken down by variable. It can be seen that risks were high during the 2008-2009 financial crisis, especially in the consumer portfolio. During this period there was a notable increase in credit card IMORA.[5] Another period of elevated risk occurred during 2012, when a high level of NPL ratio and high interest rates were observed in the mortgage portfolio. Finally, the heat map also indicates that risks were elevated during 2013, which was associated with credit defaults by companies engaged in residential construction.[6] While risks increased during the COVID-19 pandemic as a result of the termination of the Special Accounting Criteria, they were not as high as those observed in previous episodes. Currently, the heat map indicates that credit risk is at a low level; however, consumer portfolio exposures increased slightly over the past year due to higher growth and portfolio concentration.

IV. Final considerations

Given the diversity of indicators used to analyze credit risk, the risk heat map presented in this Box is a useful tool to summarize and monitor information on various variables. The heat map indicates that elevated credit risk has been observed in periods such as the 2008-2009 financial crisis, as well as during 2012 and 2013 due to events associated with the mortgage loans portfolio and companies in the construction sector. Currently, the aggregate credit risk index remains at low levels, although during the last year a slight increase in the risk of the consumer portfolio has been registered.

References

Aikman, D., Kiley, M., Lee, S. J., Palumbo, M., & Warusawitharana, M. (2017). *"Mapping heat in the US financial system,"* Journal of Banking & Finance, 81, 36-64.

Foote, C., & Willen, P. (2018). *"Mortgage-default research and the recent foreclosure crisis,"* Annual Review of Financial Economics, 10, 59-100.

Gerardi, K., Herkenhoff, K., Ohanian, L., & Willen, P. (2018). *"Can't pay or won't pay? Unemployment, negative equity, and strategic default,"* The Review of Financial Studies, 31, 1098-1131.

Márquez, J. (2002). *"Capital adequacy and credit risk in bank loan portfolios",* Banco de México Research Paper, No. 04.

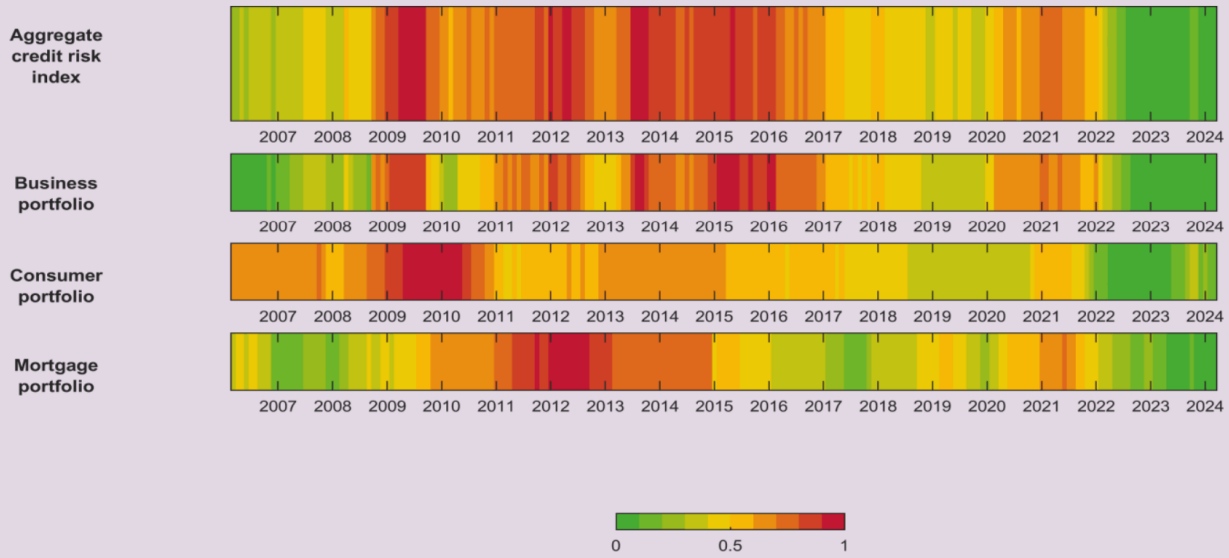
Mian, A., & Sufi, A. (2009*). "The consequences of mortgage credit expansion: Evidence from the US mortgage default crisis,"* The Quarterly Journal of Economics, 124, 1449-1496.

[5] See Box 22 "La Información Asimétrica y la Morosidad en la Cartera de las Tarjetas de Crédito en México" from the Report on the Financial System, June 2009.

[6] See Report on the Financial System, October 2014, pp. 27-28.

Graph 1

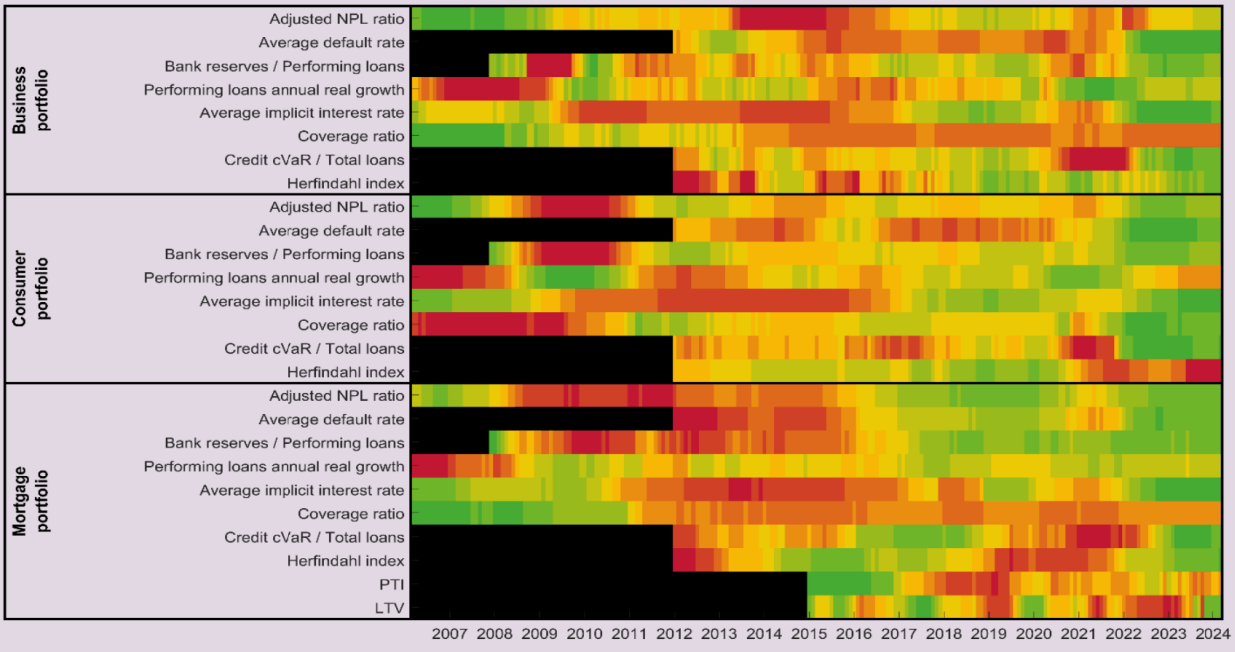
Credit risk heat map of the Mexican banking sector



Data as of March 2024.
Source: Banco de México, CNBV and Credit Bureau.

Graph 2

Disaggregated credit risk heat map of the Mexican banking sector



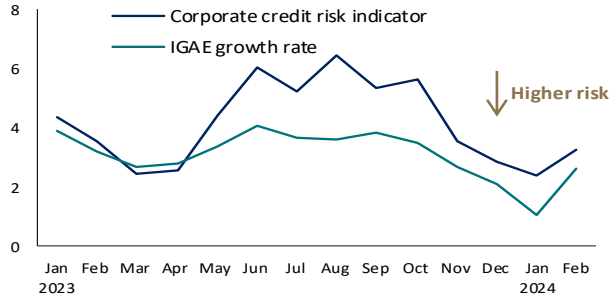
Data as of March 2024.
Source: Banco de México, CNBV, and Credit Bureau.

Bank exposure to changes in inflation, economic activity and formal employment

Inflation, formal employment and economic activity affect credit risk in the corporate, payroll, mortgage, auto, personal and consumer durables good acquisition (ABCD, its acronym in Spanish) portfolios; Thus, it is possible to construct indicators that account for this relationship.

In the corporate portfolio, the indicator reflects more credit risk when the economic growth rate falls, in aggregate terms or in those sectors that have a greater share of the portfolio.[61] With respect to the previous *Report*, the indicator fell, indicating higher credit risk (Graph 78). This drop was greater than the slowdown in economic growth, as measured by the Global Economic Activity Index (IGAE, its acronym in Spanish). This was largely due to the slowdown in some sectors with a greater share of the credit portfolio than in the IGAE, such as construction and professional services.

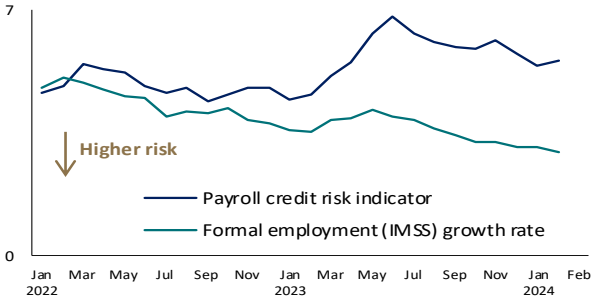
Graph 78
Corporate portfolio credit risk due to changes in economic activity
Annual variation in percent



Data as of February 2024.
Source: Banco de Mexico and INEGI.

In the payroll, mortgage and auto portfolios, the indicator reflects more credit risk when the growth rate of formal employment falls, in aggregate terms or in those labor markets with a higher share in these portfolios.[62] Compared to the previous *Report*, the indicator improved for the mortgage portfolio, but worsened for the payroll and automotive portfolios.[63] This is largely explained by the fact that this slowdown occurred in conjunction with a strong growth rate in the employment of formal workers with higher salaries, who are the most represented in mortgage loans. In addition, these workers are more represented in payroll and auto loans than in the total population of formal workers, which explains why the worsening of the risk indicator in these portfolios is less than the slowdown shown by total formal employment (Graph 79).

Graph 79
Payroll portfolio credit risk due to changes in formal employment
Annual variation in percent



Data as of February 2024.
Source: Banco de Mexico, INEGI and IMSS.

In the personal and ABCD portfolios, the indicator reflects the credit risk arising from changes in inflation. This is due to the fact that, in these portfolios, borrowers have less purchasing power than in other types of loans and are more vulnerable to price increases.[64] Therefore, the indicator reports more risk when inflation increases, either general inflation or the inflation of the expense categories most consumed by the borrowers with a higher share in these portfolios. Compared to the previous *Report*, the indicators showed higher credit risk in both the personal loans and ABCD portfolios (Graph 80). In the personal portfolio, the increase in the risk indicator was greater than that of general inflation because: (i) borrowers with a higher share in this portfolio spend (proportionally) more on housing and, in this category, inflation increased more than general

[61] The risk indicator is constructed as the weighted average of economic growth in the different sectors. The weight assigned to each sector is equal to its share of corporate credit.

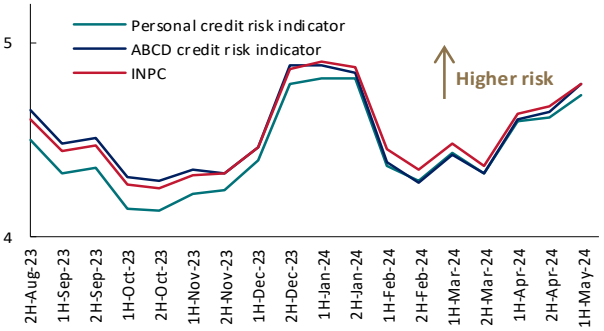
[62] To construct the indicators related to formal employment, the proportion of credit for each state is obtained by gender and wage level, is obtained according to the information of workers affiliated to the IMSS. The high-salary formal employment threshold is defined as the median of the historical wage distribution of the borrowers.

[63] The median income of the borrowers for the three portfolios was updated, which serves as the threshold to divide high and low salary workers.

[64] See Box 1 "Inflation and non-performing ratio levels in non-revolving consumer credit", from the Financial Stability Report, December 2022.

inflation.[65] On the contrary, in the ABCD portfolio, the increase in the risk indicator was lower than that of inflation and, therefore, lower than that of personal loans, since: (ii) in the states with greater overrepresentation in ABCD, that is, with more participation in this type of loans than in the population, such as Veracruz and Yucatan, inflation increased less than the National Consumer Price Index (INPC, its acronym in Spanish) at the national level.

Graph 80
Credit risk in personal and ABCD portfolios due to changes in inflation
Annual variation in percent

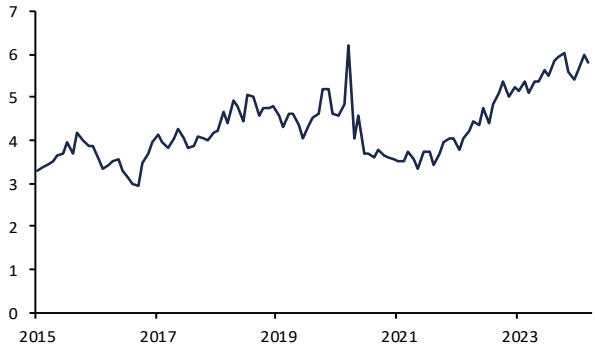


Data as of the first half of May 2024.
Source: Banco de Mexico and INEGI.

Market risk

Banks' market risk, measured through market *CVaR* as a proportion of net capital, decreased during the fourth quarter of 2023, and then increased during the first quarter of 2024, reaching 5.81% at the end of the period, slightly lower than the level observed in September 2023 (5.96%). This is due to changes in the composition of the portfolios, particularly in instruments that are sensitive to interest rate movements (Graph 81).[66]

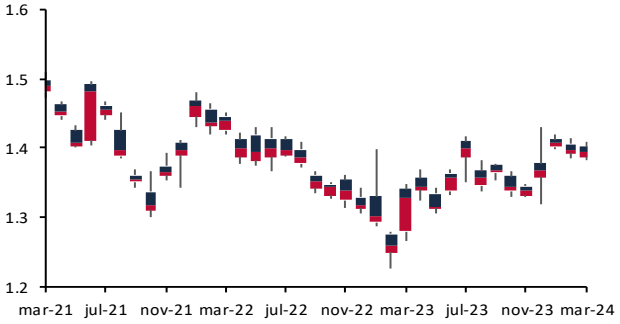
Graph 81
99.9% CVaR for commercial bank's market risk
Net capital percent



Data as of March 2024.
Source: Banco de Mexico, CNBV, BMV, Bloomberg and Valmer.

The sensitivities of debt instruments portfolio to changes in interest rates, measured through the durations of bank portfolios, were slightly higher in March 2024 than in September 2023. This change is mainly due to the rebalancing of the institutions' portfolios towards fixed-rate securities. As of March, duration stood at an average level of 1.40 years, showing a marginal increase with respect to the value in September 2023 of 1.37 years (Graph 82).

Graph 82
Average monthly duration of commercial bank's position
Years



Data as of March 2024.
Source: Banco de Mexico and Valmer.

[65] To construct the indicators for the personal and ABCD portfolios, the exposure of each municipality to inflation is estimated and then a national average is calculated by weighting each municipality by its share in each portfolio. The classification by object of expenditure categories of the INPC and economic activity by state is used, presenting disaggregated information on expenditure categories such as food, education, leisure, and housing, among others. This classification allows for a detailed analysis at the state level and type of expenditure component. This information is different from the breakdown of the INPC by its traditional components. An illustrative example is the housing component: in the classification by object of expenditure, this category includes generics such as electricity and fuels. However, in the classification by core and non-core INPC subindexes, the housing item (in the core component) excludes these items, which are classified in the non-core component as energy.

[66] The *CVaR* represents the 99.9% quantile of the loss distribution generated by historical simulation, which is generated with the observed 20-day changes in risk factors since 2004, applied to the positions of the date considered. Given the number of observations, the behavior of the *CVaR* is almost entirely explained by changes in portfolio composition, with a marginal effect of recent changes in risk factors.

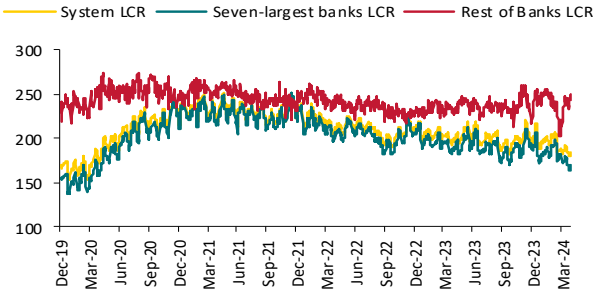
Liquidity risk

The liquidity of commercial banks remains ample at the aggregate level, at levels above the regulatory minimums. The aggregate Liquidity Coverage Ratio (LCR) of the banking system, an indicator of the sufficiency of liquidity to face a stress event during a thirty-day horizon, was around 200% (Graph 83). Likewise, each bank maintained a LCR higher than the regulatory minimum of 100% during the period covered by this *Report* (Graph 84).

Graph 83

Daily LCR of the banking system and group of banks

Percentage



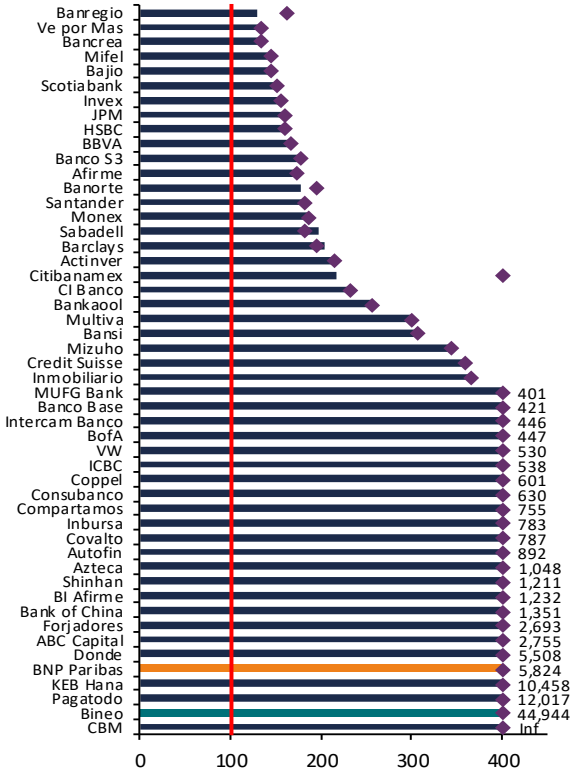
Data as of April 30, 2024.

Source: Banco de México.

Graph 84

LCR of commercial banking institutions [1/]

Percentage



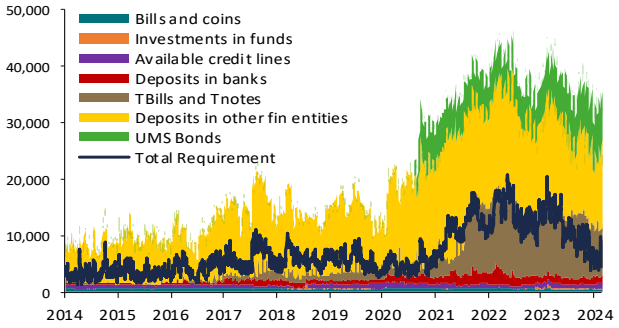
Data from January to March 2024.

Source: Banco de México and CNBV.

1/ The graph shows the quarterly average of the LCR for each bank from January to March 2024. The bar shows the consolidated LCR and the rhombus the individual LCR. In accordance with the regulation, banks marked in dark blue must meet a minimum LCR of 100%, banks marked in orange a minimum of 70%, and banks marked in turquoise a regulatory minimum of 0%.

In addition, banks also maintain a large surplus of liquid assets in foreign currency with respect to the requirement known as the Foreign Currency Investment Regime and, at the individual level, every bank in Mexico complies with this requirement (Graph 85).

Graph 85
Liquidity requirement in foreign currency and liquid assets
Millions of USD

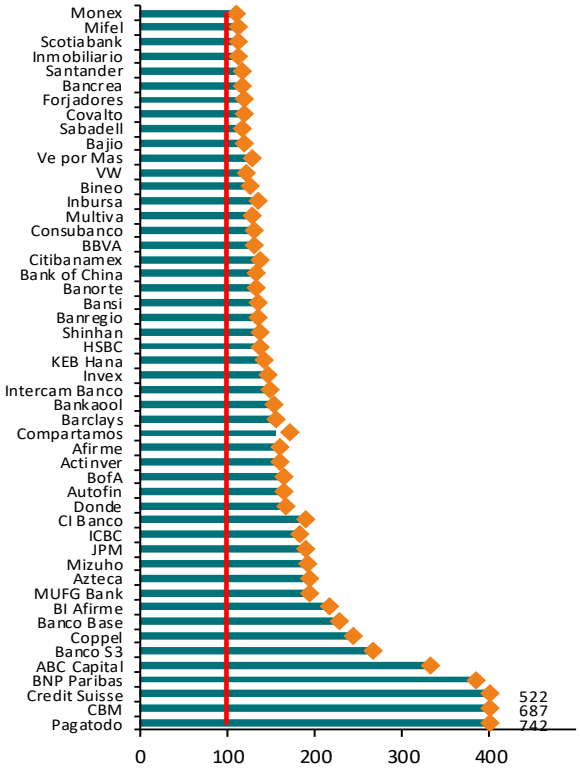


Data as of April 30, 2024.

Source: Banco de México.

In relation to their structural liquidity, the Net Stable Funding Ratio (NSFR) indicates that banks maintain a balance sheet structure with sufficient stable funding to finance assets with lower-liquidity and longer-terms. All banks maintained a NSFR above the regulatory minimum of 100% in the first quarter of 2024 (Graph 86). This indicator has remained stable, with marginal movements, since its implementation in March 2022 (Graph 87).

Graph 86
NSFR of commercial banking institutions 1/
Percentage

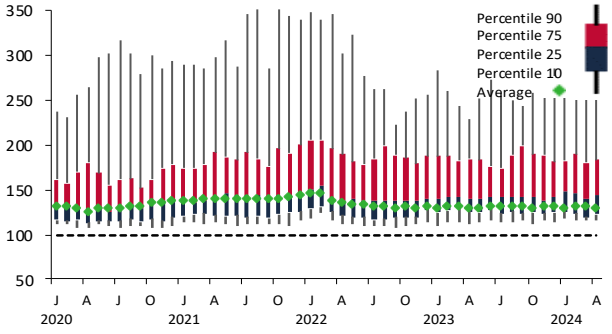


Data from January to March 2024.

Source: Banco de México and CNBV.

1/ The graph shows the quarterly average of the NSFR for each bank from January to March 2024. The bar shows the consolidated NSFR and the rhombus the individual NSFR.

Graph 87
NSFR Distribution
Percentage



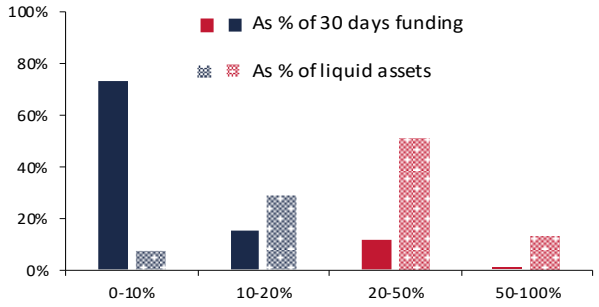
Data as of April 2024.

Source: Banco de México.

On the other hand, in general, banks' funding concentration has decreased. The level of banks' liquid assets would be sufficient to face outflows equivalent to the 90th percentile of the historical outflows of their ten largest creditors. However, some small banks still maintain a high concentration in a few creditors. Thus, they should monitor the behavior of larger creditors and diversify their sources of funding, since the withdrawal of funding from these creditors could press their liquidity situation (Graph 88).

Graph 88
Funding concentration of the 10 largest counterparts that fall due within 30 days [1/, 2/]

Vertical axis: proportion of total assets of the system
Horizontal axis: percentage that the 10 largest funding counterparts as a proportion of liquid assets and 30 days funding



Data as of April 30, 2024.

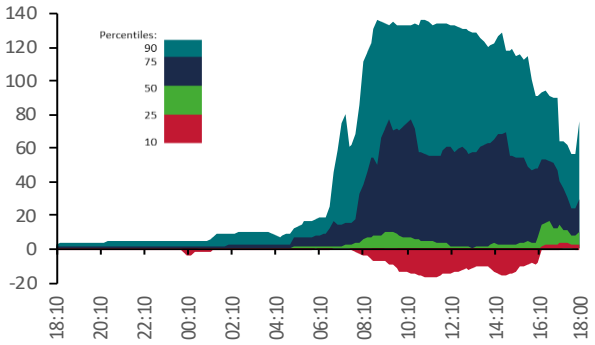
Source: Banco de México.

1/ Concentrated counterparts consider only those funding counterparts whose total funding at the end of the month is at least 200 million pesos or amounts 0.5% of the bank's total liabilities.
2/ Observations in which the 10 largest counterparts represent more than 20% of the liquid assets or of 30 days funding are identified in red.

With respect to banks' intraday liquidity, the net cumulative intraday liquidity position[67] suggests that, in general, banks hold sufficient liquid assets to cover their liquidity needs at times when they face the highest demands for payments and transfers (Graph 89).

Graph 89
Net cumulative intraday liquidity position (received payments minus sent payments) [1/]

Vertical axis: Percentage of deposits in Banxico
Horizontal axis: Hours (10 minute intervals)



Data from January to March 2024.

Source: Banco de México.

1/ Net cumulative intraday liquidity position refers to intraday payments received minus payments sent, it allows identifying times of the day with liquidity deficit and its magnitude with respect to available liquidity. The total payments sent and received are normalized as a proportion of liquidity in Banco de México (DRM, unencumbered deposits in pesos and dollars). The graph presents the percentiles of distribution per hour in 10-minute intervals, considering average observations for the quarter.

[67] Intraday liquidity risk is monitored by specific indicators for this purpose. One of these indicators is the net cumulative intraday liquidity position, which refers to payments received minus payments sent, measured throughout the day (intraday operation). This indicator makes it possible to identify the times when total payments sent exceed total payments received and their magnitude with respect to available liquidity.

Box 5: Implementation of the Large Exposures regulation and Net Stable Funding Ratio in Mexico in compliance with international standards

I. Introduction

The Regulatory Consistency Assessment Program (RCAP) is an initiative of the Basel Committee on Banking Supervision (BCBS) to assess how the standards issued by the Basel Committee are implemented in the various jurisdictions. The aim is to converge towards the full and consistent implementation of the Basel framework. RCAP monitors and publishes reports on the implementation of standards and the results of consistency assessments for each jurisdiction.

RCAP assessments are conducted by a group of experts selected from BCBS members and supervised by the Committee's own bodies, which review the methodology and consistency of the rating given at the end of the assessment. The process considers local regulations and, if deviations from the standard are identified, the evaluation assesses the materiality of the current and potential impact of such deviations. The rating does not consider aspects related to the functioning and effectiveness of the supervisory framework of the assessed jurisdiction. Ultimately, the Committee has the final responsibility for reviewing and approving assessments of consistency in the implementation of standards.

In 2023, the BCBS assessed, as part of *RCAP*, the consistency of the Mexican regulations with respect to two standards recently implemented in Mexico: the Large Exposures regulation (LEX) and the Net Stable Funding Ratio (NSFR). The assessment considered that the Mexican regulations meet the two Basel Standards, and determined to grant the highest possible rating, "Compliant", with respect to the two standards assessed. This *Box* summarizes the results of each assessment. [1]

II. Large Exposures (LEX)

The LEX regulation establishes a concentration limit on financing operations granted to the same counterparty or group of connected counterparties according to the definitions of the regulation. Its objective is to limit the maximum loss that a bank may face in the event that a counterparty or group of connected counterparties defaults on its obligations. Among the elements incorporated in this regulation, two stand out. First, the inclusion of "economic interdependence" as a criterion for identifying common risk groups. Second, the establishment of a general limit of 25% of Tier 1 equity for such exposures, and 15% in the case of exposures to institutions considered to be systemically important.[2]

The assessment determined that LEX regulation is "Compliant" with the Basel Standard. This is the highest possible rating.[3] In addition, each of the three components of the standard were also assessed as compliant (Table 1). On the other hand, the review team identified five findings, although it determined that they are not relevant, and two features of the Mexican regulation that are more conservative than the minimum Basel standards.[4]

Table 1
RCAP LEX: Ratings and findings by component

Component of the standard	Grade 1/	Findings 2/
Overall grade	**Compliant**	
Scope and definitions	Compliant	1
Minimum requirements and transitional arrangements	Compliant	1
Value of exposures	Compliant	3

1/ Scale: Compliant> Largely Compliant> Materially Non-Compliant > Non-Compliant.
2/ The five findings identified by the review team were evaluated as not material.

The first finding refers to the fact that Mexican regulation applies a limit of 100% of Tier 1 capital to the exposures of state-owned companies (CFE and Pemex). As these are companies with their own legal personality and equity, technical and operational autonomy, the standard would have considered these companies within the 25% limit. However, the Mexican authorities set the limit at 100% because they consider that these companies have the unconditional backing of the Federal Government. During the last five years, most banks maintained exposures to these counterparties below 25% of Tier 1 capital, which together with the implicit backing of the Federal Government resulted in a non-relevant deviation.

The second finding consisted of a difference in the agreed implementation date, according to the Basel standard the rule should have been fully implemented in January 2019 and without transitional arrangements. However, in Mexico the rule became effective for new operations in October 2023 for Domestic Systemically Important Banks (DSIB) and in January 2024 for the rest of the banks. The finding was assessed as not material considering that in Mexico the rules cannot be applied

[1] The BCBS reports on the assessment of Mexico for these standards can be consulted at: RCAP Assessment of Basel LEX regulations -Mexico (https://www.bis.org/bcbs/publ/d564.pdf) and RCAP Assessment of Basel NSFR regulations -Mexico (https://www.bis.org/bcbs/publ/d565.pdf).

[2] For a detailed description of the LEX regulation, see Box 5 "Regulation of Large Exposures: new regulatory limit in Mexico" of the Financial Stability Report, December 2023.

[3] As of May 2024, 16 out of 20 jurisdictions have completed the LEX assessment, twelve were assessed as "Compliant" and four as "Largely Compliant". Jurisdictions assessed as "Largely Compliant" include the United States, Japan, Switzerland and the European Union.

[4] In accordance with the RCAP peer review process, the review team evaluates the materiality and potential of the findings based on a sample of banks. On the other hand, the characteristics of the Mexican regulation that go beyond the Basel Standard do not impact the assessment grade.

retroactively and that most of the operations did not exceed the limits of the international standard and that those that did, had maturities ending between 2023 and 2024, so the lack of retroactivity would have a low impact.

The third finding refers to the fact that the standard establishes that indirect exposures for the underlying of an option should be added to direct exposures with the same counterparty. The deviation was assessed as not material as the average impact of offsetting the difference between gross and net positions was very small, only 0.11% of Tier 1 capital in the sample of banks.

The fourth finding refers to the provisions that the standard establishes to prevent regulatory arbitrage when exposures are less than 0.25% of eligible capital and no look-through approach is required. According to the standard, banks must demonstrate that regulatory arbitrage has not influenced their allocation of resources, for example, by performing several transactions of low amounts but exposed to the same type of assets. Although Mexican regulation does not explicitly include these considerations, supervision does consider preventing regulatory arbitrage. Likewise, the materiality analysis showed that exposures to collective investments and securitizations are very small relative to total bank assets, thus the finding was deemed immaterial to the assessment.

The last finding has to do with the fact that the standard requires banks to identify third parties that may constitute an additional risk factor, beyond the underlying asset, and that specific cases and examples should be explicitly mentioned. The Mexican regulation cannot refer to specific cases so the wording of such requirements is less prescriptive than the standard, but still provides guidance to banks on how additional risk factors should be identified by third party structures. Considering the above and that the supervisory process verifies that banks perform a comprehensive risk identification, including the identification of third parties, the review team assessed the finding as not material.

III. Net Stable Funding Ratio (NSFR)

The NSFR is a structural liquidity requirement that seeks to ensure that banks maintain stable funding sources, in line with the liquidity and maturity of their assets.[5] In Mexico, the regulation implementing the NSFR became effective as of March 1, 2022 and is binding for all commercial banks, each of which must maintain a minimum requirement of 100%.[6]

The assessment determined that the Mexican NSFR regulation is "Compliant" with the Basel Standard.[7] Each of the four components of the rating were also evaluated as compliant (Table 2).

Table 2
RCAP NSFR: Ratings and Findings by Component

Component of the standard	Grade 1/	Findings 2/
Overall grade	**Compliant**	
Scope, minimum requirement and application issues	Compliant	1
Available Stable Funding (numerator)	Compliant	0
Required Stable Funding (denominator)	Compliant	0
Disclosure requirements	Compliant	0

1/ Scale: Compliant> Largely Compliant> Materially Non-Compliant> Non-Compliant.
2/ The finding identified by the review team was evaluated as not material.

The review team identified a finding considering that financial authorities should be able to impose more restrictive requirements on individual banks that exhibit a specific risk in their funding structure. However, the Mexican authorities considered that, if a risk factor is identified that warrants the application of stricter regulation, such application should be general; that is, mandatory for all institutions which eventually get exposed to the specific risk that gives rise to the additional requirement, rather than applying it only to one institution. The review team assessed the finding as not material, based on the ability of the Mexican financial authorities to modify the regulation for all institutions in case of identifying risks in the funding structure, as well as the low potential impact of the finding for the NSFR.

IV. Final considerations

The "Compliant" grade obtained in both assessments demonstrates that the Mexican regulations were drafted and implemented in accordance with the Basel standards. While the assessment identified some differences between the Basel standards and the Mexican regulations, these differences are due to specific characteristics of the Mexican financial and legal context, and do not constitute deviations from the standard or represent a risk to financial stability.

Finally, the result of the RCAP assessment confirms the commitment of the Mexican financial authorities to continue advancing, within the scope of their mandate, towards the full implementation of Basel standards. This type of assessments strengthen the credibility of the Mexican authorities in their role as regulator, and in the case of Banco de México, in achieving its mandate to promote the sound development of the financial system. Mexican financial authorities also recognize that the RCAP peer reviews are an exercise that promotes full, timely and

[5] The NSFR is defined as the quotient of Available Stable Funding that comes from capital and liabilities weighted by maturity and stability, divided by Required Stable Funding that results from weighting assets by liquidity and maturity. For a detailed description of the NSFR and its interaction with other liquidity requirements, see Box 3 "Net Stable Funding Ratio" of the Financial Stability Report, October 2017 and Box 4 "Interaction between the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR)" of the Financial Stability Report, December 2021.

[6] The Mexican regulations that implement the NSFR are under the supervision of Banco de México and the National Banking and Securities Commission (CNBV), the regulation is the General Provisions on liquidity requirements for commercial banks.

[7] As of May 2024, 16 out of 20 jurisdictions completed the NSFR standard assessment, twelve were assessed as "Compliant" and four as "Largely Compliant". Among the jurisdictions assessed as "Largely Compliant" are the United States, South Africa, Switzerland and the European Union.

consistent implementation of the standards and helps to increase transparency and a level playing field among jurisdictions.

