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According to the Political Constitution of Colombia, *Banco de la República* is responsible for safeguarding the price stability of the economy. The proper implementation of this task depends crucially on maintaining financial stability.

Financial stability is understood as a general condition in which the financial system (financial institutions, markets, and infrastructures):

1. Assesses and manages financial risks in such a way that it facilitates the performance of the economy and the efficient allocation of resources;
2. is capable of autonomously absorbing, dissipating, and mitigating the materialization of the risks that may arise as a result of adverse events.

This Financial Stability Report (FSR) presents the Central Bank's appreciation on the recent performance of credit institutions and their debtors, as well as on the main risks and vulnerabilities that could affect the financial stability of the Colombian economy. The FSR intends to keep the participants in financial markets and the public informed, besides promoting public debate on the trends and risks related to the financial system. The results herein presented also serve as a basis for the monetary authority to make decisions that promote financial stability in the general context of the constitutional objectives of price and macroeconomic stability.

This FSR is complemented by the Payment Systems Report, published annually by *Banco de la República*, which reports on the performance of the financial infrastructures of the Colombian economy.

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Glossary

ACO: OMO placement agent
PFM: Pension Fund Managers
HQLA: High quality liquid assets
LAM: Liquid assets adjusted for foreign exchange and market risk
TLS: Temporary Liquidity Support
BAAAFS: Banking Sector Benchmark Curve for Simple Fixed Rate Securities and AAA Rating
BAS: Bid-ask spread
BOE: Bank of England
BIS: Bank of International Settlements
BVC: Colombia Stock Market
CP: Collective portfolios
SLC: Savings and Loan Cooperatives
CD: Certificates of Deposit
CDS: Credit default swap
IB: Investment banks
FC: Finance companies
NSFR: Net stable funding ratio
COP: Colombian pesos
CCRC: Central counterparty risk clearinghouses
CUD: System of deposit accounts managed by *Banco de la República*
CSD: Central Securities Depository
DSGE: Dynamic Stochastic General Equilibrium
DTF: Fixed term deposit rate
CI: Credit institutions
ECB: European Central Bank
EUR: Euros
Fed: Federal Reserve of the United States
ASF: Available Stable Funding
RSF: Required Stable Funding
CIF: Collective investment funds
IMF: International Monetary Fund
FNA: *Fondo Nacional del Ahorro*
Frech: Reserve Fund for Portfolio Stabilization Mortgage
FSB: Financial Stability Board
ALC: Administrative and labor costs
GBP: Pounds sterling
NG: National government
CNG: Central National Government
BBI: Banking benchmark indicator
NPL: Quality indicator by default
QIR: Quality indicator by risk
ICE: Indicator of consolidated short-term exposure
FDI: Foreign Direct Investment
IIE: Individual indicator of short-term exposure
NBFI: Non-bank Financial Institutions
FEMI: Foreign exchange market intermediaries
IPSA: Stock Index of Chile
LRI: Liquidity Risk Indicator
CPI: Consumer Price Index
IRPR: Indicator of Risk Perception by Rating
IERR: Indicator of Exchange Rate Risk
LRI: Liquidity Risk Indicator

LIH: Low Income housing
BDBR: Board of Directors of *Banco de la República*
Libor: London Interbank Offered Rate
MADR: Ministry of Agriculture and Rural Development
MEXBOL: Mexican Stock Exchange Index
GFM: Gross Financial Margin
MHPC: Ministry of the Treasury and Public Credit
MSCI COLCAP: Colombian Stock Exchange Stock Market Index
IFRS: International Financial Reporting Standards
OIS: Overnight index swap
OMO: Open market operations
OPEC+: Organization of Petroleum Exporting Countries and allies
OPA: Takeover bid
PAD: Debtor Assistance Plan
PCMVR: National Plan for the Construction and Improvement of Low-Income Rural Housing
GDP: Gross Domestic Product
NLP: Net liquidity position
PCP: Proprietary cash position
LSRR: Liabilities subject to reserve requirements
TC: Technical capital
UAP: Unified Accounting Plan
FSR: Financial Stability Report
NLR: Net liquidity requirements
ROA: Return on assets
ROE: Return on equity
IMC: Investment management companies
SARC: Credit Risk Management System
SBF: Stock Brokerage Firms
FSC: Office of the Financial Superintendent of Colombia
TC: Trust Fund companies
SMMLV: Minimum legal monthly salary in effect
SPBLPGPT: Lima Stock Exchange Stock Market Index
SPBV: Retail payment system
SCA: Superintendency of Corporate Affairs
ST: Stress tests
Sysmo: Systemic stress model
TES: Public debt securities issued by the General Office of Public Credit and the National Treasury
TC: Trading companies
IMC: Investment management companies
PFM: Pension fund managers
RI: Intraday repo
IBR: Interbank rate
MPR: Monetary Policy Interest Rate
MER: Market exchange rate
USD: US dollars
UVR: Real Value Units
VAR: Autoregressive vectors
VeR: Value at Risk
PH: Priority housing
LIH: Low-income Housing
WATM: Weighted average term to maturity
WEO: World Economic Outlook

Executive Summary

Between March and September 2024, the period analyzed in this edition of the *Financial Stability Report*, some central banks in the world's major economies began reducing their interest rates in a context of lower inflationary pressures and a decreased likelihood of recession linked to the outlook for global economy. However, in an environment of high global debt, international financial markets have been susceptible to episodes of high volatility within a scenario of increased geopolitical tensions, uncertainty related to the recent elections in the United States, and escalating conflicts in the Middle East and Ukraine. These factors have affected market volatility, asset prices, and certain commodity prices in a context of a stronger US dollar, which has resulted in significant depreciations of most Latin American currencies vis-à-vis the dollar.

During the second and third quarters of 2024, the Colombian economy continued to adjust in an orderly manner in terms of economic growth, inflation, and external imbalances. The annual growth of Gross Domestic Product (GDP) in the third quarter stood at 2.0%, and full-year growth projections have been adjusted upwards to 1.9% for 2024 and 2.9% for 2025. Annual inflation continued to decline reaching 5.41% in October and keeps a converging path toward the 3.0% target. This process has been accompanied by a cautious easing of monetary policy aimed at achieving the 3.0% inflation target in 2025 and driving GDP growth on a sustainable long-term path. The current account deficit, on the other hand, continued to decline during the third quarter of 2024, standing at 1.6% of GDP, a figure lower than its historical average.

Despite this adjustment process, in recent months, the Colombian peso has depreciated vis-à-vis the dollar, reflecting, on the one hand, the international phenomena affecting all Latin American countries and, on the other, uncertainty regarding the fiscal situation in Colombia, which has raised concerns about the future path of public debt and has led to increases in the sovereign risk premium.

Assets of credit institutions (CIs) continued to register negative real growth, although in recent months the pace of decline has slowed compared to March 2024. Similarly, the loan portfolio (the main asset of these institutions) continued to experience real contractions in a context of lower risk-taking and a slight recovery in disbursements. Particularly, the consumer and commercial loan portfolios continue to exhibit smaller real declines, while housing loans began to exhibit positive growth rates. Surveys conducted by *Banco de la República* (the Central Bank of Colombia) give signs of higher demand for credit, especially for housing loans. As economic growth increases in a scenario of lower interest rates, a higher loan portfolio dynamic is expected. Meanwhile, CI investments exhibited increases in the context of valuations of local public debt instruments (TES in Spanish) until September 2024, after which these valuations have partially reversed.

Loan portfolio quality indicators continue to exhibit high levels of delinquency compared to the average of the last five years, but recent improvements have

been observed compared to the beginning of 2024. This behavior is mainly explained by consumer loans, which showed a significant decrease in the Non-performing Loans Indicator (NPL) compared to the credit risk materialization observed at the beginning of the year. It is also worth noting that household debt indicators continued to adjust downward. On the other hand, the commercial loan portfolio has experienced greater deterioration in specific sectors, such as commerce, industry, and construction. However, during the analysis period, CIs maintained a level of provisions that adequately covers their non-performing loan portfolio.

The profitability of CIs, measured by Return on Assets (ROA), stands below the average of the last five years but increased slightly during the second and third quarters of 2024, compared to the first quarter of the year. This slight improvement in profitability is mainly explained by investment valuations in the context of reduced market interest rates and lower loan-loss provisions compared to those observed in March 2024. This effect has been partially offset by lower interest income associated with the low growth of the loan portfolio. As credit demand rises, profitability recovery for CIs is expected to continue in the medium term.

CIs in Colombia maintain adequate capital adequacy and liquidity levels above regulatory minimums. In aggregate terms, the CIs' capital adequacy ratios have increased since mid-2024 and are now above regulatory minimums. Structural and short-term liquidity indicators also remained above regulatory limits. Particularly, the Liquidity Risk Indicator (LRI), defined as the ratio of liquid assets to short-term liquidity requirements, stood at 200%. Meanwhile, the Structural Liquidity Indicator (NSFR), which considers the stable funding needs of institutions, increased to 115.6%, a level above the regulatory minimum of 100%. Adequate levels of liquidity indicators demonstrate the resilience of CIs to meet liquidity needs.

During the analysis period, Banco de la República reduced the reserve requirement ratio on certain deposits held by credit institutions by 100 basis points (bps). In line with the Central Bank's Strategic Plan for the 2022-2025 period, it was deemed appropriate to review the role of reserves as a policy tool and it was found that the reserve level required to ensure the proper functioning of the payment system was lower than the existing one. By lowering intermediation costs, this reduction could support the process of financial deepening in the Colombian economy.

This Report also presents an analysis of the resilience of CIs through stress tests that assess their response to hypothetical extreme and low-probability adverse scenarios. The results suggest that, as a group, these institutions have sufficient capacity to face large-scale adverse shocks, which confirms their resilience during Colombia's recent macroeconomic adjustment process.

On the other hand, the assets of non-bank financial institutions (pension fund managers, trust companies, stock brokerage firms, insurance companies, among others) continued to grow, while their profitability remained stable. This performance is mainly explained by the dynamics of the third-party managed loan portfolio, which grew above its historical average. In particular, higher investments in TES by pension fund managers (who have become the largest holders of these

securities) explain this trend. The profitability of these institutions remained at positive and stable levels.

In compliance with its constitutional objectives and in coordination with the Financial System's Safety Net, *Banco de la República* will continue to closely monitor the financial stability outlook in this current context and will make the necessary decisions to ensure the proper functioning of the economy, facilitate sustainable credit and liquidity flows, and promote the proper functioning of the payment system.

Leonardo Villar Gómez
Governor

Vulnerability Analysis

Vulnerability Matrix

The identification and analysis of the main weaknesses in the Colombian financial system are complemented by a matrix of vulnerabilities faced by the financial system, which includes the current status, mitigating factors, and the evolution of each vulnerability over the past six months (Table A).

Table A
Vulnerability Matrix for Financial Stability

Vulnerability	Status	Mitigating Factors	Evolution
Deterioration of loan portfolio quality	- Decrease in consumer loan portfolio delinquency, stabilization in the microcredit portfolio.. - Higher materialization in the corporate loan portfolio, especially for smaller companies. - Continuation of the deterioration trend in the housing loan portfolio.	- Decrease in household debt-to-income ratio. - Labor market stability and resilience. - Coverage through CIs provisions. - Adequate capital adequacy and liquidity levels.	Decreased
Low profitability of CIs compared to their historical performance	- The profitability of CIs is at relatively low levels. - Lower net interest income resulting from the real contraction of the portfolio and deterioration of its quality. - High loan-loss provisions as a result of loan portfolio quality deterioration. - Higher income from investment valuation.	- Adequate capital adequacy levels of the CIs. - Adequate short-term and structural liquidity management for CIs.	Stable
Increased exposure to market risk	- Increase in TES holdings by financial intermediaries.. - Context of fiscal uncertainty that could affect the valuation of the National Government instruments. - Increased market stress to new information.	- Limited impact of possible materializations of market risk (VAR). - Prudential monitoring and regulation of market risk by financial authorities.	Increased

Source: Banco de la República.

In this edition, the identified vulnerabilities are: i) the materialization of credit risk in the context of low growth, high sectoral heterogeneity in economic performance, and economic uncertainty, ii) the deterioration in the performance of financial institutions due to low profitability of CIs in a context of stable capital adequacy (which has resulted from capitalization decisions by entities), and iii) an increase in exposure to market risk¹ in a context of fiscal uncertainty, higher participation of financial institutions in the TES market, and high sensitivity of international markets to negative economic data.

¹ Risk related to asset devaluation due to market price volatility.

The analysis in this edition of the *Report* points to a reduction in the vulnerability associated with the materialization of credit risk, although some indicators suggest that the risk remains high.

In recent months, improvements in the consumer loan portfolio quality indicators have consolidated, along with a downward trend in household debt indicators. Despite this, there is a need for monitoring the write-offs made by institutions in this loan portfolio, which partially explain the improvement in credit risk indicators. On the other hand, the microcredit loan portfolio, which had exhibited an accelerated deterioration in the previous version of this *Report*, has stabilized its delinquency indicators, while its risky loan portfolio has shown significant decelerations. In contrast, corporate loans and the housing loan portfolio continue to exhibit increases in their delinquency indicators, although moderated. The local economic environment of slow investment recovery and fiscal uncertainty makes continuous monitoring of these borrowers relevant, especially in sectors that could be more affected by a potentially more challenging situation than expected, such as smaller firms and sectors with a higher participation of vulnerable firms. The relative stability of the labor market, better economic growth prospects compared to the beginning of the year, and the adequate levels of capital adequacy, liquidity, and provisions of CIs are mitigating factors that allow facing this vulnerability.

In a context of stabilization of CIs' profitability at low levels and a high number of institutions with negative profitability, their capital and liquidity indicators remained stable and above their regulatory minimums. Therefore, no significant threats to the financial institutions' soundness are foreseen in the short term.

The recent importance of capitalizations, mainly by credit institutions that have been recording losses, reaffirms the commitment of the system's shareholders to its stability. Meanwhile, non-bank financial institutions exhibit high and stable profitability levels. Open-end collective investment funds recorded a decrease in their liquidity during the analysis period, although prudential indicators remain well above the regulatory minimums and are higher than those registered in 2023. Additionally, the supervisory standards, which follow international guidelines, are a mitigating factor that has led financial institutions in Colombia to have the necessary soundness to face the materialization of this risk.

The exposure to market risk for local financial institutions has increased with the rise in their investments (mainly in TES). The fiscal uncertainty, along with uncertainty about external financial conditions, could exacerbate this vulnerability.

During 2024, local financial institutions, both CIs and non-bank financial institutions, have raised their holdings of TES due to the withdrawal of foreign investors. This may have been influenced by fiscal uncertainty related to the General Participation System (GPS) and falling tax collection, as well as a lack of clarity on external financial conditions. Additionally, the recent sensitivity of global markets to negative factors could transmit volatility to local markets in less favorable scenarios than expected. Despite the above, stressed events of devaluation would have reduced impacts on most intermediaries, a mitigating factor that remains in place thanks to constant and prudent monitoring by financial authorities regarding this risk.

Shaded Section 1: Heat Map

The heat map is a tool that helps to simultaneously view the evolution over time of different variables grouped into specific categories reflecting both the performance of financial institutions and the financial and macroeconomic risks to which they are exposed. Each variable is represented using a color scale that assigns colors and shades based on its historical performance of the variables and some expert judgments. Thus, reddish tones indicate periods in which a variable is at risky levels, while green tones indicate periods of lower risk; yellow tones, in turn, reflect an intermediate point. In the case of some variables, such as asset price indexes or credit cycle indicators, which reflect risks when they exhibit both high and low values, blue shades are used to indicate the risk of low activity in the respective markets¹ (Graph S1.1). The map seeks to show graphically and comprehensively the evolution of a set of indicators used in the assessment and characterization of risks in a cross-sectional and historical manner.

With the most recent information available, the map still shows the process of orderly adjustment that the local economy is undergoing. The main risks continue to be concentrated on a few macroeconomic variables consistent with the slower pace of growth and the reduction of imbalances, the credit cycle (which remains at levels below its long-term trend), the housing market (which has shown slight recoveries), and market risk, all of which are discussed in detail below.

As can be seen, the macroeconomic variables indicators have shown consistent results with the orderly adjustment of the local economy. On the one hand, relatively low levels of economic growth have continued, which has led the indicator to show reddish hues, both for the aggregate and for the main components on the demand side (household consumption and gross capital formation). This has occurred within a context of deterioration of the National Government's fiscal metrics, lower growth in trading partners, and low local consumer confidence. Although inflation indicators remain in orange tones, the deviation from the target defined by *Banco de la República* has decreased and is expected to continue its convergence to green tones in the remainder of 2024 and early 2025. On the other hand, the Colombian unemployment rate remains in green tones, in a context of resilience of employment to the lower local economic dynamics. Similarly, the current account deficit has decreased, which implies less vulnerability to sudden changes in global financial conditions.

Credit risk has seen an improvement in loan portfolio deterioration over the last few months, leading the non-performing loans indicator² to lighter yellow tones, while the quality risk indicator³ remained in orange tones. The deterioration levels have affected the profitability of credit institutions, which has stabilized at reddish levels without impacting solvency levels, which are above regulatory limits. Slight improvements in the growth of non-performing loan portfolio⁴ and risky loan portfolio⁵ are highlighted, reaching light greens. In contrast, the coverage indicator, which measures the ratio of provisions to non-performing loan portfolio, has decreased, although it

1 Technical details on the reading, construction, and variables used on the map are provided in Box 1 of the September 2017 *Financial Stability Report*.

2 Defined as the ratio between the portfolio over 30 days past due and the total portfolio.

3 Defined as the ratio between the portfolio with a rating other than A and the total portfolio. The rating has five categories from A to E, with A being the best quality.

4 Defined as the portfolio more than 30 days past due.

5 Defined as the portfolio with a rating other than A.

Graph S1.1
Risk Map of the Colombian Financial System



Sources: Financial Superintendency of Colombia, National Administrative Department of Statistics (DANE in Spanish), Fedesarrollo, Bloomberg, and Banco de la República, calculations by Banco de la República.

remains above 100% for the aggregate loan portfolio. The growth of the write-off portfolio has shown significant growth that has taken the indicator to red levels.

On the other hand, the liquidity risk indicators of credit institutions have shown robustness during the period under analysis. The green shades of the liquidity risk indicator (LRI) and the Net Stable Funding Ratio (NSFR) reflect adequate buffers for intermediation, both in the short and medium term, while the funding gap (defined as the difference between portfolio and deposits) has narrowed. In this context, the leverage of the CIs has grown marginally.