References

Basel Committee on Banking Supervision (BCBS), (2018) RCAP Handbook for Jurisdictional Assessments.
https://www.bis.org/bcbs/publ/d434.pdf

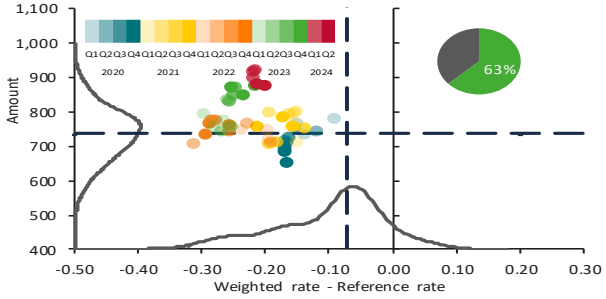
Basel Committee on Banking Supervision (BCBS), (2023) RCAP Assessment of Basel LEX regulations -Mexico.
https://www.bis.org/bcbs/publ/d564.pdf

Basel Committee on Banking Supervision (BCBS), (2023) RCAP Assessment of Basel NSFR regulations -Mexico.
https://www.bis.org/bcbs/publ/d565.pdf

Repurchase (repo) funding and unsecured funding

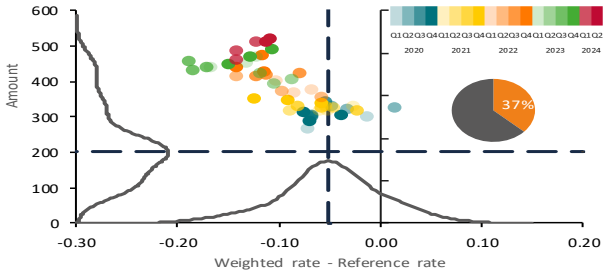
The repo market remains dynamic and continues to be an important source of funding for the banking sector. As of the first half of 2024, the amount of repo funding received from banks remains at historically high levels (since 2008). For Domestic Systemically Important Banks (DSIBS), the spread between repo funding rates and the monetary policy target rate increased slightly to around 0.20 basis points below the reference rate, after having remained without significant changes since the second quarter of 2022 (Graph 90); while the spread remained stable for the rest of the institutions in this period with respect to the fourth quarter of 2023, at around 0.11 basis points below the reference rate (Graph 91).

Graph 90
Repo Market[1/]
DSIBs[2/ 3/]
X axis: Basis points
Y axis: Billions of pesos



Data as of May 2024.
Source: Banco de Mexico.
1/Data includes all authorized counterparties and all types of collaterals.
2/Data points correspond to monthly weighted average of the daily observations for rates' spread and simple monthly average for the amount.
3/Dotted lines correspond to medians calculated since 2008.

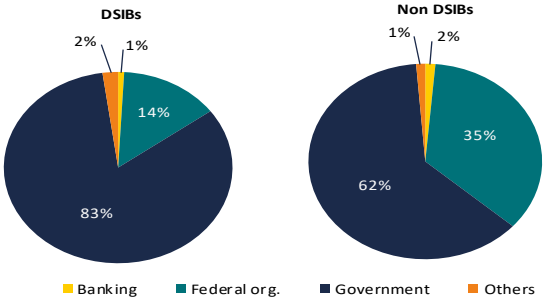
Graph 91
Repo Market[1/]
Non DSIBs[2/ 3/]
X axis: Basis points
Y axis: Billions of pesos



Data as of May 2024.
Source: Banco de Mexico.
1/Data includes all authorized counterparties and all types of collaterals.
2/Data points correspond to monthly weighted average of the daily observations for rates' spread and simple monthly average for the amount.
3/Dotted lines correspond to medians calculated since 2008.

As for the type of securities that institutions use for repo funding, the vast majority are government instruments.[68] As for banks that are not DSIBS, they repo securities from federal agencies[69] in greater proportion than DSIBS (Graph 92).

Graph 92
Collaterals in the repo market
Percent



Data as of May 2024.
Source: Banco de Mexico.

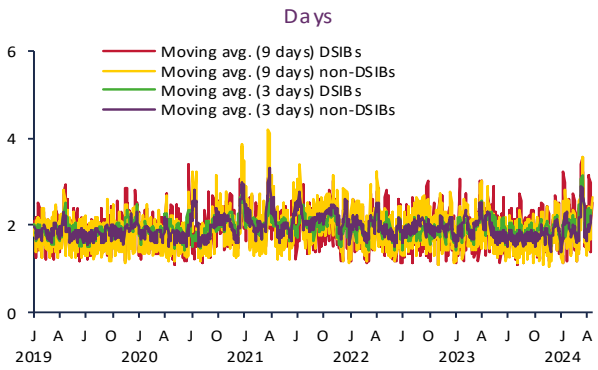
[68] Federal government bonds: bondes D, bondes F, bondes G, udibonos, bonos M and segregated bonds; federal government certificates; BREMS.

[69] IPAB, development banking, Pemex, CFE, state and municipal instruments, Banking and Deposit Insurance and Resolution Agency (IPAB, its acronym in Spanish).

Likewise, the average term of transactions in the repo market oscillates around two days, although with a slight decrease as of October 2023 (average term of 2.05 days) (Graph 93). It is worth mentioning that on May 16, 2024 Banco de México issued amendments to the Rules to which credit institutions must adhere to in their repo transactions, which will allow for longer transaction terms (see Box 2).

Graph 93

Term of securities traded in the repo market[1/]

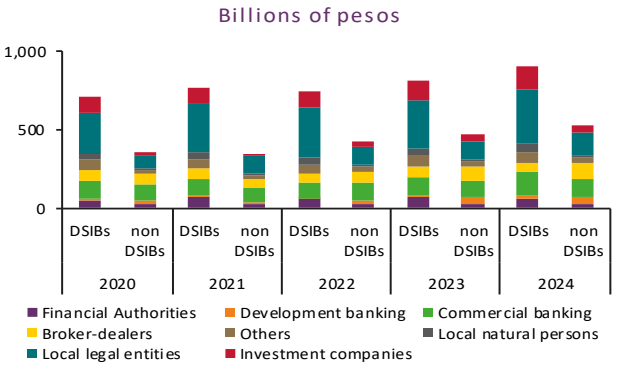


Data as of May 2024.
Source: Banco de Mexico.
1/ Weighted average by traded amount.

The main counterparties of banks, by transaction amount, are local legal entities, followed by other commercial banks. The latter presented the largest increase so far this year for both DSIBS, with an increase of 32%, and non-DSIBS, with an increase of 18% (Graph 94). With respect to interconnections between groups of institutions and counterparties within the system, repo funding from investment companies to development banks predominates, as well as from legal entities to DSIBS (Graph 95).

Graph 94

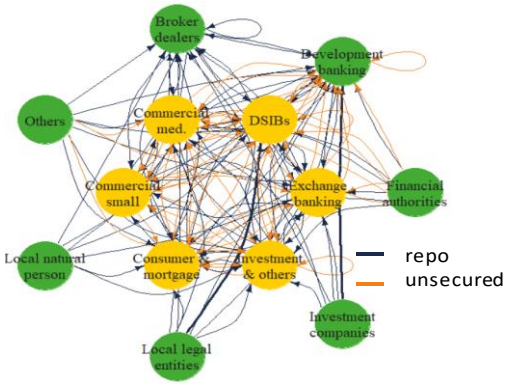
Amount traded in the repo market by counterparties[1/, 2/]



Data as of May 2024.
Source: Banco de Mexico.
1/ Amounts correspond to the annual average of the total daily trades for each counterparty.
2/ Others: lessor, surety, Siefores, insurance, treasury companies.

Graph 95

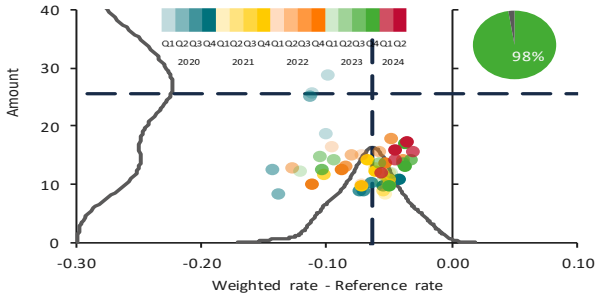
Interconnections in the repo and unsecured market[1/,2/]



Data as of May 2024
Source: Banco de Mexico.
1/ A → B: group B receives funding from group A.
2/ The thickness of the arrows corresponds to the average of the total amounts operated daily by group in 2024.

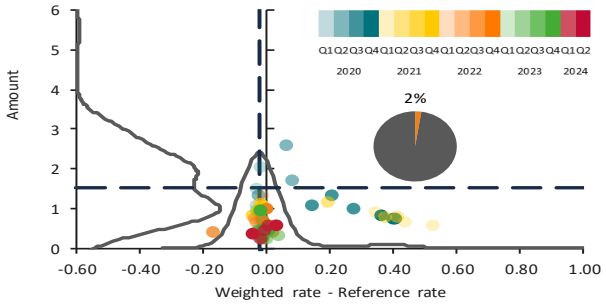
As for financing in the unsecured market, it remains relatively low: for non-DSIBS the amount is at historic lows (since 2008) and with little variation in spreads for both types of institutions since the last *Report* (Graph 96 and Graph 97).

Graph 96
Unsecured market
DSIBs[1/2/]
X axis: Basis points
Y axis: Billions of pesos



Data as of May 2024.
Source: Banco de Mexico.
1/ Data points correspond to monthly weighted average of the daily observations for rates' spread and simple monthly average for the amount.
2/ Dotted lines correspond to medians calculated since 2008.

Graph 97
Unsecured market
Non DSIBs[1/ 2/]
X axis: Basis points
Y axis: Billions of pesos



Data as of May 2024.
Source: Banco de Mexico.
1/Data points correspond to monthly weighted average of the daily observations for rates' spread and simple monthly average for the amount.
2/Dotted lines correspond to medians calculated since 2008.

Box 6: Analysis of the effect of a measure of aggregate interbank risk perception on financing decisions in the interbank market

I. Introduction and Theoretical Framework

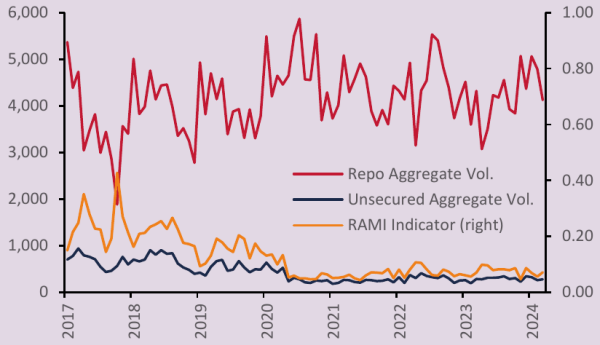
Interbank markets are fundamental sources of financing for all commercial banks, and their efficient functioning is essential for financial stability, especially during periods of financial stress. In particular, according to data on the financial situation of commercial banks published by the National Banking and Securities Commission (CNBV) in March 2024, interbank financing represented 20.1% of total commercial bank financing. What role does the perceived risk in the interbank market play on the dynamics of financing through repurchase (repo) loans or unsecured loans?[1]

A new measure of aggregate risk focused on the interbank market (RAMI), defined as the ratio of total unsecured loan volume over total repo loan volume, is presented. Total volumes are aggregated over the entire Mexican banking system on a monthly basis. This measure is simple, directly observable, and is based on intuitions about the dynamics of the different interbank segments.[2] This measure reflects that lending banks should decrease (increase) the volume of unsecured (repurchase) financing as aggregate risk in the interbank market increases. Therefore, if the aggregate risk in the interbank market increases (decreases), the value of the RAMI measure decreases (increases).[3]

This measure of aggregate interbank risk perception may be relevant to understand the future dynamics of repo and unsecured financing, which can be considered as substitutes. In particular, repo financing is characterized by the fact that the loan is protected by some collateral(s) in order to reduce counterparty risk in case of default. In contrast, unsecured financing does not involve collateral. The average maturity of both types of loans is very similar, with overnight loans representing 95% of daily repo transactions and 96% of daily unsecured transactions. The same happens with interest rates, since both markets have practically the same spread with respect to the reference rate, at around -0.25 to 0.00 basis points. The dynamics of these two markets may vary depending on the level of financial stress and banks' liquidity needs.

Graph 1 shows the evolution of the total volumes (deflated) traded in both the repo and unsecured markets during the sample period, which extends from January 2017 to March 2024 (left axis), as well as the evolution of the RAMI measure (right axis). It can be seen that repo (unsecured) financing presents an upward trend (downwards), and as of March 2020, the date that marks the beginning of the pandemic in Mexico, this trend changed as financing remained stable. This is reflected with a decrease in the RAMI measure until March 2021, which implies that the aggregate risk in the interbank market was increasing, and since then it has remained constant, and without showing a downward trajectory.

Graph 1
Aggregate volumes and measure of aggregate risk perception in the interbank market
Left axis: MXN Billions
Right axis: Index



Figures as of March 2024
Source: Banco de México

II. Methodology

Daily information from Banco de México on interbank lending in the money market with collateral (repurchase financing) and without collateral (unsecured financing) is used. The observations aggregate the financing granted at the bank level for each month, differentiating between the repurchase and unsecured markets. The following econometric model is estimated:

$$\ln\left(VolInterbancario\right)_{i,t}^{k} = \alpha + \beta RAMI_{t-1} + \delta X_{t-1} + \gamma_i + \lambda t + Dum(i^{BISL}) + \varepsilon_{i,t}$$

where $\ln\left(VolInterbancario\right)_{i,t}^{k}$ is the logarithm of the volume of financing granted by the bank i in the month t in the interbank market k (repurchase or unsecured market). On the one hand, X_{t-1} is a vector of variables that can influence the dependent variable. In particular, it controls for monetary policy shocks by including the residuals of the regression of the interbank interest rate (Overnight TIIE funding rate) on the growth rate of the real gross domestic product (GDP) and the consumer price index inflation (INPC), which represents a Taylor shock which controls for borrowing costs in the interbank market (Morais et al., 2019).[4]

[1] This analysis is based on the article by Bechara et al. (2024), published in the "Journal of Money, Credit and Banking".
[2] See Piquard and Salakhova (2019); and Di Filippo et al. (2022).
[3] It is important to note that the RAMI measure is different from the global systemic risk measures. This is because the RAMI measure reflects information on aggregate risk focused on the interbank market, while the global systemic risk measures provide information on a potential systemic collapse of the entire financial system and include information on multiple sectors of the economy (as in the case of the IEMF or ICF measures in Mexico). This is not to say that the RAMI measure is better, worse, or a substitute for such measures of financial systemic risk, but rather that these reflect different types of information.
[4] Although there are several ways to identify monetary policy shocks, this criterion proposed by Morais et al. (2019) was chosen since, for the purposes of this analysis, it is effective in isolating movements in the monetary policy rate that are not explained by the business cycle, i.e., by changes in real activity.

Additionally, we control for the Financial Market Stress Index (IEMF), an aggregate indicator that is contemporaneously related to the level of realized systemic risk (see Graph 27 of this Financial Stability Report). In addition, bank fixed effects and a linear time trend are included. Finally, some specifications include a dichotomous variable that takes the value of one if the bank in question is a locally systemically important bank (BISL), which is *interacted with all the other explanatory variables*.[5]

In order to mitigate possible endogeneity biases, all explanatory variables are lagged, since, at any point in time, these are very unlikely to be affected by the future funding activity of banks (dependent variable).[6] Additionally, such biases are further mitigated by the fact that the measure of interbank risk perception is constructed from aggregate indicators, while the response variable consists of individual-level volumes.

III. Results

Columns 1 and 2 of Table 1 show the estimated impacts on repurchase financing and columns 3 and 4 on unsecured financing, incorporating bank-level fixed effects to control for the effect of heterogeneity across banks, and a linear time trend to control for trends in the series over time. Table 2 presents the results adding the interaction of the explanatory variables with the dichotomous variable BISL, which will provide information on whether the effects are driven by local systemically important banks, relative to the rest of the banks.

It should be noted that all types of collateral and maturities are used. However, the results shown below are robust and very similar in magnitude when considering only repurchase transactions secured by government securities and securities issued by the Banking and Deposit Insurance and Resolution Agency (IPAB), as these represent 93% of such transactions and, therefore, the aggregate risk measure does not vary significantly. Additionally, the results are robust when only overnight loans are used, as they account for around 95% and 96% of daily repurchase and unsecured transactions, respectively. Additionally, it is worth mentioning that the commercial banks participating in the repurchase market are the same as those participating in the unsecured market, which reinforces the possibility that the same institution can substitute between types of loans.

Table 1
Estimation of the effect of aggregate interbank risk on funding decisions in the interbank market.

	$ln\ (Interbank\ Volume)^k_{i,t}$			
	Report		Unsecured	
	(1)	(2)	(3)	(4)
$RAMI_{t-1}$	-1.654*	-0.345	1.446*	0.013
	[0.955]	[0.669]	[0.725]	[0.521]
$Resid\ TIIE_{t-1}$	0.008	-0.014	-0.009	0.016
	[0.029]	[0.025]	[0.015]	[0.021]
$IEMF_{t-1}$	0.889**	0.856**	-0.002	0.034
	[0.406]	[0.405]	[0.246]	[0.239]
Bank fixed effects	Yes	Yes	Yes	Yes
Linear trend	No	Yes	No	Yes
Adjusted R^2	0.778	0.778	0.593	0.595
Observations	3440	3440	3440	3440

Source: Own elaboration with data from Banco de México.
1/***, **, * denotes statistical significance at 1%, 5% and 10%, respectively. Standard errors are robust and clustered at the bank level.

Table 2
Estimation of the effect of aggregate interbank risk on funding decisions in the interbank market - BISL relative to other banks.

	$ln(Interbank\ Volume)^k_{i,t}$			
	Report		Unsecured	
	(1)	(2)	(3)	(4)
$RAMI_{t-1}$	-2.192**	-0.883	0.443	-0.990
	[1.065]	[0.745]	[0.697]	[0.629]
$RAMI_{t-1}$ *$Dum(i)^{BISL}$	3.588*	3.588*	6.684***	6.684***
	[1.850]	[1.850]	[1.332]	[1.332]
$Resid\ TIIE_{t-1}$	-0.003	-0.026	-0.007	0.019
	[0.032]	[0.028]	[0.017]	[0.023]
$Resid\ TIIE_{t-1}$ *$Dum(i)^{BISL}$	0.075	0.075	-0.018	-0.018
	[0.068]	[0.068]	[0.037]	[0.037]
$IEMF_{t-1}$	1.242***	1.209***	0.190	0.225
	[0.434]	[0.434]	[0.239]	[0.233]
$IEMF_{t-1}$ *$Dum(i)^{BISL}$	-2.356***	-2.356***	-1.278	-1.278
	[0.802]	[0.802]	[0.819]	[0.819]
Bank fixed effects	Yes	Yes	Yes	Yes
Linear trend	No	Yes	No	Yes
Adjusted R^2	0.782	0.783	0.609	0.611
Observations	3440	3440	3440	3440

Source: Own elaboration with data from Banco de México.
1/***, **, * denotes statistical significance at 1%, 5% and 10%, respectively. Standard errors are robust and clustered at the bank level.

According to the results, it cannot be ruled out that the new interbank risk measure influences banks' funding decisions in Mexico, and it provides additional information relative to other systemic risk indicators already in place, such as the IEMF. In particular, an increase in the RAMI indicator (i.e., a decrease in aggregate interbank risk) is associated with a decrease in future financing in the repurchase market, and with an increase in future financing in the unsecured market; that is, given a perception of lower aggregate risk in the interbank market, banks are likely to grant more unsecured financing in the coming period.

Interesting results are also found in the case of BISL, as the associations between the new interbank risk measure and banks'

[5] Standard errors are robust and clustered at the bank level.

[6] The Akaike and Schwarz information criteria were used to define the optimal number of lags, which, in both cases, is one month. However, the results described below are robust to lags of 3 and up to 6 months.

financing decisions are different for BISL and the rest of the banks. In particular, an increase in the RAMI indicator (i.e., a decrease in aggregate interbank risk) is associated with an increase in future repurchase financing for BISL, and with an increase in future funding in the unsecured market of much greater proportion relative to the increase in repurchase financing, and relative to the rest of the banks.[7]

IV. Final considerations

A dislocation in the interbank market could lead to liquidity problems for the banking system in general. The results presented in this Box are useful for understanding the dynamics of the interbank market, one of the most important sources of funding for banks in Mexico.

In particular, the results suggest that, following an increase in the RAMI indicator (i.e., a decrease in aggregate interbank risk), BISL receive more funding in the interbank market, with a greater effect on unsecured funding relative to repurchase financing. For the rest of the banks, although the effects are less significant, there is a decrease in future repurchase financing and an increase in unsecured financing.

References

Bechara, A., Bernales, A., Cañón, C. & Garrido, N. (2024) "Aggregate Risk and Lending Decisions in the Interbank Market." *Journal of Money, Credit and Banking*. Forthcoming in the May-June 2024 issue.

Di Filippo, M., Ranaldo, A. & Wrampelmeyer, J. (2022) "Unsecured and Secured Funding." *Journal of Money, Credit and Banking*, 54, 651-662.

Morais, B., Peydró, J., Roldán-Peña, J. & Ruiz-Ortega, C. (2019) "The International Bank Lending Channel of Monetary Policy Rates and QE: Credit Supply, Reach-for-Yield, and Real Effects". *Journal of Finance*, 74, 55-90.

Piquard, T. & Salakhova, D. (2019) "Secured and Unsecured Interbank Markets: Monetary Policy, Substitution and the Cost of Collateral." *Banque de France Working Paper* No. 730.

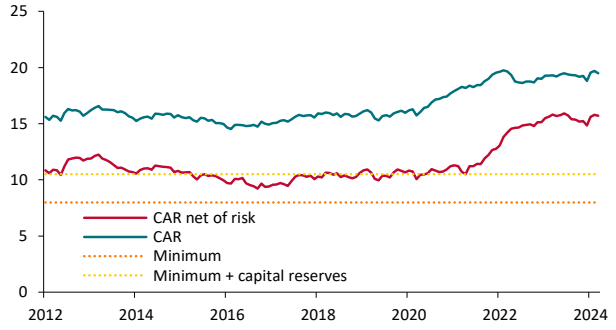
[7] No significant effects are found for the residual of the overnight interbank funding rate. In the case of the IEMF, there are only effects on repurchase financing, although of a lesser magnitude than the effects of the RAMI indicator.

CAR and liquidity-at-risk

A combined assessment of the capitalization ratio net of risk and the LCR-at-risk for commercial banks, with data as of the end of March 2024, shows that most banks have sufficient levels of capital and liquid assets to withstand periods of stress.

First, the CAR net of risk, which is estimated as the resulting capital adequacy ratio in the face of portfolio losses equivalent to the 99.9% credit *CVaR*,[70] decreased slightly during the last quarter of 2023, and then increased in the first quarter of 2024, going from 15.36% in September 2023 to 15.70% in March 2024 (Graph 98). The above is the result of the performance of the system's CAR, together with the slight decrease in portfolio risk in recent months. These levels for the financial system continue to be higher than the regulatory minimum, which shows the banks' capacity to absorb unexpected losses derived from the credit default of their portfolios.[71]

Graph 98
CAR net of risk [1/]
Percent



Data as of March 2024.
Source: Banco de México, CNBV and Credit Bureau.

1/ Estimated as the capital adequacy 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.

In addition, according to the results of the liquidity-at-risk analysis[72] as of the end of March, the banking system has a robust liquidity position. Most of the banking institutions, which represent around 93.6% of the system's total assets, maintain an LCR-at-risk above the minimum regulatory level of 100%, even in scenarios of extreme deposit outflows (Table 5).

Table 5
Bank groups by liquidity at risk [1/]

Group	Criteria	Assets of the bank groups as a share of total commercial banks assets
1	LCR ≤ 65	2.2%
2	65 < LCR ≤ 100	4.3%
3	LCR > 100	93.6%

Data as of March 2024.
Source: Banco de México.
1/ Total assets data for commercial banks refer to those released by the CNBV at the end of March 2024.

In the aggregate, these findings indicate that the Mexican banking system has sufficient liquid resources to cope with periods of stress associated with extreme outflows of deposits from the system.

Likewise, no potential second round effects were found when assuming that those institutions experiencing LCR levels below the regulatory minimum under the liquidity-at-risk exercise stop renewing the financing granted in the interbank repo market. It is observed that, on average, such non-renewed financing would be equivalent to 2.8% of the total liquid assets and inflows of those banking institutions receiving repo funding from the banks affected in the first round of the exercise. It should be noted that the collateral pledged in all the repo transactions observed corresponds to Level 1 liquid assets, so even if the volume was higher, it is

[70] For this exercise it is assumed that losses are absorbed directly with the banks' capital without affecting their reserves and that such portfolio has a 100% weighting for the determination of its capital requirement. This indicator can be used to assess whether a bank's capitalization levels are adequate to cope with unanticipated losses in its loan portfolio.

[71] As these estimates are based on historical conditions observed to date, this indicator is a reference and not a forecast of the potential losses that could be observed in the current situation.

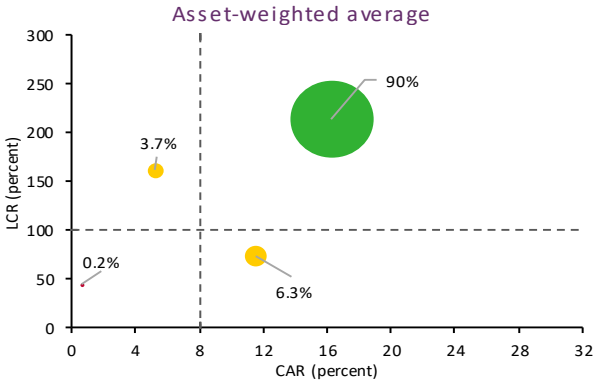
[72] The purpose of the liquidity-at-risk exercise is to evaluate whether commercial banks have sufficient liquid assets (cash and high-quality securities) to meet their net outflows over a 30-day stress period. For this purpose, outflow factors are estimated based on historical information on each bank's deposits (*CVaR* at 95 %). The potential impact on the value of liquid assets is also considered under three historical scenarios, three macroeconomic scenarios (section V.1), and two scenarios associated with climate change (section V.3).

estimated that the impact would not be significant, since the institutions that would cease to receive financing would receive back their liquid assets, which in turn only experienced an average impact of 0.4% in their market value under the stress scenarios.

When jointly evaluating the results of the exercises for the liquidity-at-risk and the capitalization ratio net of risk, it is observed that most banks continue to comply with both requirements. As of the end of March, most institutions maintained levels above the regulatory minimum in at least one of the two requirements, under said stress scenarios, representing approximately 99.8% of the system's assets (Graph 99).

Graph 99

Liquidity and CAR net of risk of commercial banks 1/



Figures as of March 2024.
Source: Banco de México.
1/ The lines show the regulatory thresholds for the liquidity requirement (LCR = 100 %) and the minimum capitalization requirement (CAR = 8 %). The bubbles depict the total assets for the group of institutions within each quadrant, and the percentage is its proportion with respect to the commercial banks' total assets, where the centroid is the asset-weighted average. The red, yellow and green colors denote those institutions that: fail to comply both requirements; fail to comply with one of the two requirements; and comply with both requirements.

Risk of contagion

This section presents the results of the contagion risk analysis.[73] This exercise uses the network of exposures between financial institutions in the interbank market and analyzes the mechanisms that allow the propagation of risks and vulnerabilities to the entire financial system. It uses daily information for all exposures of the national financial system, as well as those of foreign financial institutions.[74]

Contagion risk, measured both by the proportion of the assets of the intermediaries involved in the worst contagion chains[75] (Graph 100) and by the severity of losses (Graph 101), has increased. Thus, it has increased on average since January 2023, with periods of greater increases.

A common element in these periods is that there is an increase in the number of intermediaries raising their exposures relative to their capital. This is evident in the rise of overexposed intermediaries[76] (Graph 102), which is reflected in the number of intermediaries affected in the contagion chains.

During this period of increased contagion risk, particularly starting from June 2023, a change in the network structure (Graph 103) is observed: Density decreased and disassortativity increased.[77] This implies a less connected exposure network, but with exposures more concentrated in larger intermediaries. This greater concentration of exposures is reflected in the counterfactual exercise by an increase in potential losses and in the number of banks affected in the contagion exercise.

[73] Interbank contagion risk refers to the possibility that the financial difficulties faced by one bank in meeting its obligations could spread to other banks, either directly or indirectly.

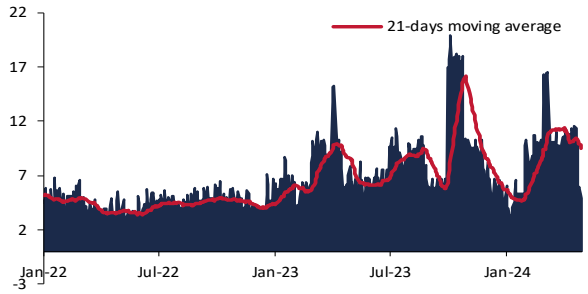
[74] It considers information on exposures in the interfinancial network, originated from: (i) the purchase and sale of securities; (ii) deposits and loans; (iii) market operations, such as derivatives and repos; and (iv) foreign exchange transactions.

[75] To determine the most severe contagion chains, a counterfactual exercise is conducted to evaluate the impact of each analyzed intermediary's failure on the financial system. The worst contagion chain is the one where the most losses are observed.

[76] An intermediary is overexposed if the total of its interfinancial exposures exceeds the amount of capital it has available to absorb such losses without falling below the minimum regulatory levels.

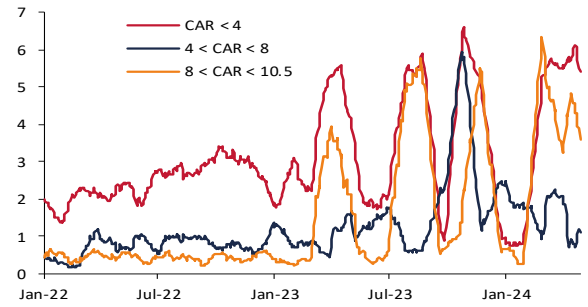
[77] *Disassortativity* is defined as a tendency for intermediaries, generally less interconnected, to seek greater relationships with highly interconnected intermediaries, while suspending interactions with others that are less interconnected.

Graph 100
Percentage of bank's and broker-dealers' assets involved in the worst contagion chains
Percentage



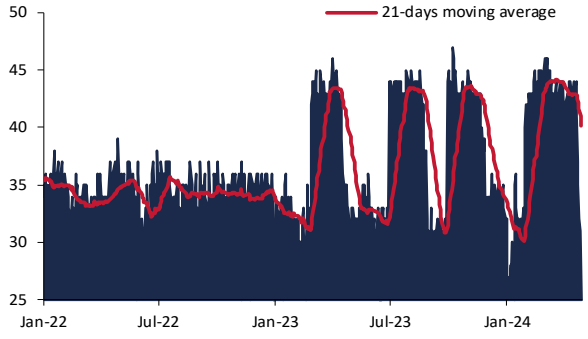
Data as of April 30, 2024.
Source: Banco de México.

Graph 101
Percentage of the bank's assets lost in the worst contagion chains by final CAR Levels 1/
Per hundred



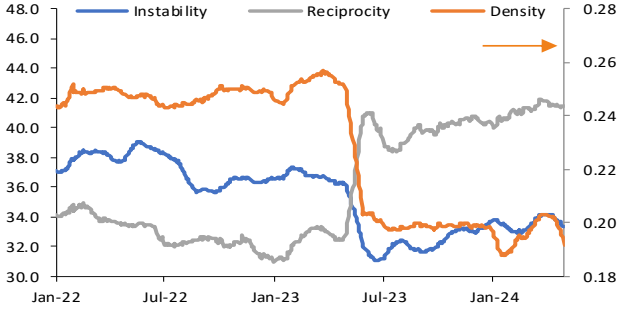
Data as of April 30, 2024.
Source: Banco de México.
1/ The graphed series relates to the simple 21-days moving average of the original series.

Graph 102
Number of banks and broker-dealers overexposed
Units



Data as of April 30, 2024.
Source: Banco de México.

Graph 103
Measures of the interfinancial exposure network 1/
Per hundred



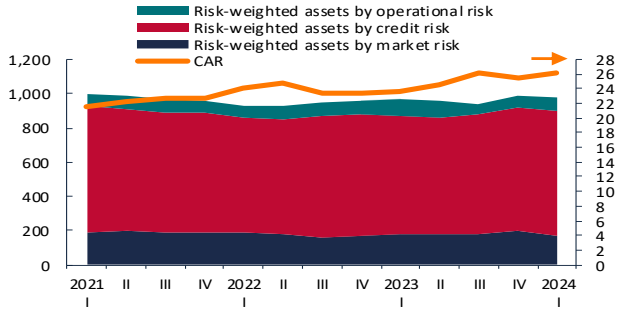
Data as of April 30, 2024.
Source: Banco de México.
1/ The graphed series relates to the simple 21-days moving average of the original series.

IV.3.2. Development banks and other financial institutions

As of March 2024, the development banks and other financial institutions[78] remained financially sound. The system evolves favorably in the main items of the financial statements, in which a positive net income and a growing capitalization index stand out.

As of March 2024, development banking institutions have comfortable capital levels; the system's CAR was 26.25%, 251 bps higher than that recorded in March 2023. Net capital increased 11.5% annually as a result of capital contributions and the results obtained, while total risk assets increased 0.9% with respect to March 2023, mainly due to the increase in risk-weighted assets by credit risk (Graph 104).

Graph 104
Development banks Capital Adequacy Rate
Left axis: billions of pesos
Right axis: percentage

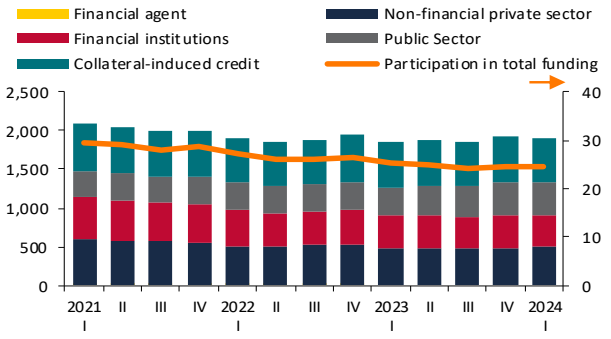


Figures as of March 2024.
Source: CNBV.

[78] Refers to the 6 development banks (Bancomext, Banco del Bienestar, Banjercito, Banobras, Nafin and Federal Mortgage Society (SHF, its acronym in Spanish) and FIRA. As of the third quarter of 2023, the system's financial information does not include FND, since this institution stopped its reporting of financial statements due to its extinction process.

As of March 2024, the development banking system registered a direct and induced financing balance[79] of 1,913 billion pesos, equivalent to 25% of the banking sector's total financing and 6.0% of GDP; however, in the last year its share decreased by 81 bps and 16 bps, respectively, due to lower demand for resources. The financing balance registered an annual growth of 2.1% in real terms as a consequence of the 3.8% real increase in credit to the private sector and an 11.7% real increase in credit to the government sector (Graph 105). At the same date, 70% of financing consisted of direct credit and 30% of guarantee-induced credit (Figure 2).

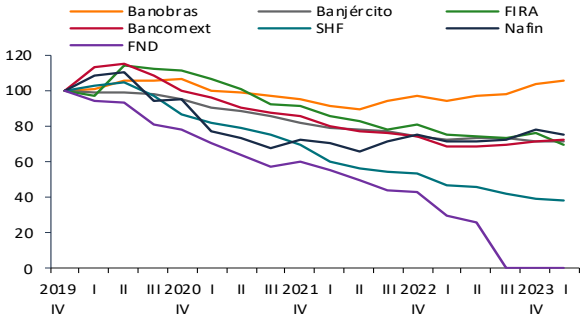
Graph 105
Evolution of loan balances and induced credit balances from development banking system
Left axis: billions of pesos
Right axis: percentage



Figures as of March 2024.
Source: CNBV.

First-tier credit grew 7.3% in real terms with respect to March 2023, while second-tier and induced credit fell 3.5% and 1.7% in real terms, respectively. The total balance of credit showed a mixed performance among institutions (Graph 106). The real annual increase in the portfolio balance of Nafin, Bancomext and Banobras, of 5.4%, 6.2% and 12.0%, respectively, stands out, mainly due to financing related to state owned companies; while the other institutions presented decreases in real terms.

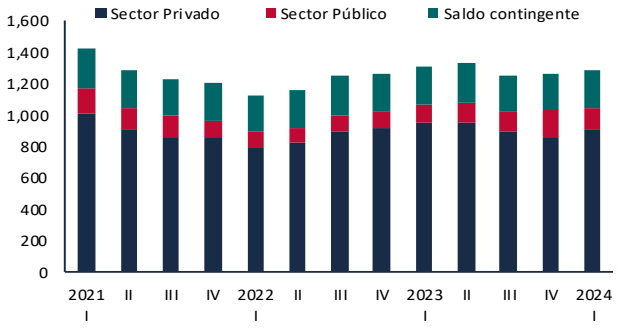
Graph 106
Evolution of loan portfolio by institution
Index (December 2019 = 100)



Figures as of March 2024.
Source: CNBV y Banco de México.

The allocation of credit and guarantees, defined as the amount dispersed in the last 12 months, showed a real annual drop of 1.7% as of March 2024 (Graph 107). This is explained by the real contraction of 5.4% in lending to the private sector and 1.8% in guarantee products; this negative effect was almost entirely mitigated by the higher placement of credit to the public sector, which increased by 30.2% in real annual terms. Of note was the 37% real increase in the amount granted by Banobras.

Graph 107
Loan and guarantee placement flows from development banking system (12M)
Billions of pesos



Figures as of March 2024.
Source: CNBV and Banco de México.

The concentration of the development banking loan portfolio in borrowers is relatively low. Indicators have remained at levels similar to those of recent years.[80] Additionally, 91% of the portfolio is

[79] Development banks and other financial institutions fulfill their mission by: a) granting funding through first and second tier credits, "direct lending", and providing collateral, "induced lending", which means the final loan amount with a percentage of collateral coverage; b) operating special development programs; c) providing technical assistance; and d) operating as a financial agent.

[80] The Herfindahl-Hirschman Index is 106 in the aggregate; the highest levels among development banks correspond to Federal Mortgage Society (SHF, its acronym in Spanish) with 435 and Banobras with 286.

concentrated in the highest regulatory credit ratings (A1/A2 CNBV scale).

As of March 2024, the stage 3 portfolio[81] (past-due portfolio) stood at 35,264 million pesos, registering a 21.6% contraction in real terms compared to the same month of the previous year, mainly due to the exit of FND from the system and portfolio recoveries. It should be noted that 66% of the stage 3 portfolio is concentrated in ten counterparties. On the other hand, loan portfolio provisions showed a real annual decrease of 5.6%.

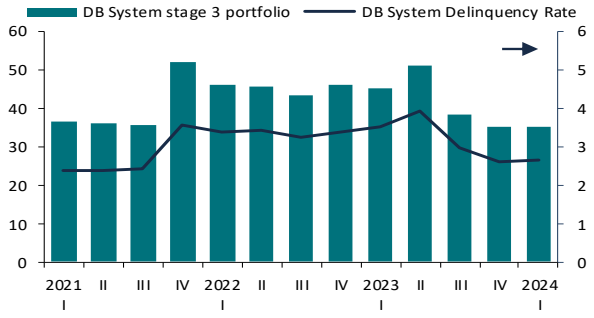
In March 2024, the development banking system recorded a non-performing loans rate (IMOR, its acronym in Spanish) of 2.64%, 85 bps lower than that recorded in March 2023, explained by the decrease in the stage 3 portfolio (Graph 108). As a reference, the delinquency Rate of the commercial portfolio of commercial banks reached 1.38%.[82]

Graph 108

Evolution of "Stage 3" portfolio from development banking system

Left axis: billions of pesos

Right axis: percentage



Data as of March 2024.

Source: CNBV and Banco de México.

As of March 2024, credit induced by guarantees represents 2.4 times the contingent balance, i.e., coverage is 40.8% on average; induced credit recorded a decrease of 1.7% in real terms over the last year, due to the decrease registered in the guarantee's portfolio of Banobras. The rest of the institutions presented positive real growth in the induced balance.

The main sources of funding for development banks are promissory notes with yields payable at maturity (PRLV, its acronym in spanish) and securities issued, which as of March 2024 accounted for 60% and 27% share, respectively, of the total funding assets. As of the same date, the cost of funding remains at levels below the 28-day TIIE (TIIE, its acronym in Spanish) (Graph 109).

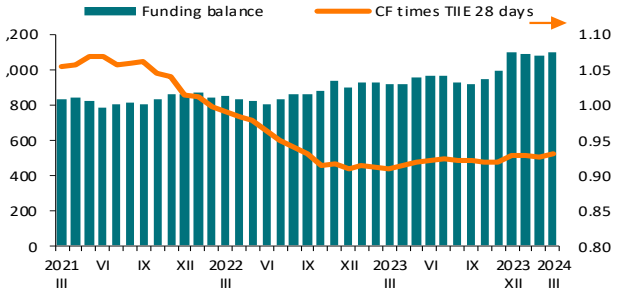
Regarding market risk, Banobras, Nafin and Bancomext account for 72% of investments in securities of the total development banking sector. Of these securities, 69% have a term to maturity of less than 3 years and most are government securities.

Graph 109

Development banks funding evolution

Left axis: billions of pesos

Right axis: times



Figures in current prices.

Source: Banco de México.

CF: Cost of funding in times TIIE 28 days times (weighted average).

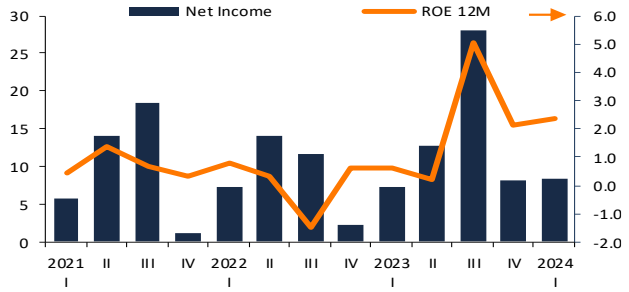
As of March 2024, liquidity conditions in development banks and other financial institutions have remained stable.

As of the same date, the development banking system as a whole reported a net income of 8.34 billion pesos, 13.7% higher in real terms than the previous year. This performance was mainly due to higher interest income at Banobras, derived from investments in financial securities. The system's annualized ROE indicator stood at 2.38% (Graph 110).

[81] The loan portfolio is classified in 3 stages, according to the level of risk and impairment: in general terms, stage 1 incorporates those loans less than 30 days past due, stage 2 those between 30 and 89 days past due and stage 3 those 90 days or more past due. For more information see: Box 5 "Adoption of IFRS9 accounting criteria", from the Financial Stability Report, June 2022.

[82] The data for commercial banks also includes the loan portfolio of sofomes regulated as having an equity link with a bank, whether they are subsidiaries of the latter or not.

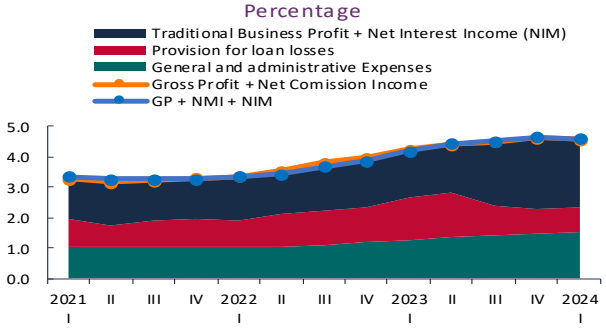
Graph 110
Net income and ROE (12M) from development banking system
Left axis: billions of pesos
Right axis: percentage



Figures as of March 2024.
Source: CNBV and Banco de México.

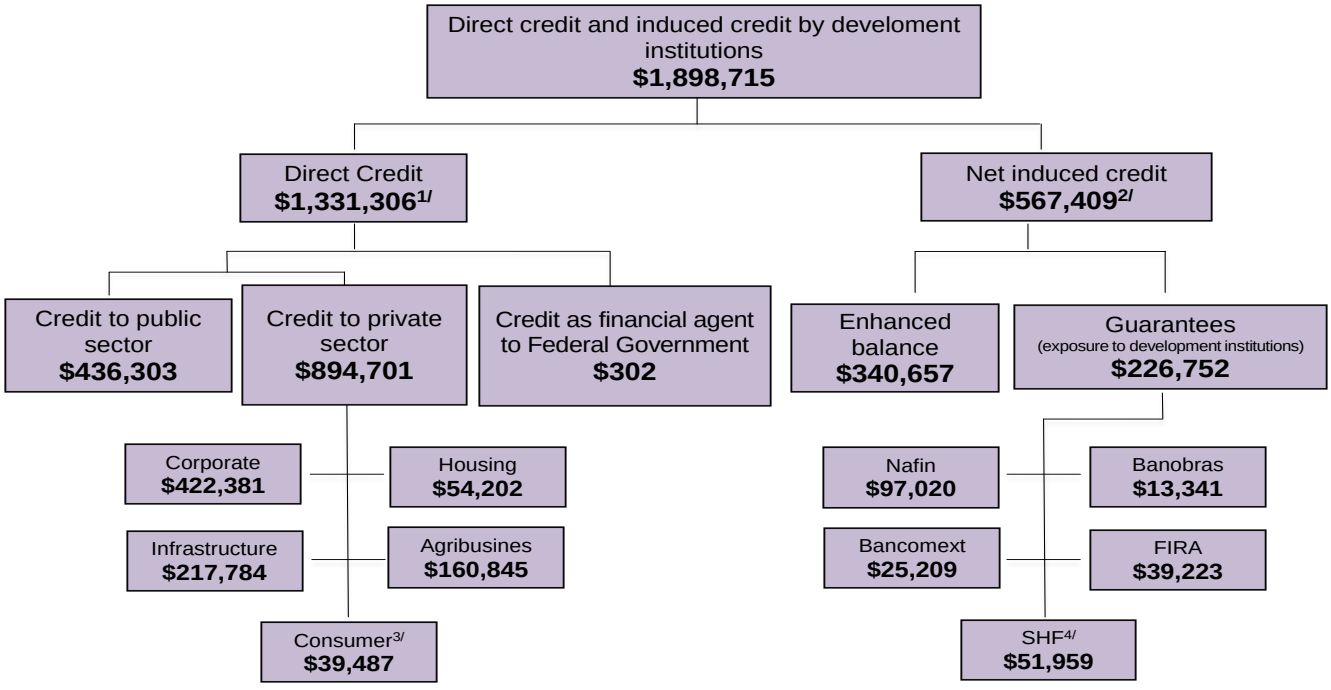
Financial margin as of March 2024 was 6% higher than a year earlier, mainly due to higher interest income from an increase in the securities and repurchase agreements position, as well as higher loan portfolio income. The increase in interest income was sufficient to offset the increase in expenses and the creation of loan-loss provisions (Graph 111).

Graph 111
Performance indicators (proportional to Net Productive Assets)
Percentage



Data as of March 2024.
Source: CNBV and Banco de México.
Cumulative figures from the last 12 months.

Figure 2
Direct credit and credit induced by guarantees granted by development banks and other financial institutions
Millions of pesos (1,000,000,000,000,000)



Data as of March 2024.
Source: Banco de México.
1/ Amount of credit on the balance sheet of development financial institutions.
2/ Net induced credit refers to the total credit balance granted by various private financial brokers, which is partially guaranteed by development banks and FIRA, and which is not funded by development institutions.
3/ Consumer credit consists of credit to the armed forces, which is serviced by Banjercito, and credit to employees of development banking institutions associated with employee benefits.
4/ Includes guarantees from the insurance company Seguros de Crédito a la Vivienda (scv) of the Federal Mortgage Society (SHF, its acronym in Spanish).

IV.3.2.1. Infonavit and Fovissste

Infonavit

The Infonavit is the main provider of housing financing in Mexico. It grants mortgage loans to claimants through fixed and differentiated interest rates based on their income. It is also the administrator of the resources of the national housing fund for employees and part of the retirement savings system, since it manages the investment of the resources concentrated in the housing subaccounts of the claimant workers.[83]

In January 2024, amendments to the accounting provisions applicable to development agencies, including Infonavit, issued by the National Banking and Securities Commission (CNBV) came into effect, which changed the classification of the loan portfolio and established the recording of the portfolio in risk stages.[84]

At year-end 2024, Infonavit recorded positive real annual growth (0.2%) in its total housing portfolio for the first time since March 2021. On the one hand, although the outstanding performing portion of this portfolio had not shown positive growth rates since November 2019, positive rates have been observed again since February of this year, albeit relatively low (0.4% on average). On the other hand, the non-performing loan portfolio contracted in real terms since September 2023 (-2% on average).

The growth in the outstanding balance is explained by a recovery in the origination of mortgage loans. In particular, there was a 37.6% annual increase in the number of loans granted with respect to the same period of the previous year, while the amount granted during the same period increased by 44.3% in real terms. There was an increase in the number of loans granted to claimants of all income levels; however, the growth was greater for those with lower incomes (up to 15 UMA),[85] which received 92% of the total number. Eighty-one percent of the total amount granted in the last twelve months was to claimants in this income group.[86]

Although there was a recovery in lending, the adoption of new criteria contributed to a slight decrease in the balance of the performing housing portfolio, since part of the balance of the portfolio in deferment status was reclassified as stage 1, 2 or 3 at the end of March 2024, while in the previous classification it was part of the performing portfolio. In addition to this reclassification effect, the total balance of the portfolio in rollover grew 23.4% in real terms between December 2023 and March 2024 (19% real annual growth since the last *Report*). [87]

The aforementioned accounting changes had an impact on the level of the NPL during 2024, mainly due to the increase in the balance of the stage 3 or non-performing loan portfolio (Graph 112). The NPL of the housing portfolio increased by 0.32 percentage points since the last *Report*, to register a value of 18.34% as of the first quarter of the year after the indicator decreased during the second half of 2023 due to transfers from the non-performing portfolio to the performing portfolio, as well as write-offs carried out.

[83] See Ley de los Sistemas de Ahorro para el Retiro (Retirement Savings Systems Law) and Ley del Infonavit (Infonavit's Law).

[84] Therefore, the accounting information for the loan portfolio for 2024 is not strictly equivalent to that of 2023. The adjustments made to the accounting criteria as part of the process of adopting the international standard known as ifrs9 adjust, among other aspects, the classification of the loan portfolio according to the risk perception and level of impairment of the loans, as well as the creation of reserves related to the remaining term of the obligations that present certain impairment. In particular, the classification of current and non-performing loan portfolio is eliminated and a classification by credit risk stages (Stage 1, Stage 2 and Stage 3) is established. In addition, for each stage, a line item of portfolio in extension status is included, whereas previously this type of portfolio was only part of the performing portfolio. In its Resources and Obligations statistics, Banco de México maps the information and, as in the case of commercial banks and other brokers that adopted the aforementioned accounting criteria in 2022, the sum of the Stage 1 and Stage 2 portfolios is considered as outstanding or performing, and the Stage 3 portfolio is considered as non-performing.

[85] Unit of Measurement and Actualization (UMA, its acronym in Spanish). The UMA is the unit of account, index, base, measure or economic reference in pesos to determine the amount of the payment of the obligations and assumptions set forth in federal and state laws, as well as in the legal provisions arising from all of the above.

[86] To cope with rising housing prices, the Infonavit increased the maximum loan amounts in all of its financing schemes.

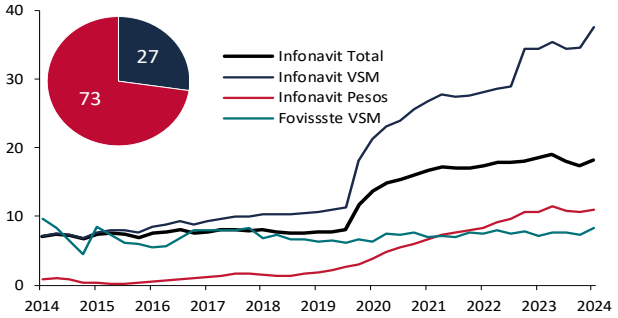
[87] Part of this increase in deferments is explained by the application of the special accounting criteria due to Hurricane Otis, which at the end of March had granted 30,353 extensions to claimants whose outstanding balances amounted to $9,875,055.

In addition, the Institute continues with the program to convert its portfolio denominated in minimum wage multiples (VSM, its acronym in Spanish) to pesos, so that the former represented almost a quarter of its total portfolio as of March 2024.[88]

The reserve coverage indicator decreased 0.43 percentage points since the last *Report* to 76.8% as of March 2024. The most important risk for Infonavit continues to be the unemployment of its borrowers, since in this situation the employers cannot carry out direct payroll discounting and the credit risk of the portfolio depends on the borrowers' willingness to pay once the deferment scheme is exhausted.

Moreover, Infonavit's profitability, measured by its ratio of net income to total assets (ROA), was 0.55% and decreased with respect to the last *Report* due to a lower financial margin, despite recording a lower expense in loan provisions. At the end of March 2024, Infonavit's Capital Adequacy Ratio (CAR) stood at 11.27%, which means that in addition to having reserves, it has sufficient equity to face potential losses generated by the past-due portfolio.

Graph 112
Non-performing Loan ratio of Infonavit and Fovissste's Mortgage Portfolio [1/ 2/]
Per cent



Data as of March 2024.
Source: Infonavit and Fovissste.
1/ The Non-performing loan (NPL) ratio is defined as the ratio of non performing loans over the total portfolio. NPL Breakdown by currency of origination is disclosed for analysis purposes and it is not a regulatory indicator used by CNBV.
2/ Fovissste's total portolio is minimun wage indexed.

The Institute of Security and Social Services for State Workers' National Housing Fund (Fovissste, its acronym in Spanish)

The Fovissste is the third largest provider of housing loans in Mexico and, like Infonavit, administers the resources of affiliated workers (in this case, those in the service of the State). The resources of the Housing Fund are used to grant loans for the acquisition or construction of housing, repairs, additions or the payment of liabilities for the aforementioned items. As in the case of Infonavit, the new accounting criteria were adopted in January 2024 affected the breakdown of the credit portfolio of the development agencies and establish the recording of the portfolio in accordance to risk stages.

Fovissste manages a mortgage loan portfolio of 620,872 loans, 8.9% of which were non-performing at the end of March 2024. As of the same date, Fovissste's performing portfolio grew 2.9% in real annual terms -half the average rate observed in the last year-; while the non-performing loan portfolio grew 21.5%. However, growth rates were impacted by the adoption of new accounting criteria, as were those of Infonavit. This adoption implied a reclassification of the portfolio in accordance to risk stages, including the reclassification of a portion of the portfolio in deferment status to the non-performing portfolio (previously classified within the performing portfolio). As of March 2024, 29.3% of this portfolio was registered in stage 3 (or non-performing), so the NPL increased (Graph 112).[89] Moreover, at that time mortgage portfolio NPL was at 8.4%, while in December 2023 it stood at 7.3%, prior to the adoption of accounting criteria.

Although the reserve coverage indicator also registered a reduction due to the increase in the non-performing loan portfolio as a result of the introduction of the new accounting criteria, its level is comfortable and therefore manages to cover more than the total non-performing loan portfolio. Thus,

[88] These VSM-denominated loans were granted from 1997 to 2016 and until 2023 their outstanding balances were denominated in units of measurement for updating (UMA), the value of which is revised each time the minimum wage is modified, i.e., annually. For 2024, Infonavit's Board of Directors determined that the adjustment to loans denominated in minimum wage multiples (VSM) would be equal to the lesser of the percentage increase in the minimum wage and the percentage growth of the UMA, with the UMI or Infonavit Mixed Unit being the new monetary reference that captures the minimum wage. Thus, for 2024, minimum wage loans were updated at a rate of 4.66% since the increase in the minimum wage was 20%. See link.

[89] Like Infonavit, Fovissste, published a program of facilities for its borrowers affected by Hurricane Otis in municipalities in Guerrero. In

Fovissste has ample reserves to face losses in its non-performing loan portfolio.

In addition, although its profitability indicator decreased in December 2023, it has remained at positive levels. In particular, the Fund's profitability as of March 2024, measured by its ratio of net income to total assets (ROA), was 2.1%, lower than that recorded since the previous *Report.* To address unexpected losses, Fovissste has an Equity Strength Indicator (IFP, its acronym in Spanish),[90] which as of March 2024 was at 16.8%. It should be recalled that the Fund does not have its own equity because it is a decentralized body of the Institute for Social Security and Services for State Workers (ISSSTE, its acronym in Spanish). On the other hand, the Housing Fund balance recorded an annual increase of 1.9% in real terms. The employment stability of Fovissste claimants has been an element of strength for its financial situation.

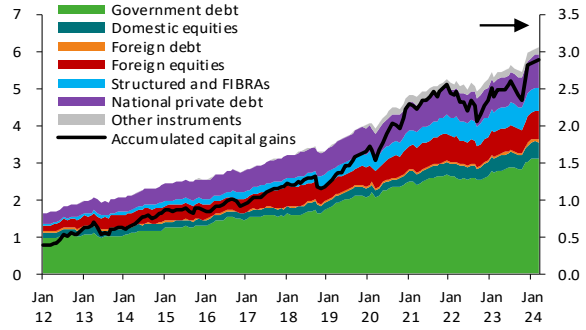
IV.3.3. Siefores and investment funds

Siefores

Siefores continue to be the main institutional investors in the country, with an investment portfolio composed mainly of government securities and domestic private securities (Graph 113).

Between September 2023 and March 2024, the siefores reported an increase in the market value of their investment portfolios, mainly in their positions in government securities and foreign securities. Given the current geopolitical conditions and their consequent impact on international financial markets, among other factors, the siefores' investment portfolios future market value could be affected.

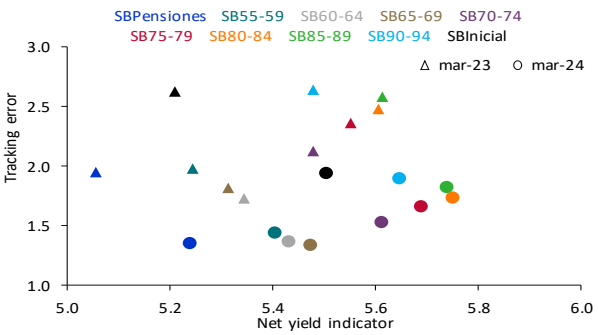
Graph 113
Siefores' portfolio and accumulated capital gains
Right axis: Accumulated flows in trillions of pesos
Left axis: Balances in trillions of pesos



Figures as of March 2024.
Source: CONSAR.

Between March 2023 and March of this year, there was also a reduction in the risk of siefores investment portfolios, as measured by the tracking error between the investment path set by portfolio managers for their investments and the observed path, while in parallel there was an increase in the yield of the portfolios (Graph 114).

Graph 114
Risk-Perfomance relation of Siefores 1/
Percent



Data as of March 2024.
Source: CONSAR.

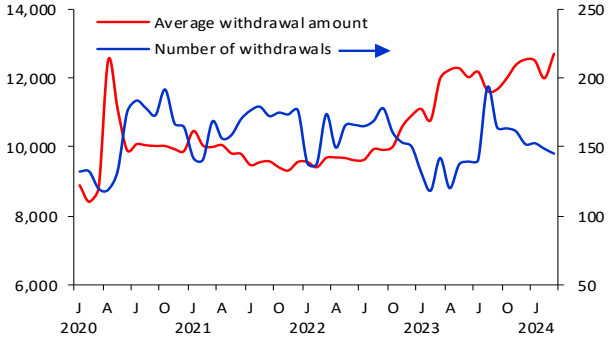
1/ The net yield Indicator is calculated as the weighted average of the moving averages of market performances (using daily data from the most recent six months) at 36, 60 and 120 month horizons. The weights of this average are: 20% for the 36 month horizon, 30% for the 60 month horizon and 50% for the 120 month horizon, thus giving a higher weight to longer-term performances. The tracking error is the average deviation considering a six-month moving window between the optimal and the target trajectory of the fund. 5% is the set by Consar limit.

particular, it extended discount extensions for around 18 thousand affected borrowers whose current portfolio had been affected by Hurricane Otis, so this could also have an impact on the aforementioned growth.

[90] The IFP is calculated as the ratio between the resources to meet unexpected losses and the positions subject to risk. For more details on its calculation, see here.

Meanwhile, unemployment withdrawals remained high as of March 2024, showing a higher average than the one observed during the same period of 2023. These withdrawals continue to be bounded, as they represent a small percentage of the contributions received by the Afores. In this context, although the number of employees who exercised their right to request a partial withdrawal of their individual account resources has remained relatively stable, there has been an increase in the average amount withdrawn in real terms (Graph 115).

Graph 115
Number of unemployment withdrawals and average unemployment withdrawal
Right axis: Thousands of number of withdrawals
Left axis: Pesos in real terms



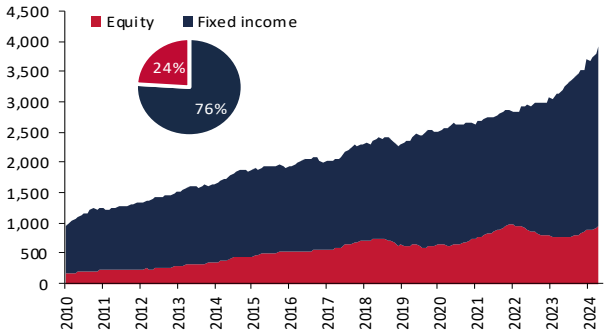
Data as of March 2024.
Source: Banco de México with data from CONSAR.

On April 30, 2024, a decree[91] was published in the Official Gazette of the Federation (DOF, its acronym in Spanish) creating a public trust called *Fondo de Pensiones para el Bienestar*, whose purpose is to grant a pension supplement to workers that reach sixty-five years of age, so they can receive a retirement pension equal to their last salary.[92] In this respect, the SHCP is responsible for setting up the public trust at Banco de México, the latter acting as trustee.

Investment Funds

The investment funds system is comprised of 250 fixed-income funds and 382 equity funds (as of the end of May 2024) and it ranks third in assets share in the Mexican financial system, with a share of 10.8%, below siefores and commercial banks. As of that date, the total amount of assets managed by investment funds added up to 3.79 trillion pesos (Graph 116), which represents an increase of 12.4% with respect to the end of 2023. This was mainly driven by the growth of fixed-income funds.

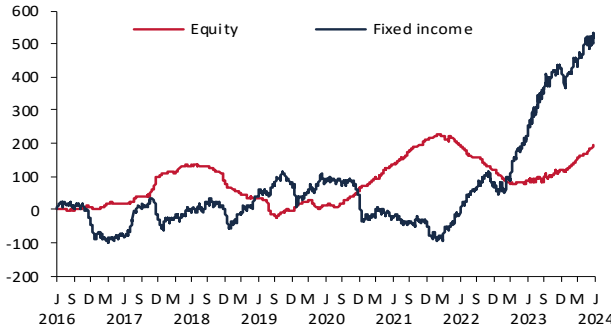
Graph 116
Investment funds' net assets
Billions of pesos



Data as of May 2024.
Source: Banco de Mexico using CNBV data.

Fixed income funds increased their total assets by 12.5% in the first half of 2024, as a result of both inflows and positive returns observed during the period (Graph 117 and Graph 118).

Graph 117
Cumulative flows of investment funds
Billions of pesos



Data as of May 2024.
Source: Banco de Mexico with CNBV data.

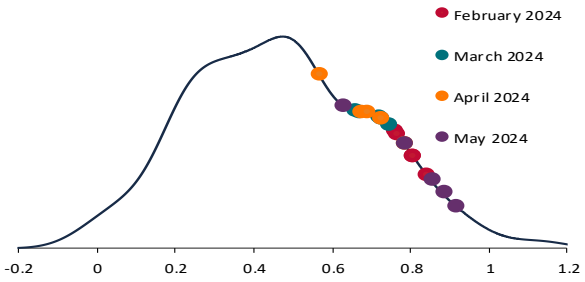
[91] Decree published in the Official Gazette of the Federation (DOF, its acronym in Spanish) on April 30, 2024.

[92] Eligible individuals will be those who began contributing as of July 1, 1997 in the IMSS and those under the individual accounts regime who contribute in the ISSSTE. The supplement they will receive will be such that their old age retirement pension will be equal to their last salary, up to an amount equivalent to sixteen thousand seven hundred and seventy-seven pesos and sixty-eight cents, which will be updated annually in accordance with inflation.

Graph 118

Monthly returns of fixed income funds[1/2/]

Percent



Data as of May 2024.

Source: Banco de México using CNBV and Morningstar Direct data.

1/Each point represents the average of the daily observations of the monthly returns for each week of the month.

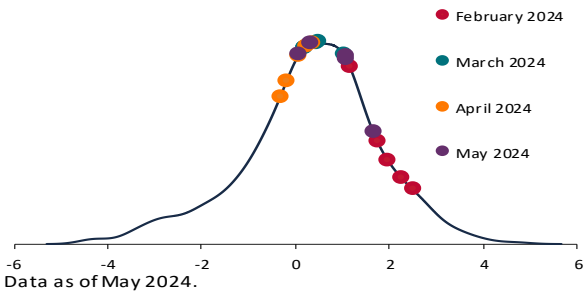
2/ Historical distribution since 2008.

Equity funds, in general, have shown positive returns and flows, therefore the amount of assets under management has increased 12.1% (Graph 117 and Graph 119).

Graph 119

Monthly returns of equity funds[1/2/]

Percent



Data as of May 2024.

Source: Banco de México using CNBV and Morningstar Direct data.

1/Each point represents the average of the daily observations of the monthly returns for each week of the month.

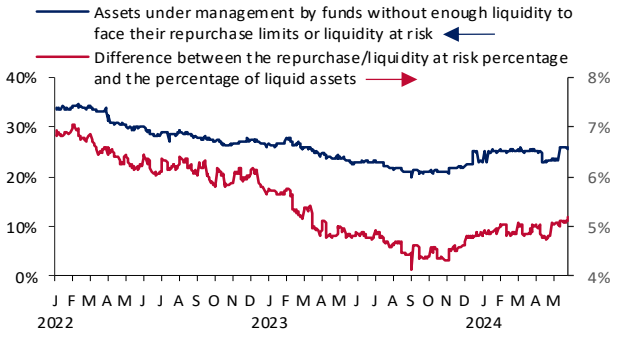
2/ Historical distribution since 2008.

The liquidity of investment funds increased slightly compared to year-end 2023. Likewise, when considering only those funds without sufficient liquidity to meet their repurchase limits or liquidity-at-risk,[93] these remained stable and represent 26% of the sector's total assets as of the date of this *Report* (Graph 120); most of these assets belong to equity funds which, as a reflection of their business model, maintain a lower share of liquid assets in their portfolios.

Graph 120

Assets of investment funds with liquidity shorfall

Percent of total net assets



Data as of May 2024.

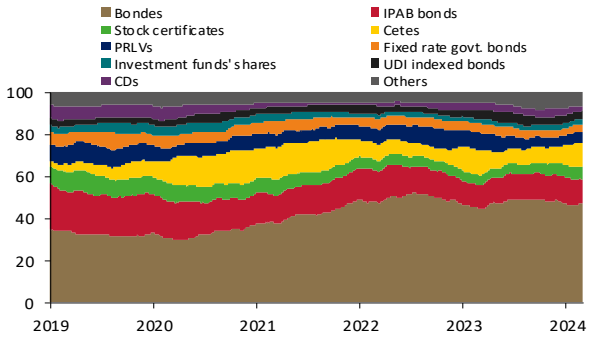
Source: Banco de Mexico using data from CNBV.

Holdings of the fixed-income funds mainly comprise government securities. As of the end of May 2024, Bondes F represented 47% of total assets, followed by securities issued by the Institute for the Protection of Bank Savings (IPAB, its acronym in Spanish), with 11.6%. Since year-end 2023, there have been no major changes in the composition of their portfolio, except for the increase in the participation of treasury certificates (Cetes, its acronym in Spanish), which in this period went from 7.5% to 11.2% of the fixed-income system's assets (Graph 121).

Graph 121

Top holdings in fixed income funds' portfolios

Percent



Data as of May 2024.

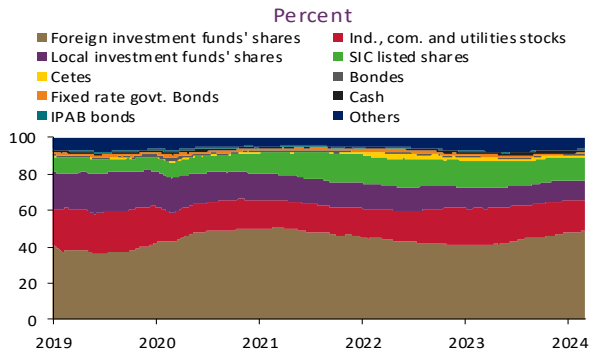
Source: Banco de Mexico using CNBV data.

[93] It is calculated as the average of monthly outflows in the 95th percentile or higher of the flow distribution since 2008, according to historical data as a proportion of total assets at the beginning of the month.

As for equity funds, they invest mainly in foreign investment funds (including Tracs).[94] As of the end of May 2024, foreign funds accounted for 48.9% of total equity funds' assets, marginally higher than the 45% observed at the end of 2023. In addition, they invest in domestic industrial, commercial and service stocks, which constituted 17% of their assets; and in foreign stocks, with 12.6% (Graph 122).

Graph 122

Top holdings in equity funds' portfolios

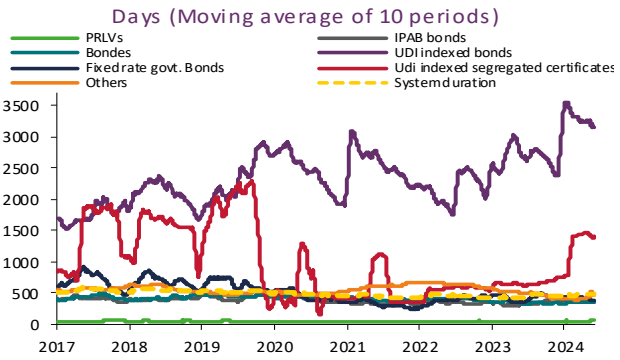


Data as of May 2024.
Source: Banco de Mexico with CNBV data.

The sensitivity of the aggregate fixed income portfolio to interest rates, as measured by duration, has remained stable in recent years. The average duration of the fixed-income portfolio tends to remain in a range of 400 to 500 days (between 1.1 and 1.3 years) (Graph 123). Regarding the portfolio of equity funds, the average duration tends to be more volatile (Graph 124). However, for these funds, the securities for which the calculation of duration applies represent a very small proportion of total assets, only 7.6% as of the end of May 2024.[95]

Graph 123

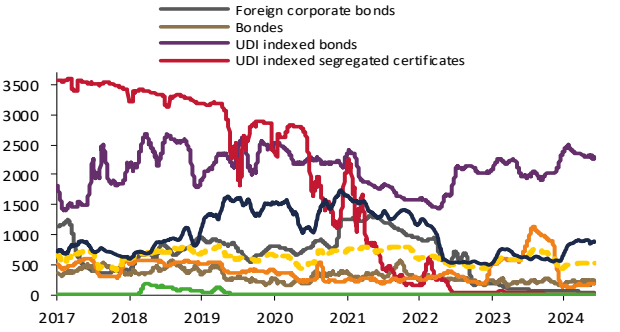
Duration of the aggregate portfolio of fixed income funds by securities



Data as of May 2024.
Source: Banco de Mexico with CNBV data.