Market risk indicators were marked by the recomposition of investment flows of public debt instruments and by looser local financial conditions. On the one hand, the volatility of fixed-income securities decreased in an environment of orderly liquidations of public debt instruments by foreign investors and significant purchases by pension funds. This performance may reflect positive adjustments in local and external financial conditions. The duration of the portfolios of credit institutions and non-bank financial institutions increased, in line with the greater exposure they have shown in that market. In turn, the equity market showed higher valuations in a context of lower volatility after a prolonged period of low growth (blue tones) in COLCAP growth. In turn, 5-year CDS, which reflect the country's risk perception, have shown improvements in the last six months, maintaining orange levels of risk. However, the most recent data have shown increases related to local fiscal uncertainty.

Finally, the heat map shows continued pressures in the housing market, which have resulted in the reddest shades for activity indicators and the bluest shades for housing prices in recent years (decreases in real terms). The low pace of new housing sales, which has resulted in an impact on high turnover ratios (the time required to sell the available units), could affect the creditworthiness of construction sector firms, which is why it is necessary to continue monitoring these variables. Despite this, in the recent past there have been recoveries in sales growth and smaller real decreases in price indices, which could reduce the vulnerability of this market in the near future.

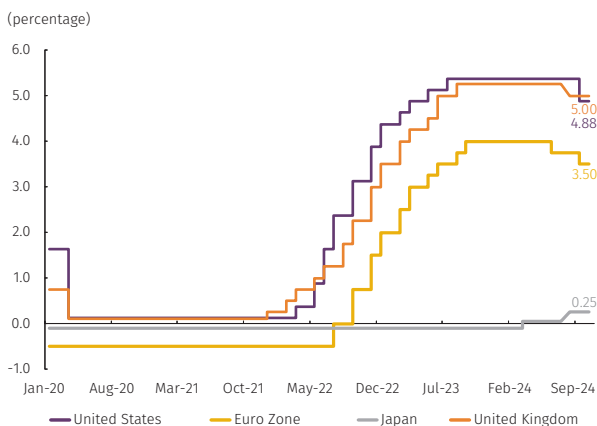
In conclusion, the recent evolution of the heat map reflects the adjustment process that the Colombian economy is currently undergoing. The lower lending activity reflects a cautious response to the deterioration of credit risk indicators, which in turn has impacted profitability indicators. Despite the deterioration in some of the financial intermediaries' performance indicators, their high levels of capital adequacy and liquidity allow them to face the possible materialization of various risks without compromising the stability of the financial system. In turn, the decrease in the current account deficit shows an adjustment to growth more consistent with the productive structure of the local economy.

1. Macroeconomic Context*

1.1 External Environment

Some of the major central banks have initiated a process of lowering their benchmark interest rates after a prolonged period of contractionary policies aimed at controlling inflation. In September 2024, the U.S. Federal Reserve (Fed) reduced its monetary policy rate by 50 basis points (bps), bringing it to a range between 4.75% and 5.0% (Graph 1.1). This decision considered the gradual decrease in inflation towards its target¹, slight signs of deterioration in the labor market, and an uncertain economic outlook. Similarly, the European Central Bank (ECB) lowered its benchmark interest rates by 25 bps in June, September, and October 2024 (for a total of 75 bps), decisions motivated by improvements in inflation, which is approaching its medium-term target. In the same way, the Bank of England reduced its monetary policy rate by 25 bps in its August meeting due to improvements in its inflation forecasts, along with expectations of a slowdown in its economic recovery. In contrast, the Bank of Japan increased its benchmark rate by 25 bps and halved its bond-buying program due to a weakening yen, which could affect inflation stability in the medium term. Despite the divergence in the case of Japan, lower interest rates internationally could translate into better financial conditions and greater liquidity for the local market and other emerging economies. A greater risk appetite from investors would not only favor the inflow of international capital. Still, it could also have favorable effects on the valuation of local assets and positive impacts on investment. These factors could drive local credit demand, accelerating loan portfolio recoveries and improving credit quality indicators.

Graph 1.1
Monetary Policy Interest Rates in Advanced Economies



Note: For the United States, the midpoint of its monetary policy interest rate range is shown.

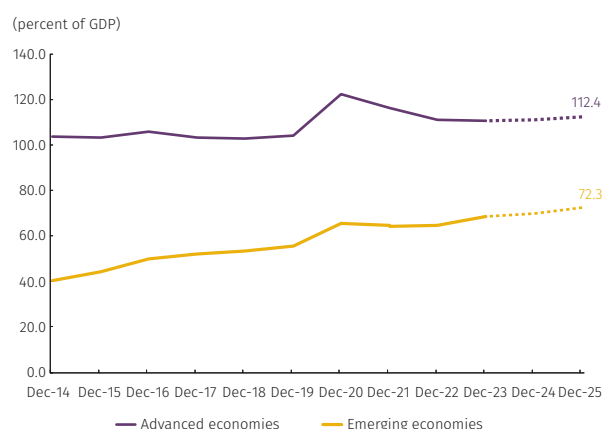
Source: Central banks of each jurisdiction.

The market anticipates a soft landing for the global economy. However, financial variables are highly susceptible to mixed signals, as evidenced by the volatility episode in August 2024. As indicated in the October 2024 World Economic Outlook (WEO) prepared by the International Monetary Fund (IMF), the probability of a global recession has decreased, and economic agents expect a slowdown without major disruptions for the global economy. Despite this, in recent episodes, financial markets have been affected by negative

* This chapter presents information as of 18 October 2024.

1 The Fed, the ECB, the Bank of England, and the Bank of Japan have inflation targets of 2.0%.

Graph 1.2
Debt-to-GDP ratio in Advanced and Emerging Economies



Source: Monitor Fiscal, April 2024 (IMF).

economic data, which has contributed to increased volatility. Specifically, in August 2024, a slower-than-expected recovery in the U.S. labor market, along with tightening monetary policy in Japan, led investors exposed to interest rate fluctuations to liquidate various positions in global assets, resulting in significant devaluations and increased volatility in financial markets and commodities. Particularly, oil prices, the local economy's main export commodity and a major driver of investment in Colombia, exhibited high volatility, impacting foreign investment flows². Although the effect of this shock quickly dissipated, this high sensitivity could represent a risk to international financial conditions.

After a period of loose fiscal policies globally, several expected adjustments could have a negative impact on capital flows to emerging economies. In response to spending needs and economic recovery plans generated by the pandemic, most global economies established expansive fiscal policies that have continued on average to the present day. This has led to significant debt-to-GDP ratio increases in advanced and emerging economies (Graph 1.2). Increases in interest on this debt could raise the financial burden, mainly on emerging economies (which have higher interest rates), and potentially reduce the benefit of looser financial conditions. In this regard, a shift in global fiscal policy is likely, involving either reduced public spending or increased taxation, factors that could negatively affect investment in emerging economies and their expected growth rate.

Risks related to geopolitical conflicts in the Middle East and Ukraine persist. Political elections in 2024 in several jurisdictions will be decisive for their future performance and relevant factors such as international trade and fiscal adjustments. The military conflicts between Russia and Ukraine and between Israel and Palestine (which has spread to other regions of the Middle East) have continued despite international pressure to find solutions. This, along with an uncertain context associated with presidential elections held throughout 2024, particularly in the United States, has impacted some commodities' prices and increased market volatility. The results of the elections will determine the future performance of variables such as debt levels, trade growth, and the stance of international monetary policy, all of which are crucial for global economic activity.

1.2 Internal Environment

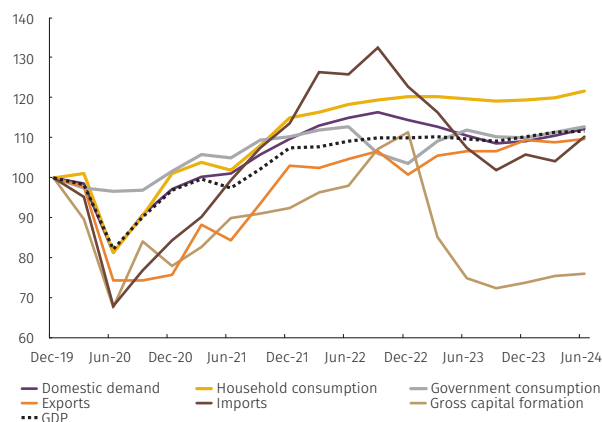
During the first half of 2024, the Colombian economy continued to adjust in an orderly manner regarding economic growth, inflation, and external imbalances. In the year's second quarter, GDP grew by 1.8% in its seasonally adjusted series, compared to the same period in 2023, mainly driven

2 This topic is further elaborated in section 2.2.3 of this Report.

Graph 1.3

A. Real GDP on the Expenditure Side

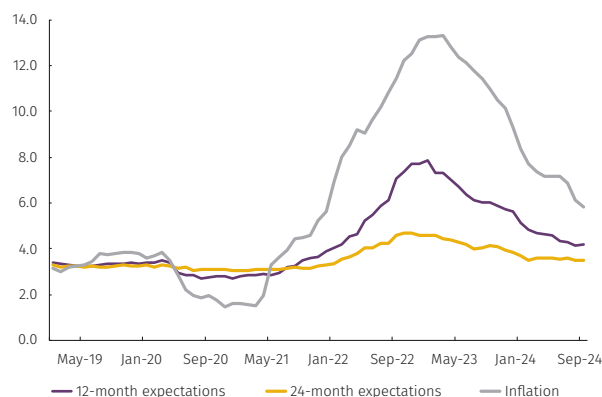
(index, 2019 = 100)



Source: DANE

B. Inflation and Inflation Expectations

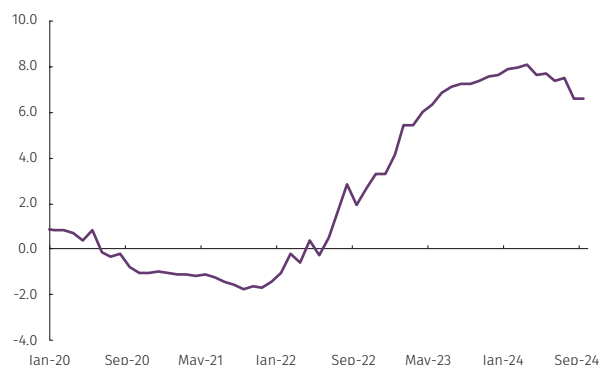
(percentage)



Note: Inflation expectations correspond to those recorded in Banco de la República's Monthly Survey of Economic Expectations of Analysts.
Source: DANE and Banco de la República.

C. Ex-Ante Real Interest Rate

(percentage)



Note: The ex-ante real interest rate is calculated as the difference between the monetary policy rate and 12-month inflation expectations of Banco de la República's Monthly Survey of Economic Expectations of Analysts.
Source: Banco de la República.

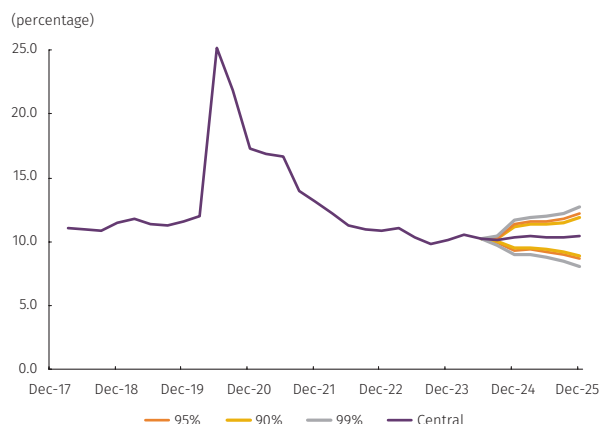
by household consumption dynamics. The contribution of the agricultural and services sectors to the growth dynamic stands out, as well as the slight recovery in commerce and construction³. Despite this, in the year-to-date these last two sectors continue to contract at rates close to 2.0%. Manufacturing, mining-energy, and the information and communications sectors all declined. Although investment expanded by 2.2%, its levels remain significantly below those that would have been reached if its pre-pandemic trend had been maintained (Graph 1.3, Panel A). Both the market and the technical staff of the *Banco de la República* anticipate higher growth for 2025, thus continuing with the recovery process that would positively impact the demand for credit and the recovery of credit institutions' profitability. On the other hand, annual inflation in August 2024 stood at 6.1%, below the forecasts of the technical staff of the *Banco de la República* and the market. This favorable adjustment, driven by the monetary policy stance, reinforces the expectation of convergence to the inflation target of 3.0% by the end of 2025 (Graph 1.3, Panels B and C). Meanwhile, the current account deficit continued to reduce in the second quarter of 2024, standing at 1.6% of GDP; however, a slight widening is expected in the second half of the year, in line with the recovery of domestic demand.

The labor market has shown recent improvements driven by service activities. A negative impact on households' creditworthiness could be expected if a less favorable dynamic materializes. In its seasonally adjusted version, the national unemployment rate stood at 10.0% as of August. Although the indicator exhibited an upward trend until the first quarter of 2024, it reversed this trend and has shown improvements in recent months. Seven out of the thirteen productive sectors exhibited declines in employment, with sectors such as construction, public administration, and real estate activities being notable examples. Meanwhile, the industries that contributed positively to the variation in the employed population are related to service activities. The technical staff of the *Banco de la República* projects a relatively stable unemployment rate, with moderate increases by the end of 2024, reaching 10.4% as the most likely value, a level that would remain until 2025 (Graph 1.4). Adverse effects on household creditworthiness could be expected if higher unemployment scenarios materialize. This would reverse the recovery of quality indicators of the consumer loan portfolio and worsen the deterioration trend in housing loans, a factor discussed in detail in Chapter 2.2.2 of this Report.

In line with the international environment, the Colombian economy faces challenges in meeting its fiscal targets.

3 The sectors that contributed the most to economic growth in the second quarter of 2024 were agriculture (1.0%); public administration, defense, education, and health (0.8%); and artistic, entertainment, and recreational activities, and other service activities (0.4%).

Graph 1.4
National Unemployment Rate Forecast



Note: the graph exhibits the forecast path of the central scenario of *Banco de la República*'s technical staff, as well as 90%, 95%, and 99% confidence intervals on this path. Quarterly and seasonally adjusted data.

Source: November 2024 Labor Market Report, *Banco de la República*.

According to the *Medium-Term Fiscal Framework* for 2024 (MTFF-2024), prepared by the Ministry of Finance and Public Credit, the estimated fiscal deficit for 2024 stands at 5.6% of GDP, meeting the targets established by the fiscal rule but increasing compared to the previous forecast of 5.3%. Despite the Colombian Government's commitment to comply with the fiscal rule, statistics from the Colombian Tax and Customs National Authority (DIAN in Spanish) exhibit a 9.7% decline in revenues during this year so far, compared to the results of the previous year, which generates additional pressure to achieve the deficit target. Recently, the Government proposed a financing law to raise around 0.7 percentage points (pp) of GDP to facilitate compliance with fiscal commitments for the upcoming year.

Given the above, the main macroeconomic risks that could affect local financial stability are: 1) volatility in global financial markets and its repercussions in terms of risk aversion toward emerging economies, 2) the potential weakening of Colombia's fiscal position, and 3) an eventual deterioration of the labor market. In Chapter 3 of this *Report*, we present a stress test exercise to evaluate the resilience of credit institutions (CIs) to extreme and low-probability macroeconomic and financial shocks that would result from the hypothetical joint materialization of these vulnerabilities.

2. Vulnerabilities of the Financial System

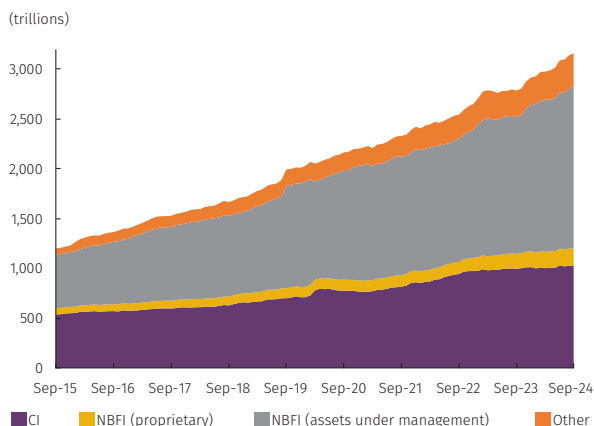
This chapter analyzes the evolution of the overall situation of financial institutions between the first and third quarters of 2024 in the context of an orderly economic adjustment characterized by falling inflation, with expectations for this trend to continue, lower interest rates, and economic recovery. The first two sections detail the performance of the main variables of the financial system during the analysis period, while the following sections identify and analyze the vulnerabilities faced by the financial institutions: credit risk, market risk, liquidity risk, and interest rate in the banking book risk, in order to provide an updated assessment and future outlook.

2.1 Current Situation of the Financial System

This section analyzes the institutions that comprise the Colombian financial system, whose total assets as of September 2024 amounted to COP 3,160.0 trillion (t) (Graph 2.1). The first part focuses on credit institutions (CIs)¹, whose assets represent 32.6% of the system's total and 65.4% of the 2023 GDP (COP 1,028.7 t). The second part focuses on non-bank financial institutions (NBFIs), which account for 56.9%² of the total assets of the system and 114.3% of the 2023 GDP: COP 174.6 t in proprietary position and COP 1,622.9 t in assets under management³.

Between the first and third quarters of 2024, the main balance sheet accounts of CIs, both at individual and consolidated levels⁴, continued to recover. The pace of contraction in real terms⁵ for investments and the loan portfolio has slowed.

Graph 2.1
Composition of Financial System Assets



Note: the acronym CI stands for credit institutions, NBFi for non-bank financial institutions, and Other for infrastructure providers, special government institutions and companies specializing in electronic deposits and payments.

Source: Financial Superintendency of Colombia, calculations by Banco de la República.

- 1 Credit Institutions (CIs) are those financial institutions whose primary function is to collect resources from the public in legal tender in the form of demand or term deposits and to reallocate these funds through loans, discounts, advances, or other active credit operations. This group includes banks, finance companies (FCs), investment banks (IBs), and financial cooperatives.
- 2 The remaining 10.6% of the financial system's assets correspond to infrastructure providers, special official institutions, and companies specialized in electronic deposits and payments.
- 3 Assets under management correspond to capital that financial institutions hold or manage on behalf of their clients, while proprietary account assets refer to the institutions' own capital.
- 4 Regulations require CIs to report their financial statements individually (i.e., covering only the business of the CI considered as an individual legal entity) and, if applicable, on a consolidated basis (i.e., including the business of local and foreign banking subsidiaries with which the CI has ownership ties). This section separately includes an analysis of vulnerabilities using the financial statements reported individually and those on a consolidated basis.
- 5 The real growth figures presented in this Report were calculated using the consumer price index (CPI) less food.