Graph 124

Duration of the aggregate portfolio of equity funds by securities



Data as of May 2024.
Source: Banco de Mexico with CNBV data.

Holdings of securities of other financial groups within the investment funds system represent 4% of total holdings as of the end of May 2024. Therefore, the risk of contagion through this channel is limited (Graph 125). Securities mainly include certificates of deposit, PRLVS, stock certificates, shares and investment funds shares.

[94] Stock-referenced certificates (TRACS, its acronym in Spanish).

[95] The instruments for which the duration calculation does not apply are shares, variable income Tracs, investment funds shares and derivatives, with the exception of those referenced to interest rates.

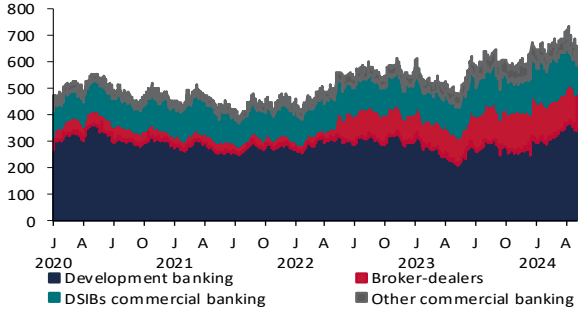
Graph 125
Holding of securities of another financial group by investment funds
10 top managing companies [1/,2/]



Data as of May 2024.
Source: Banco de Mexico with CNBV data.
1/ A ⟶ B: group A has securities of group B.
2/ The size of the nodes represents the total amount held by other financial groups.

Investment funds provide liquidity to the financial system through the market of repurchase agreements (repos). In particular, with data as of May 2024, investment funds contribute with 22% of the total amount of repo funding in the financial system. In addition, so far in 2024, the amount of financing granted by investment funds in the repo market increased by 11%, mainly due to an increase in operations with development and commercial banks. The main counterparties of investment funds are development banks (53%), followed by commercial banks (25%) and broker-dealers (22%) (Graph 126). In terms of receiving repo funding, investment funds have not experienced liquidity pressures and have not had to resort yet to these operations as a source of funding, despite the fact that they have been legally allowed to do so since June 2020.

Graph 126
Amount financed by investment funds in the repo market
Billions of pesos



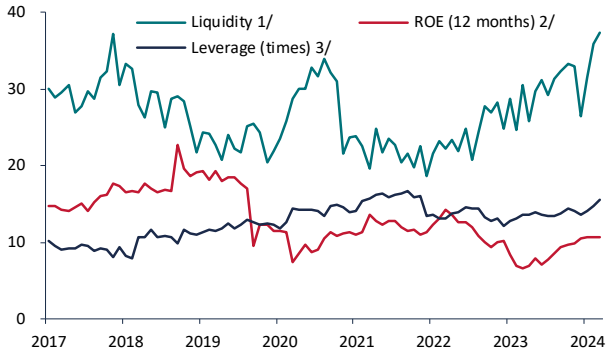
Data as of May 2024.
Source: Banco de Mexico.

IV.3.4. Broker-dealers

The broker-dealers sector is comprised of 36 institutions. The sector's total assets are approximately 1.1 trillion pesos and increased 8.7% annually in real terms. Assets represented 3.6% of the financial system's total assets at the end of March 2024.

The main risks in this sector are leverage through repurchase transactions and the market risk of the proprietary investment portfolio. Since the last *Report*, broker-dealers' leverage increased due to higher passive positions with repurchase agreements. On the one hand, the liquidity indicator recorded an increase reaching levels not observed since 2020; and their profitability remained stable (Graph 127).

Graph 127
Leverage, Liquidity and ROE
Per cent



Data as of March 2024.
Source: Banco de México and CNBV.
1/ Liquidity = Current assets / Current liabilities. Where:
Current Assets = Cash and Equivalents (Cash + Banks + Other cash and cash equivalents + Currencies receivable) + Unrestricted Tradeable Instruments + Unrestricted Readily Marketable Instruments + Repo Receivables + Accounts Receivable.
Current Liabilities = Short-term bank loans and from other bodies + Repo liabilities + Other Accounts Payable

2/ ROE = Net Income 12-month flow / Total Equity 12-month average.
3/ Leverage = (Total liabilities - Settlement Receivables) / Total Equity.

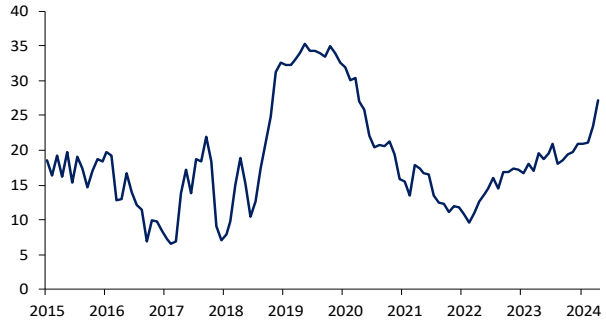
With respect to the sector's solvency, the CAR decreased slightly with respect to the previous *Report*; however, it remains at high levels both for the system and for most of the individual institutions. Although the regulatory capital increased slightly during the period, the decrease in the system's CAR is explained by the increase in total risk weighted assets. This increase was mainly due to higher market risk assets, while credit risk assets decreased.

The market risk to which broker-dealers are exposed, measured through the 99.9% CVaR over a one-month horizon of the market portfolio as a proportion of net capital, increased with respect to the value observed in September 2023, a change that is due to adjustments in the composition of the positions of the institutions' portfolios, particularly in equity (Graph 128).

Graph 128

99.9% CVaR for broker-dealers' market risk

Net capital percent



Data as of April 2024.
Source: Banco de México, CNBV, BMV, Bloomberg and Valmer.

The sensitivity of the broker-dealers' debt instruments portfolio to interest rate changes, as measured by portfolio duration, is at a similar level in April 2024 as in September 2023.

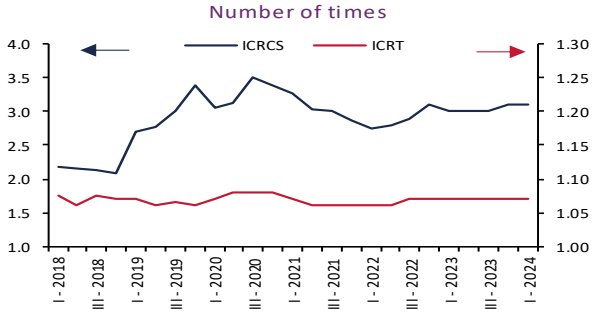
IV.3.5. Insurance companies and bonding institutions

The insurance and surety sector in Mexico continues to show high solvency ratios. Both the Technical Reserves Coverage Index (ICRT)[96] and the Capital Solvency Requirement Coverage Index (ICRCS)[97] indicate that the sector has sufficient reserves to face its risks without endangering the sector's stability and solvency (Graph 129).

Graph 129

Coverage ratios of the insurance sector

Number of times



Data as of March 2024.
Source: CNSF.

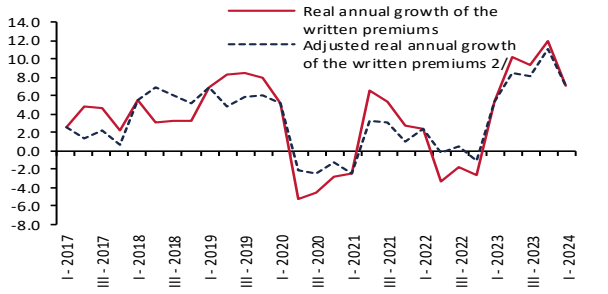
The sector is comprised of 104 insurance and 10 surety institutions. The sector's assets as of the first quarter of 2024 totaled 2.45 trillion pesos (7.8% of the financial system's total assets), which registered a real annual increase of 7.6%.

Premium issuance in the sector increased by 7.0%[98] during the first quarter of 2024 (Graph 130), with increases in the volume of premiums written in almost all business lines, with the exception of Pensions and Non-automotive Property & Casualty. The largest contribution to this growth was made by the Life line, with a real growth of 14.6%.

Graph 130

Real annual growth of the written premiums of the insurance and bonding sector 1/

Percentage



Data as of March 2024.
Source: CNSF.
1/ Cumulative growth compared to the same quarter of the previous year.
2/ The Pemex comprehensive policy has a biennial term. In order to understand the growth trends of the sector, the premium is evenly spread over each year.

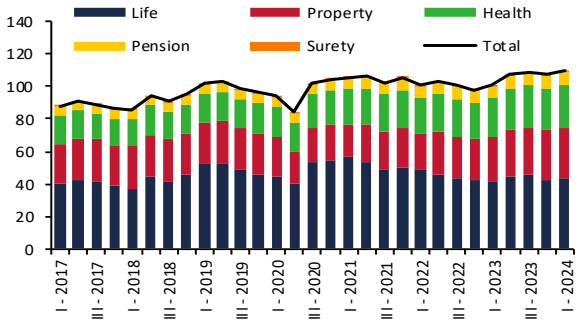
[96] The ICRT is calculated by dividing the investments backing the technical reserves by the amount of such reserves. When this ratio is greater than or equal to one, it means that the institution maintains sufficient resources to back its obligations.

[97] The ICRCS is calculated by dividing the sum of eligible own funds supporting the solvency capital requirement by the amount of the solvency capital requirement. If the ratio is greater than one, it means that the institution maintains sufficient resources to cover unexpected losses.

[98] Growth data in this section are expressed as growth in the cumulative amount for the year through the reference quarter, compared to the same period of the previous year.

The sector's cost of claims presented a real annual growth of 8.5% as of the first quarter of 2024 compared to the same period of the previous year. It is worth mentioning that this annual increase in the cost of claims was observed in all business lines (Graph 131).

Graph 131
Quarterly insurance claims 1/, 2/
Billions of pesos



Data as of March 2024.
Source: CNSF.
1/ Seasonal adjustment and constant pesos of 2024.
2/ Property includes car operation.

Estimated claims for Hurricane Otis in October 2023 amount to approximately 37 billion pesos.[99] This places it as the hurricane that has generated the second largest cost of claims for the Mexican insurance sector only behind Hurricane Wilma. However, the reserves for catastrophic risks that the sector kept before the passage of this hurricane were higher than the estimated indemnities, which has allowed the institutions to meet their obligations with policyholders. Considering that there is a growing trend in economic and insured losses due to natural disasters at a global level,[100] weather-related losses may become more relevant for the insurance sector in the future, so it is important to follow up on the resilience of this sector in the face of these events.

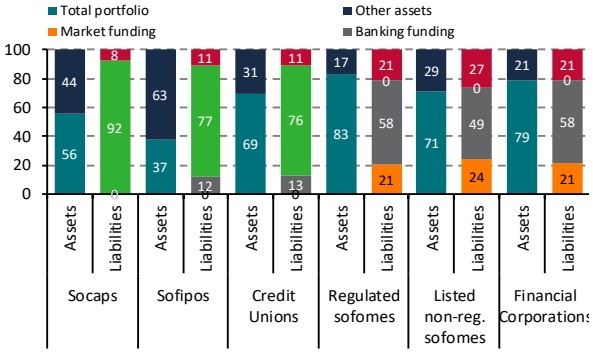
The insurance sector's profit grew 19.4% in real terms in March 2024 with respect to the previous year, due to both higher premium issuance and higher gains in the investment of its reserves. Nevertheless, its profit levels remain below those observed in March 2020.

IV.3.6. Other-Non-bank Financial Intermediaries (OIFNB, its acronym in Spanish)

Non-banking financial intermediaries and companies that carry out credit intermediation or credit operations on a regular and professional basis in the country are collectively referred to as other-Non-bank Financial Intermediaries (OIFNB). They continue to face challenges, particularly related to restrictive financial conditions (Table 6).

Although the sector's asset size is small relative to the rest of the financial intermediaries, its participation is important in some segments, both for financing consumption and productive activities. It is a heterogeneous sector, with some institutions that depend mainly on non-stable funding sources, while others have a relatively stable funding base (Graph 132).

Graph 132
Assets and Liabilities of Other Non-Bank Financial Intermediaries (OIFNB)
Per cent



Data as of March 2024.
Source: Banco de México, BMV, CNBV and Condusef.

During the first quarter of 2024, total financing to the non-financial private sector granted by the country's OIFNB increased in real annual terms and at a higher rate than in previous quarters. This is mainly explained by the growth of the portfolio granted by regulated entities. In particular, regulated sofomes increased their financing to companies and consumers.

The NPL ratio of the loan portfolio granted by OIFNBs remained stable, although they continue at historically high levels, mainly for non-regulated

[99] See Mexican Insurance Institutes' Association (Mexican Insurance Institutes' Association, its acronym in Spanish) press release dated April 15, 2024. Data subject to revision.

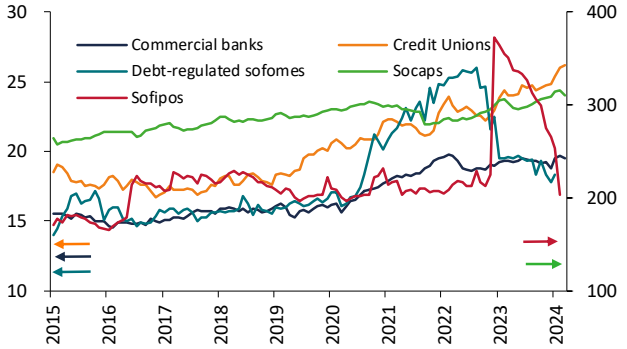
[100] See AON. Climate and Catastrophe Insight 2024 Report.

entities. The capitalization levels of OIFNB, in the aggregate, are above the regulatory minimums, although some of them, such as those of the regulated multi-purpose financial companies (sofomes, its acronym in Spanish) and Popular Finance Corporations (sofipos, its acronym in Spanish), decreased (Graph 133). [101]

Graph 133

Capitalization of Regulated OIFNBs [1/, 2/]

Per cent



Preliminary data as of March 2024.

Source: CNBV.

1/ Right axis: Capitalization Level = Net capital / Total capital requirement for risks. Socaps and Sofipos must maintain a net capital equal to or greater than the total regulatory capital requirement for risks; i.e., equal to or greater than 100%.

2/ Left axis: Capital Adequacy Ratio (CAR) = Net capital / Risk-weighted assets. Commercial Banks, regulated Sofomes equity-linked to Commercial banking institutions or financial groups and and Credit Unions must maintain a minimum ICAP of above 8%.

Regarding OIFNBs' sources of funding, there was a recovery in the balance obtained through bank loans, although this occurred mainly in the case of regulated entities. In contrast, non-regulated OIFNBs, which rely more on market funding, faced challenges during 2023 to obtain funding and as a result decreased their loan origination. While they recorded a slight recovery in both their funding and market funding conditions in late 2023 and early 2024, these entities continue facing tight funding conditions.

The greater risk aversion towards the sector stems in part from the fact that some entities are not subject to supervision or prudential regulation by any financial authority, except against money laundering and financing of terrorism in the case of unregulated sofomes (Table 6). In particular, some companies in the unregulated segment (financial companies or unregulated sofomes) have faced significant challenges to refinance their debt in a context of greater risk aversion among investors, due to the default in payment into which some companies in the sector fell, almost all of them with liabilities in international bonds. One of the troubled entities completed its bankruptcy process to continue as a going concern, while others are still continuing with their corresponding legal processes. However, it is possible that other entities may face similar challenges at a later date, as the episode of contraction of financing to this sector has been prolonged. To date, the cases of entities that have experienced defaults have not put the stability of the financial system at risk because their interconnection with the banking system has been limited.

[101] In the case of sofipo sector, the largest entity, which represents almost 40% of total assets, recorded a decrease in its regulatory capitalization levels (NICAP, its acronym in Spanish) in the period between September and March 2024, which, given its market share, manages to affect the NICAP of the aggregate sector. Notwithstanding the above, this entity has a NICAP above the regulatory minimum.

Table 6

Regulation and Risks Related to Other Non-Banking Financial Intermediaries[1/]

Entity / Instruments / Activity		Risk of:			Those that participate in credit intermediation other than banking	Total assets			Regulation by:			Supervisor / Regulator
		Maturity Trans-formation	Leverage	Runs		Thousands of million Mexican Pesos	% of GDP	Real annual change in per cent[2/]	Capitalization	Liquidity	Leverage	
Socaps (levels 1 to 4)		✓	✓		✓	261	0.8	4.1	✓	✓		CNBV
Sofipos (levels 1 to 4)		✓	✓	✓	✓	119	0.4	69.5	✓	✓		CNBV
Credit unions (levels 1 to 3)		✓	✓		✓	67	0.2	1.4	✓	✓		CNBV
Regulated Sofomes	With links with a bank and consolidated with said bank	✓	✓			307	0.9	3.2	✓	✓		CNBV
	With links with a bank but not consolidated [3/]	✓	✓			125	0.4	n.a.	✓	✓		CNBV
	No links with a bank and issues debt [4/]	✓	✓	✓	✓	203	0.6	-2.9				CNBV
Non-regulated Sofomes [5/]		✓	✓		✓	668	2.0	18.2				
Financial corporations [6/]		✓	✓		✓	417	1.3	8.4				
Non Bank credit card issuers [7/]		✓	✓		✓	91	0.3	21.5				
Securitizations of financial entities [8/ 9/]		✓	✓		✓	497	1.5	-0.4				CNBV
Securitizations of non-financial entities [8/ 10/]		✓	✓			253	0.8	-17.0				CNBV
Total non-banking financial intermediaries						**2,700**	**8.1**	**8.7**				
Real Estate Investment Trust (fibras) [8/]			✓			554	1.7	5.8			✓	CNBV
Mortgage trusts (no fibras) [8/]		✓	✓		✓	6	0.02	-11.3			✓	CNBV
Development Capital Certificates (CCD) [8/]			✓			465	1.4	14.1			✓	CNBV
Energy and infrastructure trusts (fibra E) [8/]			✓			138	0.4	-2.7			✓	CNBV
Investment projects trusts (CERPIS) [8/]			✓			68	0.2	16.6			✓	CNBV
Total infrastructure financing vehicles						**1,229**	**3.7**	**8.2**				
Total of financial intermediaries, infrastructure financing vehicles and activities						**3,929**	**11.8**	**8.5**				
Other financial intermediaries or activities [11/]					✓	4,877	14.7	12.0				CNBV/CNSF
Capital investment funds [12/]						0	0.0	n.a.				
Pensions funds [13/]						6,811	20.5	7.8				Consar
Commercial banks		✓	✓	✓		13,820	41.5	2.6	✓	✓	✓	CNBV/ Banxico

Data as of March 2024.

Source: Banco de México, CNBV, CNSF, Condusef, Indeval and BMV.

1/ The red marks indicate cases in which the risk described may materialize or does materialize currently in some of the entities within the specific sector in Mexico. The risks in the columns are defined as: (i) maturity transformation risk: the risk from obtaining short-term funding to invest in long-term assets; and (ii) the leverage risk: the risk coming from borrowing funds to buy assets to increase potential investment profits (losses).

2/ In the case of the column referring to the actual annual variation, "n.a." indicates an absolute value growth of more than one hundred percent.

3/ The increase in the annual real growth of assets of regulated Sofomes, linked to a bank and not consolidated, is due to the incorporation of Cetelem into Grupo Financiero Inbursa in March 2024.

4/ In 2014 several legal provisions were reformed to include sofomes that issue debt within the regulatory framework. From 2015, 18 non-regulated companies changed their purpose to regulated on being issuers of debt and gradually began to report to the CNBV.

5/ The figures referring to the number of non-regulated sofomes is taken from the Commission's Registry - RECO (Condusef). The figures on assets are not available, so we use instead the size of the total credit portfolio granted by the entities and reported to the Condusef. The credit portfolios of non-regulated sofomes that only grant credit to related or affiliated entities are not considered. The figures of non-regulated Sofomes collected by the Condusef are subject to changes.

6/ These are companies that take on indebtedness but are no financial entities under Mexican law. For example, the financial arms of auto manufacturers and commercial credit or leasing companies. The figures shown here only include those that issue debt in the financial markets.

7/ This only includes the balance of the credit granted directly by department stores to their customers without the intervention of any financial broker. Figures at December 2023.

8/ Relates to the outstanding value a market prices.

9/ Includes securitizations of banks, sofomes, the Infonavit and the Fovissste.

10/ Includes securitizations of both the private and public sectors, such as of the states and non-financial companies.

11/ Includes fixed income investment funds, locally exchange traded funds (ETFs) bond warehouses, brokerage firms and credit insurers. Figures for fixed income investment funds at December 2023.

12/ Includes investment funds in capital instruments and local ETFs linked to equity indexes.

13/ Includes Siefores.

On the other hand, banks' exposures through loans granted to other OIFNBs, as well as through their holdings of securities issued by them, remained relatively low. In addition, there has not been a considerable level of concentration in financing by individual banks to the OIFNB sector. Consequently, in the event of a default by some entities in this sector, it would not represent a risk for the banking system as a whole. [102]

When analyzing the aggregate asset and liability positions in foreign currency of the OIFNBs, including positions in financial derivatives, the mismatch for the sector as a whole is in surplus in dollars, so that a greater appreciation of the peso against the dollar could have a negative impact, in the aggregate, for the sector.[103]

The entry of new competitors into the popular savings and loan sector, following the acquisition of sofipos' licenses and the subsequent increase in credit granted, poses important challenges ahead: on the one hand, having access to and maintaining a stable source of funds; and on the other, maintaining adequate credit risk management of their portfolios, given that their models incorporate individuals new to the financial system (with no prior credit history). If these entities compete for the same borrowers -or with similar characteristics- and increase the leverage of these borrowers, it would be difficult to achieve adequate risk management. [104]

As part of an effort to compete for depositors, some sofipos with digital business models continue to offer high deposit rates to the public. This strategy has put pressure on their net interest margins, and they are also burdened with high loan-loss provisions, downwards affecting the profitability of these entities. Although their regulatory capital levels mitigate these pressures, the evolution of these brokers will have to be monitored. Some sofipos with traditional business models are also experiencing profitability pressures; however, this is due to their high administrative expenses.[105] It is important to remember that the rest of the OIFNBs are prevented by law from taking deposits from the public.

Currently a sofipo is in the process of transforming from a Popular Finance Corporations with a digital business into a bank. With this transformation, the entity will be able to expand the services it offers to the public, favoring inclusion and competition, under a more robust regulatory and supervisory framework. This reduces the potential for regulatory arbitrage in the system.

In general, OIFNBs are vulnerable to downturns in economic activity due to the segment of the population and companies they serve, which is why an abrupt slowdown could lead to a significant deterioration in NPL ratio levels, causing problems in their credit quality and generation of income from financial margin. Although these institutions do not represent a risk to financial stability because they are small and not very interconnected with the country's banks, as well as with other financial intermediaries, their absence could reduce access to credit for the households and small-and-medium-size-businesses they currently serve (pymes, its acronym in Spanish).

[102] In particular, some Savings and Loan Cooperatives (socaps, its acronym in Spanish) have had their operating license revoked. From 2020 to date, four sofipos with assets representing only 1.3% of the sector's assets and with 151,622 clients out of the 11.8 million clients in the system have had their license revoked. Likewise, from 2020 to date, the license was revoked for three socaps with assets that represented only 0.1% of the sector's assets and with 14,360 members out of 8.8 million clients in the system.

[103] There are some cases of OIFNBs whose funding was highly concentrated in international debt issues in foreign currency and which suffered important restrictions to their sources of financing. In fact, some of them defaulted on their obligations and are currently immersed in financial restructuring or settlement processes.

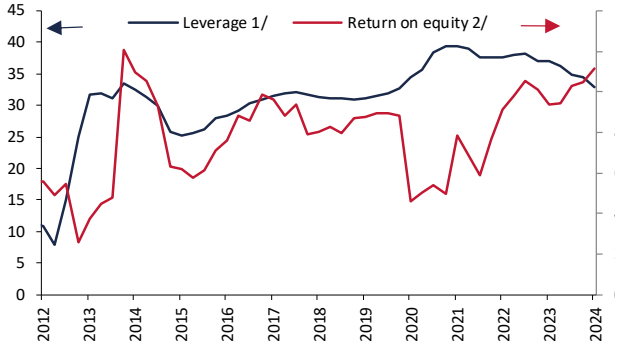
[104] As of December 2022, NU Financiera México, a Fintech entity specializing in credit through a digital card, became a sofipo after acquiring an entity that was no longer operating. Fintech Klar also acquired the sofipo Servicios Financieros Alternativos (Sefia) in April 2023 and the company Fondeadora acquired the sofipo Apoyo Múltiple in September 2023. As of March 2024, the shares of these sofipos within the sector are 51%, 6.5% and 0.9%, respectively. It should be recalled that the sofipo sector represents 0.2% of the financial system's assets as of the same date.

[105] Sofipos rely heavily on traditional fundraising to fund their lending activity. In order to guarantee its deposits, a sofipo must be associated with the *Fondo de Protección*, which is a trust set up by the Federal Government with the development bank acting as trustee institution, without such trust having the status of a federal public administration entity or a public trust (Articles 98 and 99 of the Ley de Ahorro y Crédito Popular (LACP, its acronym in Spanish). The deposit insurance is managed by Prosofipo through the trust and the savings of the depositors of the sofipos are protected for up to 25 thousand inflation indexed units (UDI, its acronym in Spanish) in the event of a settlement or disappearance of a sofipo (Article 105 of the LACP). The assets of the Protection Fund will be made up of the following resources: contributions made by the Federal Government; ordinary monthly fees payable by the sofipos; extraordinary fees payable by the sofipos; and other assets, rights and obligations acquired by the Fund (Article 101 of the LACP).

Other financing vehicles

Real Estate Investment Trusts (REITs) increased their revenues and occupancy rates since June 2023. In particular, the opportunities attracted by the relocation of production chains to the United States have generated greater demand for leasing industrial properties and in turn an increase in investment spending by REITs specializing in these types of properties. As a result of the aforementioned phenomenon, there has also been a reorganization of the sector, such as mergers between industrial REITs, proposals to spin off their industrial assets into new ones, among others. It should be noted that the new REITs investments were financed through capital issues, so that their leverage levels were slightly reduced, while their profitability increased (Graph 134).

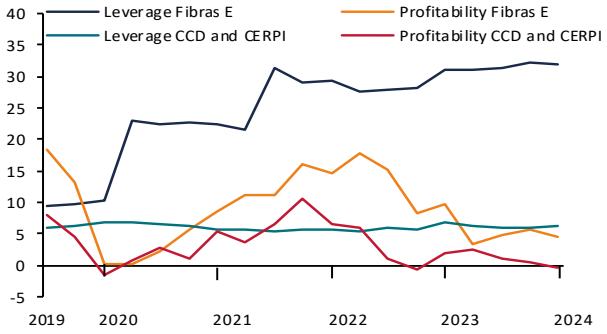
Graph 134
Leverage and return on equity of REITs
Per cent



Data as of March 2024.
Source: BMV and BIVA.
1/ Leverage is calculated by dividing debts by assets.
2/ Return on equity (ROE) is calculated by dividing Net Income by Equity. Net Income is the sum of the last 4 quartes. Assets, debt and equity are the average of the last 4 quartes.

The outstanding balance of Infrastructure Trusts (Fibras E, by its acronym in Spanish) equity issues decreased, while their leverage and liquidity risk indicators remained stable. The profitability of the vehicles decreased slightly. Meanwhile, the outstanding balance of Certificates of Capital Development (CCD) and Trust on Energy and Infrastructure Projects (Cerpis) increased since the last *Report,* mainly due to the new issuances of Cerpis; however, profitability indicators deteriorated (Graph 135).

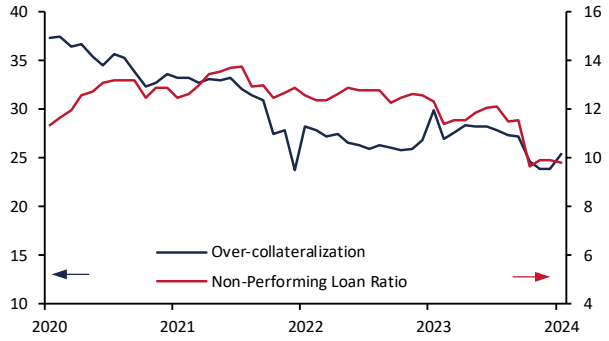
Graph 135
Leverage & profitability of Fibras E, CCD and CERPI 1/
Percent



Data as of March 2024.
Source: BMV and BIVA.
1/ Leverage is calculated as total liabilities divided by total assets. Profitability is mesured by ROE, and it is considering the 12-month net income.

The outstanding balance of securitizations of homogeneous loans (such as mortgage or leasing securitizations), which had contracted due to a slowdown in portfolio securitizations by Infonavit and Fovissste, increased at the end of 2023 due to a significant securitization carried out by a bank. The insolvency risk of the structures, measured by the overcollateralization of the structures, is low as they maintain a significant capital cushion, although this has been reduced in recent quarters. At the same time, the NPL ratio of the vehicles' portfolios remains stable and at low levels relative to their history (Graph 136).

Graph 136
Over-collateralization and Non-Performing Loan Ratio in Homogeneous Securitizations[1/]
Per cent



Data as of March 2024.
Source: BMV y BIVA.
1/ Over-collateralization is calculated as 1 minus the ratio of the outstanding balance of the issuance to the sum of current assets and cash, multiplied by 100.

The size of non-homogeneous securitizations (securitizations backed by assets such as highway tolls or tax income) contracted due to the slowdown in the securitization of public sector debt. Thus, the trust leverage and liquidity levels were stable, while assets backing the trusts associated with these securitizations showed high profitability.

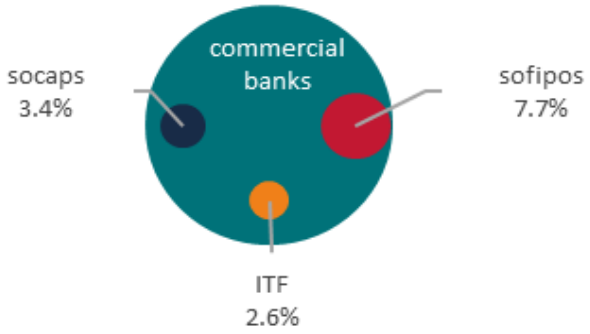
Institutions using financial technology

During the first half of 2024, new Financial Technology Institutions (ITF, its acronym in Spanish) continued to be incorporated into the financial sector following the authorization of four licenses, two of them for Crowdfunding Institutions (IFC, its acronym in Spanish) and the other two for Electronic Payment Fund Institutions (IFPE, its acronym in Spanish). ITF provide innovative financial services and may contribute to complement the existing supply to promote inclusion, efficiency, and competition among participants.

As of May 2024, a total of 78 ITF have been authorized under the Law to Regulate Financial Technology Institutions (LRITF, its acronym in Spanish). Of these, 25 correspond to IFC and 53 to IFPE.

The ITF sector is still small with respect to commercial banks, with its capital accounting for only 2.6% of the latter's capital stock (Graph 137). However, it has grown when compared to other financial intermediaries. The capital of ITF is equivalent to 78.1% of the capital of Savings and Loan Cooperatives (socaps, its acronym in Spanish) and 34.2% of that of Popular Finance Corporations (sofipos, its acronym in Spanish). ITF have faced a challenge with the tightening of financial conditions, which has put pressure on the sector and, in particular, questioned the viability of some companies dedicated to crowdfunding. However, given the size and limited interrelationship of the sector with other sectors of the financial system, it does not represent a threat to the stability of the financial system.

Graph 137
Relative size of financial intermediaries compared to commercial banks [1/]
Percentage in terms of capital stock

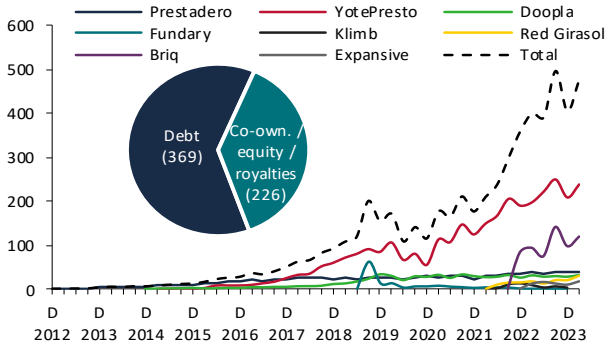


Source: CNBV, Federal Official Gazette, Crunchbase and entities' websites.
1/ For the case of Financial Technology Insitutions (ITF), this refers to the contributed capital, which results from the sum of the initial capital stock plus the financing obtained through several investment rounds. Data related to commercial banks' capital stock is as of March 2024, socaps data as of February 2024, and sofipos data as of December 2023.

As of the end of March 2024, an upward trend continues for the financing granted through debt IFC, with a nominal increase of 17.6% with respect to the last quarter of 2023, according to the information reported by the entities on their websites (Graph 138a). It is important to closely monitor the evolution and viability of their business models, since credit in arrears continues to be a relevant issue for some institutions, for which default levels stand at around 30% of their credit portfolio. However, the weighted average (by funding granted) of non-performing loans of all debt IFC reporting information is 6.3%. Non-performing loans do not constitute a risk to financial stability but, due to the nature of the business (where loans are made between individuals), non-performing loans end up impacting private investors (lenders).

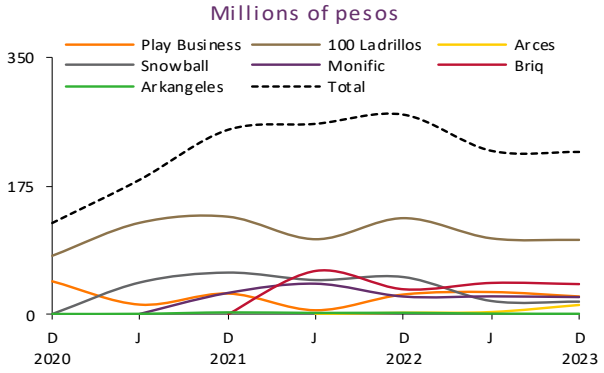
In the co-ownership, equity and royalties IFC, the semi-annual financing granted during 2023 remained constant (Graph 138b). Unlike debt IFC, in this business model investors acquire a percentage in a company or future project; or in the revenues or profits they generate.

Graph 138
Funding granted by institution
a) Debt IFC [1/]



Data as of March 2024.
Source: Institutions' website.
1/ The last observation is omitted for Fundary and Klimb, since their website has not updated the corresponding information. The pie chart shows the contributed capital by IFC, by type of business model (millions of pesos).

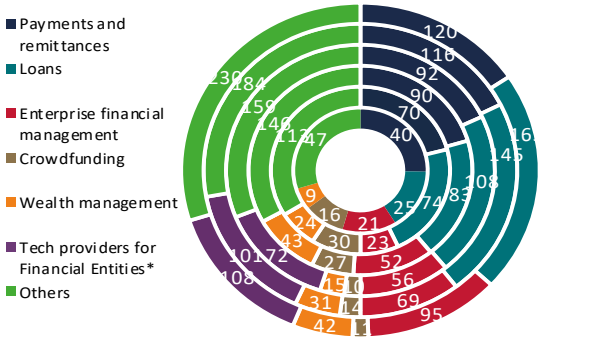
b) Equity, co-ownership or royalties IFC



Data as of December 2023.
Source: Institutions' website.

On the other hand, the sector of Fintech companies in a broad sense (entities that provide technology-enabled financial services, even if they do not hold or have not required authorization to operate as ITF but rather operate under other legal figures) continues to grow, from 650 Fintechs identified during 2022 to 773 during 2023. The sectors with the highest number of companies are: loans, payments and remittances, enterprise financial management, and technology providers for financial entities. In addition, it is estimated that 60% of Fintechs focus their products on the business-to-business (B2B) market, targeting corporations, traditional financial institutions and small and medium-sized enterprises (PYMES, its acronym in Spanish). Likewise, the sectors that incorporated the largest number of new companies during 2023 were: loans, enterprise financial management, and real estate services (Graph 139). The growth of Fintechs was also reflected in the increase in their reported revenues. In 2020, those with revenues between 500 thousand dollars and 5 million dollars represented only 14% of Fintechs, while in 2023 they represented 40%. In contrast, the share of Fintechs earning up to 500 thousand dollars has decreased from 80% in 2020 to 38% in 2023. [106]

Graph 139
Fintech Startups
2016-2023 [1/]



Data as of December 2023.
Source: "Radar México-VIII Edición", "Radar México 2023", "Radar Fintech e Incumbentes". Finnovista, Alianza del Pacífico y BID. 2021 and "Radar México 2020", Finnovista. 2020.
1/ The rings correspond to the years 2016, 2018, 2020, 2021, 2022 and 2023, seen from the center of the graph outwards, respectively.
*Before 2021, the segment of Technology providers for Financial Entities was included in the "other" category.

The high-interest rate environment has increased the cost of funding for these institutions, increasing the interest rate of savings products offered by Fintechs and the competition for the market of new savers.

In this regard, as mentioned in section V.3.7, it has been observed that some sofipos with digital business models, which can be categorized as Fintech in a broad sense, offer high interest rates, even above the bank funding rate, which puts pressure on their financial margin. Therefore, they should be monitored to prevent them from becoming a source of risk.

Fintechs can contribute to financial inclusion by serving the underbanked population. For example, it is estimated that 45% of Fintech clients did not

[106] Finnovista (2024). "Radar Mexico-VII Edition". February 16, 2024.

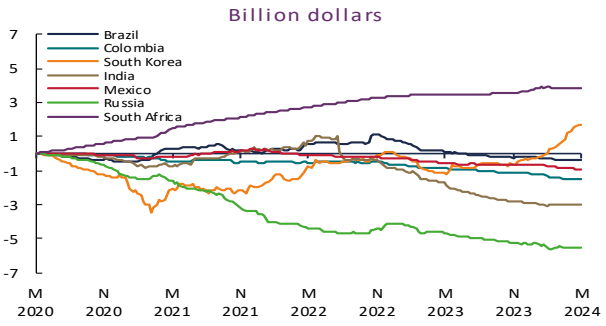
previously have financial services.[107] However, it is important that they offer their services in line with sound risk management practices.

The incorporation of Fintech companies into the ITF regulatory framework has continued, although at a slower pace compared to the previous year, with only 5.6% of Fintechs in the process of obtaining a license as an IFC or IFPE. On the other hand, 9.9% are in the process of obtaining another license as a regulated entity (bank, broker-dealer, insurance companies, sofom, sofipo, etc.). This compares with 12% and 14% in 2022.[108]

With respect to the development of the virtual assets (VA) market, although interest in this type of assets in the country continues to be low, it is important to continue monitoring it in order to identify any threat to the financial system in a timely manner. According to available data on the accumulated net flows of VA to each country,[109] Mexico maintains net cumulative flows well below those observed in other emerging economies, which could be an indicator of the low level of adoption of this type of assets in our country (Graph 140). Similarly, Google searches conducted in Mexico on the main VA continue to show relatively low search interest (Graph 141).

Graph 140

Accumulated net flows of virtual assets to the main EMEs[1/]



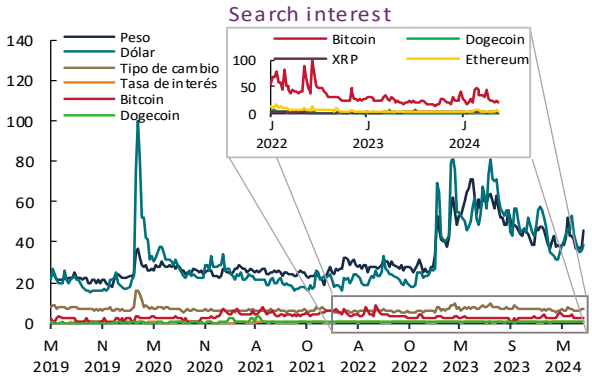
Data as of May 19, 2024.

Source: Chainalysis Market Intel.

1/ The series represent an estimate of the cumulative net value (inflows minus outflows) of virtual assets (VA) transferred on the blockchain to each country, based on the location of visitors to the website of the VA services identified by Chainalysis and the flows recorded on the chain between these services.

Graph 141

Google searches for main virtual assets in Mexico[1/]



Data as of May 2024.

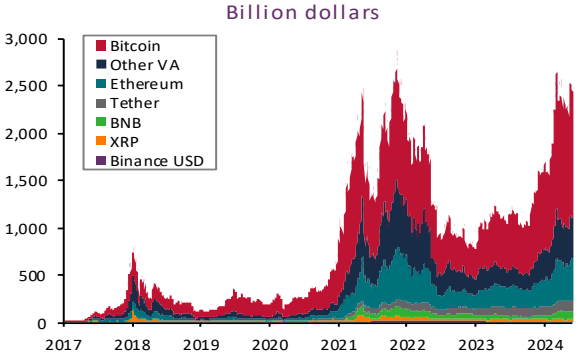
Source: Google Trends.

1/ "Google Trends" normalizes search interest to facilitate comparisons between terms. Search results are also normalized relative to the time and region of the query. Some virtual assets were omitted from the graph as their search interest was close to zero (< 6).

This, despite the increase in market capitalization for these assets observed so far in 2024, which appears to be related to several factors, such as the authorization of spot Bitcoin ETF in the U.S. equity markets[110] and the most recent bitcoin *halving* event on April 19, 2024, events that have historically led to an increase in the price of Bitcoin (Graph 142). [111]

Graph 142

Total market capitalization of virtual assets[1/]



Data as of May 2024.

Sources: CoinGecko, Coin Dance.

1/ The "Other VA" category represents the market capitalization of the remaining VA, according to the total estimated by Coin Dance.

[107] Fintech Mexico, Nader Ayaux & Goebbel and NTT Data (2023). "Fintech Mexico 2023 Annual Report".

[108] Finnovista (2024). "Radar Mexico-VII Edition". February 16, 2024.

[109] Chainalysis Market Intel.

[110] Globally, at the end of the first quarter of 2024, there was an increase in the participation of institutional investors in the VA market, according to data from Coinbase platform, which could be influenced by the authorization of Bitcoin ETFs in the United States.

[111] *Bitcoin Halving* is a pre-programmed event in the Bitcoin protocol whereby miners' rewards are halved in order to slow the rate of issuance of new Bitcoin.

Finally, in addition to the risks pointed out by Banco de México in previous editions of the *Report* and various press releases, it is important to take into consideration the implications that the holding of this type of assets may have for the international emission reduction targets, and the policies and actions to address climate change.

Banco de México will continue to promote a healthy distance between VA and the traditional financial system, as well as to monitor the evolution of this market, in order to identify in a timely manner the implications that its evolution could have on financial stability and to promote, if necessary, measures to safeguard it.

Banco de México supports the development of innovative financial services that promote inclusion, efficiency and competition in the financial system. In this vein, the central bank will participate, together with seven central banks, in the Agorá project coordinated by the Bank for International Settlements (BIS), in order to analyze how the tokenization of central bank wholesale digital money and commercial bank deposits in programmable platforms can serve to improve the monetary system.[112]

According to the BIS, tokenization is the process of registering a claim to financial or real assets that exist in a traditional registry or programmable platform. The Agorá project will analyze how tokenization and smart contracts can facilitate functionalities and transactions that are currently unfeasible. For example, in the case of cross-border transactions, because the participants are on different platforms and would require international messaging systems to carry out the transactions.[113,114] The main aspect to be analyzed will be how to increase the speed and integrity of international payments and, at the same time, reduce costs. In addition, the project seeks to address several structural inefficiencies in cross-border payments and explore a new infrastructure based on the concept of a unified ledger proposed by the BIS, and will investigate how tokenized deposits from commercial banks can be integrated with digitized central bank money in a programmable financial platform of public and private origin.

IV.4. Financial markets infrastructures

Central securities depository institutions and securities settlement systems

The Securities Deposit, Administration and Settlement System (DALI), managed by Institución para el Depósito de Valores, S. A. de C. V. (Indeval) is the financial market infrastructure responsible for the deposit and settlement of securities of all transactions (including trading, repurchase and repurchase agreements and securities lending) settled in the Mexican financial market.

At the end of April 2024, the cumulative availability level during the year of the DALI services, as well as peripheral services, was 100%. Said peripheral services correspond to:

- Report Valuation Management Services (SAVAR): manages collateral for repurchase transactions with terms of more than three days in Mexico;
- Specialized securities lending facility (Valpre E): administers securities lending in Mexico related to the SHCP'S market makers program, and;
- Securities lending facility for DALI participants (Valpre FV): enables the arrangement of loans between financial institutions in Mexico.

At the close of April 2024, the average daily settlement amount in the DALI was 5.0 trillion pesos. The settlement was mostly composed of government securities, which accounted for 83.13% of the average amount settled, followed by banking securities with 14.94%, corporate sector securities with 1.25% and capital market securities with 0.68%.

[112] Banco de México (2024). "*Proyecto Agorá: los bancos centrales y el sector bancario emprenden un ambicioso proyecto para analizar la tokenización de pagos transfronterizos*", Press release, April 3, 2024. The central banks that will participate in the project are: the Bank of France (representing the Eurosystem), the Bank of Japan, the Bank of Korea, Banco de México, the Swiss National Bank, the Bank of England and the New York Federal Reserve.

[113] According to the BIS, a smart contract is a *Distributed Ledger Technology* protocol or code that self-executes when certain conditions are met.

[114] See BIS (2024). "Blueprint for the future monetary system: improving the old, enabling the new," Chapter III, BIS Annual Economic Report 2023, June 20, 2023.

Central counterparties (CCP)

A central counterparty is a financial market infrastructure that interposes itself between parties entering into financial transactions, becoming a buyer to every seller and a seller to every buyer.

The trust Asigna Compensación y Liquidación (Asigna) and Contraparte Central de Valores, S.A. de C.V. (CCV) are the central counterparties established in Mexico to clear and settle securities and derivatives transactions, respectively. Asigna and CCV have procedures and methodologies for requesting financial resources from their participants to cover the credit and liquidity risk exposures that these infrastructures assume as a result of their role as reciprocal debtor and creditor of the financial transactions they clear and settle. The contributions Fund and the default Fund are made up of these resources. The Contributions Fund is made up of collateral provided by the participants of the central counterparties, also known as Clearing Members, and the clients of such members to cover their market and liquidity risk exposures, in the event that the credit risk of a Clearing Member materializes. In turn, the Default Fund is made up of Clearing Members with collateral that can be mutualized to address a default, particularly in stressed market conditions.

During the first half of 2024, Asigna and CCV have covered their risk exposures consistent with the resources required as guarantees for the contributions Funds and default Funds. In the case of Asigna, its Safety Net[115] is Ps. 35,369 million, which is mainly composed of a Contributions Fund of Ps. 30,662 million,[116] with 62.50% cash resources, as well as a default Fund of Ps. 3,708 million, composed entirely of cash resources.[117]

On the CCV side, its Safety Net is 5,622 million pesos and is mainly composed of a Contributions Fund of 3,950 million pesos, with 97.22% cash resources, as well as a default Fund of 1,013 million pesos, composed of cash resources.[118]

At the end of April 2024, the Asigna and CCV systems had a cumulative availability level of 100%.

With respect to relevant events in the drivatives market, in February 2024, derivative contracts were authorized to operate *swaps* on the Interbank Equilibrium Interest Rate (TIIE) through MexDer or platforms, as well as changes in Asigna's methodologies and internal regulations for the implementation of the operation of such contracts.

On the other hand, in May 2024, changes were authorized in the CCV's internal regulations to reduce the settlement period for securities traded in Mexico from two business days to one business day. This modification, which applies only to the stock market, is consistent with changes made in the United States and Canada. The adjustment was requested by market participants through the CCV, in order to make the settlement process for securities transactions in Mexico more efficient. The transition of the settlement period was effective and orderly, reflecting the actions and policies that Banco de México has implemented to strengthen risk management in central counterparties, as well as the close coordination maintained with the CNBV and securities market participants for authorizations and planning.

IV.5. Other risks to the financial system

IV.5.1. Operating continuity risks

Due to the systemic importance of financial markets infrastructures and payment systems, they must provide their services and operate under any conditions, at any time and from anywhere. Therefore, Banco de México must maintain a high level of availability of the systems it manages and operates. At the close of the first quarter of 2024, the availability rate observed for the Interbank Electronic Payments System (SPEI) was 99.99%, both in Instance A and Instance B. The unavailability of 5 and 4 minutes, respectively, in these instances during the aforementioned period derives from the time required to provide maintenance to the infrastructure that supports the operation of the

[115] The Safety Net is a set of financial resources that central counterparties (ccp) make up, mainly from the requirements they make to their participants, to cover credit and liquidity risk exposures.

[116] This amount corresponds to the required contributions, which may differ from the contributions deposited, since the Clearing Members may decide to deposit more than the required amount.

[117] Data as of April 30, 2024.

[118] Data as of April 30, 2024.

system, which is carried out in scheduled windows by Banco de México in which it seeks to have the least possible impact on the system and its users.

On the other hand, during the first quarter of 2024, we continued with the execution of exercises of the operating continuity mechanisms implemented jointly with the participants, in order to verify that the necessary elements are in place to deal with any event that could affect the availability of both the central infrastructure and the participants.

It is worth mentioning that, during this period, Banco de México has not had any incidents in the technological infrastructure used to operate the payment systems, nor in its operating processes. Therefore, the payment systems have not had any interruption in their services for this reason.

In the first half of 2024, an incident was recorded by a participant in the SPEI, which affected its operation with the system. It should be noted that this incident did not affect the institution's customers' assets.[119] Similarly, the rest of the participants were not affected in any way by this event.

IV.5.2. Cybersecurity risks

Cybersecurity risks remain among the most relevant for the financial system on a global scale, given the increase in frequency and sophistication of cyberattacks, which are estimated to have doubled compared to those occurring prior to the COVID-19 pandemic.[120] The impact of the materialization of these risks is not limited to a single institution, since a successful cyberattack against a systemically important financial institution could impact the country's financial services and damage public confidence in those services.[121] Consequently, financial institutions and authorities maintain various measures to monitor cybersecurity risks and threats, both in Mexico and globally, adapting them to the changing and emerging information technology environment.

Likewise, since the growth in the use and sophistication of Artificial Intelligence (AI), it is important to follow up on the evolution and relevance of the risks associated with the use of this technology. This topic has recently been widely discussed in international forums. [122]

The use of novel technologies such as AI brings potential improvements to the financial system,[123] such as automation and speed in decision-making, fraud detection, efficiency and access to services, among other benefits. However, these technologies also bring new cybersecurity risks derived from their use by cybercriminal groups to enhance their attacks, usurp identities, deceive or misinform the population, or develop malicious code, among other illicit acts.[124] Some of the main risks associated with the use of AI and the digitization of finance are:

Cyberattacks. Surge of more sophisticated and difficult to defend attacks by cybercriminals who use AI to analyze the technological infrastructure of organizations, which would allow them to reach specific targets within them. This includes enhanced phishing attacks that can appear authentic and would be very difficult to detect.

Network economies and vendor concentration. It is estimated that AI companies could become condensed into a few major players (like cloud companies and search engines today) and several financial institutions will rely on only a few vendors, increasing the risks of contagion in new networks.

Transparency/Explainability. When considering that AI is a model that learns through data, it is important not to arrive at "black boxes" (the generation of results without a clear and transparent explanation of the decision process) or AI hallucinations (non-existent patterns and theoretical inaccuracies).

Low model diversification. Concentration in a few AI providers and models could entail risk due to "mimicry" as a consequence of all acting under the same models/results. This would mean an increase in

[119] Main relevant cyber incidents occurred in 2024 in the national financial system that have been repurchased to Banco de México, available at: https://www.banxico.org.mx/sistema-financiero/d/%7BBAFE262B-081C-B6B5-B404-07CDD8A795D7%7D.pdf

[120] Global Financial Stability Report 2024. IMF (Page 77)

[121] Promoting Global Financial Stability: 2023 FSB Annual Report (Page 13)

[122] WEF The Global Risks Report 2024.pdf (weforum.org) (Page 13)

[123] Promoting Global Financial Stability: 2023.FSB Annual Report (Page 12).

[124] Managing Artificial Intelligence-Specific Cybersecurity Risks in the Financial Services Sector (treasury.gov)

systemic risk, as there is little diversification against shocks, and would even lead to greater procyclicality and imbalances.

Fraud. A worrying aspect is its potential use to disseminate fake news, which could influence trust and generate expectations, which could culminate, for example, in bank runs; or for the development of apocryphal multimedia content to carry out more advanced digital frauds.

Against this backdrop, Banco de México monitors the evolution and adoption of this technology in the financial system and is incorporating AI-derived risks into its institutional risk management.

On the other hand, given the escalation of geopolitical conflicts, specific monitoring of risks related to the cybersecurity of financial systems is maintained, as events could occur that affect critical infrastructure through cybersecurity risks, which could directly or indirectly impact financial institutions.[125] The monitoring that has been established for the last two years by Banco de México and Mexican financial authorities of cyber-attacks originated by the conflicts between Russia and Ukraine, as well as those originated in the Middle East, merit maintaining the alert level of the Mexican financial sector at "Yellow",[126] mainly because, despite the increase of cyber-attacks in conflicts, so far the global financial sector has not been their main target, and financial institutions in Mexico have not reported cyber-attacks that could be attributable to these conflicts. Nevertheless, Banco de México keeps monitoring any possible cyber threats derived from these events and encourages financial institutions in Mexico to continue strengthening their protection and response schemes.

As of the publication of this *Report*, financial institutions in Mexico have reported 2 relevant cybersecurity incidents.[127] The Response Group for Information Security Sensitive Incidents (GRI) of the financial authorities activated its attention and response protocols. There was no economic impact on the clients of the attacked institutions, and there were no relevant economic impacts on the institutions derived from the incidents.

During the six months covered by this *Report*, the GRI developed a set of recommendations to guide authorities and financial institutions in managing media communication during cybersecurity incidents.

To increase the cybersecurity maturity of the Mexican financial sector, the GRI promotes the exchange of intelligence information related to threats, vulnerabilities, incidents and cybersecurity risks. During this period, the financial authorities, through the GRI, issued 9 bulletins with technical cybersecurity intelligence information to the regulated entities. With this information, financial institutions can proactively reinforce their protection strategies and prevent attacks that have been observed in another institution, contributing to strengthening the cybersecurity of the financial sector as a whole.

To measure the cybersecurity levels of the Mexican financial system, Banco de México monitors various cybersecurity risk indexes. In particular, the Mexican Cyberattack Risk Index[128] showed during the first half of 2024 (Graph 143) that the most recurrent cyber threats continue to be: cybercriminal groups, ransomware and card sellers[129]. The activity of cybercriminal groups represented the most

[125] Significant Cyber Incidents : Strategic Technologies Program : CSIS

[126] At the "Yellow" alert level, digital surveillance is maintained, focused on monitoring cyber threats and relevant events associated with military conflicts by the actors directly involved or their sympathizers. It comprehensively considers technological and operational actions to monitor the SWIFT system and other platforms used for international transactions.

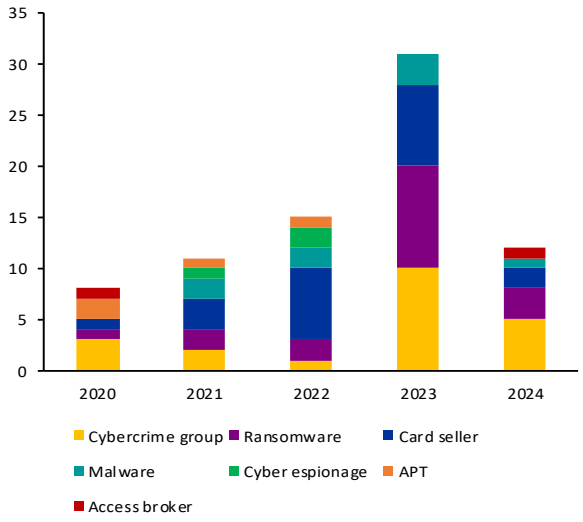
[127] The main relevant cyber incidents occurred during this period of 2024 in the national financial system that have been reported to Banco de México, in this link, in the section of Incident Response in the Financial Sector.

[128] This indicator is based on news and publications in different specialized forums and provides an overview of the types of cyberattacks that have been carried out against Mexican financial sector institutions during the period covered by this Report.

[129] **Access broker***:* Threat actor who illegally accesses organizations' computer networks and resells access through clandestine Internet forums. **APT**: An Advanced Persistent Threat has high levels of expertise in hacking techniques and the resources and time it requires so that, through the use of different sophisticated attack vectors, it manages to breach target organizations, sabotage them, and obtain sensitive information or financial gain. **Card sellers***:* Threat actors whose main activity consists in stealing information related to bank cards of the clients of financial institutions, to sell such information in clandestine

significant threat in the period. These groups have intensified and sophisticated their attacks to breach the electronic transfer services offered by financial institutions. On the other hand, ransomware was the second most significant threat during the period. Attacks of this type have managed to affect the electronic channels and systems of the branches of a financial entity, causing delays in the delivery of services and inconvenience to customers by preventing them from making transactions.

Graph 143
Mexican Cybersecurity Attack Risk Index
News items



Data as of June 2024.
Source: Banco de México.

The index presented here provides an approximate diagnosis of the state of cybersecurity in the Mexican financial system, with which Banco de México identifies the main cybersecurity risks of the period, as well as their evolution over time, and encourages financial institutions to maintain robust cybersecurity strategies to mitigate them, such as maturing their cyber intelligence capabilities, strengthening the continuous awareness of personnel including senior management, and conducting simulation exercises that include cyberattack scenarios, in which financial institutions put into practice their incident response capabilities. These actions in conjunction with compliance with regulations on the matter, allow improving the protection and cybersecurity risks protection and cyber resilience of the financial sector.

IV.5.3. Environmental risks and investment sustainability

The economic and financial impacts derived from environmental risks, especially those related to climate change and the transition towards a more sustainable economy, may result in considerable losses for individual financial institutions and, therefore, represent a risk to the stability of the system as a whole. In order to mitigate them, Banco de México actively encourages financial system participants to internalize these risks; to this end, this section of the *Report* presents an analysis in this regard.

Public interest indexes for issues related to environmental risks and natural disasters

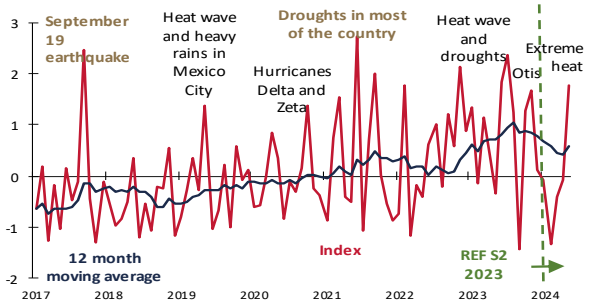
Since the last *Report*, the index of extreme events and natural disasters decreased with respect to the average of the previous six months, reflecting the high levels it had shown during that period due to the occurrence of Hurricane Otis in the port of Acapulco.[130] Nevertheless, the results show that, from December 2023 to date, the public has shown significant interest in some events in particular. Specifically, in this period, the most searched terms on the internet were "droughts", "forest fire" and "extreme heat" reflecting: i) the increase in droughts in a large part of the country during the months of January, February and April; ii) the increase in forest fires in several regions of the country from January to

Internet forums. **Cyber espionage**: Threat whose purpose is to extract sensitive information from government institutions or large corporations. **Cybercriminal group**: Threat derived from criminal activities aimed at taking advantage of the computer systems that provide services to the institutions' clients, to obtain economic resources in bank accounts controlled by the attackers. This category groups together the generalized threats to which the institutions' transaction systems are exposed and which cannot be associated with any of the other categories. ***Malware****:* Threat designed to compromise the confidentiality, integrity or availability of information in a computer system. ***Ransomware****: A* type of malicious software whose purpose is to hijack sensitive information from a computer system to make the victim pay a ransom for it or to prevent its publication on clandestine Internet forums.

[130] See the Financial Stability Report, June 2022, which explains that the construction of the indices is based on the work of Zhang, L. (2021), where a similar analysis is performed for Hong Kong. First, search terms are selected for both the environmental risks and natural disasters index and the transition risk index. Then, a seasonal adjustment is made for each index, so these reflect the interest of Mexican society above what would correspond to seasonal factors. The indexes are constructed from public web searches of terms related to each type of event.

April, particularly in Morelos, the State of Mexico and Veracruz, where the incidence of these events was higher; and iii) the high temperatures recorded by the heat waves that affected the country during the month of May (Graph 144).

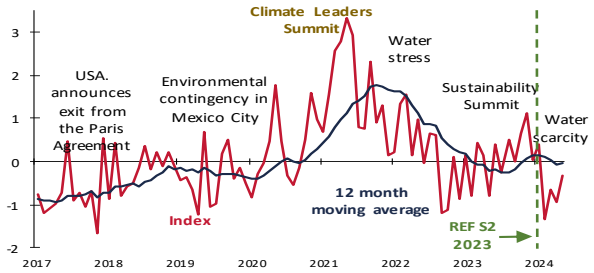
Graph 144
Interest index on isssues related to extreme hydro-meteorological events and natural disasters
Summary



Data as of May 2024.
Source: Banco de Mexico and Google Trends.

On the other hand, the index of events related to transition risks also showed a decrease with respect to the average of the previous six months. During this period, the most searched terms were "water scarcity" and "climate target" due to: i) the decrease in the storage levels of the main dams in the country, highlighting the crisis in the water network announced by the National Water Commission (Conagua) in January (see Box 7 “Water Scarcity and Business Credit Exposure” in this Report); and ii) the decrease in the country's position in the Climate Change Performance Index (*CCPI*), registered in January of this year (see Box 7*); and* iii) the decrease in the country's position in the Climate Change Performance Index (*CCPI)*, registered in January of this year (Graph 145).[131]

Graph 145
Interest index on issues related to transition risks
Summary



Data as of May 2024.
Source: Banco de Mexico and Google Trends.

It should be noted that an increase in the indexes reflects a general growing public interest, which can be triggered by events that have a positive, negative or neutral impact on the environment. Therefore, it is not appropriate to automatically assume that higher index values imply higher environmental risks or higher transition costs.

Transition risks

In the process of transitioning to a more sustainable economy, companies are investing in cleaner technologies to reduce their environmental footprint. In addition, they may have to make other adjustments in response to changes in consumer preferences and environmental regulations.

While these changes are important for preserving the environment, can create unforeseen challenges for companies. In particular, they may reduce their revenues or increase their costs in unexpected ways. This may in turn increase their credit default and generate risks to financial stability known as transition risks.

This section studies the exposure of commercial banks' exposure to transition risks. For this purpose, three groups of economic sectors are considered:[132] the first includes sectors directly exposed to transition risks because they generate high carbon emissions in their production process (Group 1); the second includes sectors indirectly exposed because they use inputs that generate high emissions (Group 2); and the third includes sectors indirectly exposed

[131] Mexico dropped seven positions in the *CCPI* 2023 compared to 2022, now ranking 38th.

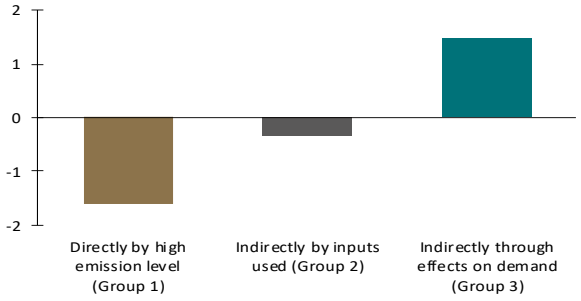
[132] Three groups of sectors are considered with different types of exposure to transition risks based on the scopes of the Greenhouse Gas Protocol (*GHG* Protocol). This grouping of sectors first appeared in the December 2020 version of this Financial Stability Report.

because their demand is closely linked to polluting industries (Group 3).[133] These sectors are exposed to the risks of a disorderly transition to a more sustainable economy, such as those related to the imposition of carbon imports tariffs by advanced economies.[134]

In addition, the sector classification is complemented with characteristics of the companies in each group. This makes it possible to identify vulnerabilities that could amplify or lessen the impact if the transition risks were to materialize.

A rebalancing of corporate credit exposure to transition risks was observed. This rebalancing occurred with a decrease in direct exposure (Group 1) and an increase in indirect exposure, linked to the possible effects of the transition on the supply of inputs and the demand of companies (Groups 2 and 3). As in the previous *Report*, this rebalancing again occurred with a heterogeneous behavior of the two groups of sectors with indirect exposure. On this occasion, the increase in indirect exposure by Group 3 was considerably more significant than in the previous *Report.* This greater indirect exposure by Group 3 is mainly explained by the growth of the portfolio in service sectors that receive demand from polluting industries, such as corporate services and professional, scientific and technical services (Graph 146).

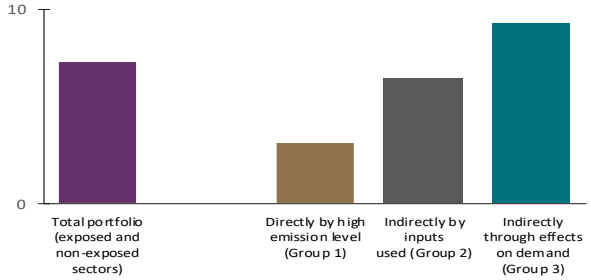
Graph 146
Portfolio balance changes in sectors exposed to transition risks
Percentage



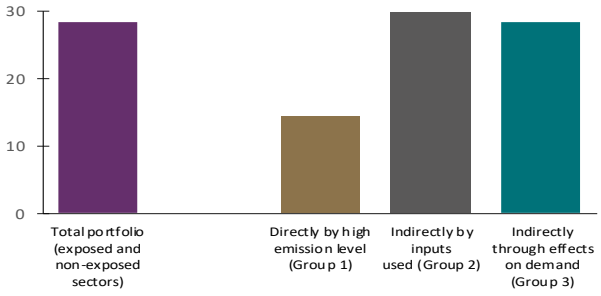
Data as of December 2023.
Source: Banco de Mexico, CNBV and INEGI.

Furthermore, in Group 3 there is a higher representation of individuals with business activity and a high participation of SMEs (Graph 147a and Graph 147b). These types of companies tend to have fewer resources of their own to face adverse events and less capacity to develop strategies to mitigate the impacts arising from transition risks. In other words, in Group 3, which explains the increase in banks' indirect exposure to transition risks, there is a greater representation of participants with characteristics that could amplify the effects if the risks were to materialize. This increases vulnerabilities for banks that lend to Group 3 companies.

Graph 147
Portfolio in sectors exposed to transition risks, by type of exposure
a) Percentage of the portfolio in companies of natural persons
Percentage



b) Portfolio percentage to SMEs
Percentage



Data as of December 2023.
Source: Banco de Mexico, CNBV and INEGI.

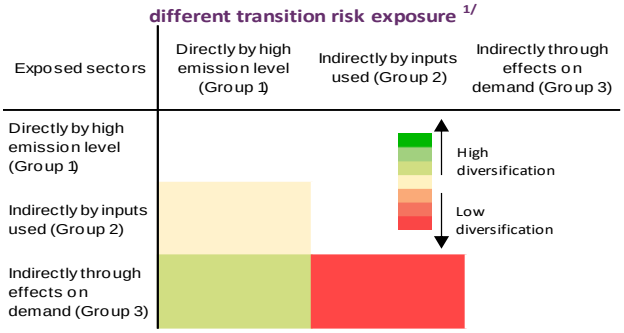
Moreover, these banks also have the greatest exposure to Group 2 sectors, i.e., to potential effects on the inputs supply to companies (Graph 148). The low diversification of corporate credit from these banks could amplify the impact if transition risks were

[133] The definition of Group 2 is related to Scopes 2 and 3 of the *GHG* protocol, since these scopes consider that companies can generate emissions even when they are physically located in the plant that produces the inputs and not in the company that consumes them. In other words, they can emit indirectly through the use of inputs. The definition of Group 1 is directly related to the definition of Scope 1.

[134] See Section II of this Report for a discussion of the tax on carbon-intensive imports in Europe and credit risk to companies.

to materialize. However, on the other hand, it is noteworthy these are the banks with the highest levels of liquidity and capitalization, which could lessen the total damage on the system (Graph 149).

Graph 148
Portfolio diversification among sectors with different transition risk exposure 1/

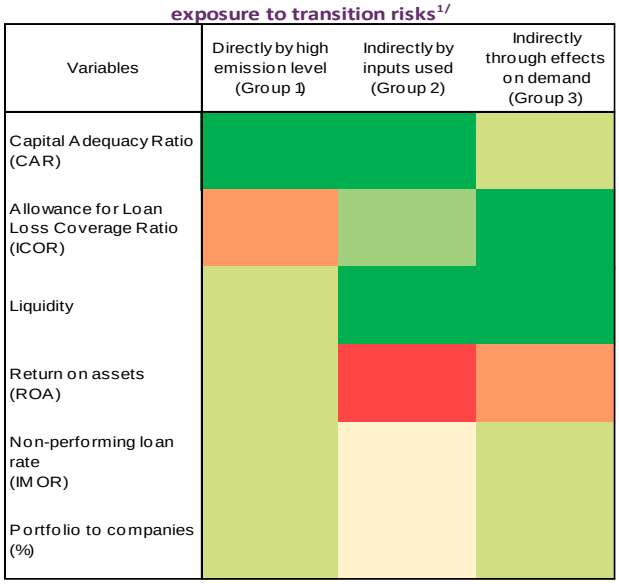


Data as of December 2023.

Sourcee: Banco de México, CNBV and INEGI.

1/ The colors show how diversified the portfolio is against these risks. The red color means less diversification, while the green color means more diversification. Diversification is based on the correlation coeffcicient between each bank's credit portfolio share in sectors exposed to different transition risks.

Graph 149
Risk amplifiers and mitigants, depending on the bank's exposure to transition risks 1/



Data as of December 2023.
Source: Banco de Mexico, CNBV and INEGI.
1/ Shades of green show mitigating effects while shades of red show amplifying factors. The color is defined by the correlation coefficient between each factor considered and the credit portfolio shares in each sector subject to transition risks.

Physical risks: Corporate credit portfolio

This section studies the exposure of corporate credit to four hydro-meteorological phenomena: tropical cyclones, floods, heat waves and droughts. These phenomena can generate shocks that increase companies' costs and reduce their revenues, which in turn can end up increasing non-performing ratio levels (see Box 7). In addition, these are four phenomena for which an increase in frequency and intensity is expected in the future.