However, the deterioration of the latter remains a significant risk factor and is therefore monitored throughout this *Report*.

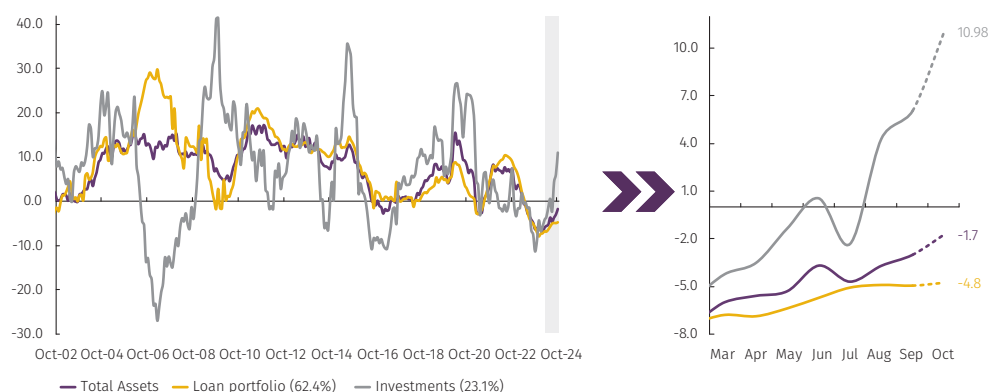
2.1.1 Credit Institutions: Individual Balances⁶

The total assets of the CIs show a slower real decline than that observed in March 2024 due to a slower real contraction of the loan portfolio and the recovery of investments. During the second and third quarters of 2024, total assets continued the positive trend seen since March 2024 (Graph 2.2). Although it remains in a contracting phase, in the context of orderly adjustment of the balance sheet accounts of CIs, the real annual growth rate is less negative compared to six months ago. This performance has been driven mainly by investments, which account for 23.7%, and exhibited recoveries in an environment of price valuations and increased issuance of local public debt instruments (TES)⁷ after declining in real terms since mid-2023. Regarding the loan portfolio, which accounts for 61.4% of total assets, although its rate of contraction is lower than that of March 2024, its contribution to total asset growth is still negative.

Graph 2.2

Real Annual Growth of Credit Institutions' Assets and their Main Components

(percentage)



Note 1: The dotted lines correspond to preliminary data from October 2024 from Form 281 of the Financial Superintendency of Colombia, which contains weekly information on the main balance sheet accounts of credit institutions.

Note 2: The real growth presented in this graph were calculated using the Consumer Price Index (CPI) less food.

Note 3: The share of the main accounts in total assets is shown in parentheses.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

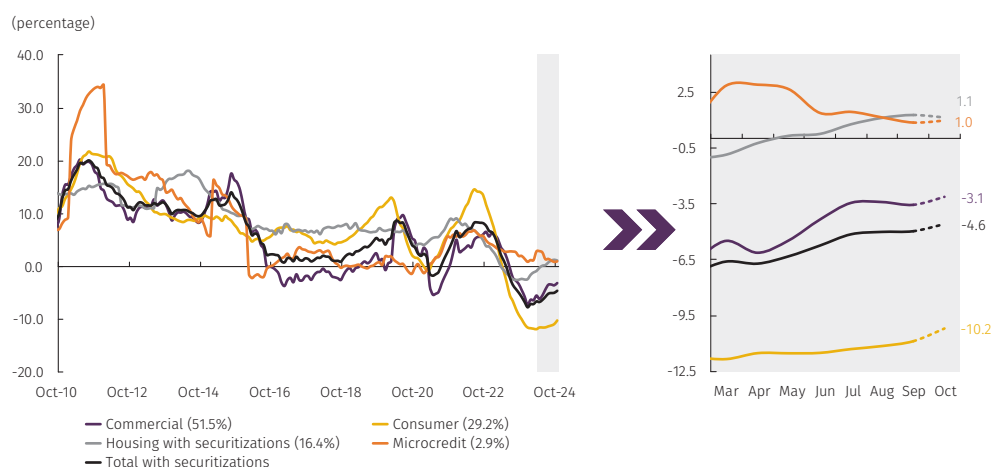
Since the second quarter of 2024, the real rate of contraction of the gross loan portfolio of the CIs has decreased. This is due to less negative growth rates in consumer and commercial loan portfolios, the recovery of housing loans, and the positive growth of microcredit loans. As of September 2024, the gross loan portfolio of the CIs stood at COP 683.4 t (43.5% of the 2023 GDP), showing a nominal annual growth of 1.2%. Of this balance, 95.9% was in local currency, and the remaining portion was in foreign currency, the latter showing annual nominal decreases since mid-2023 (-0.4% as of September 2024). Regarding real annual growth, in the context of falling inflation, the gross loan portfolio continued to contract, although

⁶ As of the publication date of this Report, official information from the monthly balance sheets of CIs up to September 2024 was available. Therefore, the graphs and analysis presented in this subsection mostly use this cutoff date. However, for total asset balances, investments, and the loan portfolio, preliminary data from October 2024 from the Financial Superintendency of Colombia (SFC in Spanish) Form 281 is presented, which includes weekly information on some balance sheet accounts of CIs.

⁷ See section 2.2.3 of this Report.

at a slower pace since the end of the first quarter of 2024 (Graph 2.3). This performance is due to the similar trend in the consumer and commercial loan portfolios, which account for 81.1%. Meanwhile, housing and microcredit loans have positively contributed to the overall loan portfolio dynamics and exhibit similar growth rates. For housing loans, the rate recorded as of September 2024 indicates a slight upturn in growth, while for microcredit loans suggests a slow deceleration.

Graph 2.3
Real Annual Growth of the Gross Loan Portfolio of Credit Institutions



Note 1: The dotted lines correspond to preliminary data for October 2024 from Form 281 of the Financial Superintendency of Colombia, which contains weekly information on the main balance sheet accounts of credit institutions.

Note 2: The real growth rates presented in this graph were calculated using the Consumer Price Index (CPI) excluding food.

Note 3: The share of the types of loan in the total loan portfolio is shown in parentheses.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

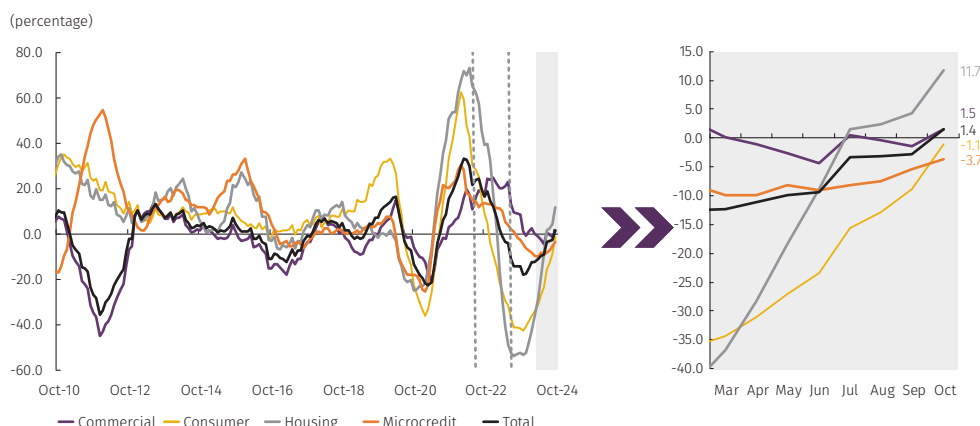
In line with the performance of the gross loan portfolio, in an environment of lower interest rates, disbursements have maintained the upward trend seen since the beginning of 2024. The slower real annual contraction in disbursements continued for all types of loans between the first and third quarters of 2024, except for commercial loans, which experienced negative real growth from March to September 2024 (Graph 2.4). This deceleration may be related to a restrictive stance by CIs in granting these loans due to a recent deterioration in their creditworthiness and the performance of local investment, which, although showing recovery signs, remains below the levels that would have been reached if the pre-pandemic trend had continued. In contrast, disbursements for housing loans recovered, showing positive real growth since July 2024. Disbursements for consumer and microcredit loans exhibited a slower contraction. This occurred in an environment of falling interest rates, where, since the end of 2023, the rate for consumer, housing, and commercial loans has decreased more than the monetary policy rate (Graph 2.5). These dynamics may reflect expectations of lower rates, in line with high confidence in the convergence of inflation toward the target.

According to the results of the latest *Report on the Credit Situation in Colombia*⁸, during the third quarter of 2024, demand indicators for all types of loans exhibited a positive balance, suggesting a slight recovery, according to the perception of the CIs. Likewise, the credit supply perception indicator and the productive sector's⁹ perception of credit availability increased. The latter approached the historical av-

8 For more details, see the Report on the Credit Situation in Colombia from September 2024.

9 The institutions in the productive sector analyzed correspond to industry and mining, transportation and communications, and large retail chains, from the four main cities of Colombia (Quarterly Survey of Economic Expectations, July 2024).).

Graph 2.4
Real Annual Growth in Cumulative Disbursements of Credit Institutions
Over the Last Twelve Months

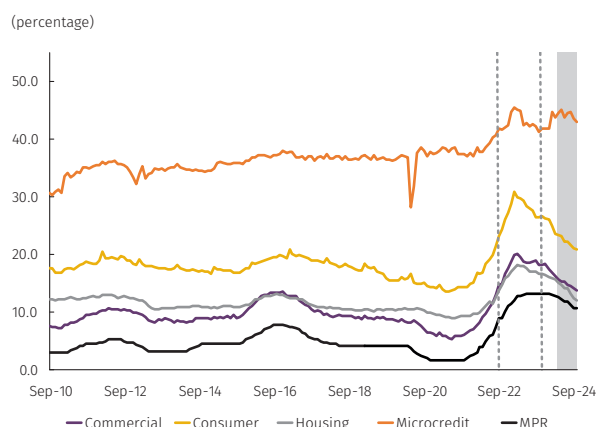


Note 1: The vertical lines indicate changes in the reporting of disbursement information and rates of credit institutions. As of July 2022, the Financial Superintendency's Form 088 "Weekly Report – Lending Interest Rates" ceased to exist and in its place Form 414 "Lending Interest Rates by Type of Loan" was created. In the change of the information report, some credit products were eliminated, and new segments were created. Therefore, information after July 2022 is not strictly comparable with the previous data. On the other hand, in October 2023, Form 414 was modified to include the new microcredit segmentation, according to Decree 455 of 2023. In this respect, the information is not strictly comparable after this date.

Note 2: The real growth was calculated using the Consumer Price Index excluding food.

Source: Financial Superintendency of Colombia, calculations by Banco de la República.

Graph 2.5
Monthly Loan Portfolio Disbursement Interest Rates



Note: The vertical lines indicate changes in the reporting of disbursement information and rates of credit institutions. As of July 2022, the Financial Superintendency's Form 088 "Weekly Report – Lending Interest Rates" ceased to exist and in its place Form 414 "Lending Interest Rates by Type of Loan" was created. In the change of the information report, some credit products were eliminated, and new segments were created. Therefore, information after July 2022 is not strictly comparable with previous data. On the other hand, in October 2023, Form 414 was modified to include the new microcredit segmentation, according to Decree 455 of 2023. In this respect, the information is not strictly comparable after this date.

Source: Financial Superintendency of Colombia, calculations by Banco de la República.

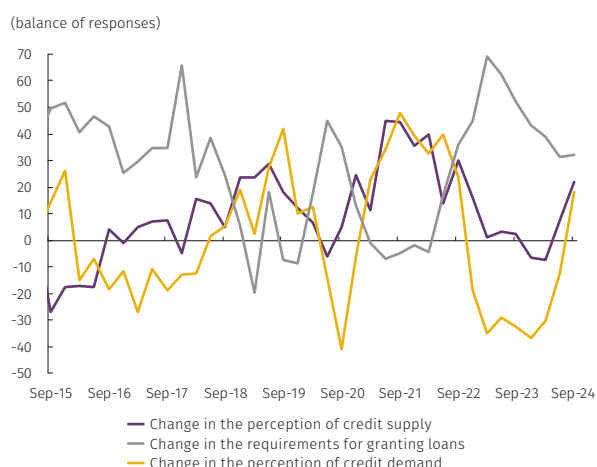
erage, suggesting a greater perspective on credit access (Graph 2.6). In line with the forward-looking message from the previous *Report*, in the context of inflation converging toward the target, broader financial conditions, driven by a lower monetary policy rate, a recovery in investment, and expectations of higher credit demand, the recovery in the credit market is expected to continue in the coming year.

The non-performing loans indicator (NPL)¹⁰ remains high for the total loan portfolio. Corporate loans (commercial and microcredit) and housing loans have slightly deteriorated since the beginning of 2024. As of September 2024, the total non-performing loan portfolio stood at COP 39.0 t, with a decrease in real terms of 0.1%, after peaking at 26.6% at the end of 2023. By type of loan, however, the growth of the non-performing loan portfolio has accelerated. Particularly, commercial loans exhibited an upturn after experiencing reductions since early 2024. Furthermore, the NPL for this type of loan increased by 30 basis points (bps) between the first and third quarters of 2024, reaching 3.9% (Graph 2.7). This latter, along with the NPL for microcredit loans at 9.6%, which is above the historical average (6.6%), suggests a challenging phase for the quality of the corporate sector's loan portfolio. Regarding households, the non-performing portfolio of consumer loans has been contracting in real terms since the second quarter of 2024, and its NPL decreased by 80 bps between March and September 2024. However, write-offs in this type of loan con-

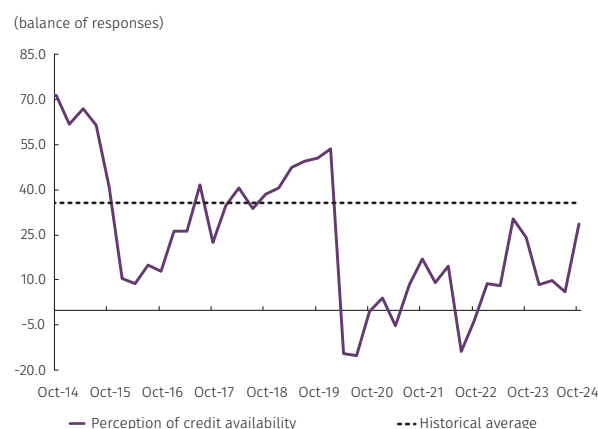
¹⁰ The non-performing loans indicator is calculated as the ratio between the non-performing loan portfolio and the total gross loan portfolio (the non-performing loan portfolio includes the balance of credits thirty or more days overdue).

Graph 2.6
Perception of the Credit Market

A. Credit Institutions



B. Companies in the Productive Sector

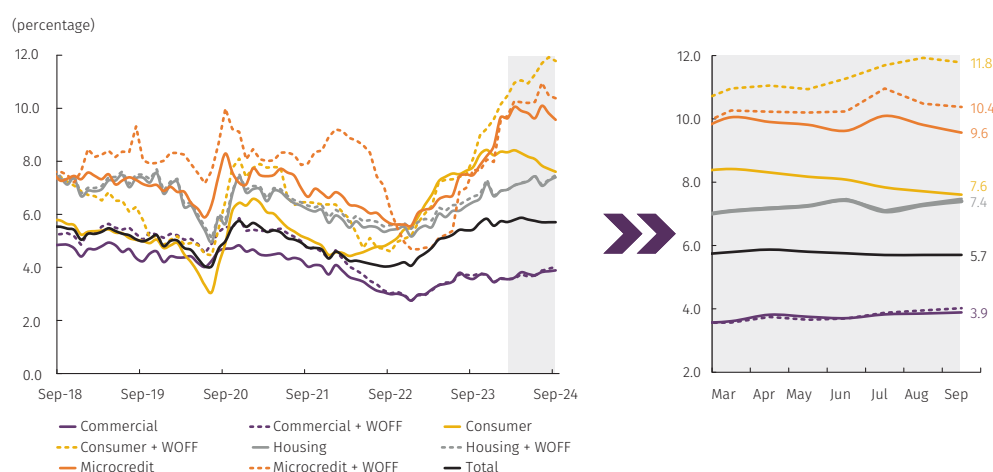


Note 1: Includes the manufacturing and mining industries, large chains stores, transportation, and communications.

Note 2: The balance of responses is defined as the sum of high and stable perception minus low perception (high + stable – low).

Source: Survey on the Credit Situation in Colombia, September 2024; calculations by Banco de la República.

Graph 2.7
Non-Performing Loans Indicator and Non-Performing Loans
Indicator + Write-offs of Credit Institutions



Note 1: The non-performing loan indicator is calculated as the ratio between the non-performing loan portfolio and the total gross loan portfolio (the non-performing loan portfolio includes the balance of loans that have not been paid for more than 30 days).

Note 2: The dotted lines correspond to the non-performing loan with write-offs (+C), which is calculated as the ratio between (i) the sum of the non-performing loan portfolio and the 12-month cumulative written-off loans net of recoveries, and (ii) the sum of the total gross loan and the 12-month cumulative written-off loans net of recoveries.

Note 3: The non-performing housing loan portfolio differs from the one usually reported by the SFC because the SFC uses as non-performing housing loan portfolio the past-due installments for delinquency periods of one to four months, while this report also includes the total principal of the loan.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

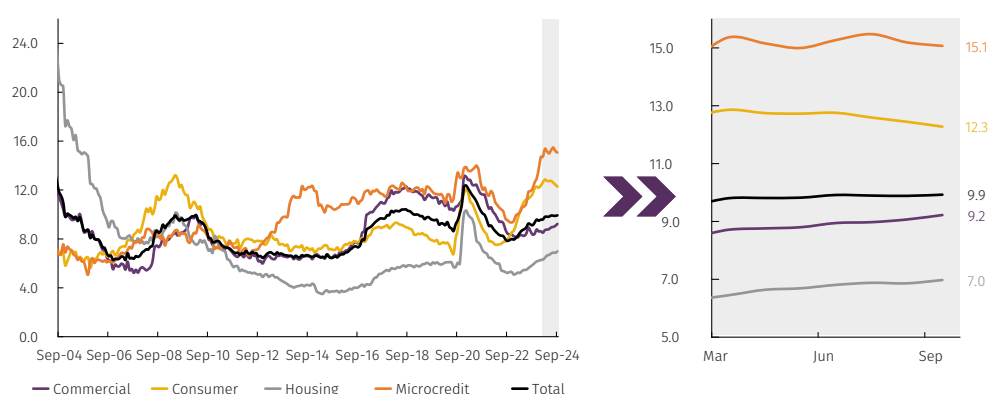
tinue to increase, as reflected in the NPL with write-offs¹¹, which exhibited an increase of 80 bps during the same period. In contrast, the non-performing portfolio of housing loans remains at high levels of growth compared to its historical figures, and its NPL reached values not seen since late 2020, suggesting a recent greater deterioration.