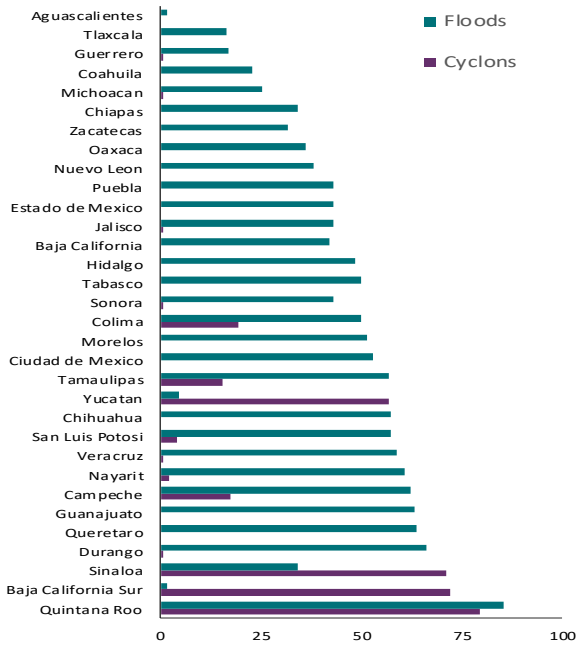
To conduct the analysis, credit is identified in sectors and regions of the country that are exposed to a specific type of hydro-meteorological event. To do so, the credit granted by commercial banks in municipalities exposed to a specific event is first calculates. Subsequently, within each of these municipalities, only the credit in sectors vulnerable to the same type of phenomenon is considered. The analysis is carried out for Mexico's states and for the financial institutions of the multiple banking system in this country.[135]

When the exposure is analyzed for the different states, floods continue to be the phenomenon to which corporate credit is most exposed (Graph 150 and Graph 151). However, exposure to this hydrometeorological phenomenon continues the downward trend it had been showing. Meanwhile, the exposure to droughts and tropical cyclones began to decrease slightly, while, on the contrary, heat waves have now become the only phenomenon for which banks' exposure continues to increase.[136]

[135] The study *Thermal stress and financial distress: Extreme temperatures and firms' loan defaults in Mexico* (Aguilar-Gómez, Gutiérrez, Heres, Jaume and Tobal, 2024) confirms the negative effect of an unusual number of days with extreme temperatures on the credit default of companies in Mexico.

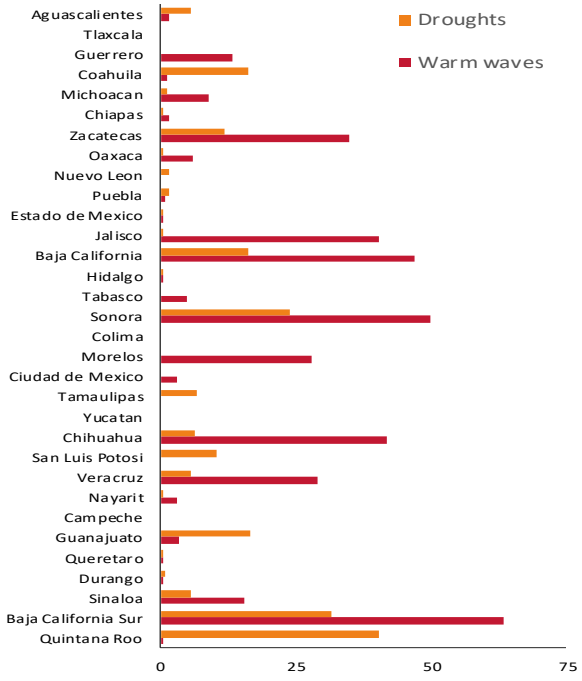
[136] This slight decrease in exposure to droughts is largely due to a reduction in credit in vulnerable sectors and regions exposed to this phenomenon, such as the primary sector in Sonora and Baja California.

Graph 150
Portfolio in sectors and municipalities vulnerable to cyclons and floods
Percentage



Data as of December 2023.
Source: Banco de Mexico, CENAPRED, CNBV and INEGI.

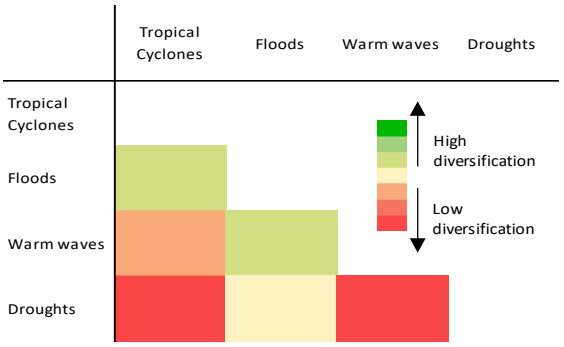
Graph 151
Portfolio in sectors and municipalities vulnerable to heat waves and droughts
Percentage



Data as of December 2023.
Source: Banco de Mexico, CENAPRED, CNBV and INEGI.

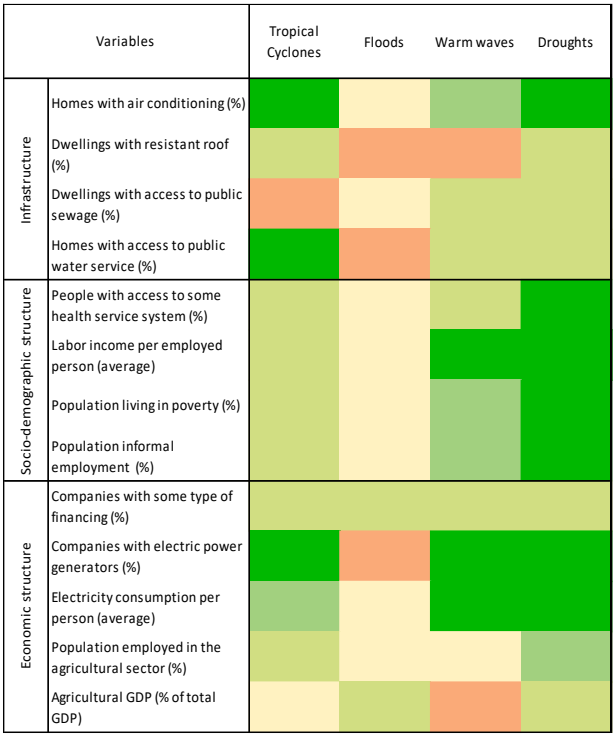
In addition, the states with the greatest exposure to heat waves have also become those with the greatest exposure to droughts (Graph 152). Being less diversified, these states could be more affected if both phenomena occur within close periods. However, on the other hand, it is noteworthy that the number of factors that could mitigate the effects has increased in the states most exposed to heat waves. In these states there is now a higher average labor income and higher electricity consumption, suggesting that there could be energy available to mitigate the effects of heat waves (Graph 153). Likewise, these are states where access to financing has increased, which could provide assistance to companies facing greater liquidity needs and reduce the impact on non-performing ratio levels.

Graph 152
Portfolio diversification among sectors and municipalities exposed to different hydro-meterological events (for different states) 1/



Data as of December 2023.
Source: Banco de Mexico, CENAPRED, CNBV and INEGI.
1/ The colors show how diversified the portfolio is against these risks. The red color means less diversification, while the green color means more diversification. Diversification is based on the correlation coeffcicient between each state's share of loan portfolios exposed to different hydro-meteorological events.

Graph 153
Amplifying and mitigating factors of physical risks (for different states)[1/]



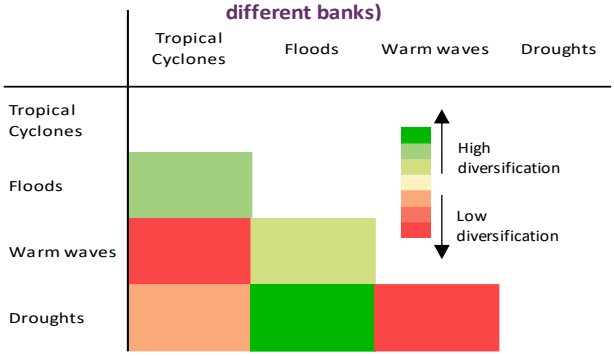
Data as of December 2023.

Source: Banco de Mexico, CENAPRED, CNBV and INEGI.

1/ Shades of green show mitigating effects while shades of red show amplifying factors. The color is determined by the correlation coefficient between each factor and the shares of credit portfolios for each sector and state exposed to the different hydro-meteorological events.

When analyzing banks' exposure, low portfolio diversification against the occurrence of heat waves is also a vulnerability. In particular, banks with more portfolio exposed to heat waves are those that also have more portfolio exposed to droughts and tropical cyclones. Additionally, for these banks, exposure to floods has increased (Graph 154). Regarding the factors that could amplify or mitigate the effects, it is noteworthy that, although the banks more exposed to heat waves have higher profitability (*ROA*), there was a decrease in their liquidity levels (Graph 155), which could amplify the damages.

Graph 154
Portfolio diversification among sectors and municipalities exposed to different hydro-meteorological events (for different banks)

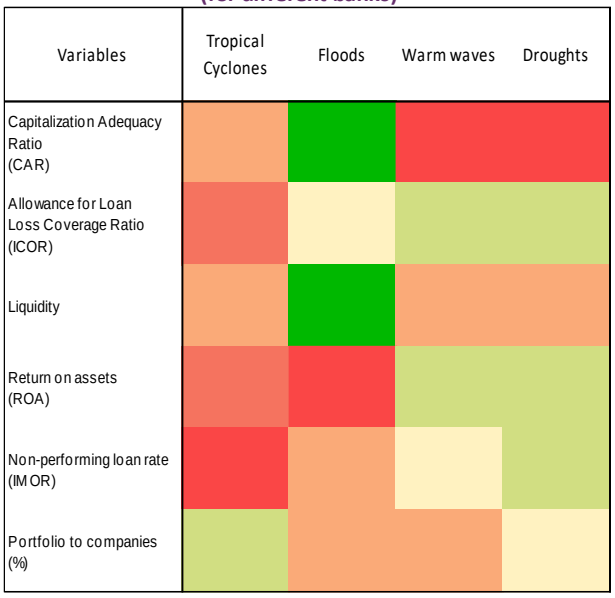


Data as of December 2023.

Source: Banco de Mexico, CENAPRED, CNBV and INEGI.

1/ The colors show how diversified the portfolio is against these risks. The red color means less diversification, while the green color means more diversification. Diversification is based on the correlation coefficient between each bank's share of loan portfolios exposed to different hydro-meteorological events.

Graph 155
Factors amplifying and mitigating physical risks (for different banks)[1/]



Data as of December 2023.

Source: Banco de Mexico, CENAPRED, CNBV and INEGI.

1/ Shades of green show mitigating effects while shades of red show amplifying factors. The color is determined by the correlation coefficient between each factor and the shares of credit portfolios for each sector and state exposed to the different hydro-meteorological events.

Box 7: Water scarcity and corporate credit exposure

I. Introduction

Water scarcity is defined as the insufficiency of available water resources to meet the demands of society and ecosystems. Among the factors affecting water scarcity are extreme temperatures, droughts and a series of events linked to climate change that converge in the lack of rainfall, as well as the efficiency in the management of available resources. In addition, other factors, such as population growth, can increase the demand for water and increase its scarcity.

Water scarcity can negatively affect public health, the environment, the economy, and the financial system through several channels. It can decrease the availability of safe drinking water, lead to lack of sanitation, and increase the exposure to diseases. Water scarcity can also affect aquatic habitats and generate desertification, deteriorating the environment. In terms of its economic impacts, water scarcity can limit the availability of irrigation resources and agricultural yields, interrupt manufacturing and refrigeration processes, and disrupt industrial production or limit the production of thermal and hydroelectric energy.

Therefore, water scarcity can unexpectedly reduce revenues and increase costs for companies, which can reduce their profitability and ability to pay back their loans. Thus, the lack of water can increase companies' non-performing ratio levels, generating risks to financial stability.[1] Therefore, this box analyzes the exposure of Mexican commercial banks' corporate portfolio to water scarcity. The Mexican case is relevant since, in several parts of the country, but more pronounced in the central and northern regions, droughts have increased and rainfall patterns have changed. These changes have reduced water availability, both from groundwater sources (stored in aquifers) and surface water sources (stored in dams).

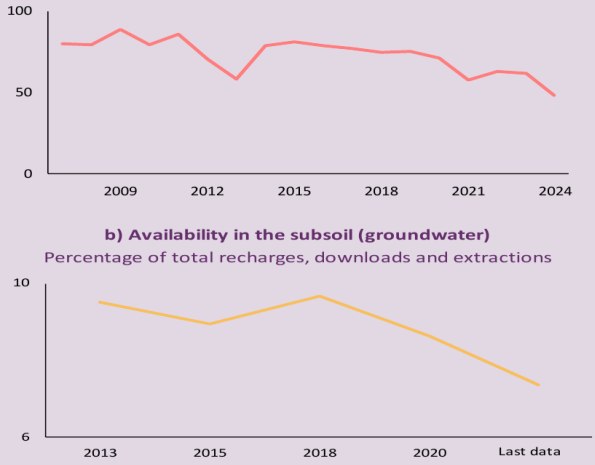
For this study, several definitions of exposed credit portfolio are considered. Initially, exposed credit is considered to be credit granted in those hydrological-administrative zones of the country with the greatest lack of water resources. Then, exposed credit is considered to be credit granted in these zones, but only in those sectors that use water intensively. Finally, a more restrictive criterion is imposed and excludes those sectors that are exposed to the scarcity of a type of water source (groundwater source or surface source), but depend less on this type of source for their water supply. In addition, characteristics of the exposed companies are analyzed that describe their credit risk profile and, therefore, could amplify or mitigate possible effects on the financial system.

II. Sources of water: groundwater and surface water

Humans obtain water resources for their use and consumption from groundwater and surface water sources. Groundwater is the water found below the water table and is mainly stored in aquifers. In order to extract this type of water from aquifers, wells are drilled and pumped to the Earth's surface. On the other hand, surface water is the water found on the Earth's surface in the form of rivers, lakes, reservoirs and streams. This type of water is collected through a number of systems for human use, including catchment systems such as dams. In addition, other sources of water are used, such as melting glaciers and snow in mountainous and polar areas, or the desalination of saltwater, especially in the Middle East.[2]

In Mexico, groundwater and surface water are the two relevant sources for human use and consumption of water resources. The most important information on the availability of these resources and, therefore, on groundwater and surface water storage in aquifers and dams, respectively, comes from the National Water Commission (Conagua). This information reveals that the surface water available in dams as a proportion of the storage capacity has been decreasing (Graph 1a). Thus, the difference between natural recharge and discharges and extractions of water from aquifers (*availability of groundwater*) has also been decreasing as a proportion of total recharge, discharges and extractions (Graph 1b).[3] In other words, both groundwater and surface water availability has been decreasing in Mexico in recent years.

Graph 1
Water availability



Source: Banco de Mexico and Conagua
Note: The percentage of surface water is the percentage of total storage in dams. Availability of groundwater is calculated as the ratio of the difference in natural recharge and discharges and withdrawals of water from aquifers to total recharges, discharges and withdrawals. In each case the latest data available from Conagua is used, for surface water it is January 2024 and for groundwater it is 2022. The drop in the measure of water availability (the curve in the graphs) entirely reflects a drop in the availability of water resources in absolute terms, since storage capacity has even shown a slight decrease during the period.

[1] Aguilar-Gómez, Gutiérrez, Heres and Tobal (2024) show that unusual days of extreme temperatures increase corporate non-performing ratio levels.
[2] The contribution of these other sources to human water use and consumption is more limited than that of groundwater and surface water (see United Nations, 2003).
[3] An alternative way to illustrate the reduced availability of groundwater is through the increase in the number of overexploited aquifers in the country, as also illustrated by Conagua's data.

III. Corporate credit exposure to water scarcity, according to different definitions of exposed portfolio.

Three definitions of exposed corporate credit are used to assess banks' exposure to water scarcity. These definitions gradually introduce more restrictive criteria.

In the first definition of exposed credit, a regional criterion is considered. Exposed loans are defined as those granted in areas with the greatest lack of water resources. To define these zones, the starting point is the division of Mexican territory into thirteen hydrological-administrative regions used by the Conagua.[4] Based on this territorial division, the hydrological-administrative regions with less water available in dams as a proportion of their storage capacity are defined as: (i) areas most vulnerable to surface water shortage (Figure 1);[5] (ii) areas most vulnerable to groundwater scarcity, hydrological-administrative regions with less *availability of groundwater* in their aquifers as a proportion of their total recharge, discharge and extraction; and (iii) areas most vulnerable to scarcity of both types of water sources in hydrological-administrative regions that meet requirements (i) and (ii).

Figure 1
Regions most vulnerable to water scarcity: scarcity measures relative to the rest of the country



Source: Conagua
Note: In each case the latest data available from Conagua is used, for surface water it is January 2024 and for groundwater it is the end of 2022.

Under this first definition of exposed portfolio, 74.8% of commercial banks' corporate portfolio is exposed to water scarcity. This high percentage reflects that some hydrological-administrative zones in the center and north of the country, such as Rio Bravo, North-Pacific and Aguas del Valle de Mexico, have a high share of the total loan portfolio and, at the same time, are among the most affected by the lack of water resources. Of the 74.8% of the total exposure: i) 7.4% corresponds to portfolio exposed to scarcity of surface water only; ii) 50.2% to portfolio exposed to scarcity of groundwater only; and iii) 17.2% to portfolio exposed to scarcity from both types of sources (Graph 2). Therefore, under this first definition, groundwater scarcity represents the greatest risk for the commercial banks' corporate credit portfolio.

In the second definition, exposed credit is considered to be credit granted in the hydrological-administrative regions of the country with the greatest water scarcity, but only in those sectors that use water intensively. To identify these sectors, the U.S. Environmental Protection Agency classification is used.[6] According to this classification, among the most water-intensive sectors are, for example, those linked to textile production, which requires large quantities of water for the processing and treatment of cotton; the manufacture of transportation equipment, which uses abundant water for cleaning engines and painting car bodies; as well as the agricultural sector, the food industry, and the manufacture of computer equipment, which uses a lot of water resources for cleaning devices integrated in electronic circuits, in addition to other sectors of the economy. In other words, these are sectors in which an interruption in the water supply can generate a significant loss of income.

Under this second definition, 16.6% of the corporate portfolio is exposed to water scarcity (Graph 2). The drop in the exposed portfolio with respect to the first definition is largely due to a decline in exposure to groundwater scarcity. In fact, of the 16.6% of the total exposure under this second definition: i) 2.1% corresponds to portfolio exposed to scarcity of surface water only; ii) 9.5% to groundwater scarcity only; and iii) 5% to both types of sources. This lower exposure to groundwater scarcity is due, in part, to the fact that the most affected regions have less credit participation in water-intensive sectors. For example, the

[4] The territorial delimitation of these regions was published in the Diario Oficial de la Federacion (DOF) on December 12, 2007. In this classification, a state may belong to more than one region, but the definition of regions aligns with municipal boundaries. The 13 hydrological-administrative regions are: Northwest (Sonora with some other municipalities of other states), North Pacific (Sinaloa and part of the states of Chihuahua, Durango, Zacatecas and Nayarit), North Gulf (154 municipalities of: Tamaulipas, San Luis Potosi, Veracruz, Guanajuato, Hidalgo, Estado de Mexico, Queretaro and Nuevo Leon), Rio Bravo (part of the states bordering the United States: Chihuahua, Coahuila, Nuevo Leon and Tamaulipas), Cuencas Centrales del Norte (82 municipalities belonging to Coahuila, Durango, Nuevo Leon, San Luis Potosi, Tamaulipas and Zacatecas), Aguas del Valle de Mexico (part of the states of Hidalgo, Mexico, Tlaxcala and all of Mexico City), South Pacific (part of the states of Guerrero and Oaxaca), Southern Border (Chiapas, Oaxaca, Tabasco and Campeche), Baja California Peninsula (includes the states of Baja California and Baja California Sur), Lerma-Santiago-Pacific (Aguascalientes, Colima, Guanajuato, Jalisco, Mexico, Michoacan, Nayarit, Queretaro and Zacatecas), Balsas (the entire state of Morelos and part of Tlaxcala, Puebla, Mexico, Oaxaca, Guerrero, Michoacan and Jalisco), Golfo Centro (Hidalgo, Oaxaca, Puebla and Veracruz) and Yucatan Peninsula (Campeche, Quintana Roo and Yucatan).

[5] In order to define the areas with the lowest water availability, the bottom third of regions with the least water availability is considered for groundwater and surface water.

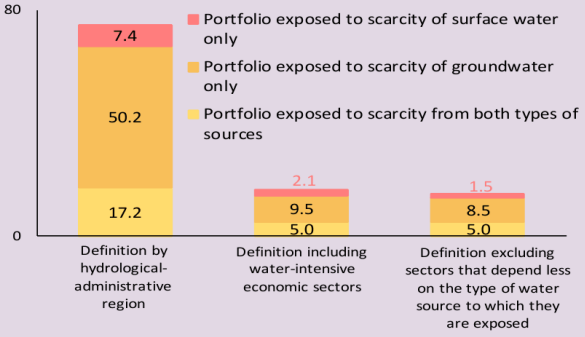
[6] This classification makes it possible to identify the sectors that consume the most water in relative terms to production (US EPA, 2011). That is, it is a classification that captures, to a greater extent, the water uses of each sector per unit produced. Alternatively, a classification based on the share of each sector in the total intermediate water consumption of the Mexican economy could be used. By construction, these alternative classifications tend to identify more water-intensive sectors as those that have a larger share of GDP. In general, the intersection of sectors between the two types of classifications is high. Excluding from one of these alternative classifications, the governmental activities sector (which is not included in the type of credit analyzed in this box as it pertains to corporate credit from private companies), and the services sector (which is characterized by having a high share of total intermediate water consumption in the economy but low consumption per unit produced), it is found that about 80% of the sectors in the alternative classification are incorporated in our classification. Both types of classifications are valid; however, our classification better identifies those sectors where a supply interruption is more likely to generate a significant loss of income, while the alternative classification is better designed to identify effects on economic activity, since it considers the weight of each sector in GDP.

Aguas del Valle de Mexico region has a lower share of credit in the agricultural and food industry sectors than the rest of the regions.

In the third definition of exposure, a more restrictive criterion is imposed. It excludes from the second definition those sectors that are exposed to water scarcity in one type of source (surface or groundwater source), but depend less on this type of source for their supply. To identify how much each sector depends on each type of source, the water uses considered by the Conagua are linked to one or more of the water-intensive sectors.[7]

By imposing this more restrictive criterion, it is found that 15% of the corporate credit portfolio is exposed to water scarcity (Graph 2). Under this third definition, total portfolio exposure then falls only slightly from the second. This is because, in general, firms use more of the type of water source (groundwater or surface) that is scarcer in the region where they are located. Of the 15% total exposure: i) 1.5% corresponds to portfolio exposed to surface water scarcity only; ii) 8.5% to groundwater only; and iii) 5% to both types of sources. Therefore, despite the fact that exposure to groundwater scarcity is decreasing again, it is precisely this scarcity that continues to represent the greatest risk for the corporate credit portfolio of commercial banks' exposure in Mexico. Within the 8.5% of the portfolio exposed to the scarcity of this type of source, groundwater, stand out the sectors of transportation equipment manufacturing in the Cuencas Centrales del Norte area, where part of the country's automotive production takes place, and the basic metals sector in the Baja California Peninsula, where part of the mining production takes place.

Graph 2
Corporative credit exposed to water scarcity according to different definitions of exposed portfolio
Percent



Source: Banco de Mexico and Conagua

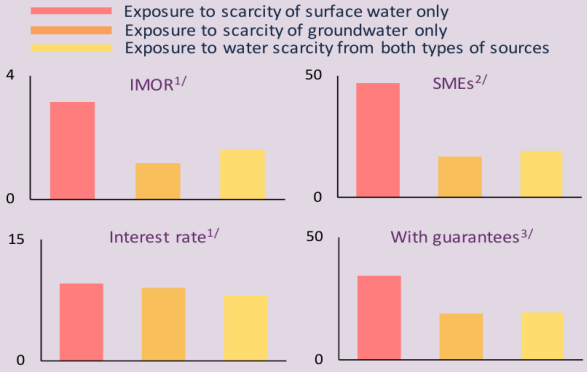
IV. Characteristics of corporate credit by different types of exposure

In addition to calculating the total portfolio exposure to shortages in different types of water sources, it is important to analyze the characteristics of the exposed firms. Based on these characteristics, the negative effects of a water supply disruption on the financial system, and the resulting reduction in companies' profits, could be greater or, conversely, mitigated. Therefore, in this section we take the most restrictive definition of exposed portfolio, the last one considered in section III, and study the characteristics of the exposed firms.

The results are mixed depending on whether exposure to groundwater scarcity or exposure to surface water scarcity is analyzed. The portfolio exposed to surface water scarcity has historically had higher non-performing ratio levels, a higher representation of SMEs, which tend to be more vulnerable, and financing costs similar to those of the total portfolio (Graph 3).[8] In other words, firms exposed to surface water scarcity have historically had a higher risk credit profile than the system as a whole. Therefore, these firms have been required to provide more collateral than other firms, which could at least partially reduce the effects if water from below the surface were to become scarce.

In contrast, firms exposed to scarcity of groundwater only and scarcity in both types of sources have a lower risk credit profile, i.e., they have historically had lower non-performing ratio levels, have also been larger companies, and have traditionally faced lower financing costs than the system as a whole (Graph 3). Therefore, these are companies that have normally been required to provide less collateral than other firms.

Graph 3
Characteristics of corporative credit exposed to water scarcity
Percent



Source: Banco de Mexico and Conagua

1/ Average delinquency rate and average interest rate for all Decembers from 2016 to 2023, excluding Decembers during the pandemic (2020 and 2021).

2/ Percentage of exposed portfolio. A small and medium-sized company is defined as one that from June 2016 to December 2023 did not have a line of credit of more than 100 million pesos.

3/ Refers to the percentage of credit covered with guarantees.

[7] Agricultural, aquaculture, livestock, agroindustrial and electricity generation uses are directly linked to one or more of the water-intensive sectors of the 3-digit SCIAN classification. In the case of industrial and public-urban, they were linked to different manufacturing sectors, considering the size of the firms. While sectors have the same Conagua use throughout the country, the same use in different regions may correspond to a different percentage of dependence on surface and groundwater sources. A sector in a given region is defined as being less dependent on a type of source if it falls within the quartile that uses it the least. The results are robust to also using the quintile as an exclusion threshold.

[8] To calculate historical behavior, data from 2016 to 2023 is used, excluding 2020 and 2021, as these have been influenced by the effects of the COVID-19 pandemic.

In summary, the characteristics of the firms could reduce the impact on the financial system in the face of groundwater scarcity, but, on the contrary, could amplify it in the face of surface water scarcity. Given that the largest exposure of the total portfolio comes from a possible scarcity of groundwater sources, this implies that, in aggregate, the effects on the Mexican financial system could be smaller.

V. Concluding remarks

Largely due to the occurrence of a series of climatic events that converge in the lack of rainfall, including an increase in the frequency and intensity of droughts, the availability of water resources has been decreasing in several parts of the world, including Mexico. Since water is an essential input in the production process of various sectors, reduced water availability can increase costs and reduce revenues for firms in unexpected ways, which can, in turn, increase credit defaults and affect financial stability.[9]

The exposure of corporate credit to water scarcity varies depending on the definition of exposed portfolio, decreasing significantly when only those sectors of the economy that use water intensively are included in this definition. Under this definition, the exposure is between 15% and 16.6% of total corporate credit. In addition, most of this exposure corresponds to companies exposed to groundwater scarcity, which have a lower risk credit profile than the system as a whole.

This suggests that water scarcity does not seem to represent, for the time being, a systemic risk for the financial system in Mexico. However, an ongoing assessment of risks and vulnerabilities deserves special attention for at least two reasons. First, there is high uncertainty as to what the effects of climate change will be and how they will influence water availability going forward. These effects may be non-linear due to the complex interaction of multiple factors that may cause negative impacts to feed back or even become more significant above certain thresholds. Second, these effects have a greater impact on SMEs and, in general, on borrowers with less access to financing and, therefore, those with fewer resources to avoid default.[10]

In this context, it is particularly important for companies to adopt adaptation and mitigation practices. This implies the implementation of measures such as water use efficiency, the development of cleaner and more sustainable technologies, the diversification of supply sources, and the constant assessment of climate risks within the company. These actions are important to reduce their financial vulnerability. However, in some cases, this may require a high investment. It is therefore important that the financial system also plays an important role in providing credit to facilitate this investment, especially to SMEs.

References

Aguilar-Gómez, S., Gutiérrez, E., Heres, D., Jaume, D., and Tobal, M. (2024). Thermal stress and financial distress: Extreme temperatures and firms' loan defaults in Mexico. *Journal of Development Economics*, 168, 103246.

National Water Commission. (2006). Water in Mexico. Mexico. Available at: https://www.conagua.gob.mx/CONAGUA07/Publicaciones/Publicaciones/EL-AGUA-EN-MEXICO.pdf.

Ministry of Environment and Natural Resources (2010). Water Atlas of Mexico 2010. Available at: https://gisviewer.semarnat.gob.mx/geointegrador/enlace/atlas2010/atlas_agua.pdf

World Water Assessment Programme (United Nations). (2003). Water for People, Water for Life: A Joint Report by the Twenty-Three UN Agencies Concerned with Freshwater (Vol. 1). Unesco.

World Water Assessment Programme (United Nations) (2022) *Groundwater. Making the invisible visible.* The United Nations World Water Development Report. France.

US Environmental Protection Agency (US EPA) (2011). Lean & Water Toolkit. Achieving Process Excellence Through Water Efficiency.

[9] It is important to highlight that an analysis of the evolution of these characteristics over time could give a better description of how these characteristics have been affected by water scarcity itself. The analysis in this section only captures the historical average characteristics to ultimately analyze whether or not these averages represent a vulnerability to the risk of possible increased scarcity going forward. The analysis of the evolution of the characteristics over time represents a relevant source of additional research for future studies.

[10] In the evidence provided by Aguilar-Gomez, Gutierrez, Heres, Jaume and Tobal (2024), it is the non-performing ratio levels of SMEs that are affected by extreme temperatures in Mexico.

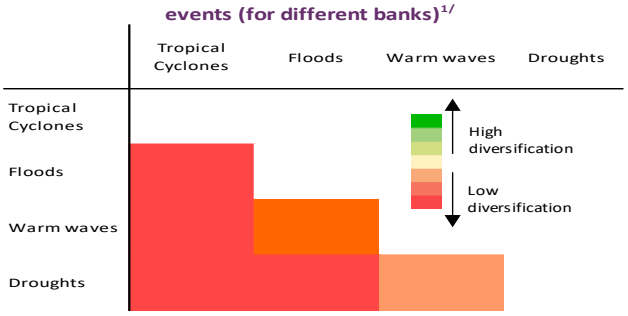
Physical risks: Mortgage loans and consumer credit portfolio

In this section, the analysis of physical risks is extended to mortgage loans and a portion of consumer credit, which includes payroll, auto, personal and revolving consumer loans. The same four hydro-meteorological events are considered as in the previous section, and a similar process is followed to identify the credit exposed, based on the municipality and sector in which the credit is granted.[137]

As with corporate credit, in mortgage loans, floods continue to be the hydro-meteorological event for which banks' exposure is the highest. Furthermore, as in the case of corporate credit, mortgage exposure to this hydro-meteorological phenomenon continued with the downwards trend that had been showing, while exposure to heat waves continued with its upward trend. Unlike what was observed for corporate credit, however, exposure to droughts and tropical cyclones increased for mortgages.

In addition, in mortgages, banks continue to be less diversified than in other credits regarding the possible occurrence of several events in a short time (Graph 156). Compared to the previous *Report*, there was a slight improvement in the diversification of the banks most exposed to droughts, but a significant worsening in the diversification of the banks most exposed to tropical cyclones.

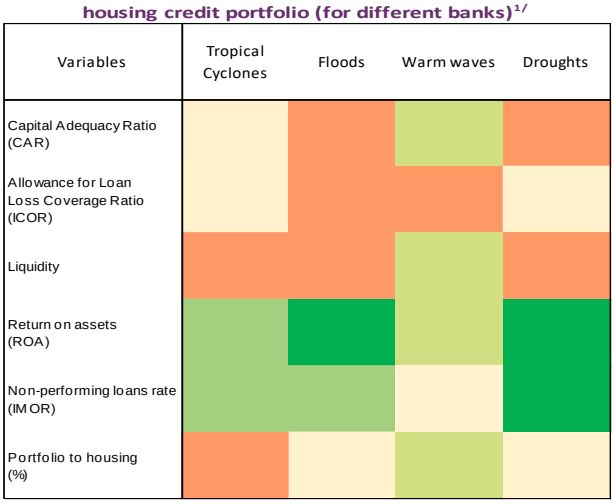
Graph 156
Housing loan portfolio diversification among sectors and municipalities vulnerable to different hydro-meteorological events (for different banks)[1/]



Data as of December 2023.
Source: Banco de Mexico, CENAPRED, CNBV and INEGI.
1/ The colors show how diversified the portfolio is against these risks. The red color means less diversification, while the green color means more diversification. Diversification is based on the correlation coefficient between each bank's share of loan portfolios exposed to different hydro-meteological events.

With respect to the characteristics of the banks that could lessen or amplify the effects, it is noteworthy that the intermediaries most exposed to physical risks continue to be those with highest profitability and lowest non-performing ratio levels. However, for these banks there was a considerable decrease in capitalization and liquidity (Graph 157).

Graph 157
Amplifying and mitigating factors of physical risks in the housing credit portfolio (for different banks)[1/]



Data as of December 2023.
Source: Banco de Mexico, CENAPRED, CNBV and INEGI.
1/ Shades of green show mitigating effects while shades of red show amplifying factors. The color is determined by the correlation coefficient between each factor and the shares of credit portfolios for each sector and municipality exposed to the different hydro-meteorological events.

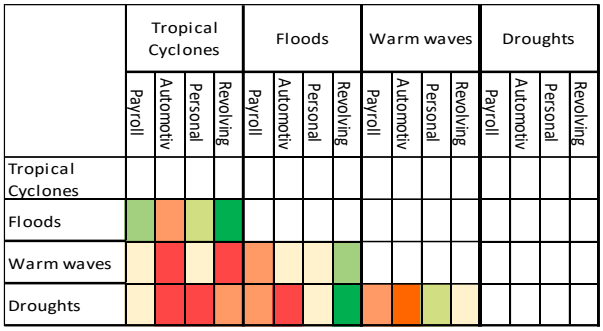
[137] As with the corporate portfolio, credit is identified in regions and sectors exposed to the same type of hydrometeorological phenomenon; however, the proportion of the portfolio in at-risk sectors is approximated by following two steps: first, the proportion of the portfolio in high and low-wage sectors is identified for each municipality. The second step is to combine this information with employment data from the last census; in particular, for each wage level, the portfolio of sectors at risk is approximated as the proportion of formal employment in those sectors.

Exposure to cyclones, heat waves and droughts increased for all segments of consumer credit, as it did for mortgages. On the other hand, for floods, the behavior was mixed, with a slight increase in exposure in the payroll and automotive segments and a decrease in exposure in the revolving and personal segments.

In addition, for all consumer segments, the diversification of banks against the occurrence of several events remains greater than in mortgage (Graph 158). Within consumer credit, the banks most exposed to physical risks in payroll increased their diversification, reversing the deterioration shown in the previous *Report.*

Graph 158

Consumer loan portfolio diversification among sectors and municipalities vulnerable to different hydro-meteorological events (for different banks)[1/]

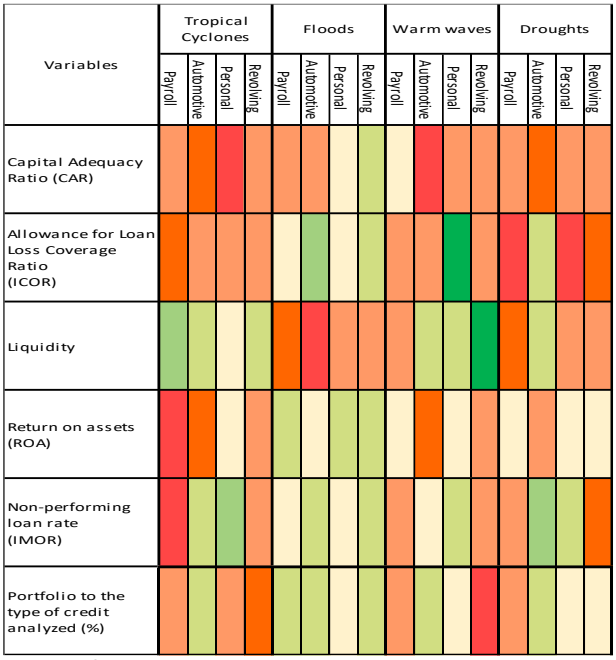


Data as of December 2023.
Source: Banco de Mexico, CENAPRED, CNBV and INEGI.
1/ The colors show how diversified the portfolio is against these risks. The red color means less diversification, while the green color means more diversification. Diversification is based on the correlation coeffcicient between each bank's share of consumer loan portfolios exposed to different hydro-meteorological events.

The banks most exposed to physical risks in all consumer credit segments reduced their non-performing ratio levels, but also their capitalization, which could increase the impact if the risks materialize (Graph 159).

Graph 159

Amplifying and mitigating factors of physical risks in the consumer credit portfolio (for different banks)[1/]



Data as of December 2023.
Source: Banco de Mexico, CENAPRED, CNBV and INEGI.
1/ Shades of green show mitigating effects while shades of red show amplifying factors. The color is determined by the correlation coefficient between each factor and the shares of credit portfolios for each sector and state exposed to the different hydro-meteorological events.

Sustainable Finances Committee (CFS, its acronym in Spanish)

The Sustainable Finances Committee (CFS), within the Financial System Stability Council (CESF, its acronym in Spanish), continued to meet in the first half of 2024. The working groups established by the Committee continued to develop evaluations, proposals, recommendations, and training on sustainable taxonomy and the integration of environmental and social risks in the decision-making process of authorities and institutions through scenario analysis, mobilization of sustainable financing, and disclosures of environmental, social, and corporate governance factors by issuing companies and financial institutions.

During this period, progress was made in planning a pilot climate scenario with various financial institutions in the banking, insurance and pension fund sectors.

The CFS, through Banco de México, continued working on the creation of a digital repository for learning and collaboration in sustainable finance.

Box 8: Disclosure on sustainability-related risks

I. Introduction

In recent years, there have been significant developments in sustainability-related risk disclosures. These disclosures are relevant because they help financial and non-financial institutions identify exposures to climate, environmental and social risks. Market participants are increasingly aware of how sustainability risks and opportunities can impact the long-term value of assets and, therefore, sustainability factors are becoming a fundamental part of investment decision-making. The following highlights the financial reporting standards with the greatest impact at the international level, followed by a description of some standards at the jurisdictional level.

II. ISSB (International Sustainability Standards Board)

The mission of the *IFRS* Foundation (International Financial Reporting Standards) is to establish the accounting standards that apply to companies on a global level. Thus, its standards avoid the proliferation and fragmentation of accounting standards in different countries. In 2021, the *IFRS* Foundation created the International Sustainability Standards Board (ISSB) with the aim of developing standards that form a comprehensive, high-quality global foundation of sustainability disclosures focused on the needs of investors and financial markets.

In June 2023, the ISSB of the *IFRS* Foundation issued the first two International Financial Reporting Standards (IFRS) on Sustainability: one on general sustainability-related disclosure requirements (S1) and one on climate-related disclosures (S2).[1]

In this regard, the Financial Stability Board (*FSB*) considered the publication of these standards to represent a substantial achievement in sustainability-related disclosure and deemed that, as a next step, the key priority was the consideration by the International Organization of Securities Commissions (IOSCO) of the approval of the standards for adoption, implementation or use by local authorities in a robust and timely manner, reflecting the circumstances of each jurisdiction.[2]

In July 2023, IOSCO announced its endorsement of the ISSB sustainability-related standards.[3] As part of the announcement, IOSCO called on its 130 member jurisdictions to consider how they can incorporate the ISSB standards into their respective regulatory frameworks to provide consistency and comparability of sustainability-related disclosures around the world.

Some of the key elements of these standards are highlighted below:

IFRS S1 on general disclosure requirements related to sustainability

The objective is to require an entity to disclose information about its sustainability-related risks and opportunities that is useful to users of financial information.

IFRS S1 sets out how an entity should prepare and report its sustainability-related financial disclosures. In particular, an entity is required to provide information on the four pillars of the *Task Force on Climate-Related Financial Disclosures* (TCFD):

a) the governance processes, controls and procedures used by the entity to monitor, manage and supervise risks and opportunities related to sustainability;

b) the entity's strategy for managing sustainability-related risks and opportunities;

c) the processes the entity uses to identify, assess, prioritize and monitor sustainability-related risks and opportunities; and

d) the entity's performance in relation to sustainability-related risks and opportunities, including progress towards any targets that the entity has set or is required by law or regulation to meet.

IFRS S2 on climate-related disclosure

The objective of *IFRS* S2 is to require an entity to disclose information about its climate-related risks (physical and transitional) and opportunities that is useful to users of financial information.

In particular, *IFRS* S2 requires an entity to disclose information that enables users of general purpose financial reports to understand the four pillars described in S1, but explicitly applied to climate (governance, strategy, management and performance of climate-related risks).

Other notable elements of the S2 are:

- **Transition plans:** as part of their overall strategy, entities should disclose their transition plans. This involves setting targets, actions or resources for their transition to a low-carbon economy, including the reduction of their greenhouse gas (GHG) emissions.
- **Climate resilience and opportunities:** information should be disclosed to enable users to understand the resilience of the entity's strategy and business model to climate-related changes, developments and uncertainties. This requires climate-related scenarios analysis using an approach that is commensurate with the entity's circumstances.
- **Scope 1-3 emissions:** S2 requires entities to disclose information on Scope 1, 2 and 3 GHG emissions, based on the GHG *Protocol Corporate Standard*.[4]

[1] https://www.ifrs.org/news-and-events/news/2023/06/issb-issues-ifrs-s1-ifrs-s2/

[2] Financial Stability Board, Progress Report on Climate-Related Disclosures 2023, https://www.fsb.org/2023/07/fsb-roadmap-for-addressing-financial-risks-from-climate-change-2023-progress-report/

[3] https://www.iosco.org/news/pdf/IOSCONEWS703.pdf

[4] The S2 defines Scope 1 emissions as direct GHG emissions that occur from sources that are owned or controlled by the entity; Scope 2 emissions are those indirect GHG emissions that occur from the generation of purchased electricity, heat or steam consumed by an entity; and Scope 3 emissions are indirect GHG emissions outside of Scope 2 emissions that

Effective date and transitional provisions of *IFRS* S1 and *IFRS* S2

Both ISSB standards were issued on June 26, 2023 and are effective for annual reporting periods beginning on or after January 1, 2024.

The ISSB has agreed that entities may adopt a "climate first" approach, allowing them in their first reporting period to only disclose information on climate-related risks and opportunities. This will give entities an extra year to report on the full range of sustainability-related risks and opportunities.

III. Basel Committee on Banking Supervision

The Basel Committee on Banking Supervision (*BCBS*) issued a consultation on a disclosure framework for climate-related financial risks in November 2023,[5] which was open until March 2024. Through this consultation, the BCBS is seeking views on the importance, feasibility and features of such a disclosure framework, as well as prudential metrics that would most effectively support the BCBS' mandate, particularly as it relates to Pillar 3 on promoting market discipline and disclosure of and access to key information.

In general terms, the consultation is on qualitative and quantitative requirements. With respect to qualitative disclosures by banks, the BCBS is seeking views on disclosure in four areas: (i) governance; (ii) strategy; (iii) risk management; and (iv) concentration risk management in relation to climate-related financial risks.

On the quantitative requirements side, the BCBS submits three aspects for consultation:

- **Exposure by sector:** whether banks should disclose their exposures to non-financial companies according to standardized sectors of economic activity.
- **Funded emissions:** obligors' emissions could be considered an indicator of their transition risk, particularly when examined alongside adequate supporting context. Accordingly, disclosure of Scope 1, Scope 2 and Scope 3 financed emissions by banks could provide market participants with an indication of banks' exposure to climate-related transition risks and the related impact on their risk profiles.
- **Exposures subject to physical risk by geographic area:** consultation on whether banks should disclose their exposures by region or geographic location, subject to the physical risk of climate change, to enable market participants to better understand a bank's risk profile based on the geographic split of exposures.

IV. Jurisdiction level standards

Europe[6]

As part of the European Green Pact, the European Union (EU) adopted the Corporate Sustainability Reporting Directive (CSRD), which came into force on January 5, 2023. The CSRD requires certain companies to report sustainability-related information in accordance with the European Sustainability Reporting Standards (ESRS).

The ESRS framework was published on July 31, 2023 and consists of twelve standards (two general standards that apply to all sustainability-related issues and ten thematic standards that address specific sustainability-related issues, such as climate and biodiversity). The ESRS came into force as of January 1, 2024 for large companies and public-interest companies, including banks and insurance companies that are already subject to the Non-Financial Reporting Directive (NFDR). Large companies that are not currently subject to the NFDR will have to apply the new rules as of January 1, 2025; while small-and-medium-size entities (small-and-medium-size-businesses) and other listed companies will have to apply the new rules as of January 1, 2026.

USA[7]

On March 6, 2024, the U.S. Securities and Exchange Commission (SEC) issued rules to standardize the requirements for climate-related information to be disclosed by companies in the United States. Such information must be included in annual reports and registration statements filed with the SEC.

In adopting the rules, the SEC considered the more than 24,000 comments that were submitted in response to the proposed rules published in March 2022.

The rules have structural elements, definitions, concepts and, in some cases, substantive requirements that are similar to those of the TCFD. Among its requirements are: climate-related risks that have materially impacted or are reasonably likely to have a material impact on business strategy; information on Scope 1 emissions and Scope 2 emissions; and material impacts on the estimates and assumptions used to produce the financial statements, arising from risks and uncertainties related to severe weather events.

As a result of a legal challenge brought by a group of states led by Republican governors, the SEC decided to exercise its discretion to stay its rules on climate-related disclosures pending the completion of judicial review.

Mexico

The Mexican Financial Reporting and Sustainability Standards Board (Consejo Mexicano de Normas de Información Financiera y de Sostenibilidad, CINIF)[8] is the body in charge of issuing the Financial Reporting Standards (NIF) in Mexico. Its standards are aimed at non-public interest entities (non-listed companies,

occur in the reporting entity's value chain, including both upstream and downstream emissions.

[5] https://www.bis.org/bcbs/publ/d560.htm .

[6] Financial Stability Board, Progress Report on Climate-Related Disclosures 2023, https://www.fsb.org/2023/07/fsb-roadmap-for-addressing-financial-risks-from-climate-change-2023-progress-report/

[7] https://www.sec.gov/files/rules/final/2024/33-11275.pdf

[8] https://www.cinif.org.mx/index.php

other than banks, Afores, insurance companies, etc.) in Mexico. On May 13, 2024, the CINIF issued its first two sustainability reporting standards (NIS):

NIS A-1: Conceptual Framework for Sustainability Reporting Standards, whose objective is to establish the general quality requirements applicable to the preparation and disclosure of sustainability information and the basis for the development of other NIS.

NIS B-1: Basic Sustainability Indicators, whose objective is to establish universally applicable metrics that entities should include in their sustainability information. These indicators are a starting point for identifying sustainability-related risks and opportunities.

The CINIF seeks to converge with the IFRS of the ISSB; however, it proposed a phased implementation strategy with the intention of promoting sustainability actions and generating knowledge, in order to subsequently establish greater information requirements.

CINIF's sustainability reporting standards will be effective as of January 1, 2025.

V. Final considerations

Implementation of the standards described in this Box will enable financial and non-financial companies to disclose consistent and comparable sustainability-related information. Better information will enable companies to incorporate sustainability-related risks and opportunities into their risk management, strategic planning and decision-making processes. As both companies and investors better understand the financial implications of climate change, markets will be better able to channel investment toward sustainable and resilient solutions, opportunities and business models.

Table 1
Summary of selected features of the described Disclosure Standards

Standards	Jurisdiction	Issued by	Dates of Publication (P) and Effective Date (ED)
International Financial Reporting Standards on Sustainability *IFRS* S1 and *IFRS* S2	Voluntary adoption by individual jurisdictions	IFRS Foundation International Sustainability Standards Board (ISSB)	P: June 2023, ED: 2024
European Sustainability Reporting Standards	Large companies in the European Union subject to the Corporate Sustainability Reporting Directive.	European Commission	P: July 2023, ED: from 2024 and staggered until 2026
Climate-Related Disclosure Rules	All U.S. SEC registrants, including non-U.S. companies.	Securities and Exchange Commission (SEC)	P: March 2024, ED: Suspended until judicial resolution.
Sustainability Reporting Standards	Non-public interest entities (unlisted companies other than banks, Afores, insurance companies, etc.) in Mexico.	Mexican Financial Reporting and Sustainability Reporting Standards Board (Consejo Mexicano de Normas de Información Financiera y de Sostenibilidad (CINIF))	P: May 2024, ED: 2025, except "GHG Emissions Scope 3" and "Sustainable Investment".

Source: Banco de México with information from ISSB, FSB, SEC *and* CINIF.

References

Basel Committee on Banking Supervision (2023, July). "*Consultative Document: Principles for the effective management and supervision of climate-related financial risks*".

Financial Stability Board (2023, July). "*FSB roadmap for addressing financial risks from climate change: 2023 progress report*".

International Financial Reporting Standards Foundation. (2023, June): "*ISSB issues IFRS S1 and IFRS S2*".

International Organization of Securities Commissions (2023, July 25). "*IOSCO endorses the ISSB's Sustainability-related Financial Disclosures Standards.*"

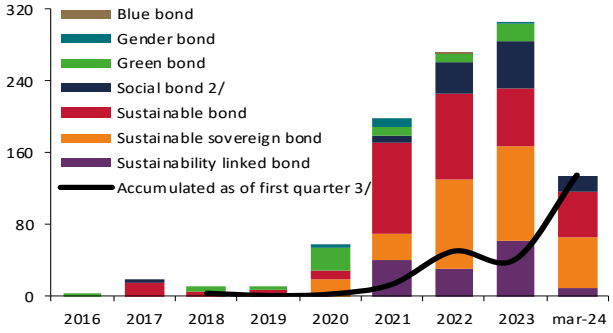
U.S. Securities and Exchange Commission (2024). "*Final Rule: The Enhancement and Standardization of Climate-Related Disclosures for Investors*".

Sustainable financial assets

The thematic bond market continues to show dynamism, allowing companies and other issuers to diversify their financing sources to a greater extent considering sustainability criteria. In particular, since 2020, the issuance of thematic bonds by domestic issuers has presented an increasing annual amount.

In the first three months of 2024, the issuance of thematic bonds by domestic private and public issuers recorded an amount of around 135.1 billion pesos, a higher figure than the one observed during the same period of 2023 of around 40 billion pesos (Graph 160).

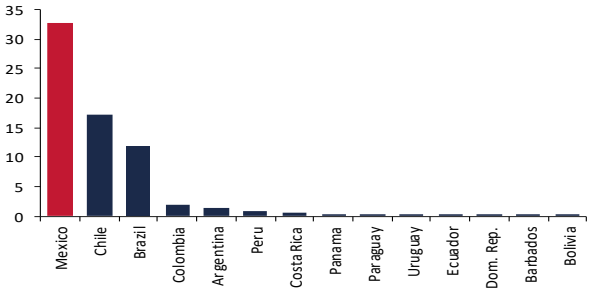
Graph 160
Issuance balance of sustainable, green, social and gender bonds 1/
Billions of pesos



Data as of March 2024.
Source: Consejo Mexicano de Finanzas Sostenibles and Indeval.
1/ At face value.
2/ Includes COVID-19 social bond.
3/ Accumulated issued amount as of first quarter per year not considering bond type.

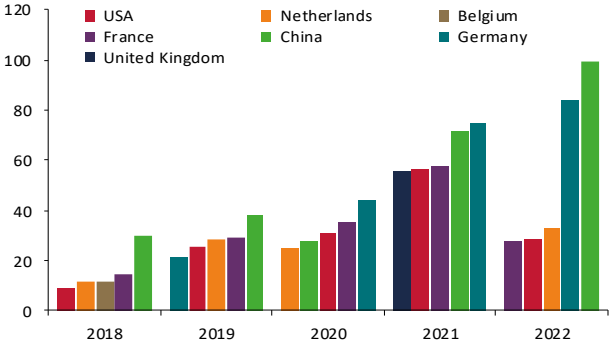
Due to the dynamism observed in the issuance of thematic bonds by Mexican residents, Mexico had one of the highest issuances of this type of bond in Latin America at the end of 2023 (Graph 161).[138] Likewise, since 2016, at the international level, there was also an expansion in the issuance of green bonds, particularly in the last two years (Graph 162).

Graph 161
Issuance balance of green, sustainable and blue bonds (2016-2023) 1/
Billons of dollars



Data as of December 2023.
Source: Data for Mexico are prepared by Banco de México based on information from Consejo Mexicano de Finanzas Sostenibles and Indeval. For the rest of the countries, the information comes from the Green Bond Transparency Platform, Inter-American Development Bank.
1/ Posted información as of June 5th 2024 by BID.

Graph 162
Issuance balance of green bonds 1/
Billons of dollars



Data as of December 2022.
Source: FMI.
1/ At face value.

[138] Issuance data for some Latin American countries is available on the Inter-American Development Bank's Green Bond Transparency Platform (greenbondtransparency.com). The definitions and classification of the different thematic bonds depend on the considerations of each jurisdiction.

Box 9: Network of Central Banks and Supervisors for the Greening of the Financial System and the scenarios defined by the network

I. Introduction

The Network of Central Banks and Supervisors for Greening the Financial System (*NGFS*) is a group of central banks and supervisory bodies formed in 2017, whose founding members include Banco de México, with the aim of exchanging experiences and best practices that contribute to the development of climate and environmental risk management. Given its scope, it also seeks to help the financial system as a whole contribute to the transition towards a sustainable economy. Its main purpose is the definition and promotion of best practices, in addition to developing or commissioning technical and analytical work on sustainable finance issues. [1]

The members of the Network commit themselves to actively contribute to the work of the Network; to designate participants in the different working groups in its structure; to promote the work of the Network and to participate in the different exercises that the Network carries out to gather information and to promote its work.

II. Structure and organization

In addition to a presiding officer and the support of a secretariat, the Network uses the following structure to carry out its tasks:

The Plenary Assembly, which is constituted by all members of the Network. Its main functions include appointing the chairperson, approving the strategy and work program, approving new members and observers, as well as approving new objectives and operating guidelines.

The Steering Committee, which is the Network's executive body, is in charge of preparing the Network's strategy and work program and submitting it to the plenary assembly for approval; directing the operational effort to ensure compliance with the work plan, as well as approving deliverables, approving the creation of working groups, along with their specific mandates and operating horizons, and other operational matters.

Permanent or temporary **working groups** and expert groups. Permanent groups develop and follow up on long-term projects aligned with the Network's main objectives. Temporary working groups are constituted for the development of specific projects, for a clearly defined period of time. Finally, the expert groups, which meet to exchange information and knowledge in periodic meetings on various topics. The work of this group usually results in projects developed by temporary working groups.

The working groups are as follows:

Supervision: this working group develops strategies for network members to incorporate climate and environmental risks into their supervisory framework.

Scenario Design and Analysis: In broad terms, this group develops climate scenarios and is also responsible for promoting their use within the financial system.

Monetary Policy: the objective of this group is to study how climate change and the measures taken to mitigate it can be taken into account in the conduct of monetary policy. This includes studying the scope of climate considerations, and how monetary policy can have a positive impact on the transition to a lower carbon economy.

Net zero emissions for central banks: this group discusses the different possible approaches to sustainable investments and the disclosure that central banks themselves make on the climate and environmental aspects of their operations.

Nature-related risks: This temporary working group is developing a conceptual framework to analyze how nature-related risks, including physical and transitional risks caused by biodiversity loss, manifest themselves in the financial system; how to integrate these types of risks into other working groups of the Network; and to identify what else is needed in this analytical framework.

Capacity building for training: this temporary working group analyzes the experiences of the members in developing analytical and technical capacities to implement the proposals and developments of the Network's working groups.

III. Scenarios

Although the Network's work is extensive and includes the publication of academic and dissemination documents, as well as the organization of conferences and various forums, one of the most influential projects developed by the Network was the development and subsequent promotion and application of climate scenarios.

The analysis of climate and environmental risks involves a series of challenges: the inherent complexity of meteorological systems; the integration of these factors into macroeconomic and financial models; and the effect of the high degree of uncertainty in the potential materialization of climate risk. In addition, historical data are not necessarily a good parameter for estimating the impact of this type of risk and, in general, the evolution of meteorological, economic and financial variables.

Given this high degree of uncertainty, one of the most powerful and useful analytical tools is scenario analysis. This type of analysis consists of counterfactual simulations in which the evolution of a set of variables of interest is projected in the face of different states of nature[2] . This type of analysis has some convenient features, one of which is that it is not necessary to assign probabilities of occurrence to the different scenarios; another is the flexibility to analyze different narratives by modifying some calculation assumptions. Having these

[1] The information in this box comes from the Network's website, https://www.ngfs.net.

[2] Examples of the application of scenario analysis in this *Report* are the stress exercises.

trajectories allows brokers and financial authorities to assess the impact of different policy actions or omissions with a robust analytical framework. Scenario analysis is a fundamental tool for assessing risks and opportunities in the face of such events.

The Network is currently in the fourth phase of the design and elaboration of climate scenarios. The starting point in the generation of these scenarios is that, given the different actions and omissions, there is a permanent dilemma: omissions can potentially increase the severity and frequency of physical risks, but also, actions aimed at reducing emissions entail greater transition risks, i.e., risks of incurring potentially high costs for these measures. This framework identifies four quadrants: (1) mitigation actions and policy measures are taken in a timely and gradual manner, in which both physical and transition risks are relatively low; (2) these measures are postponed, which keeps transition risks at relatively low levels but with higher levels of physical risks; (3) measures are taken in an accelerated and unorganized manner, which reduces physical risks but increases transition risks; (4) late decisions and measures are taken in a disorderly manner, which would imply higher physical and transition risks.

The scenarios developed by the Network, with the collaboration of a consortium of academics and their institutions are:

Within the first quadrant, of scenarios with relatively low physical and transition risks, we find the following:

Net zero 2050: in this scenario, global warming would be limited to 1.5 degrees Celsius, and this goal would be achieved through stringent climate measures and innovation. The key point is that net zero emissions would be achieved globally, with major jurisdictions also achieving this level of emissions.

Low demand: the main assumption for this scenario is a significant change in the behavior of economic agents, which would reduce their demand for energy. This would contribute significantly to reaching the emissions target.

Below two degrees: this scenario is similar to the first one, but the application of stricter measures is gradual. In this scenario, the probability of reaching the target is 67%.

In the next quadrant, with high physical risks, but low transition risks:

Nationally determined contributions: this scenario assumes that all commitments made by the different countries will be fulfilled, regardless of the actual degree of progress.

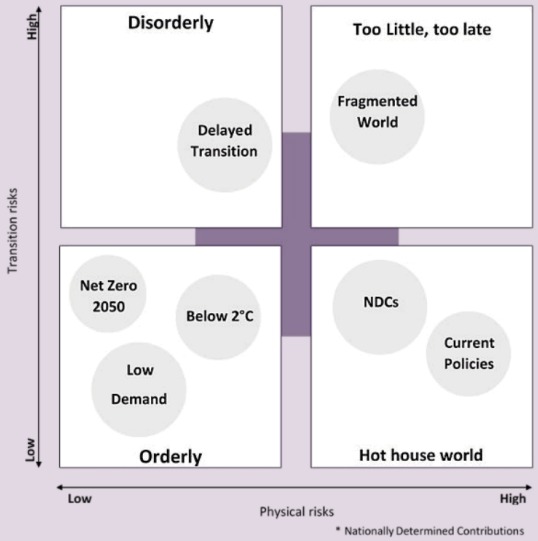
Current policies: this scenario implies that no mitigation measures are taken, which reduces transition risks, but considerably increases physical risks.

In the quadrant of high transition risks and relatively low physical risks:

Delayed transition: in this scenario, emission mitigation measures are not taken until 2030. This leads to a sense of urgency and the accelerated and very strict implementation of emission mitigation measures.

In the relatively high physical and transitional risk quadrant:

Fragmented world: this scenario reflects uncoordinated and late actions. Some jurisdictions would have high transition risks, while in others the physical risks would remain high, largely due to poor coordination and ineffectiveness of the actions being carried out.



Source: Banco de México with information of NGFS

The detailed scenarios are available to the general public and contain long-term trajectories of the main variables, including emissions, and the impact that the scenario generation assumptions have on macro-financial variables.

These scenarios have been the basis on which several central banks and financial authorities have integrated climate risk analysis into the financial stability framework. Other brokers have used these scenarios for the development of strategic plans and as part of risk analysis.

Scenario analysis will also be used in Mexico for climate risk analysis, but with some adjustments to reflect macroeconomic conditions and potential exposures to physical risks due to climate change to which the country is subject. A pilot exercise will soon be developed with financial brokers, in which participants will be able to evaluate the impact on their portfolios and financial statements of the materialization of potential transition risks, physical risks and their interaction with the macro-financial environment. This exercise will contribute to the development of participants' analytical skills, which will help them to better manage and understand these types of risks.

Final considerations

The scenarios defined by the Network have been one of the most important analytical tools for climate risk analysis. Having long-term trajectories, with a high level of geographical and sectoral disaggregation, that consider, in addition to the usual macro-financial variables in these models, the evolution of the climate system, integrated to the economic models, has led to important advances, both in academic research and in the use of these models for regulatory and business purposes.

V. Stress testing and recovery plans

V.1. Credit stress tests

Stress tests are exercises conducted by Banco de México as part of its efforts to promote the sound development of the financial system. They are simulation exercises that evaluate the capital adequacy of commercial banks in the face of severe but plausible macroeconomic and financial shocks that may affect their solvency or financial intermediation capacity.

In this exercise, the impact of the materialization of three sets of macroeconomic scenarios was evaluated.[139] Three historical scenarios that replicate the trajectories followed by the main macro-financial variables during high stress and volatility events were also considered, with the aim of observing the resilience of the system in the face of similar scenarios.

The results indicate that at an aggregate level, the financial system is resilient to the shocks considered in the scenarios examined. Both the solvency levels measured by the CAR and the leverage ratio remain above the regulatory minimum over the stress horizon.

Although the stress scenarios are based on the macro-financial risks presented in this *Report*, they should not be associated with a probability of occurrence, nor should they be taken as a prediction of the expected behavior of the economy. The aim is to identify and analyze the vulnerabilities of the banking system as a whole, so the exercise should be judged as a counterfactual and partial equilibrium simulation.

Scenario A: protracted state of tight global financial conditions

In this scenario there would be conditions of high volatility and uncertainty in financial markets, with the consequent pressure on the exchange rate and interest rates. In this environment there would be higher risk premiums, which would be reflected in higher financing costs. This environment would lead to lower credit growth and higher non-performing ratio levels.

Scenario B: slowdown in global economic activity

This scenario describes a situation in which, as a consequence of restrictive monetary measures, a significant slowdown occurs in advanced economies, particularly in the United States, so that the latter enters into recession. This environment of slowdown in industrial activity and lower imports in the United States would affect the growth rate of the Mexican economy and cause high volatility in financial markets and the exchange rate. The drop in economic activity would be reflected in lower credit demand, higher unemployment rates and an increase in non-performing ratio levels in the credit portfolio.

Scenario C: adjustment in credit rating

This scenario describes the impact of a possible adjustment in the sovereign rating and in Pemex's rating, due to a deterioration in the outlook of some rating agencies. There would be high volatility in domestic financial markets, a depreciation of the exchange rate, higher risk premiums and, therefore, upward pressure on interest rates. This would also be reflected in a contraction in aggregate demand, which would lead to a drop in output and a higher unemployment rate. In this environment, credit growth would be affected, and higher non-performing ratio levels would be expected. Both phenomena would affect the income generation mechanisms of the banking sector.

Historical scenarios

Three historical scenarios that replicated the trajectories of the main macrofinancial variables during relatively recent high stress or volatility events were considered: the 1995 crisis (scenario H1), the 2008 global financial crisis (scenario H2), and the

[139] The variables modeled in the scenarios are derived from a set of simultaneous shocks to all variables. Scenario set A covers shocks between -1.76 and 2.43 standard deviations. Relevant are the shocks of 2.05 standard deviations in unemployment, 2.43 standard deviations in the exchange rate and -1.76 in the annual growth of the IGAE. In the set of scenarios B the shocks for all variables fluctuate between -1.86 and 2.47 standard deviations. The shocks of 2.47 standard deviations in unemployment, 2.40 standard deviations in the exchange rate and -1.86 in the annual growth of the IGAE stand out. In the set of Scenarios C the shocks vary between -1.44 and 1.97 standard deviations for all variables. Of note, a shock of 1.97 standard deviations in the exchange rate and a shock of -1.44 to the annual growth of the IGAE.

economic crisis resulting from COVID-19 (scenario H3).

Methodological considerations

The same methodology was used in this exercise as in previous editions of the *Report*. The scenarios are generated using an econometric model of autoregressive vectors (var) over a 36-month horizon, based on a central trajectory that reflects movements in the main macroeconomic and financial variables. With this model it is possible to generate simultaneous random shocks that affect the trajectories of these variables, respecting their dynamics and internal consistency.

Based on the generated scenarios, the possible market losses for banking institutions were evaluated. The losses contemplate the financial contagion effects that could propagate and increase the magnitude of the shock through the interbank network.

In turn, an econometric model is used to estimate the effect that the impact on macroeconomic variables would have on the constitution of reserves, the probabilities of default of the loan portfolio and the dynamics of each bank's loan portfolio.

In addition, the exercise considers effects differentiated by the level of risk of each economic sector, based on the economic growth of each sector and its NPL rates for the loan portfolio to private non-financial companies.

In addition, a simulation process is used to model low probability and high severity events to take into account the effect that the default of the largest borrowers would have on the system's capital levels.

Finally, the effect on operating income and solvency is calculated. On the one hand, the financial margin is estimated from the elasticities of each bank's asset and liability interest rates with respect to the treasury certificates (Cetes, its acronym in Spanish) rate. On the other hand, non-interest income and administrative expenses are modeled, assuming that both are proportional to each bank's loan portfolio. Based on operating income, market, contagion and credit losses, the shock absorption capacity and the evolution of the banking system's net capital are evaluated in each scenario.

Despite the advantages of this approach, the model could underestimate the occurrence of extreme events resulting from the simultaneous interaction of shocks from different scenarios, feedback effects from the financial sector to the real sector or unexpected non-linear effects.

One of the exercise's assumptions is that the reactions of banks and regulators to the occurrence of the simulated adverse events are not considered. That is, throughout the stress horizon, banks do not change their business strategy, seek capital contributions, or adjust their derivatives or repurchase positions. On the other hand, regulators do not take any corrective measures or provide facilities that would mitigate shocks. Therefore, the stress exercise is a counterfactual and partial equilibrium analysis.

Main results

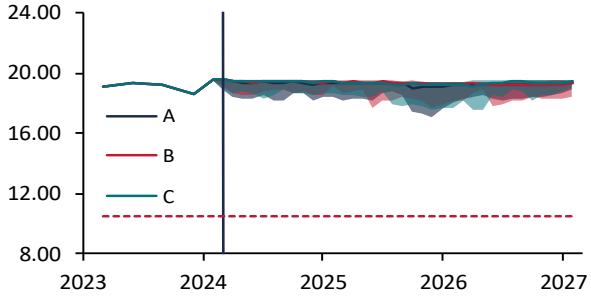
In the simulated scenarios, the system ends up with capitalization levels higher than the regulatory minimum at the end of the evaluated time horizon (Graph 163a). When considering the historical scenarios, the observed capitalization levels are lower, but still above the regulatory minimum (Graph 163b). However, in the short term, reductions are observed in both net capital levels (Graph 164a) and in risk-weighted assets (Graph 165a). This is consistent with a deleveraging process in the face of the severity of the scenarios, and it is also more pronounced in the historical scenarios (Graph 164b and Graph 165b).

Graph 163

System's Capital Adequacy Ratio (CAR)

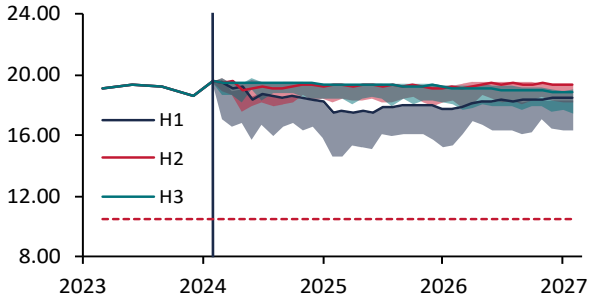
a) Scenarios A, B and C

Percent



b) Historical Scenarios

Percent



Data as of February 2024 and simulations 3 years thereafter.

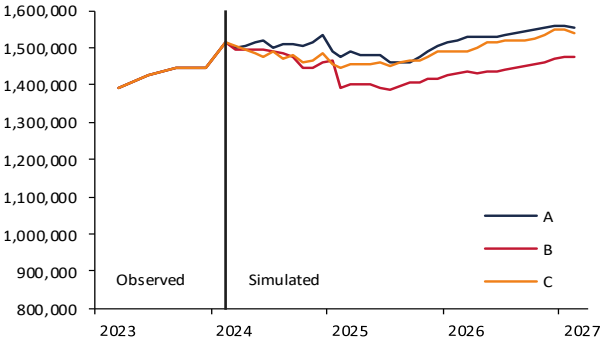
Source: Banco de México

Graph 164

Evolution of the average net capital of the system

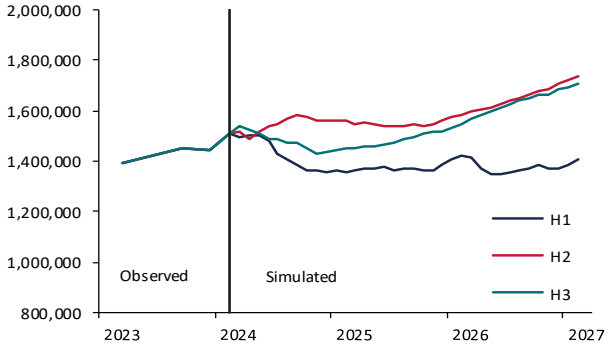
a) Scenarios A, B and C

Million pesos



b) Historical Scenarios

Million pesos



Data as of February 2024 and simulations 3 years thereafter.