¹¹ The non-performing loans indicator with write-offs is calculated as the ratio between 1) the sum of the non-performing loan portfolio and write-off credits accumulated over the past twelve months, net of recoveries, and 2) the sum of the total gross loan portfolio and write-off credits accumulated over the past twelve months, net of recoveries.

Since March 2024, the quality risk indicator (QRI)¹² for all types of loans has slightly increased, except for consumer loans, although for both consumer and microcredit loans, the indicator remains above the historical average. As of September 2024, the total risky loan portfolio stood at COP 67.8 t after registering a real annual growth of 3.5%, suggesting a slight upturn in the slowdown trend observed since late 2023. The increase in the risky loan portfolio has impacted the total QRI, which rose by 30 bps between the first and third quarters of 2024 (Graph 2.8). By type of loan, the indicators for the corporate sector's loans (commercial and microcredit) and housing loans have also increased in the last six months (70 bps for commercial and housing loans and 30 bps for microcredit). In contrast, the QRI for consumer loans decreased slightly by 40 bps.

Graph 2.8
CIs' Quality Risk Indicator (QRI)

(percentage)



Note: The Quality Risk Indicator is calculated as the ratio between the risky portfolio and the total gross loan portfolio (the risky loan portfolio corresponds to the balance of loans with a rating other than A, on a scale between A and E, where A is the best rating).

Source: Financial Superintendency of Colombia, calculations by Banco de la República.

The CIs maintain an adequate level of provisions to cover the deterioration of the loan portfolio. However, for microcredit loans, the coverage ratio is at low levels not seen since 2008. The total provision balance stood at COP 41.9 t after registering a real annual growth rate of -4.7%. For thirteen months, negative real growth has been observed, mainly due to the use of the countercyclical component¹³ by some CIs to address the loan portfolio deterioration observed over the last year. Using this component implies that CIs must reconstitute the balance of countercyclical provisions that have been decumulated, which could impact their cash flow. The misalignment of this re-accumulation with the credit market conditions and the measures that the Financial Superintendency of Colombia (SFC in Spanish) has taken to mitigate it are discussed in detail in Box 2. On the other hand, given the still high balance of non-performing loan portfolio, CIs maintain coverage ratios¹⁴ above 100% for consumer and commercial loans. However, for the latter, the ratio has decreased by 10.9 percentage points (pp) between March

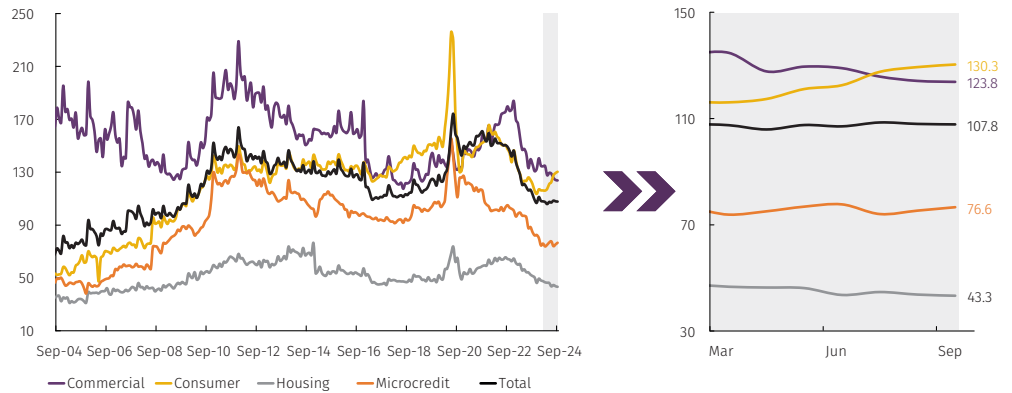
12 The quality risk indicator is calculated as the proportion between the risky loan portfolio and the total gross loan portfolio (the risky loan portfolio corresponds to the balance of loans rated other than A on a scale from A to E, where A is the best rating).

13 Provisions correspond to the funds that CIs maintain to cover potential future obligations. These comprise procyclical, countercyclical, and other provisions. The procyclical component refers to provisions made for each borrower based on their risk rating. The countercyclical component refers to provisions accumulated for each borrower to be used later during periods of high loan portfolio deterioration, and the "other" category mainly consists of provisions for housing and microcredit loan portfolios.

14 The coverage ratio is defined as the ratio between the provision balance and the non-performing loan portfolio balance.

Graph 2.9
Coverage Ratio

(percentage)



Note 1: The coverage indicator is defined as the ratio between the balance of provisions and the non-performing loan portfolio.

Note 2: The housing coverage ratio differs from the one usually reported by the SFC because the SFC uses as non-performing housing loan portfolio the past-due installments for delinquency periods of one to four months, while this report also includes the total principal of the loan.

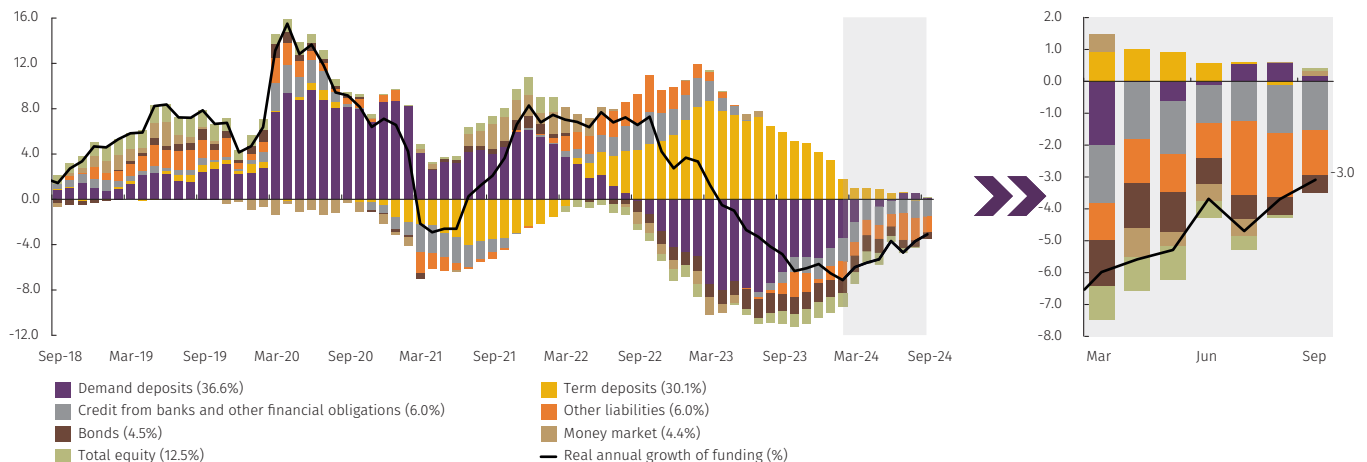
Source: Financial Superintendency of Colombia, calculations by Banco de la República.

and September 2024 due to the rise in delinquencies (Graph 2.9). Similarly, for housing loans, the ratio decreased by 3.4 pp¹⁵, while for microcredit, it remained close to 75.6%, suggesting low coverage in this type of loan.

The recovery in demand deposits has led to a slower contraction in CI funding¹⁶. Between March and September 2024, the real annual growth rate of funding went from -6.0% to -3.0%, driven by demand deposits, which account for 36.1% and whose growth has accelerated since July 2024 (Graph 2.10). In contrast, term deposits, which represent 30.2% and which, since the beginning of 2022, had high growth

Graph 2.10
Real Annual Growth of Funding and Contribution to the Growth of its Components

(percentage)



Note 1: The share each item has in funding is in parenthesis (liabilities + equity) as of August 2024.

Note 2: Term deposits include CDTs and CDATs.

Note 3: Other liabilities mainly include accounts payable and convertible securities (Bocas and Boceas).

Note 4: Real annual funding growth is calculated using the consumer price index excluding food.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

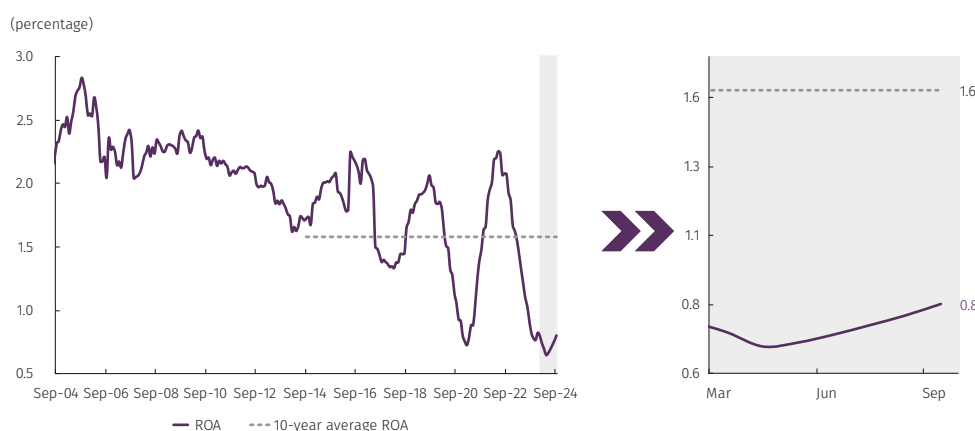
¹⁵ Provisions are calculated on the part of the loan not covered by the collateral. Since the collateral in the housing loans corresponds to the value of the financed property, provisions are lower than those in other types of loans. Therefore, the housing coverage ratio has historically been below 100%.

¹⁶ Funding corresponds to the sum of liabilities and equity.

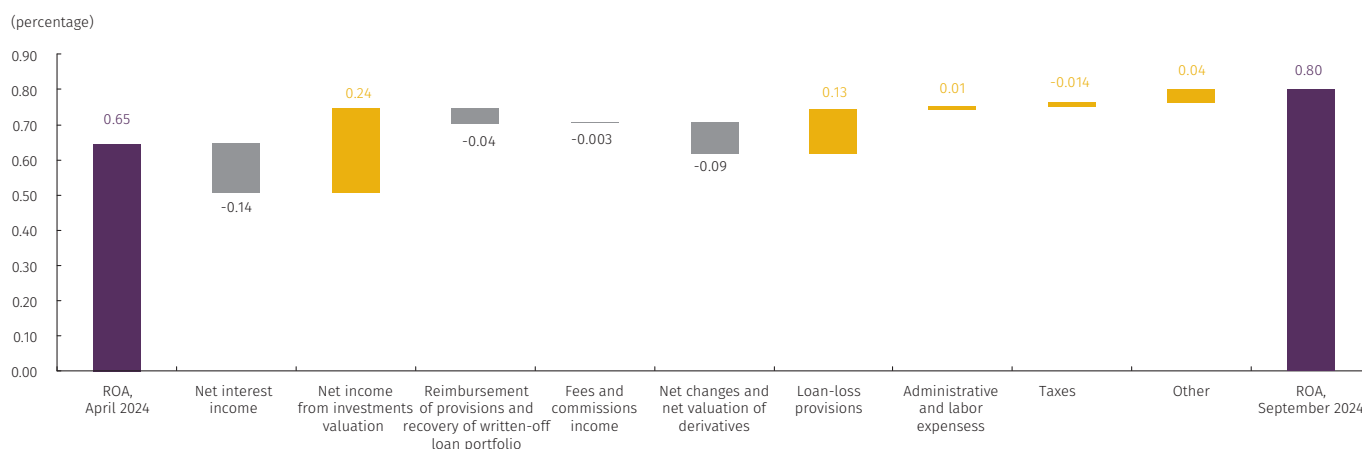
rates and contributed positively to funding, recorded a real contraction of -0.04%. The above, in the context of loosening local financial conditions and decreasing credit. Although CIs may have incentives to recompose their funding sources towards demand deposits (given the expected reduction in the monetary policy rate), if credit demand continues to recover and the credit market becomes more dynamic, institutions may once again boost their fundraising through term deposits¹⁷.

After remaining relatively stable at around 0.7%, the return on assets (ROA)¹⁸ of CIs increased slightly in recent months, although it remains below the average of the last ten years. Between March and September 2024, the ROA increased by 10.3 bps to reach 0.8%¹⁹ (Graph 2.11). This increase is due to higher income from investment valuation (particularly from government bonds (TES)) and lower loan-loss provi-

Graph 2.11
Aggregate Return on Assets (ROA)



Graph 2.12
ROA Breakdown



Note 1: Shade of gray (yellow) indicate a negative (positive) contribution to ROA.

Note 2: Other includes net income from money market transactions and equity.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

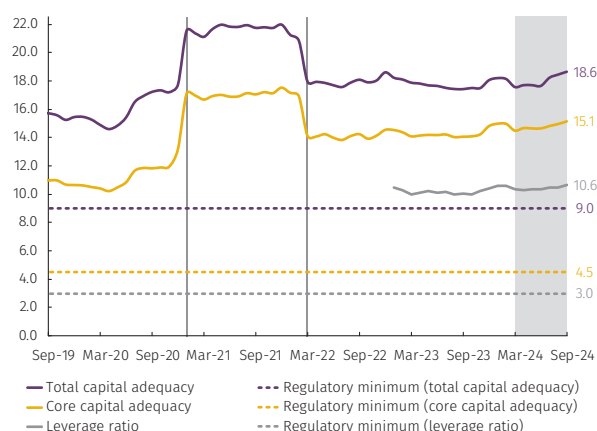
¹⁷ See section 2.4.1 of this Report.

¹⁸ The ROA corresponds to the ratio between the accumulated net income of the last twelve months of CIs and their total assets.

¹⁹ This figure differs from the one usually reported by the SFC because this entity's annualization considers the year-to-date figures and not the last twelve months.

Graph 2.13
Capital Adequacy Indicators at the Aggregate Level

(percentage)



Note 1: Total capital adequacy is defined as the ratio between the calculated technical equity and the value of assets weighted by level of credit, market, and operational risk level, and the core capital adequacy as the ratio between the Common Equity Tier 1 net of deductions and the value of assets weighted by level of credit, market, and operational risk level.

Note 2: Figures reported since January 2021 for capital adequacy and core capital adequacy are not comparable with historical series due to the regulatory change that required entities to start converging to the guidelines established by Basel III.

Note 3: As of 2024, the limits including the conservation buffer are 10.5%, 7.5%, and 6.0% for the total capital adequacy, additional common equity tier 1, and core capital adequacy, respectively. For systemically important institutions, an additional 75 bp is required. In practice, non-compliance with capital buffers does not imply non-compliance with regulatory limits and, therefore, does not constitute an insolvency situation.

Note 4: With the issuance of decrees 1477 of 2018 and 1421 of 2019, credit institutions had to start complying with the regulatory leverage ratio requirement as of January 2021. This ratio is defined as the sum of the value of Common Equity Tier 1 net of deductions and Additional Tier 1, divided by the leverage value.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

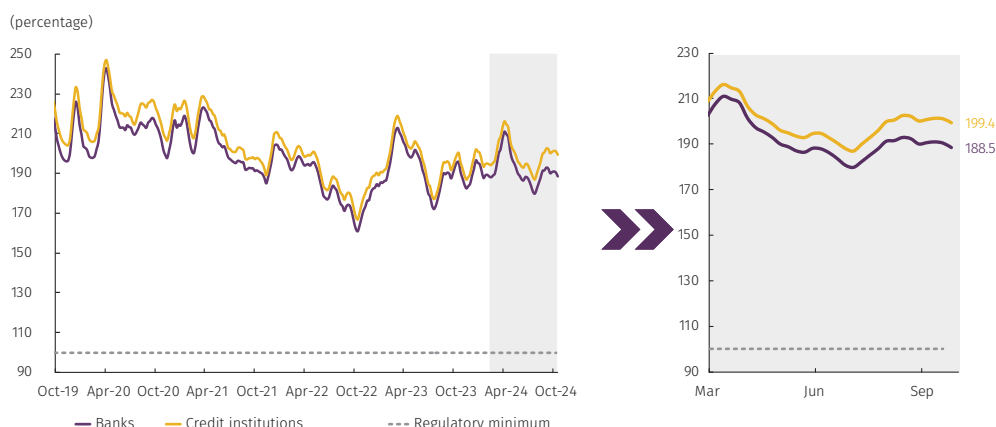
sions (Graph 2.12). The latter is related to the decumulation of countercyclical provisions, a tool that allows CIs to smooth their loan-loss provisions during periods of low credit growth and higher delinquency in the credit cycle. However, the ROA of CIs is 77.7 bps below the ten-year average, primarily due to low credit growth and high credit default, which negatively impacts interest income. Individually, by September 2024, twenty-eight CIs, representing 22.4% of the total loan portfolio, reported annualized losses (from September 2023 to September 2024)²⁰. Looking ahead, it is likely that the ROA will remain at low levels if credit risk persists in certain loan portfolios while CIs continue to reconstitute the balance of countercyclical provisions decumulated so far.

The capital levels of CIs, which enable them to withstand the materialization of various risks, are adequate and have increased since mid-2024. Between March and September 2024, the total capital adequacy²¹ and the common equity tier 1²² ratios of CIs increased by 107.9 and 65.5 bps, respectively (Graph 2.13), a trend explained by reductions in risk-weighted assets (due to low credit growth) and the increase in equity capital. During the analyzed period, the growth rate of this capital rose from 0.4% to 8.6% due to efforts by the institutions to improve their equity capacity to cover the losses incurred. In particular, CIs that have recorded accumulated losses for the year have conducted capitalizations, enabling them to face the current situation.