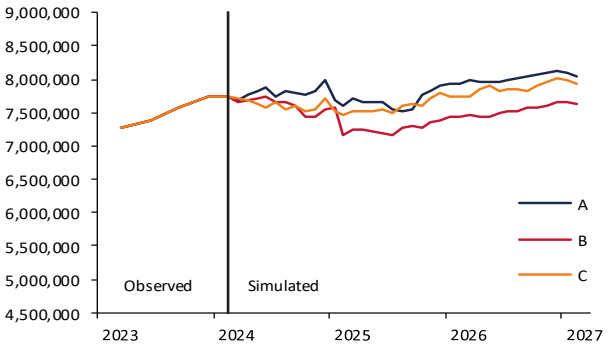
Source: Banco de México

Graph 165

Evolution of the system's average risk-weighted assets

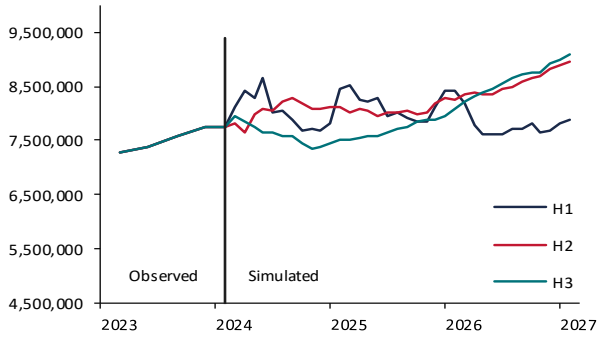
a) Scenarios A, B and C

Million pesos



b) Historical Scenarios

Million pesos

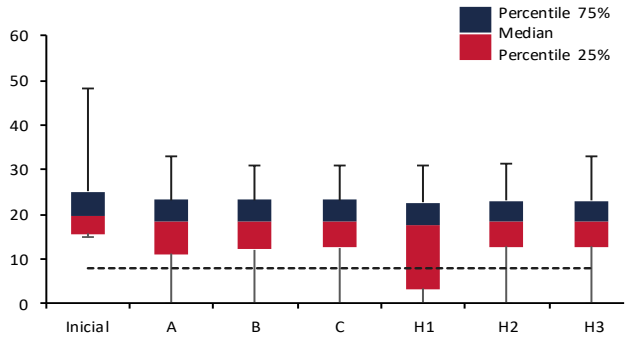


Data as of February 2024 and simulations 3 years thereafter.

Source: Banco de México

Although the system as a whole would maintain capitalization levels above the regulatory minimums, in some of the simulated scenarios, some intermediaries, who represent a relatively low proportion of the system's assets, could have a greater degree of impact on their capitalization levels (Graph 166).

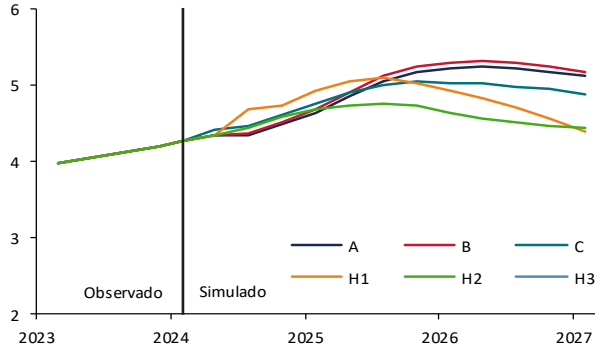
Graph 166
Distribution of the average CAR at bank level at the end of the test[1/]
Pecent



Data as of February 2024 and simulations 3 years thereafter.
Source: Banco de México.
1/ The dotted horizontal line corresponds t o the minimum ICAP without considering capital supplements. In the box and arms diagram, the arms represent 10 and 90% of the distribution.

One indicator that helps to illustrate the impact of these scenarios is the behavior of the portfolio's non-performing ratio levels. In (Graph 167) shows that at the beginning of the year, non-performing ratio levels were at low levels; therefore, even though the shocks imply important relative changes in this indicator, the levels would continue to be low.

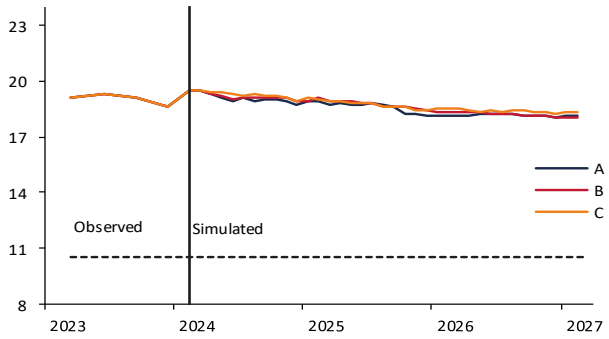
Graph 167
Average probabilities of default of the system's credit portfolio
Weighted by the current portfolio of each bank, percent



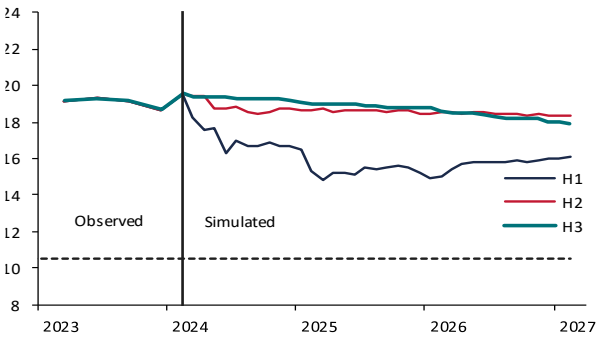
Data as of February 2024 and simulations 3 years thereafter.
Source: Banco de México

A common characteristic of the Mexican banking system's loan portfolio is high concentration. A relatively small number of borrowers hold a high proportion of the credit. In order to evaluate the effect that this high concentration may have on the resilience of the system, an exercise is performed to simulate the default of these large borrowers (Graph 168a and Graph 168b). The capitalization levels in this exercise are lower, but still above the regulatory minimums for the system as a whole.

Graph 168
Average CAR of the system considering an impact per concentration corresponding to 99% of the losses[1/]
a) Scenarios A, B and C
Percent



b) Historical Scenarios
Percent



Data as of February 2024 and simulations 3 years thereafter.
Source: Banco de México
1/ The horizontal line corresponds to the minimum CAR plus capital supplements.

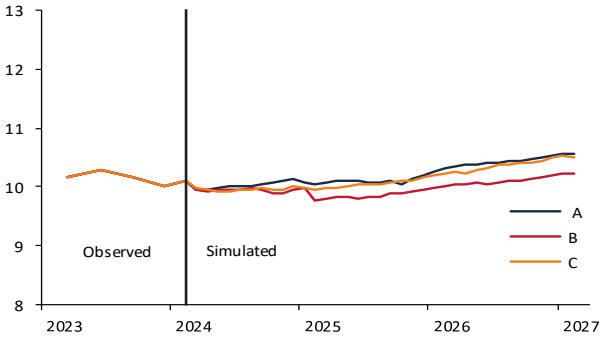
This exercise also evaluates the impact of the scenarios on the banks' leverage ratio. The average leverage level of the system was above the regulatory minimum of 3% (Graph 169a and Graph 169b); however, at the individual level, some institutions, whose assets represent a low proportion of the system's assets, would be more affected. Likewise, there is a high correlation between the level of leverage and capitalization: those institutions with a low CAR also tend to have a similarly low leverage ratio (Graph 170).

Graph 169

Average leverage ratio of the system

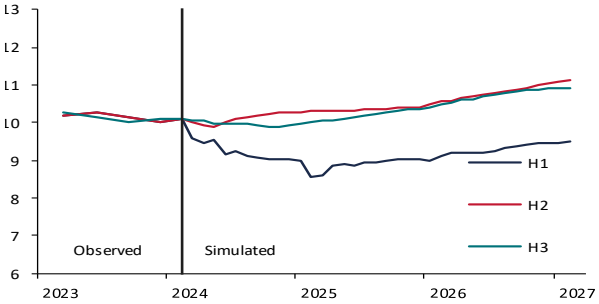
a) Scenarios A, B and C

Percent



b) Historical Scenarios

Percent



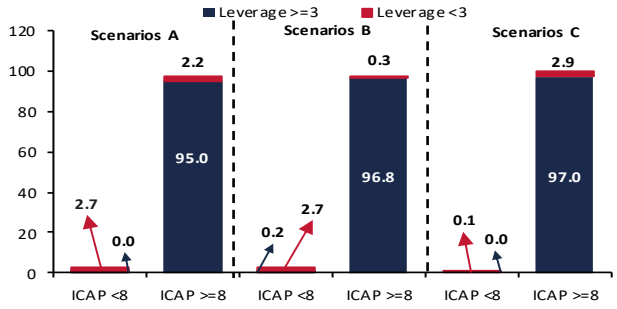
Data as of February 2024 and simulations 3 years thereafter.

Source: Banco de México

Graph 170

Distribution of the average CAR at bank level at the end of the test

Percent of System Assets



Data as of February 2024 and simulations 3 years thereafter.

Source: Banco de México

V.2. Liquidity stress tests

According to the results of the liquidity stress tests conducted by Banco de México, the current liquidity position of commercial banks would allow them to withstand stress episodes more severe than those experienced in the past and those used to design international standards. However, some individual institutions could present liquidity shortages in the face of very severe stress scenarios. However, it is important to note that, in addition to the severity of the scenarios evaluated the tests do not assume any response on the part of the institutions to face such scenarios.

In particular, the liabilities coverage horizon,[140] with data as of April 2024, indicates that most banks could meet their obligations for a period of at least thirty days using only their stock of liquid assets (Graph 171). However, it should be noted that banks with a liabilities coverage horizon of less than 20 and 30 days represent the lowest percentage of the system's assets for the period covered by this *Report*.

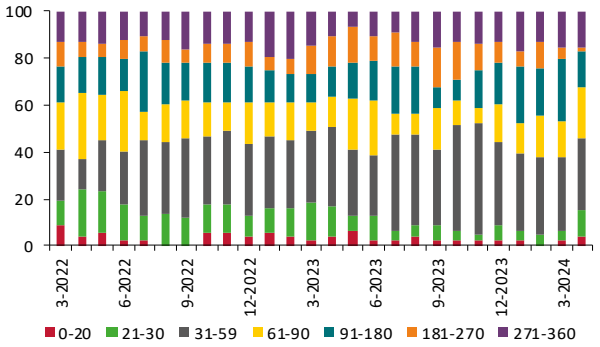
Graph 171

Percentage of banks that could meet their liabilities under the liabilities coverage stress scenario 1/

Vertical axis: percentage of banks

Horizontal axis: date of the calculation

Color: days that banks could cover their obligations



Data as of April 30, 2024.

Source: Banco de México.

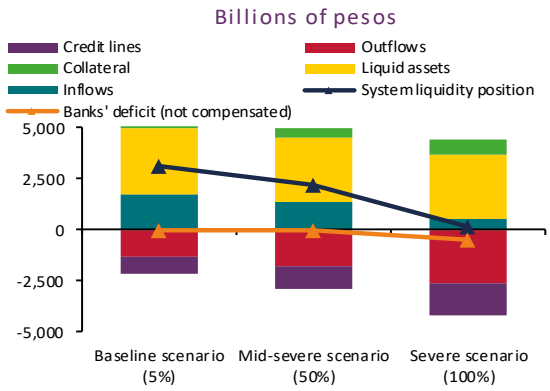
1/ For each month, banks are aggregated by range of days, according to their monthly average calculated with daily observations, of the number of days that they could cover their liabilities in a severe stress scenario. See Box 9 "Stress testing methodologies based on cash flows" of the Financial Stability Report, December 2022.

[140] The liabilities coverage horizon evaluates funding risk under a more severe scenario than the LCR, as it does not consider the inflow of contractual cash flows that banks normally have available to meet their obligations.

The cash flow stress tests for a 90-day horizon, with data as of April 2024, indicate that the stressed value of liquid assets and inflows for banks as a whole would exceed the stressed outflows modeled in the 21 stress scenarios considered, thus commercial banks would maintain a liquidity surplus under severe stress scenarios. However, some institutions -which represent a low percentage of the system's assets- would face a liquidity deficit in the most severe hypothetical scenario (Graph 172).

Graph 172

Liquidity stress scenarios over 90-day period 1/



Data as of April 30, 2024.

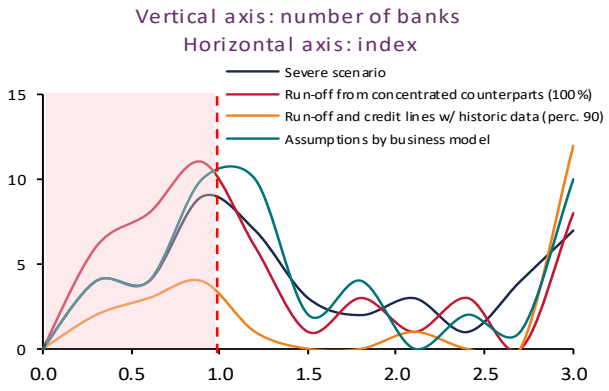
Source: Banco de México.

1/ In the severe scenario (100% severity), a haircut on liquid assets of around 4% is considered. Repos have a roll-over of 45% and released collateral has the same haircut as liquid assets. Inflows from loans portfolio are not considered (100% haircut). Wholesale deposits (demand and term) have a 20% run-off factor and retail deposits (demand and term) have a 10% run-off factor. Contingent outflows and granted credit lines have a 40% run-off factor. The baseline scenario and mid-severe scenario consider a 5% and 50% severity compared to the severe (100%) scenario. The mid-severe scenario estimates an aggregate outflow which is similar in magnitude to the outflow calculated under the LCR (See Box 9 "Stress testing methodologies based on cash flows" of the Financial Stability Report, December 2022).

Additionally, based on the cash flow framework, three variations to the stress exercises were performed. The exercises assessed the impact of modifying the outflow factors of deposits and credit lines, on the one hand; and of the main counterparties, on the other; as well as shocks by business model. In these exercises, although some of the assumptions used in the tests described above were modified, the use of scenarios at least as restrictive as those used by international standards was preserved.[141] The results show that the current liquidity of the banking system would allow it to face the alternative stress scenarios. However, depending on the assessed scenario, certain vulnerabilities are identified in some institutions (Graph 173).

Graph 173

Distance to Liquidity Stress Indicator under different scenarios



Data as of April 30, 2024.

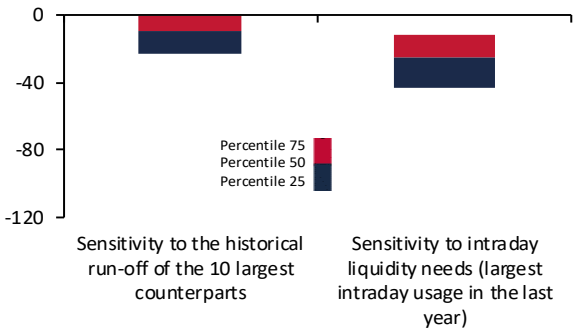
Source: Banco de México.

1/ The DLSI refers to the sufficient severity for the institution to present a liquidity deficit. The severe scenario is normalized to 1, values above indicate greater resilience than the assesed scenario. In the severe scenario it corresponds to the scenario calibrated to stress the entire bank (See Box 9 "Stress testing methodologies based on cash flows" of the Financial Stability Report, December 2022). The scenarios adjusted with historical data (historical outflows and credit lines) consider data since 2017 by bank to calculate the 90th percentile of financial, wholesale and retail outflows, or exercise of credit lines. In the event that the 90th percentile is lower than the base scenario (5% of the severe scenario), the assumptions of the base scenario are used. The concentration scenarios (100% outflow rate) consider that in addition to the severe scenario outflows, the 10 main counterparties withdraw their deposits. The scenario by business model considers differentiated cash inflows and outflows assumptions for: large banks, commercial banks, consumer banking, foreign exchange banks, investment banking and others.

[141] The modifications of the three exercises consider: (i) outflows of funding and drawdowns of credit lines based on historical data, in which the assumptions on outflows of funding and drawdowns of credit lines granted are calibrated based on historical data since 2017 for each bank and considering the 90th percentile of the distribution of such data; (ii) outflows of concentrated counterparties, in which, in addition to the assumptions on outflows of funding, a 100% outflow of the 10 largest counterparties is assumed; (iii) assumptions on inflows and outflows differentiated by business model for: large banks, commercial banks, consumer banking, foreign exchange banks, investment banking and others.

As a complementary exercise, the sensitivity of the LCR to different hypothetical levels of deposit withdrawals by the main counterparties and different intraday liquidity needs was estimated to have a simplified measure of the expected impact in the event of a shock such as the one modeled. To assess the sensitivity to funding concentration, a LCR was calculated assuming the outflow of the top ten creditors according to their historical behavior. To assess the potential impact of intraday liquidity risk, a LCR adjusted by the observed "maximum intraday liquidity usage"[142] of each bank in the last year was calculated. The results of both exercises reflect that most banks have sufficient liquid assets to deal with these scenarios and would continue to meet the minimum LCR requirement (Graph 174). It is important to note that presenting a LCR below 100% under such restrictive assumptions is not, in itself, indicative of a lack of liquidity, since liquidity reserves are precisely intended to be used to face liquidity stress events.

Graph 174
Sensitivity (what-if analysis) of the LCR under different assumptions of concentration and intraday liquidity needs 1/
Percentage, change from the regulatory scenario



Data as of April 30, 2024.

Source: Banco de México.

1/ The graph presents the percentage difference from the regulatory scenario. In the case of the concentration analysis, the historical output (90th percentile) of the 10 counterparties with the highest concentration is assumed. In the intraday liquidity analysis, the largest gap between payments sent and received accumulated on the intraday, observed over a 1-year horizon, is subtracted from the liquid assets.

V.3. Stress tests of physical risks associated with climate change.

The test evaluates the impact on the financial system, in the event of an extreme hydrometeorological events. It follows an approach similar to that of the historical scenarios, i.e., it assumes that recent historical events, such as the occurrence of extreme hydro-meteorological events, are repeated and occur simultaneously. The impact on banks is observed in two ways: certain borrowers affected by the shocks would not be able to pay their loans, and the magnitude of the shock generates a recession in economic activity. The impacts of a 1% and 2% drop in GDP, respectively, are evaluated. The methodology used is the one described in previous editions of the *Report*.[143]

Main results

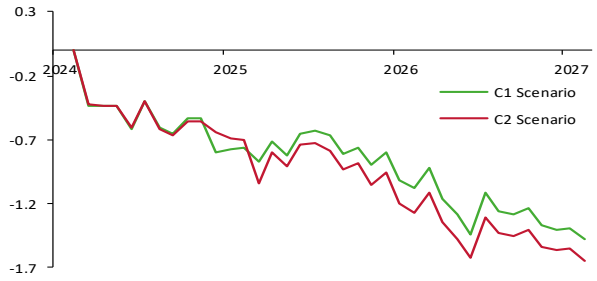
The results are shown in comparison to the levels in a baseline scenario in which the trajectories have no adverse shocks, since climate shocks are independent from macro-financial shocks, and the severity of losses is lower. This allows interpreting the losses as an additional loss to other scenarios in case macro-financial and climate shocks occur simultaneously. For both climate scenarios the results are similar.

The first scenario shows a difference in the drop of the CAR at the end of the test of 1.65 percentage points with respect to the baseline, whilst in the second scenario, the difference is of 1.83 percentage points (Graph 175). It is important to highlight that, in both climate scenarios, there is heterogeneity in the impact on different intermediaries. Some banking institutions finalize the exercise with a lower level of capitalization as compared with the base scenario; however, they continue to comply with regulatory minimums (Graph 176).

[142] This metric is part of the liquidity monitoring toolkit and allows incorporating into the analysis the different timing of inflows and outflows throughout the day.

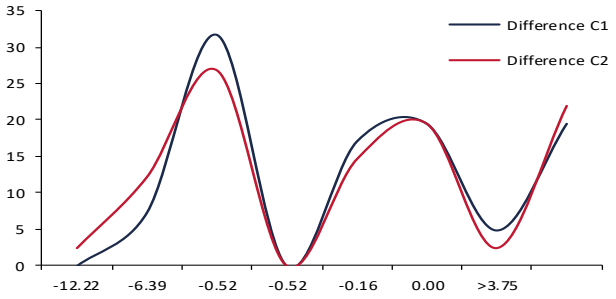
[143] See section VI.3. Stress testing of physical risks associated with the climate change, published in the Financial Stability Report of June 2022.

Graph 175
Capital adequacy ratio of the system with respect to the base scenario
Percentage points



Data through February 2024 and simulated figures up to the stress horizon
Source: Banco de México

Graph 176
Distribution of banks' CAR with respect to the base scenario
Percentage points



Data through February 2024 and simulated figures up to the stress horizon
Source: Banco de México

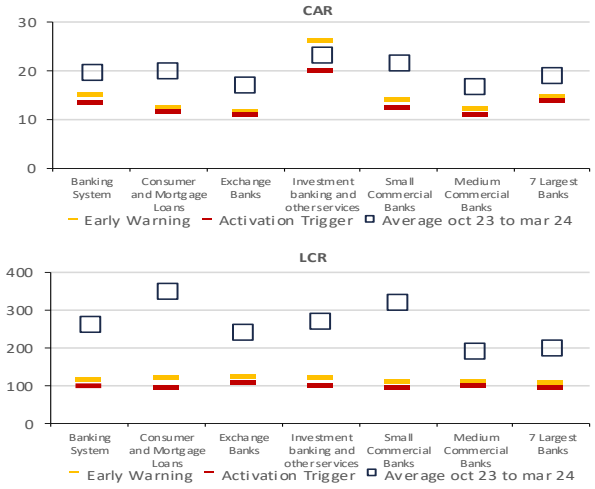
The results suggest that extreme hydro-meteorological events would affect the capitalization levels of the Mexican banking system. Although these are not insignificant, they do not represent a risk to its solvency. Furthermore, the impacts are heterogeneous, some institutions, with credit concentration in high-risk regions or sectors, may experience a greater loss of capital.

V.4. Recovery plans

The recovery plans of most commercial banks have improved in comparison to those presented in previous years. Regarding the new requirements for recovery plans, banks seem to struggle more to comply with the requirements related to the communication plan, followed by the new requirements related to recovery actions.[144] Thus, commercial banks should strengthen the communication strategy they would follow in a stress situation, as well as improve the measurement of the impact that recovery actions could have, the possible incompatibility between them, the description of the factors that would hinder their implementation and their respective mitigants, as these elements are fundamental for the effective implementation of recovery actions.

During the period from October 2023 to March 2024, banks presented levels of CAR and LCR above the activation thresholds established in the recovery plans of the different groups of banks (Graph 177).

Graph 177
Activation thresholds and observed data of CAR and LCR 1/
Percentage



Data of CAR and LCR from October 2023 to March 2024.
Source: Banco de México and CNBV.
1/ The graph shows averages of thresholds and observed data by type of institution. The most recent threshold available is considered. For the observed data, capped averages are presented due to scale issues, the LCR is capped to 350 and the CAR is capped to 25.

[144] With the entry into force of the new requirements of Annex 69, as of 2023 recovery plans must present greater granularity in: i) description of the institution; ii) description of the financial or business group; iii) participation of administrative units, officers and committees of the institution involved in planning and implementing the plan; iv) communication plan; v) indicators to assess the financial position; vi) recovery actions; and vii) stress tests.

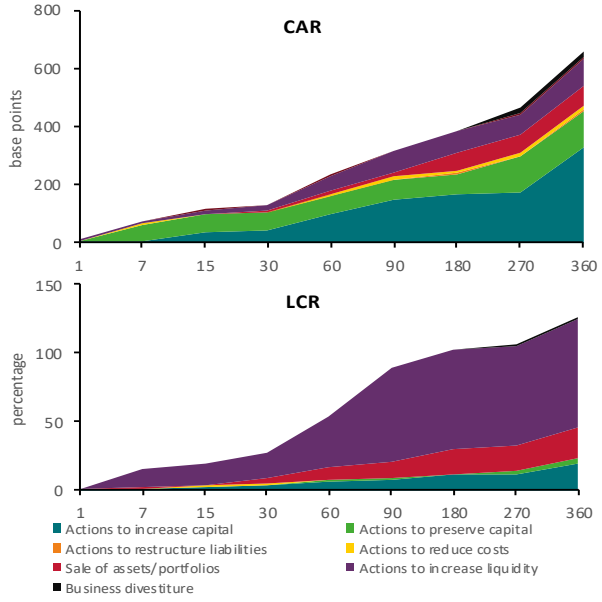
The capacity to recover, both for solvency and liquidity, from implementing the plans is reasonable provided that: i) the institutions manage to correctly execute the measures within the expected timeframe, ii) the potential impact of their recovery actions on their financial situation is not diminished, and iii) other simultaneous shocks do not occur (Graph 178).

Graph 178

Recovery Capacity of CAR and LCR [1/]

Vertical axis: Base points for CAR and percentage for LCR

Horizontal axis: days



Data of Recovery Plans submitted during 2023 and 2024.
Source: Banco de México.
1/ The expected impact of recovery actions on regulatory indicators is aggregated weighted by total assets.

Final considerations

As of the first half of 2024, the Mexican financial system shows a solid and sound position. The capital and liquidity levels of commercial banks remain far above regulatory minimums. During the period, international financial markets showed a behavior dominated by a slower than anticipated global disinflation dynamic, which has generated a delay in the convergence to the targets set by central banks and in turn, along with the resilience observed in the data related to economic activity, has led to expectations that monetary policy will maintain a restrictive stance for a longer period.

In April, the International Monetary Fund (IMF) revised global economic growth projections slightly upwards for 2024 and kept them unchanged for 2025. However, it highlights that this growth forecast is historically low, due to the influence of restrictive financial conditions, lower fiscal support in several countries, geopolitical tensions, weak productivity growth and economic fragmentation.

With respect to the monitoring of vulnerabilities and risks to the stability of the financial system, which could affect its proper functioning, it is identified that certain internal risks persist and some external risks have intensified. This *Report* considers the following macro-financial risks to financial stability: i) tighter financial conditions and/or for longer than expected; ii) a worsening of geopolitical tensions and/or trade conflicts; iii) the materialization of a systemic event with implications for the global financial system; and iv) unanticipated adjustments in the credit ratings for the sovereign or Pemex debt.

Thus, based on these risks, credit stress tests were conducted for the Mexican banking system. From the results obtained, it can be concluded that the Mexican banking system, as a whole, has sufficient capital levels to face the adverse scenarios simulated, although in some scenarios a deleveraging of the system is observed. However, in some of them, certain banks (which represent a low percentage of the system's total assets) could register greater impacts on their capitalization levels, while concentration risk could generate additional pressures. Leverage ratio levels, at an aggregate level, would also remain above the regulatory minimum.

Liquidity and credit risks for commercial banks remained stable and limited in the first half of 2024. On the one hand, market risk showed a decrease compared to the previous *Report*, while contagion risk increased during the period.

Other-non-bank financial intermediaries still face challenges, particularly related to restrictive financial conditions. Regulated entities recorded a recovery in the balance of funding obtained through bank loans; while non-regulated entities, which faced problems in obtaining funding in 2023, recorded a slight recovery in their funding and market funding conditions in the period for this *Report*. The sector's assets continue to represent a small fraction of the

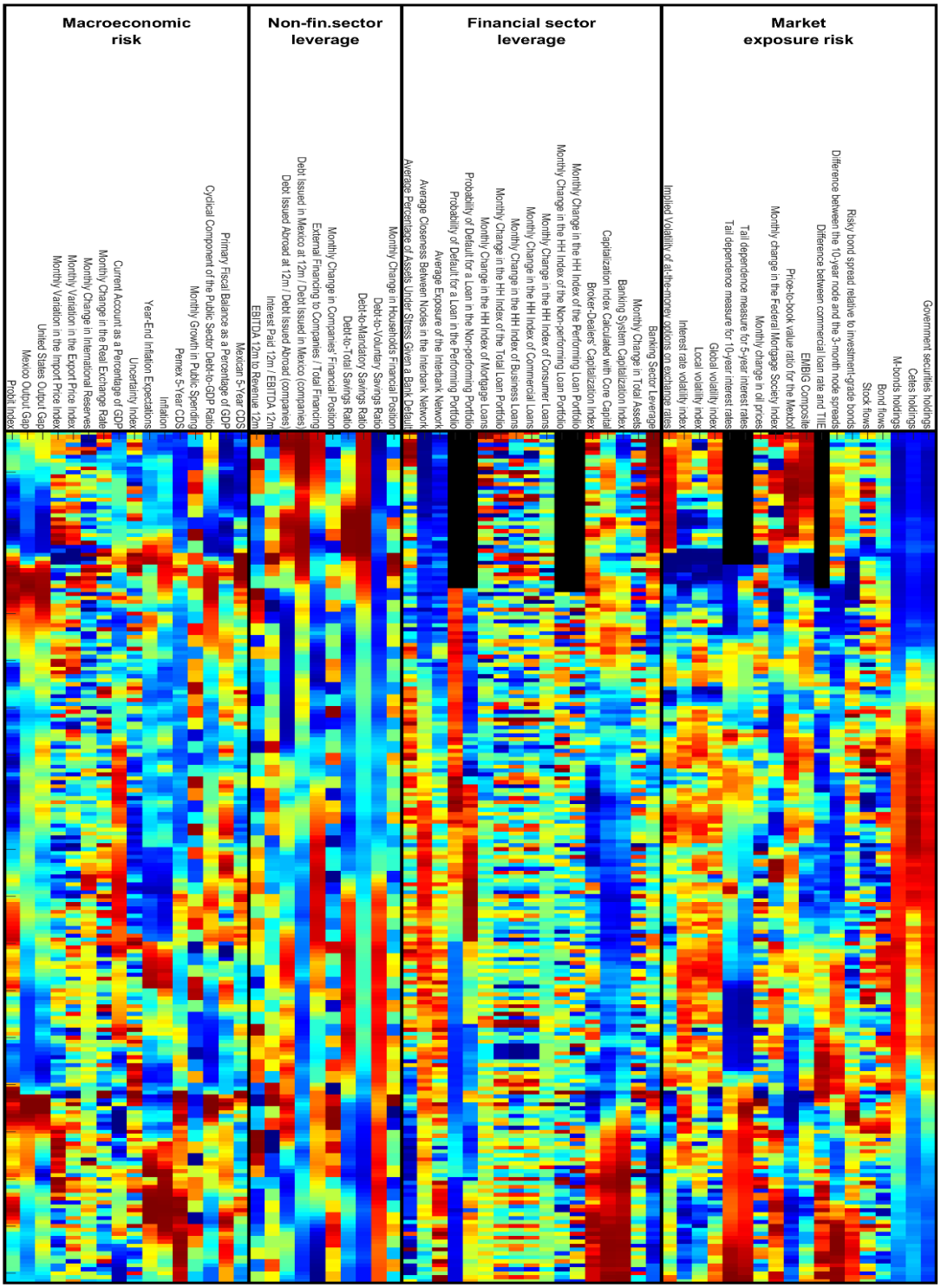
financial system. Although some entities in the non-regulated segment face significant challenges to refinance their debt, this situation does not currently represent a risk to the stability of the financial system due to their limited interconnection with the banking system.

During the period, the financial authorities implemented measures to improve the regulatory framework to keep it robust and updated, including the adoption of international standards and best practices. Accordingly, regulatory changes were made in the derivatives market, as well as in liquidity risk and sustainable finance. In addition, the facilities granted to financial institutions to support customers affected by Hurricane Otis in Guerrero were extended.

Finally, Banco de México remains vigilant to the evolution of the country's financial markets in order to take, if necessary, the actions required within its responsibilities, in coordination with other financial authorities and in strict compliance with its legal framework to maintain the stability of the financial system and the proper functioning of the payment systems.

Annex 1

Disaggregated Heat Maps of Mexican Financial System Risks



Data as of March 2024.
Source: Banco de México.

List of acronyms and abbreviations

Bancomext	National Foreign Trade Bank
Banobras	National Public Works and Services Bank
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BISL	Local Systemically Relevant Banks
BIVA	Institutional Securities Exchange
BMV	Mexican Stock Exchange
BONDES	Federal Development Bonds
BPAS	Savings Protection Bonds
CAR	Capitalization ratio
CBFI	Real Estate Investment Trust Stock Certificates
CCE	Special Accounting Criteria
CCD	Certificates of Capital Development
CCV	Mexican Central Securities Counterparty
CDS	Credit Default Swaps
Cenapred	National Disaster Prevention Center
Cerpis	Senior Trust Bonds for Investment Projects
cetes	Federal Treasury Bills
CF	28-Day Equilibrium Interbank Interest Rate (TIIE) Deposit Cost
CFE	Federal Electricity Commission
CFEN	Net Stable Funding Ratio
CNBV	National Banking and Securities Commission
CNSF	National Insurance and Bonding Commission
Conavi	National Housing Commission
Condusef	National Commission for the protection and defense of the users of financial services
Consar	National Commission for the pension system
CyRCE	Capitalization and Credit Risk
CUB	General Provisions Applicable to Credit Institutions (Single Banking Circular)
CVaR	Conditional Value at Risk
DOF	Official Gazette of the Federation
D-SIBS	Domestic Systemically Important Banks
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
ECB	European Central Bank
ESG	Environmental, Social and Governance
FIFOMI	Mining Development Trust
Fibras e	Energy and Infrastructure Investment Trusts
FIRA	Instituted Trusts in connection with Agriculture (Agricultural Trusts)
FLAO	Additional Ordinary Liquidity Facility

FND	National Farming, Rural, Forestry and Fisheries Development Bank
FONADIN	National Infrastructure Fund
FOVI	Banking Housing Financing Operation Fund
Fovissste	State worker's social security and services institute housing fund
FSB	Financial Stability Board
GDP	Gross Domestic Product
ICF	Financial Conditions Index
ICRCS	Capital Solvency Requirement Hedging Index
ICRT	Technical Reserves Hedging Index
IEMF	Financial Markets Stress Index
IFC	Crowdfunding Institutions
IFNB	Non-Banking Financial Institutions
IFPE	Electronic Payment Fund Institutions
IFRS	International Financial Reporting Standards
IGAE	Global Economic Activity Indicator
IIF	Institute of International Finance
IMF	International Monetary Fund
IMOR	Non-performing loans rate
IMORA	Adjusted non-performing loans rate
INEGI	National Geographical Statistics and Information Institute
Infonavit	Federal Housing Fund
IOSCO	International Organization of Securities Commissions
IPCC	Intergovernmental Panel on Climate Change
IPYC	Stock exchange index
IRS	Interest Rate Swaps
ITF	Financial Technology Institutions
LCR	Liquidity Coverage Ratio
LDI	Liability Driven Investment
LIF	Federal Income Law
LRITF	Financial Technology Institutions Regulation Law
LTV	Loan to Value
MexDer	Mexican Derivatives Market
Nafin	Nacional Financiera (Mexican Development bank)
NGFS	Network for Greening the Financial System
NICAP	Capitalization Level
OIFNB	Other Non-Banking Financial Brokers
PEF	Federal Expenditure Budget
Pemex	Mexican State oil company
PLD/FT	Money Laundering and Terrorist Financing Prevention
PRLV	Promissory Note with Interest Payable on Maturity

PTI	Payment to Income
pymes	Micro, small and medium-sized companies
RCS	Capital Solvency Requirement
REIT	Real Estate Investment Trust
RFSP	Public Sector Financial Requirements
ROE	Return on Equity
SAR	Retirement Savings System
SCV	Mortgage Credit Insurance
SHCP	Ministry of Finance and Public Credit
SHF	Federal Mortgage Society
SHRFSP	Historical Public Sector Financial Requirement Balance
siefores	Investment companies specializing in retirement funds (Pension Funds)
socaps	Savings and loan cooperatives
sofipos	Popular finance corporations
sofomes ENR	Non-Regulated Multi-Purpose Financial Companies
TIIE	Interbank Equilibrium Interest Rate
TMEC	United States-Mexico-Canada Agreement
VSM	Minimum Salary Multiple



BANCO DE MÉXICO®

www.banxico.org.mx