CIs maintain a solid liquidity position, reflected in short-term liquidity risk indicators (LRI)²³ and structural funding liquidity (NSFR)²⁴, both of which are well above regulatory limits. After the LRI of CIs decreased by 29.2 pp between April and July 2024 due to higher net liquidity requirements over a thirty-day horizon (NLR), the indicator increased and reached 200.2% by the end of September 2024 (Graph 2.14). This recovery is due to improvements in the LRI of banks, finance companies (FCs), and cooperatives, which recorded a larger reduction in NLR relative to liquid assets due to lower (higher) expected outflows (inflows) over the thirty-day horizon. Similarly, NSFR,

- 20 The number of institutions with annualized losses remained stable between March and September 2024, although the share of total assets from CIs with negative profits decreased by 2.6 pp.
- 21 Total capital adequacy is the ratio between the calculated total regulatory capital and the value of risk-weighted assets for credit, market, and operational risks. The regulatory limit is 9.0%.
- 22 Tier 1 capital is the ratio between the Common Equity Tier 1 net of deductions and the value of risk-weighted assets for credit, market, and operational risks. The regulatory limit is 4.5%. This indicator captures the ability of entities to face unexpected losses in terms of their best-quality capital.
- 23 The liquidity risk indicator measures the short-term liquidity of CIs.
- 24 The NSFR is a liquidity indicator that ensures CIs maintain a stable funding profile, in relation to the composition of their assets. It is calculated as the ratio between available stable funding (ASF) and required stable funding (RSF). ASF consists of liabilities and equity accounts, and RSF consists of asset and off-balance-sheet accounts.

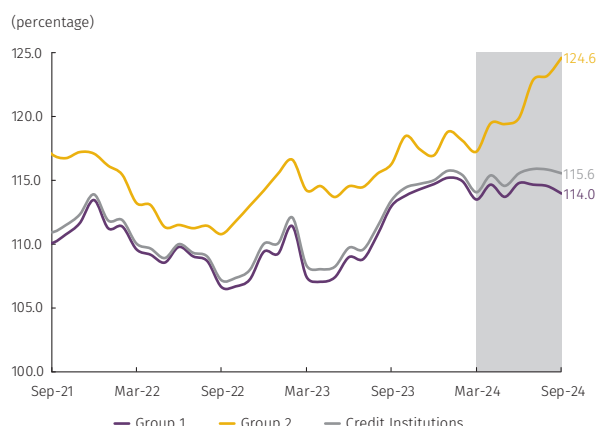
Graph 2.14
Thirty-day Simple Average Liquidity Risk Indicator of Credit Institutions



Note: The LRI presented in the report is calculated as the ratio of the average of the last four weeks of the month of liquid assets adjusted for market liquidity and exchange rate risk (LAM) to the average of the last four weeks of the month of net liquidity requirements (NLR).
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

which aims to match terms between liabilities and assets better, increased slightly for institutions in Group 1 and significantly for those in Group 2²⁵ (Graph 2.15). This latter is due to a greater stable funding ratio over the past six months through demand deposits from the retail real sector.

Graph 2.15
Net Stable Funding Ratio of Credit Institutions



Note 1: The information used to construct this graph comes from form 238 of the Financial Superintendency of Colombia.

Note 2: The indicator series is presented only for groups 1 and 2 because the institutions comprising group 3 do not have to comply with an NSFR regulatory limit. The minimum required as of March 2022 for group 1 is 100% (purple dotted line), and for group 2 is 80% (yellow dotted line).

Note 3: Group 1 institutions consist of banks whose assets represent at least 2.0% of the total assets of the banks as of 31 December of the immediately preceding year. Group 2 includes CIs that are not part of Group 1 and for which the loan portfolio and leasing operations correspond to a significant asset. Group 3 includes CIs that are not included in the previous groups and whose significant assets are investments and derivatives transactions.

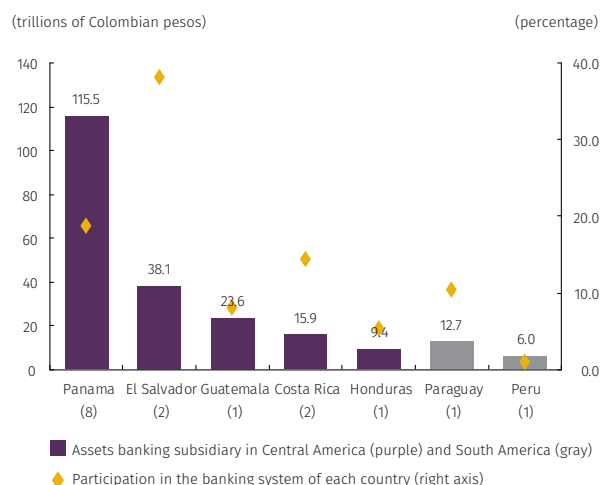
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

2.1.2 Current Situation of Credit Institutions at the Consolidated Level

Colombian banks maintain a significant presence in the Central and South American region, with eighteen banking subsidiaries²⁶ in the CAPRD region²⁷ and the Caribbean²⁸, and two in Peru and Paraguay, representing 20.1% of the consolidated assets of CIs. As of June 2024, Colombian banks hold assets in these subsidiaries amounting to COP 225.8 t. In the CAPRD region, there are a total of fourteen banking subsidiaries with assets of COP

- 25 CIs are divided into three groups for NSFR regulatory purposes: Group 1 includes banks whose assets represent 2.0% or more of the total assets of the banking sector; their minimum required NSFR is 100%. Group 2 includes banks whose assets represent less than 2.0% of the total assets of the banking sector, finance companies, financial corporations, financial cooperatives, and special official institutions specified in item i) of section 5.3.1 of Chapter XXXI of the Financial and Accounting Basic Circular (FABC), as long as these entities have a significant group of assets in loans and leasing operations; their minimum required NSFR is 80%. Group 3 includes those not classified in Groups 1 or 2 and do not have to meet a regulatory limit, so their NSFR reporting is for informational purposes.
- 26 An entity is considered a subsidiary when its decision-making power is subject to the will of another entity, which will be its parent or holding company, either directly, in which case it is called a branch, or through the parent's subsidiaries, in which case it is called a subsidiary.
- 27 The CAPRD region, as defined by the IMF, includes Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, and the Dominican Republic.
- 28 There is a presence of Colombian subsidiaries in Puerto Rico, Barbados, and the Cayman Islands; however, these are not significant in the consolidated balance sheet of Colombian CIs.

Graph 2.16
Main Banking Subsidiaries of Colombian Banks Abroad



Note: The legends in parentheses show the number of banking subsidiaries of Colombian banks in each country, as applicable.
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

202.5 t, while in Paraguay and Peru, there are two banking subsidiaries with assets totaling COP 18.6 t. By jurisdiction, Panama holds the largest share of external assets of Colombian banks (COP 115.5 t), followed by El Salvador with COP 38 t and Guatemala with COP 23.6 t. It is noteworthy that the two banking subsidiaries of Colombian banks in El Salvador represent 38.1% of the banking system in that country, while in Panama, the eight subsidiaries represent 18.7% of the banking system in that country (Graph 2.16).

On the macroeconomic front, the CAPRD region exhibits a real economic growth rate, with a recent slowdown, accompanied by a higher fiscal deficit and lower inflationary pressures, amid a stabilization of remittance flows from the United States. As developed in the September 2024 *Report on the Macroeconomic and Financial Situation in Central America*, the region's economic activity continues to grow, but at a slower pace, particularly in Panama, Guatemala, and El Salvador. GDP growth for the CAPRD region²⁹ is expected to reach 3.8% in 2024, after growing 4.1%³⁰ in 2023. Additionally, among the risks discussed in Chapter 1 of this *Report*, global financial market volatility and its repercussions in terms of higher perceived risk towards non-developed economies are mentioned. This could exacerbate the region's fiscal sustainability, where countries maintain a high debt-to-GDP ratio, except for Guatemala. However, inflation in the region has shown a downward trend since late 2022, reaching 2.9% in August 2024, signaling a trend toward stabilization. Moreover, a steady flow of remittances is expected to continue supporting the region's growth. Meanwhile, Paraguay exhibits a similar economic growth dynamic, with a projected rate by the Regional Economic Outlook (REO) of 3.8% for 2024, higher than the decade's average annual growth of 3.3%, and a slight increase in inflation by 30 bps, reaching 4.0%. In contrast, Peru exhibits a better growth pace, projected at 3.0% for 2024 (compared to -0.6% in 2023), accompanied by a decline in inflation, which would drop from 3.2% in 2023 to 2.4% in 2024.

In 2024, for most Central American countries, the profitability of CIs was above the average of recent years, and the credit loan portfolio exhibits positive real growth. However, some countries are seeing an acceleration in the deterioration of loan portfolio quality. Aligned with the region's lower economic performance, the total loan portfolio in most countries in the CAPRD region continues to grow in real terms, although at a slower pace. In Guatemala, there has been a shift toward credits granted in local currency, partly explained by a higher interest rate on foreign currency-denominated loans. In Costa Rica, in the context of currency appreciation and lower inter-

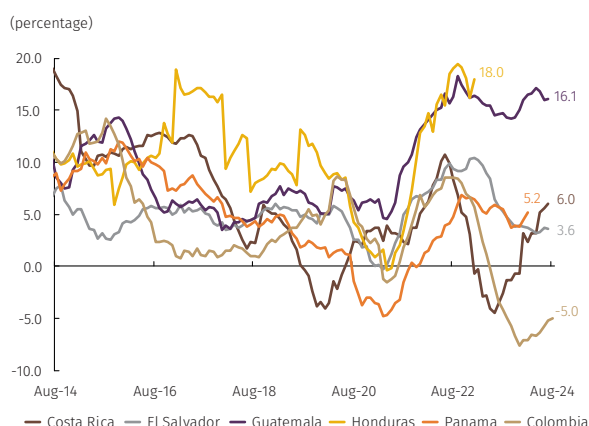
29 Information taken from the October 2024 IMF Regional Economic Outlook for the Western Hemisphere (REO).

30 According to the World Bank, the average annual real growth over the last decade is: Costa Rica at 3.3%, Guatemala at 3.6%, Honduras at 3.3%, Panama at 4.7%, El Salvador at 2.4%, Peru at 2.6%, and Paraguay at 3.3%.

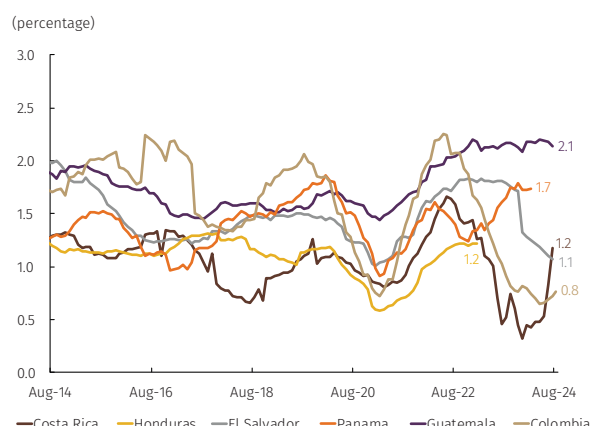
est rates on foreign currency-denominated loans, the credit loan portfolio has accelerated, driven by foreign currency-denominated loans (Graph 2.17, Panel A). In this regard, bank profitability, measured as ROA, exhibits higher growth rates, except in El Salvador (Graph 2.17, Panel B). This performance could be associated with a higher increase in the intermediation margin. However, in El Salvador and Guatemala, a greater deterioration in loan portfolio quality has been observed.

Graph 2.17
Performance Indicators

A. Real Growth of Total Loan Portfolio



B. ROA

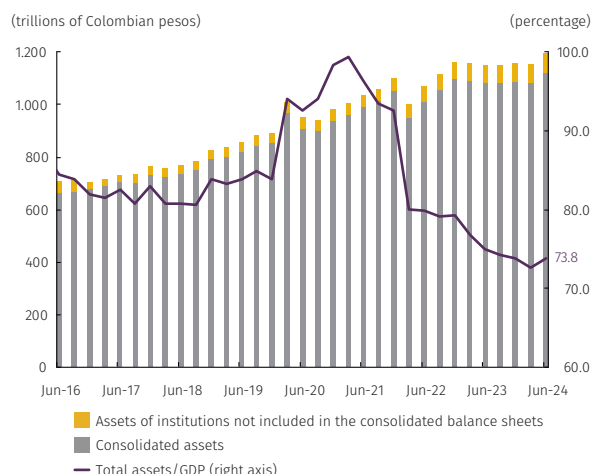


Note: For panels A and B, information is available from Colombia through August; Costa Rica, El Salvador, and Guatemala through July; Panamá through February 2024; and Honduras through January 2023. Real growth for panel A was calculated using the CPI for each jurisdiction. ROA in panel B is calculated as the ratio of the annualized profit and the average asset. The annualized profit is the sum of the current monthly flow with the previous eleven flows of profit before income tax.

Source: Central American Monetary Council; calculations by Banco de la República.

2.1.2.1 Consolidated Balance Sheets of Credit Institutions

Graph 2.18
Consolidated and Individual Assets of Credit Institutions



Note: the assets of the institutions that are not part of the consolidated balance sheets correspond to those CIs that are not part of the consolidation of another institution, nor do they consolidate other supervised entities.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

In line with the strong performance of some banking subordinates and a more favorable performance of the individual balance sheet of CIs in Colombia, consolidated assets exhibit signs of recovery. As of June 2024, out of the 53 Colombian CIs, fourteen have consolidated balance sheets, six³¹ of which are present in Central and South America. After consolidated assets reached an annual real contraction of -0.6% in December 2023, they exhibited a growth rate of 3.2% as of June 2024, with a balance of COP 1,121.1 (t), representing 73.8% of GDP (Graph 2.18). This performance was explained by positive investment growth at a real annual rate of 7.4% and a slower pace of contraction in the loan portfolio, which decreased by -5.3%. This was in line with the individual³² performance of consolidating CIs and asset growth in Central America³³ (Table 2.1).

31 In addition to these six, another fourteen belong to financial conglomerates under Colombian law. Not all consolidating CIs belong to a financial conglomerate.

32 See section 2.1.1 of this Report.

33 See the Special Financial Stability Report on the Macroeconomic and Financial Situation in Central America, September 2024.

Table 2.1
Main Financial Indicators of CIs at the Consolidated Level

Indicator	Total				Consolidated Evolution Dec.-19 to June-24
	Jun 23	Dec 23	Jun 24	Six-Month Change (percentage points)	
Real asset growth	-3.4	-9.3	-3.8	5.5	
Real investment growth	-5.7	-4.4	7.4	11.9	
Real growth of the total loan portfolio	-3.2	-11.4	-5.3	6.2	
Real growth of the commercial loan portfolio	-2.5	-12.2	-4.2	8.1	
Real growth of the consumer loan portfolio	-5.1	-12.9	-10.2	2.7	
Real growth of the housing loan portfolio	-2.5	-7.3	-0.6	9.2	
Real growth of the microcredit loan portfolio	2.5	-0.1	1.9	5.8	
NPL of the total loan portfolio	5.2	5.5	5.7	0.2	
NPL of the commercial loan portfolio	3.5	3.5	3.7	0.3	
NPL of the consumer loan portfolio	7.6	8.3	8.1	-0.2	
NPL of the housing loan portfolio	6.1	6.8	7.6	0.8	
NPL of the microcredit loan portfolio	7.2	9.0	10.1	1.1	
ROA	0.9	0.6	0.5	-0.2	
Total capital adequacy	14.4	14.4	13.9	-0.4	
Core capital adequacy	11.8	12.0	11.8	-0.2	

Note 1: The indicators were calculated using information that includes consolidated balance sheets and data at the individual level of non-consolidated institutions.

Note 2: The growth rates presented in the table were calculated on an annual basis.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

Real growth in the consolidated loan portfolio has recovered since December 2023. Although the loan portfolio is still declining, affected by the consumer portfolio, its growth rates are less negative. So far in 2024, the real growth of credit loans portfolio exhibits a recovery trend, although it remains negative. The consumer loan portfolio exhibits the highest rate of decline, followed by commercial and housing loan portfolios. This performance aligns with the real annual growth of the loan portfolio at the individual level of CIs, which stood at -5.7% as of June 2024. In contrast, the microcredit loan portfolio at the consolidated level exhibits a positive growth rate and stood at 1.9% as of June.

Further deterioration in credit risk indicators has been observed, in line with the dynamics of the individual balance sheet. As of June 2024, the real annual growth rate of the non-performing loan portfolio was 12.2%. Although the non-performing loan portfolio continues to grow across all loan types, its growth rate has decreased, mainly in consumer and commercial loans. This, combined with slower growth in the gross loan portfolio, led the consolidated NPL to exhibit slight growth so far in 2024, with a change in trend for consumer and microcredit loans, whose deterioration has occurred at a slower pace. Following the dynamics of the individual balance sheets in the third quarter of 2024 of the consolidating entities and the performance of the banking systems in which the subordinates of Colombian banks operate, it could be expected that the loan portfolio will continue to deteriorate but at a slower pace.

Despite the favorable performance of the profitability of bank subordinates in the CAPRD region, a slight decrease in ROA at the consolidated level has been observed so far in 2024, in line with the dynamics of the individual balance sheet of CIs. The consolidated ROA of CIs stood at 0.5%, which is lower than the average

for the last five years (1.1%). This performance is similar to that observed in the individual balance sheet, which exhibited a decrease of 0.1 pp between December 2023 and June 2024, to 0.7%. This is despite the favorable performance of ROA in the banking systems of the CAPRD region.

Consolidated solvency ratios have remained at adequate levels and above regulatory limits³⁴. Tier 1 capital and total capital adequacy were 2.8 and 4.9 pp above regulatory limits, respectively, slightly lower than the data observed in December 2023. At the individual and consolidated level, an increase in risk-weighted assets was observed, higher than the growth of total regulatory capital, between December 2023 and June 2024. In addition, the solvency of the consolidated balance sheet is expected to be lower than the individual balance sheet because, especially with the capital of the latter, the activity of the consolidated balance sheet must be supported. Chapter 3 of this *Report* develops a stress test of CIs to shocks due to devaluations of investments in their banking subordinates, in addition to the results of adverse scenarios (1 and 2), to assess whether the consolidated capital is sufficient to cope with them. In both adverse scenarios, the entities are resilient to the different devaluation shocks.

The performance of the banking subordinates of the Colombian CIs has been a source of diversification for the consolidated balance sheet. Banks in the CAPRD region have performed well in terms of real asset growth and profitability, as measured by ROA. In addition, the NPL, measured based on the loan portfolio over 90 days past due, exhibits a slower pace of deterioration compared to the Colombian indicator. Likewise, the low banking penetration in the region presents an opportunity for growth. Although they are smaller banks than their Colombian parent companies, and their performance does not fully offset the moderate local results, they have contributed to the fact that the deterioration of the consolidated balance sheet has not been greater. Costa Rica, for example, has exhibited good economic performance explained by a growth in exports and a good process of fiscal consolidation, restricting spending in accordance with the fiscal rule. However, in the context of fiscal uncertainty in some countries of the Central American region and the uncertainty regarding the new administration's immigration and trade policies in the United States with the countries of the region, fewer benefits could be seen from diversification.

2.1.3 Non-Banking Financial Institutions

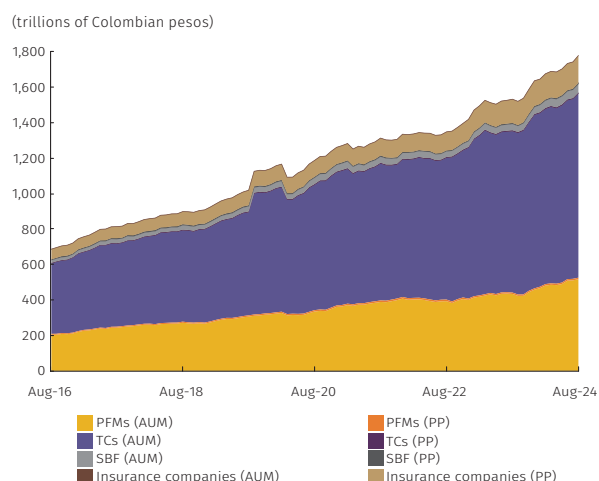
Non-banking financial institutions (NBFIs)³⁵ are responsible for managing public funds that can be used for many purposes, from making investments to hedging potential risks, those activities are essential for the proper functioning of the financial system³⁶. In carrying out these activities, the NBFIs have grown considerably in recent years and have created significant interconnections with the CIs; for example, these institutions hold a large part of the value of the certificates of deposit (CDs) issued by the CIs. This has made NBFIs increasingly important stakeholders in the financial system (Graph 2.19). Therefore, it is important to monitor

34 The regulatory minimum limit is 9.0% for total capital adequacy, 6.0% for additional Tier 1 capital, and 4.5% for Tier 1 capital.

35 In this *Report* we include as NBFIs trust companies (TCs), stock brokerage firms (SBFs), pension and severance fund managers (PFMs), and general and life insurance companies.

36 The portfolios managed by the NBFIs are henceforth divided into proprietary account or position, which are those whose resources belong to them, and third-party position or managed portfolios (assets under management), which are those portfolios belonging to the public and managed by the NBFIs.

Graph 2.19
Evolution of NBFIs' Assets: Assets Under Management (AUM)
and Proprietary Position (PP)



Note 1: Assets under management of insurance companies consist of a voluntary pension fund managed by an insurance company.

Note 2: Assets under management of trust companies include assets held in custody.

Acronyms: trust companies (TCs), stock brokerage firms (SBFs), pension and severance fund managers (PFMs).

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

the performance of these institutions and the potential risks arising from their activities. This section explores the performance of their investment portfolios, as well as the profitability and risks of these institutions.

In August 2024, the assets under management of the NBFIs grew above their all-time average³⁷, driving the growth of the financial system. While in August, the financial sector grew at an annual real rate³⁸ of 5.2%, the assets managed by the NBFIs grew at a rate of 8.8%, which is mainly explained by the good performance of portfolios managed by pension and severance fund managers (PFMs), which recorded growth above 10% (this includes mandatory pension funds, voluntary pensions and severance funds; Graph 2.20, panel A). The assets managed by the TCs grew slightly below their all-time average (6.8% vs. 7.5%), being the only portfolios in this category that recorded this performance. The assets managed by TCs, SBFs, and PFMs are 216, 10, and 57 times larger than the proprietary account assets, respectively, this figures have remained stable over the past two years.

The proprietary position assets of these types of institutions showed moderate growth, explained by the performance of insurance companies and PFMs. In the case of the former, assets grew at a real annual rate of 7.9%, lower than that observed in February (8.0% real annual rate) (Graph 2.20, panel B). In turn, the PFMs (the second group with the largest share) have started to grow above their all-time average, thus recovering from the negative growth recorded months earlier, as described in the *Report* for the first half of 2024. This performance, together with the observed increases in the assets of the SBFs and TCs, has allowed the proprietary account assets of these businesses to grow at a real rate of 7.7%.

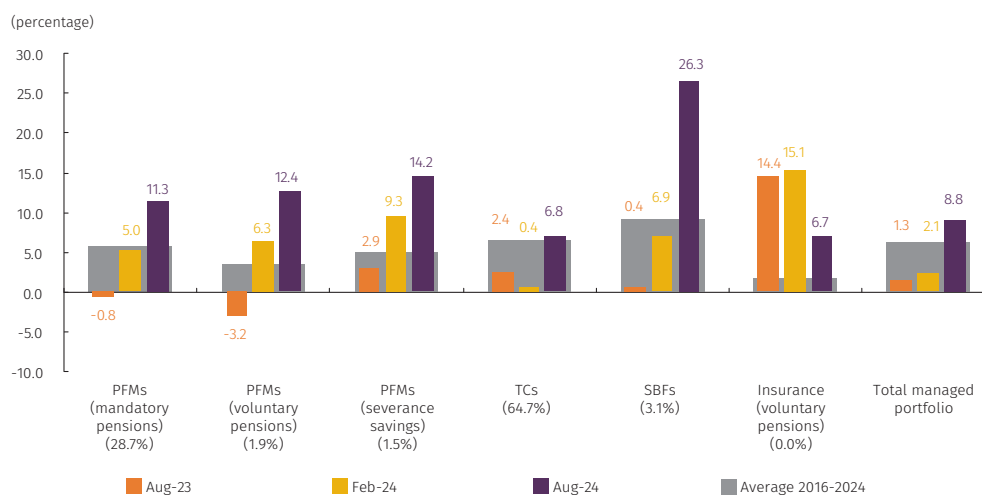
In terms of investments, the managed portfolio of TCs, SBFs, and PFMs recovered and showed a positive growth since the end of 2023. This performance is mainly explained by higher investments in TES in the context of appreciations and higher issuances of these securities, particularly in the case of the PFMs, which have consolidated as the largest holders of these securities. The portfolio managed by these NBFIs recorded a real annual growth of 25.4%, to which TES and collective investment funds (CIFs) mainly contributed, by 8.8% and 8.2%, in that order. This movement was driven by the PFMs, which replaced their CD investments in favor of larger TES holdings, so that the latter now represent 32.1% of their portfolio, while CDs represent 6.0% (Graph 2.21; the investments exhibit real annual growth of 8.1% and -3.1%, respectively). This is consistent with the TES purchase trend mentioned in the last *Report*, which, had already completed 21 consecutive months for this edition. Given this, as of September 2024, the PFMs account for

37 The all-time average considers monthly values since 2016.

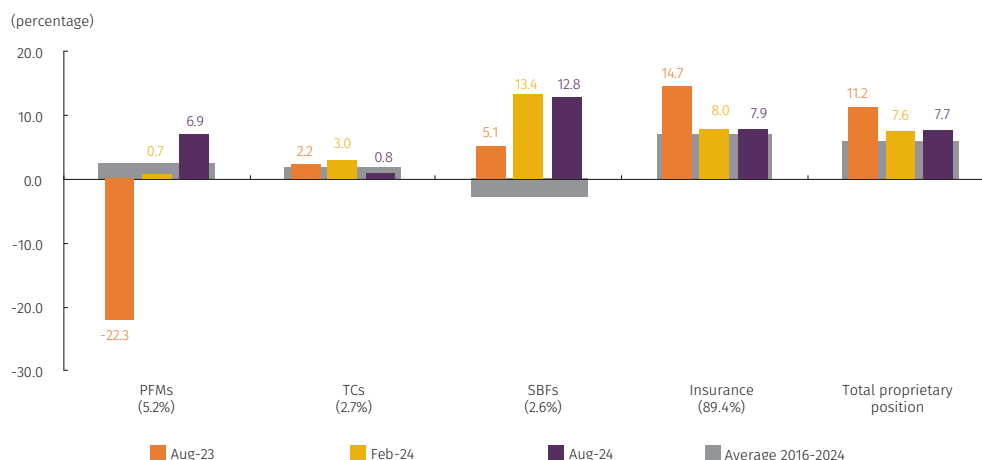
38 The real growth rates are calculated using the consumer price index excluding food.

Graph 2.20
Evolution of Real Annual Growth of NBFI Assets

A. Assets under management

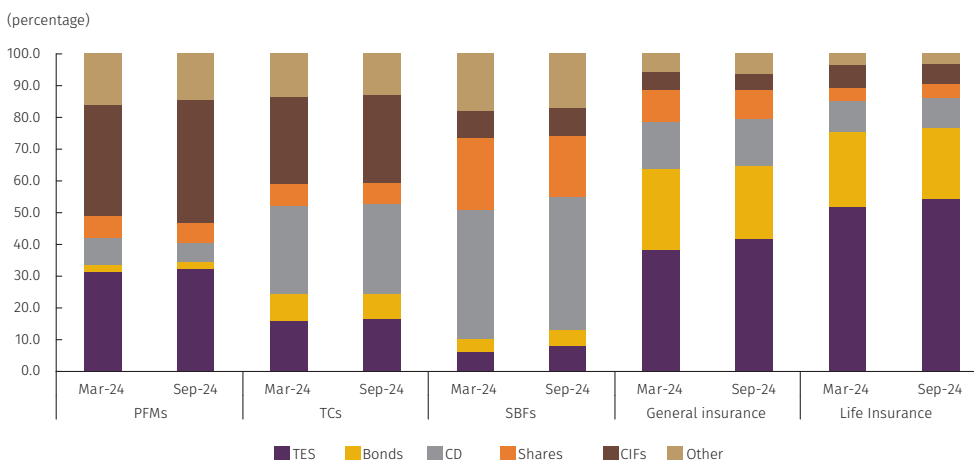


B. Proprietary Position



Acronyms: trust companies (TCs), stock brokerage firms (SBFs), pension and severance fund managers (PFMs).
 Note 1: Real growth is calculated using the consumer price index excluding food.
 Note 2: The parentheses indicate the share of each type of entity in the corresponding portfolio (AUM or PP).
 Source: Financial Superintendency of Colombia; calculations by Banco de la República.

Graph 2.21
Composition of NBFI Portfolios



Acronyms: trust companies (TCs), stock brokerage firms (SBFs), pension and severance fund managers (PFMs), Treasury Bonds (TES), certificates of deposit (CD), Collective Investment Funds (ClFs).
 Note: the composition of the managed portfolio (assets under management) of the PFMs, TCs, and SBFs is shown, while for general insurance and life insurance the portfolio in proprietary position is shown.
 Source: Financial Superintendency of Colombia; calculations by Banco de la República.

30.8% of the TES supply in the market. For TCs and SBFs, investment growth was mainly driven by higher investments in CDs (13.1% and 19.4% in that order) and TES (10.6% and 8.5%, respectively). The high exposure of NBFIs to TES highlights the idea that, in a possible scenario of greater uncertainty regarding the fiscal situation in Colombia, their managed portfolios may be negatively affected. TES market performance is analyzed in more detail in Section 2.3 of this *Report*.

In relation to assets under management, the role of the PFMs in the management of pension resources will change because of the implementation of the recently approved Pension Reform (Law 2381 of 2024). A portion of the flow of pension resources managed by these institutions will become part of the pay-as-you-go component (managed by Colpensiones). However, this component will be complemented with the creation of the Contributory Pillar Savings Fund (FAPC in Spanish), which will be financed with a percentage of the income corresponding to this segment and will be managed by *Banco de la República*³⁹ as a fiscal agent of the Government. *Banco de la República* may delegate the management of these resources to specialized administrators, including the PFMs and other financial entities⁴⁰. Thus, it is expected that the PFMs, in their new role, will continue to receive flows of pension resources from the FAPC, which could lead to no significant changes in the value of their managed assets in the short term. The definition of many of the practical aspects of the management of this fund will take place in the coming months based on the regulations to be issued by the National Government.

It is desirable that the transition of the pension reform be a smooth and orderly process, with the aim of not affecting the performance of the markets in which the PFMs are significantly involved. Such as the TES market, private debt, and the foreign exchange market (including the foreign exchange hedging market), where they also hold a significant share⁴¹.

Meanwhile, in 2024, the growth of the investment portfolio of insurance companies has remained stable and is above the average of the last five years, largely due to higher investments in TES. These securities contributed 10.6 pp to the growth of these entities' investments, which recorded a growth rate of 10.4% as of September 2024. In contrast, the investments that contributed the least to this growth were bonds (-1.2%). Life insurance companies exhibited a similar perfor-

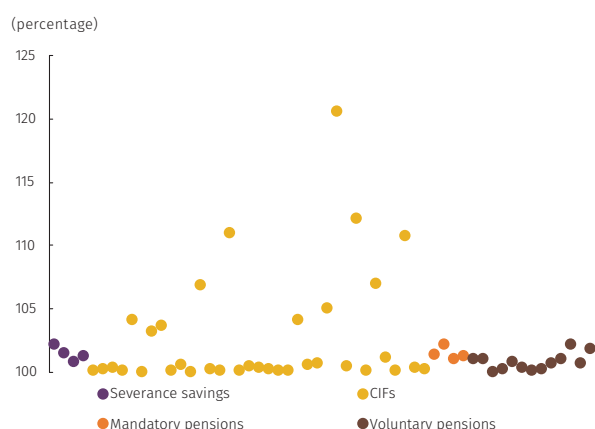
39 Under a responsibility of means and not of results. More information on the Participation of Banco de la República in the Management of the Contributory Pillar Savings Fund of the Pension System | *Banco de la República*.

40 According to Article 24 of Law 2381 of 2024: "The Contributory Pillar Savings Fund shall be created as a special account managed by Banco de la República. [...] The income of the Contributory Pillar Savings Fund shall correspond to: [...] 5. The totality of resources transferred from the Pension Fund Managers to Colpensiones, in line with the provisions of paragraph o) of Article 19 of this Law. [...] The resources shall be managed through autonomous trust funds or fiduciary mandates that shall constitute the Contributory Pillar Savings Fund in the pension and severance fund management companies, trust companies, stock brokerage firms, or life insurance companies supervised by the Financial Superintendency of Colombia. These entities must comply with the regulations on adequate capital levels and minimum solvency ratios established by the Colombian Government."

Additionally, according to Article 92 of the same law: "... The functions and powers of the Bank to manage the Fund shall be the following: [...] 2. Banco de la República may select and hire third parties for the management of the portfolio in accordance with the policies established by the Committee and for any of the operations described in number 1. For this and all the services required by the management of the Fund, the Bank shall operate under a private contracting regime."

41 Between January 2019 and October 2024, PFMs (proprietary and managed position) had an average share of 19.7% in the total traded volume of the foreign exchange hedging market, distributed by 8.0% in transactions with foreign investors and 11.8% with foreign exchange market intermediaries (IMC in Spanish).

Graph 2.22
Leverage of Funds Managed by NBFIs
(August 2024)

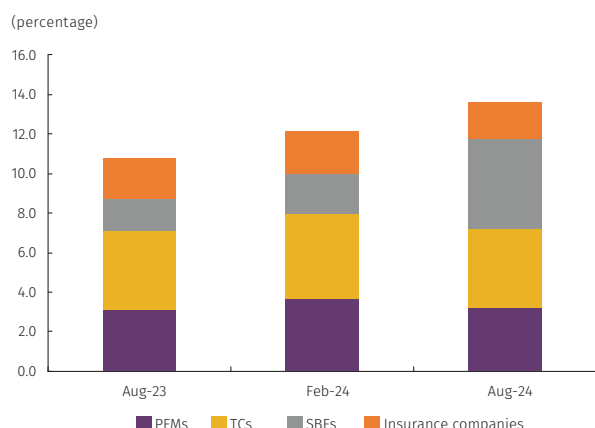


Note 1: the leverage level for each entity and fund type is calculated as managed assets / managed equity.

Note 2: Each point indicates the aggregate leverage of a type of fund managed by a single entity. For example, an orange dot indicates the leverage of CIFs managed by an X entity, while a purple dot indicates the leverage of voluntary pension funds managed by an Y entity.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

Graph 2.23
Participation of NBFIs in the liabilities of CIs
(percentage of total liabilities)



Acronyms: trust companies (TCs), stock brokerage firms (SBFs), pension and severance fund managers (PFMs), certificates of deposit (CDT), Collective Investment Funds (CIFs).

Note: The following are considered in the calculation: current and savings accounts, CD, bonds, shares, and CIFs.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

mance to the aggregate, while general insurance companies significantly reduced their participation in CDT and bonds (Graph 2.21).

Regarding the leverage level of the managed portfolio of the NBFIs⁴², some more leveraged funds can be observed, especially CIFs⁴³. High leverage may indicate greater vulnerability in terms of a managed fund's ability to absorb financial shocks, as in such cases, the assets are weakly backed by equity. In this regard, in August 2024, most of the funds managed by the NBFIs showed leverage close to 100%. The greatest dispersion and highest levels are found in CIFs (mostly private equity funds) (Graph 2.22). The performance was similar during the first half of 2024.

The share of NBFIs in the funding of CIs increased, a movement driven by the SBFs. At the same time, their share in the loan portfolio of these entities remains modest. NBFIs play a crucial role in the activity of CIs, particularly in their funding, to which they contribute through demand deposits, term deposits, shares, and bonds, among other instruments, both in proprietary and managed positions. As of August 2024, these entities accounted for 13.6% of the liabilities of the CIs. This figure is mainly explained by investments in CDs by the SBFs, which were COP 23.9 (t) as of August 2024 and represented 73.1% of their investment portfolio issued by CIs. Another significant development was the decrease due to the changes made by the PFMs in their bond investments of the CIs, which contracted by COP 200 billion, which could be explained by the restructuring of their investments toward TES, as previously mentioned (Graph 2.23). If the PFMs continue with these movements, CIs will need to implement strategies to replace the funding they receive from these institutions. Regarding the assets of CIs, insurance companies account for most of the loans granted to NBFIs, entities that represent only 0.1% of the total loan portfolio of CIs. In this regard, their participation is not significant.

Common investment holdings⁴⁴ between CIs and NBFIs represent about 45% of the value of CIs' investments. The figure remains higher in the case of TCs, specifically for TES holdings. Another significant interconnection between NBFIs and CIs arises from the type of investments they hold in common. Exposure to and concentration in the same types of assets can

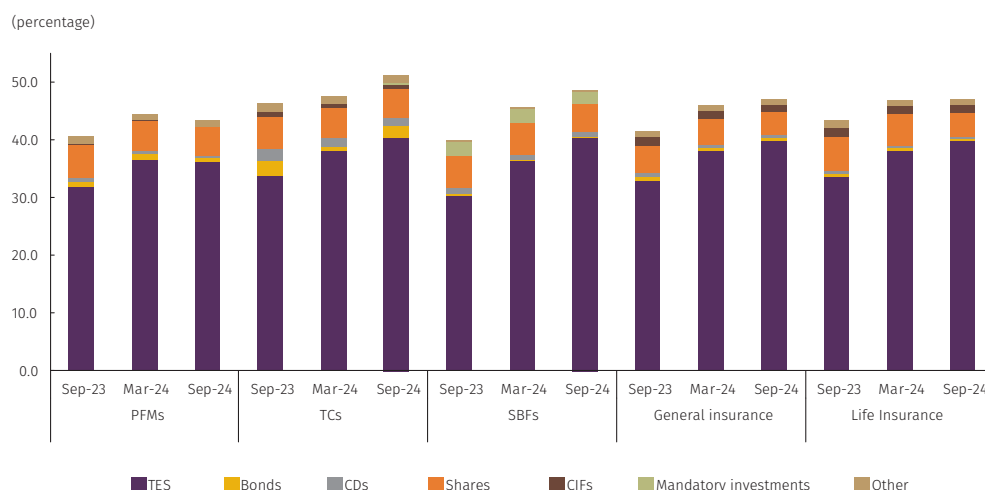
42 The leverage level is calculated as managed assets/managed equity.

43 This leverage analysis does not consider trusts managed by TCs (including those managing social security resources). This is because, due to the characteristics of this business, trusts manage assets and liabilities delivered by the trustor, so it is natural that they present leverage greater than 100%.

44 The term common investments refer to securities of the same type, with the same issuer and the same issue date (in the case of bonds) that at least one CI and at least one NBF hold in their portfolio during the same period analyzed. For this identification, the portfolio managed by the SBFs, TCs, and PFMs, as well as the insurance companies' proprietary account portfolio, are considered.

be a risk transmission channel between both types of entities; for example, in the event of a liquidity shock that generates an asset fire sale in a specific and common asset type between NBFIs and CIs. Although common investments represent about 45% of the value of CIs' investments, no significant changes in these holdings have been observed over the past year (September 2023 to September 2024). Specifically, it can be seen that TES from the same issuance are the type of security in which CIs and NBFIs invest the most simultaneously, followed by shares of the same issuer⁴⁵ (Graph 2.24).

Graph 2.24
Weight of Common Holdings between CIs and NBFIs in the Investment Portfolio of CIs



Acronyms: Treasury bonds (TES), certificates of deposit (CD), Collective Investment Funds (ClFs).

Note 1: TES and bonds in common are those belonging to the same issue number (same ISIN).

Note 2: Mandatory investments in SBFs refer to mandatory investments for CIs that are in the managed portfolio of SBFs (in this case, it is a single SBF).

Note 3: Although there are restrictions on investment in shares for CIs, both the Organic Statute of the Financial System and the Basic Legal Circular contain the exceptions and rules for holding this type of asset for each type of CI. That is why CIs report holdings in shares. Source: Financial Superintendency of Colombia; calculations by Banco de la República.

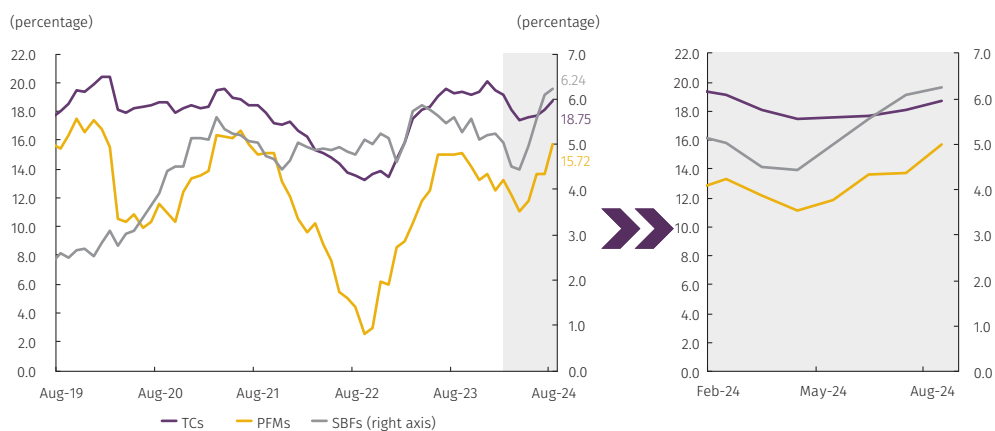
Despite the negative trend in the profitability of NBFIs in their proprietary position during the first four months of 2024, it has recovered (Graph 2.25). The performance of SBFs, TCs, and PFMs was driven by a higher administration fee income (commission income). The higher income from investment valuation also contributed in the case of PFMs. The type of commission income that contributed the most in the case of the SBFs was those associated with the management of ClFs, followed by those from advisory activity. For PFMs, it was the administration fees earned from managing the long-term severance fund and mandatory and voluntary pension funds, while for the TCs, they were those received by the management of trust business and ClFs. Additionally, for the TCs, it was observed that the entities that concentrated their activity in the administration of social security resources and those engaged in management and real estate trusts showed recoveries. In contrast, the most recently created entities continue to exhibit a negative⁴⁶ trend (Graph 2.25, panel C). In the case of insurance companies, the written premiums increased, but so did claim expenses, which caused the profitability of both types

45 Although there are restrictions on investment in shares for CIs, both the Organic Statute of the Financial System and the Basic Legal Circular contain the exceptions and rules for holding this type of asset for each type of CI. This is why CIs report share holdings.

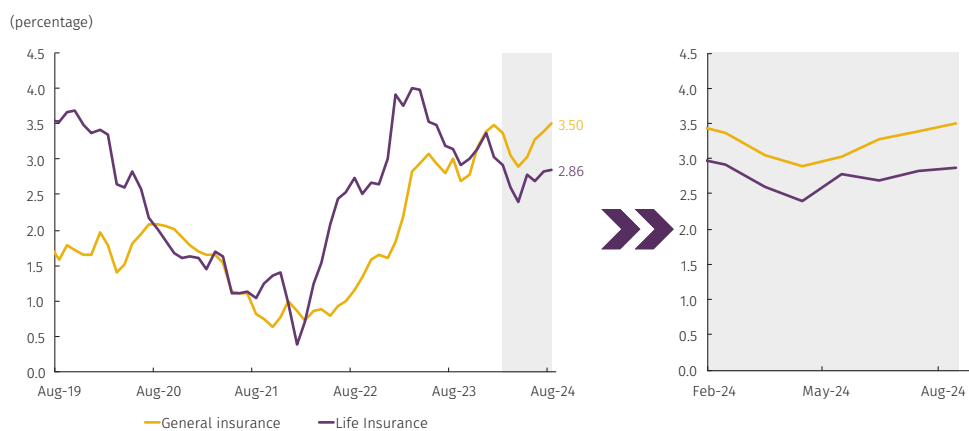
46 To make this identification, three groups (clusters) of TCs were studied, which were identified in Box 2: "Characterization and Performance of Trust Companies: An Approach Using Machine Learning Techniques" of the *Financial Stability Report* of the first half of 2020.

Graph 2.25
NBFIs' ROA

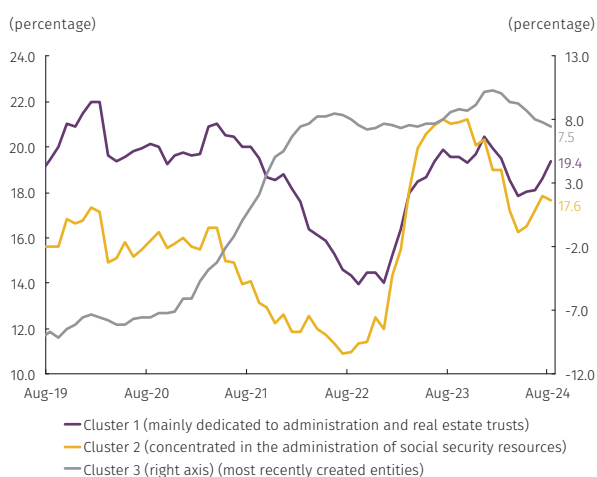
A. TCs, PFMs, and SBFs



B. Insurance Companies



C. TCs per Cluster

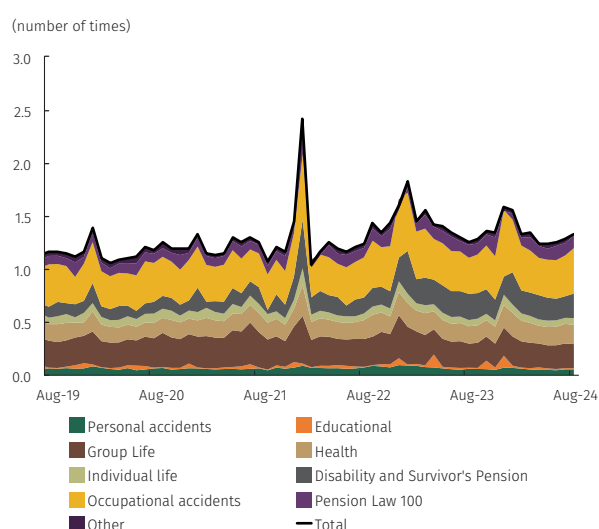


Acronyms: return on assets (ROA); trust companies (TCs); stock brokerage firms (SBFs); pension and severance fund managers (PFMs).
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

of entities to recover from the downward trend while remaining relatively stable compared to the beginning of the year.

Regarding risks associated with insurance activity, a negative trend is observed in the combined index of life insurance companies, while the ratio for general insurance remained stable. In other words, the risk of presenting lower returns due to the inability to cover claims and expenses with the income received from premiums tends to increase for life insurance and is stable for general insurance. Since each business line has its own business model and the claims they cover manifest themselves in different ways, the combined index by business line is used to identify which types of business lines are the ones that most explain the performance of claims (expense) in relation to earned premiums (income). Thus, the higher risk of life insurance is influenced by an increase in claims and expenses in the occupational accidents business line (Graph 2.26).

Graph 2.26
Combined Index of Life Insurance Companies by Business Line



Note 1: The insurance companies' combined index is defined as: (incurred claims + net expenses) / earned premiums. The calculation takes into account claims incurred, net expenses, and earned premiums in each month.

Note 2: The contribution of each business line to the total index is the contribution in terms of incurred claims and expenses.

Note 3: Public liability insurance covers the insured for indemnity expenses for damages to third parties (injury or death) or for property damage caused by the insured to the property of third parties.

Note 4: Occupational accidents insurance is offered by occupational accident insurance companies and covers the working and productive population in the event of occupational accidents.

Note 5: Under the pension branch of Law 100 (life annuities) individuals who have the capital to retire may choose the life annuity pension mode and thus authorize the PFM to transfer the balance accumulated in their individual savings account (ISA) so that the insurer will be responsible for paying the pension benefits for life. The payment of the premium (premium issue) occurs when the transfer of resources from the ISA to the insurer is generated. This payment is known as the single premium.

Note 6: The "other" category includes 8 business lines of life insurance including funeral, group life, high-cost illness, voluntary pensions, etc.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

2.1.3.1 Open-end Collective Investment Funds (OECIFs)

CIFs are financial savings and investment vehicles managed by specialized companies (TCs, SBFs, and investment management companies, IMCs⁴⁷) in which resources from contributions of several investors are invested in a portfolio of assets. CIFs are classified as: 1) open-end, where the investor may redeem its shares at any time; 2) closed, where redemption terms are established, and 3) exchange-trade⁴⁸, in which case the withdrawal policy will depend on the fund's regulations. Open-end collective investment funds (OECIFs), in turn, are divided into three types of funds: 1) monetary, whose objective is the stability, preservation, and conservation of capital through investment in fixed income instruments; 2) equity, where at least 70% of the portfolio is invested in equity instruments, and 3) balanced, which invests in fixed income and equity instruments. Given the OECIFs' susceptibility to massive withdrawals by its investors, and the market and funding effects of the CIs that the sale of securities may have to meet such redemptions, this section analyzes their performance during the last six months.

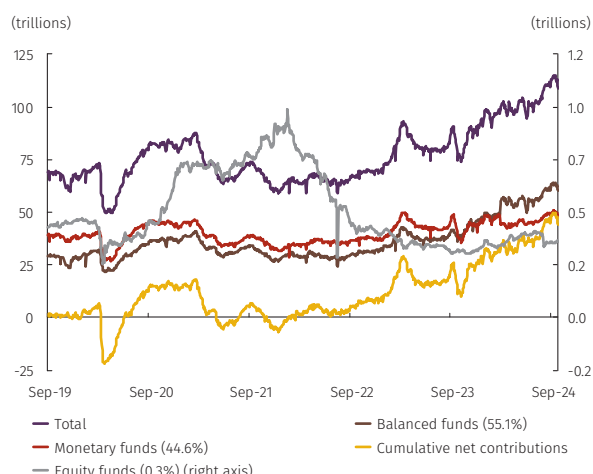
So far in 2024, OECIFs' assets continued to increase and reached record highs, recording COP 114.9 t, driven by net contributions. These contributions were mainly directed toward balanced OECIFs. During the third quarter of 2024, the total assets of OECIFs reached all-time highs of COP 114.9 t⁴⁹, a performance that is mainly explained by the dynamics of net contributions, which increased during the same period. However, the increase in contributions was not homogeneous across all types of funds, and was especially concentrated in balanced

47 There are currently no IMCs in place.

48 These funds can be open-end or close-end and seek to partially or fully replicate a stock index.

49 The total assets of the CIFs managed by TCs and SBFs amount to COP 138,2 t, of which 83.9% correspond to OECIFs.

Graph 2.27
Total Assets and Net Contributions of Open-end Collective Investment Funds



Note 1: the percentage represents the share of the type of fund in the total assets of the OECIFs.

Note 2: Cumulative net contributions are calculated as of September 2019.

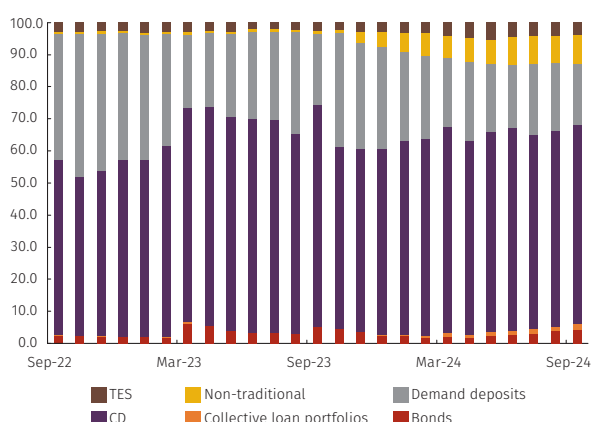
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

funds, which in 2024 became the most representative funds in the sector (55.1%; Graph 2.27).

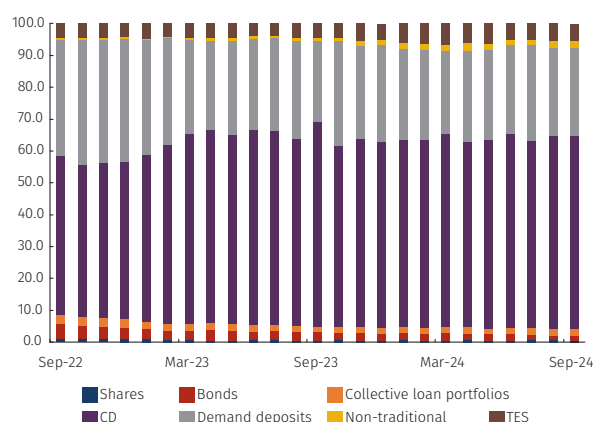
OECIFs' investment portfolio continues to be concentrated in CDs, a component that shows the highest growth. However, throughout 2024, an increase in non-traditional investments⁵⁰ has been observed to the detriment of demand deposits, particularly among the ten largest funds. As of September 2024, CDs represent 60.59% of the total assets of OECIFs and continue to be the component with the highest growth (Graph 2.28). However, since September 2023, there has been a progressive increase in the holding of non-traditional investments, driven especially by the ten largest OECIFs funds, which represent 59.5% of the total assets of these funds (Graph 2.28, panels A and C). The share of these type of investments in the total assets of the ten largest funds reached 9.0% in September 2024, compared to a year earlier, when this item corresponded to 1.0% of the total assets. Regarding cash composition⁵¹, during 2024, some TC funds reduced their demand deposits in CI to participate in *Banco de la República's (Banrep)* contraction operations⁵². However, these deposits correspond, on average, to

Graph 2.28
Breakdown of Total Assets and Contribution of its Components to Growth

A. Breakdown of Total Assets of the ten Largest Funds



B. Breakdown of Total Assets of the Remaining Funds



50 Non-traditional investments for this sector correspond to treasury securities issued by foreign governments, CDs issued by foreign banks, participation securities issued by entities not supervised by the SFC, debt securities issued by the Nation other than TES, and participation securities derived from securitization processes whose originator is an entity supervised by the SFC.

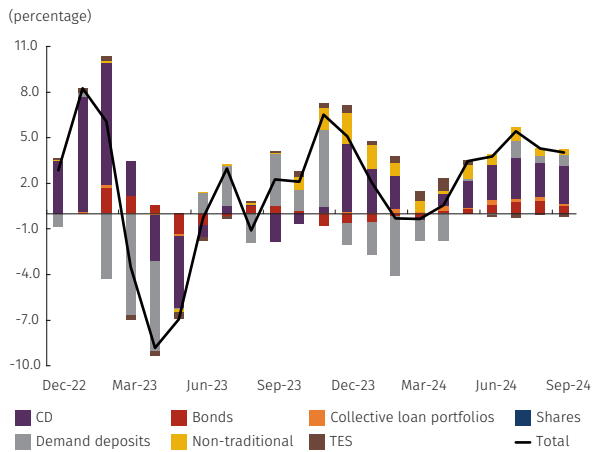
51 Cash corresponds to the value of deposits in savings and current accounts at domestic entities or foreign banks. In the latter case, the cash value must be adjusted for the foreign currency haircut.

52 These transactions were carried out through the remunerated deposits not constituting reserve requirements window, with a one-day term. Under this mechanism, Banrep does not determine the amount of resources to be collected or placed but is willing to receive resources at a fixed rate established by the Bank's Board of Directors.

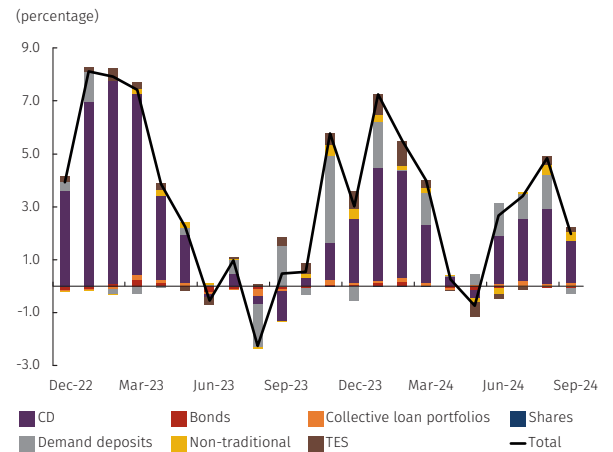
Graph 2.28 (continuation)

Breakdown of Total Assets and Contribution of its Components to Growth

C. Contribution of Components to Total Assets Growth of the ten Largest Funds



D. Contribution of the Components to Total Assets Growth of the Remaining Funds



Note 1: The quarterly moving average of each component was used to calculate its contribution to total asset growth.

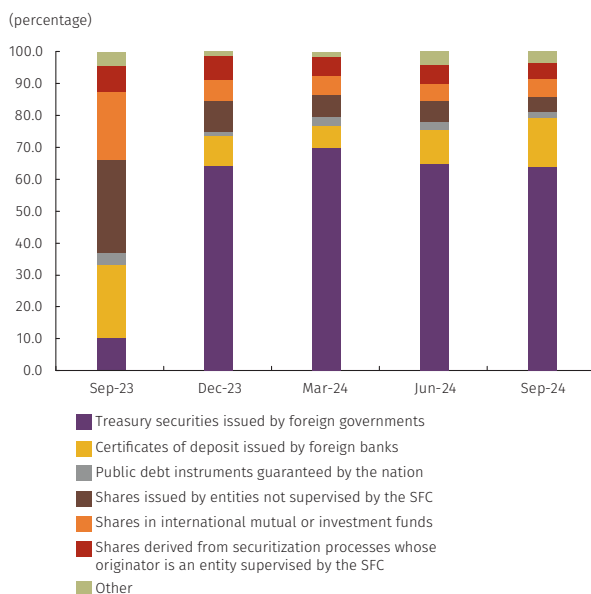
Note 2: The "Non-traditional" category refers to treasury securities issued by foreign governments, CDs issued by foreign banks, shares issued by entities not supervised by the SFC, debt securities issued by the Nation other than TES, shares derived from securitization processes whose originator is an entity supervised by the SFC.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

5.8% of the total cash of these funds, which in turn represent 29.0% of the total assets of OECIFs.

Throughout 2024, the increase in non-traditional investments by OECIFs has been associated with lower cash buffers. However, the liquidity risk indicator stood at levels well above the regulatory minimums, which would allow these funds to meet redemptions by their investors. The increase in holdings in non-traditional investments (Graph 2.29), mostly treasury securities issued by foreign governments, such as the United States, has decreased the resources that remain in demand accounts, particularly in the ten largest funds. This performance has reduced the cash buffers of these OECIFs (Graph 2.30, panels B and C), which are the first line of defense against the withdrawal of resources by investors, especially in stress scenarios. However, in this case, the non-traditional investments that have increased correspond to securities issued by the U.S. government, which are considered the most liquid sovereign bonds globally, so although these securities are not considered within the liquidity indicators, the vulnerability of funds to possible massive redemptions by investors is lower. In addition, the LRI of the funds is at levels higher than those recorded in 2023 (378% vs. 358%) and well above the regulatory minimums, although reductions have occurred so far in 2024 (100%; Graph 2.30, panel A). Therefore, the liquidity levels of these funds would allow them to cope with withdrawals by their investors.

Graph 2.29
Breakdown of Non-Traditional Investments for the ten OECIFs Largest Funds



Source: Financial Superintendency of Colombia; calculations by Banco de la República.

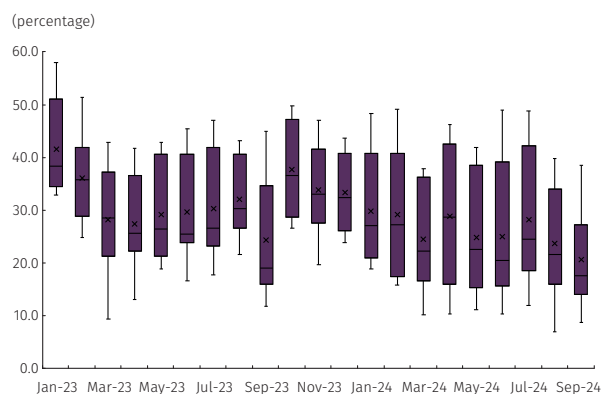
Graph 2.30
Liquidity Risk Indicator (LRI) and OECIFs' Cash Indicator

A. Liquidity Risk Indicator (LRI)



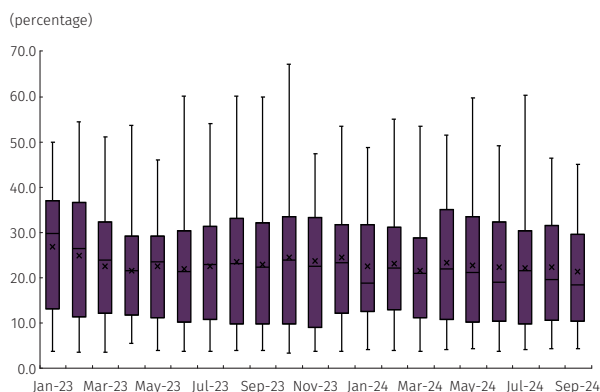
Note: the horizontal line corresponds to the regulatory limit of the liquidity risk indicator for OECIFs. The LRI is calculated as the median of the LRI of all OECIFs.

B. Cash Indicator for the ten Largest OECIFs



Note: the lower and upper limit of each box denotes the 25th and 75th percentile, in their order, of the distribution of the total capital adequacy ratio of CIs on each date. The horizontal line inside the box and X correspond to the median and the mean, respectively.

C. Cash Indicator for the Remaining ten OECIFs



Note: the lower and upper limit of each box denotes the 25th and 75th percentile, in their order, of the distribution of the total capital adequacy ratio of CIs on each date. The horizontal line inside the box and X correspond to the median and the mean, respectively.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

2.2 Credit Risk

The credit risk analysis presented below is divided between corporate sector debtors and households, whose loans as of September 2024 represent 54.1% and 45.9% of the total loan portfolio of CIs, respectively. The first subsection analyzes the evolution of firms' debt, the perception and materialization of private companies' credit risk, and their financial fragility. The second subsection studies the debt and financial burden of households and presents some risk indicators related to the performance of their loan portfolio.

2.2.1 Corporate Sector⁵³

2.2.1.1 Recent Developments in Corporate Sector Debt

During the first half of 2024, corporate sector debt as a proportion of GDP increased slightly in a context of an orderly economic adjustment, recovery of the gross domestic product, looser financial conditions, depreciation of the Colombian peso, and an acceleration of the commercial loan portfolio. As of June 2024, total corporate sector debt represented 58.2% of annual GDP, higher than in 2023 (57.3%) and lower than the historically high levels observed between 2020 and 2022. Of total debt as a proportion of GDP, the private sector⁵⁴ contributed 51.0 pp, while the public sector contributed the remaining 7.2 pp. The increase in the private firms' debt indicator is mainly explained by the higher contribution of debt contracted abroad and with the Colombian financial sector in an environment of local currency depreciation, GDP recovery, and lower financing costs, which may have increased the demand for commercial credit (Graph 2.31, panel A). In turn, public sector debt as a proportion of GDP declined, mostly explained by a lower amount of loans with the local financial system and bonds issued abroad (Graph 2.31, panel B). Considering the relatively stable performance of the exchange rate observed in September 2024 and the slight acceleration of the commercial loan portfolio (see section 2.1.1), the indicator of total corporate sector debt as a proportion of GDP probably did not present significant changes in the third quarter of the year.

The increase in the debt-to-GDP ratio observed so far in 2024 is mainly explained by the higher private corporate sector debt and by the depreciation of the peso and its impact on foreign currency-denominated debt. To illustrate this effect, a counterfactual scenario is estimated in which the representative market exchange rate (TRM in Spanish) had remained at the 2023 closing value (COP 3,822 as of 31 December 2023 versus COP 4,148 in June 2024). From the previous year, it is found that the total debt of the private corporate sector would have increased by about 0.3 pp in the first half of 2024, which is lower than the increase of 1.6 pp observed.

As of June 2024, most corporate debt denominated in foreign currency was hedged with mechanisms that mitigate exchange rate risk. Although foreign currency-denominated debt could become a source of vulnerability for the corporate sector as it exposes firms to exchange rate fluctuations, which could affect their creditworthiness and the quality of the local financial system's⁵⁵ loan portfolio, there are mitigating factors to exchange rate risk exposure. For example, if a company indebted in foreign currency is an exporter, a currency depreciation has a positive effect on its income, which would generate a natural hedge. Alternatively, if the company uses financial hedging instruments (through the use of exchange rate derivatives) or if it has a foreign company backing it (*i.e.*, foreign direct investment,

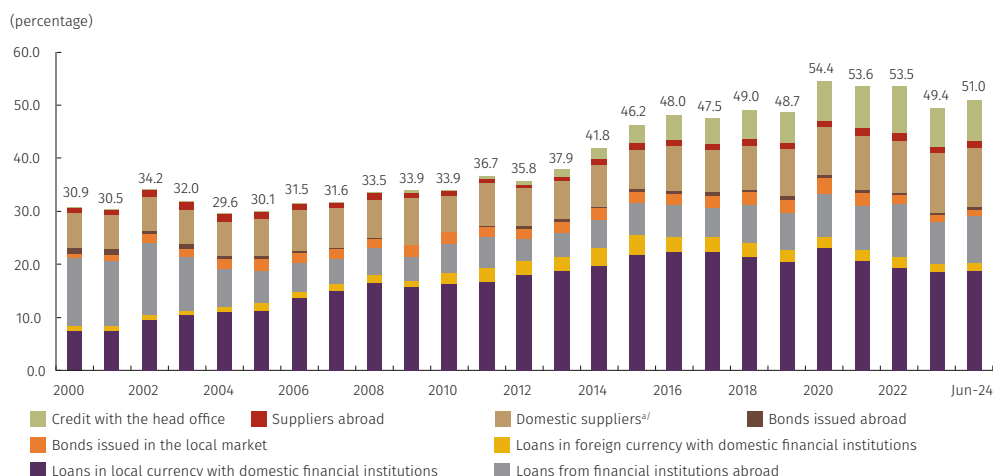
53 Due to availability of quarterly information from the SFC's Form 341, "Individual Debtor Report: Lending Transactions," the most recent figures observed on debt and loan portfolio quality in this section are presented as of June 2024. The most recent financial information available for companies that report annual balance sheets to the Superintendence of Corporate Affairs and the SFC as of December 2023. This information is complemented with the quarterly balance sheets reported to the SFC by securities issuers as of June 2024. Companies with balance sheet information represent 51.8% of the loan portfolio of private companies as of June 2024.

54 The term "private corporate sector" refers to private companies and excludes those financial companies overseen by the SFC. The term "public corporate sector" refers to non-financial and non-government public companies.

55 The direct exposure of CIs to the corporate sector loan portfolio in foreign currency is low (7.5% of the CIs' loan portfolio with the private corporate sector as of June 2024). However, exchange rate fluctuations have indirect effects on the quality of the CIs' loan portfolio, as they may affect firms' ability to meet their local and external credit obligations.

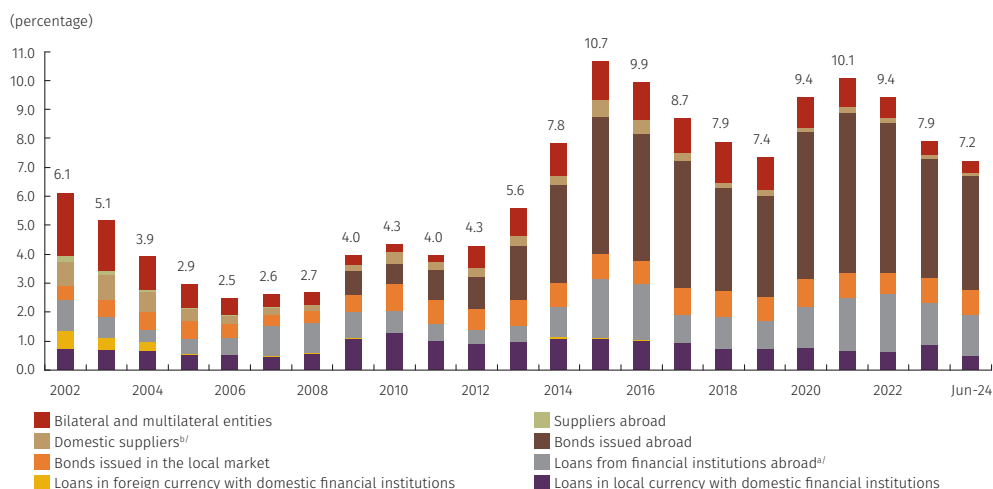
Graph 2.31
Corporate Sector Financial Debt as a Percentage of GDP by Instrument

A. Private Corporate Sector



a/ This only includes information on companies that report their financial statements to the Superintendence of Corporate Affairs. In 2016, all companies registered their financial statements using IFRS, which did not make it possible to determine the balance of debt owed to domestic suppliers. Therefore, to approximate the data from these companies, the average percentage that short- and long-term suppliers reported over current and non-current liabilities, respectively, between 2007 and 2015 was calculated for the companies that reported during the period using the UAP, and an equal percentage was assumed for the entities that submitted financial statements as of 2016. Since the financial statements for 2024 have not yet been published, annual GDP growth is used to project the June 2024 value. Sources: Financial Superintendency of Colombia, Superintendence of Corporate Affairs, and Banco de la República; calculations by Banco de la República.

B. Public Corporate Sector



Note: as of June 2022, loan portfolio data with the national financial system comes from Form 409 of the SFC.

a/ Financial leasing transactions are not included.

b/ Includes information on the balance of accounts payable of the main non-financial corporations in the public sector.

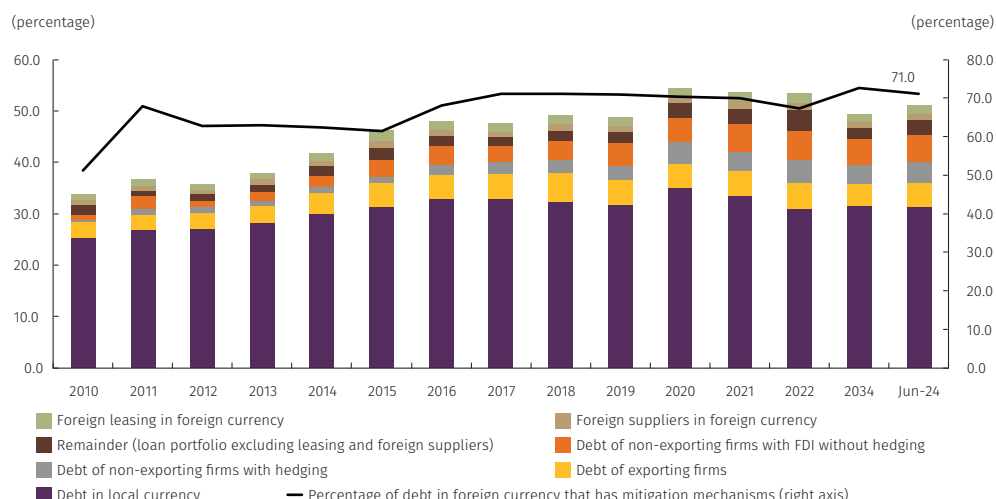
Sources: Financial Superintendency of Colombia, National General Accounting Office, Ministry of Finance and Public Credit; calculations by Banco de la República.

FDI)⁵⁶, it reduces its level of exposure to this type of risk. The foreign currency debt of the private corporate sector represents 38.3% of the total debt of these firms, which is equivalent to 19.5% of GDP. Of this, most (71.0%) correspond to agents with exchange rate risk mitigation mechanisms (Graph 2.32). Public companies, in turn, concentrate most of their debt in foreign currency (72.8% of public corporate sector debt equivalent to 5.3% of GDP as of June 2024; Graph 2.33). However, two firms that concentrate about 70% of the public corporate sector's external debt are exporters

56 When a foreign entity has FDI in a local firm, the exchange rate risk of the latter is mitigated, as it is assumed that the investor has incentives to back the firm in the event of a depreciation of the Colombian peso.

Graph 2.32

Private Corporate Sector Financial Debt as a Share of GDP and Breakdown of Foreign Currency Debt by Foreign Exchange Hedging, FDI, and Debtor's Foreign Trade



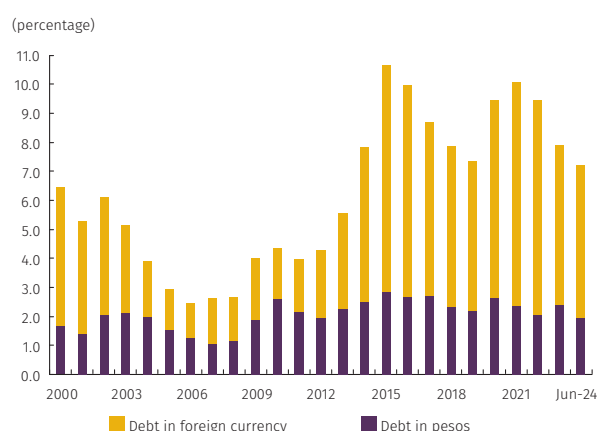
Note: the debt of suppliers in foreign currency and leasing with entities abroad is not available by NIT and, therefore, it is not possible to identify whether or not this debt belongs to hedged companies.

Sources: Financial Superintendency of Colombia, DANE, and Banco de la República; calculations by Banco de la República.

and thus have natural mitigation mechanisms against exchange rate movements.

Graph 2.33

Public Corporate Sector Financial Debt as a Percentage of GDP by Currency



Note: Prepared with the same information as in Graph 2.31, panel B.

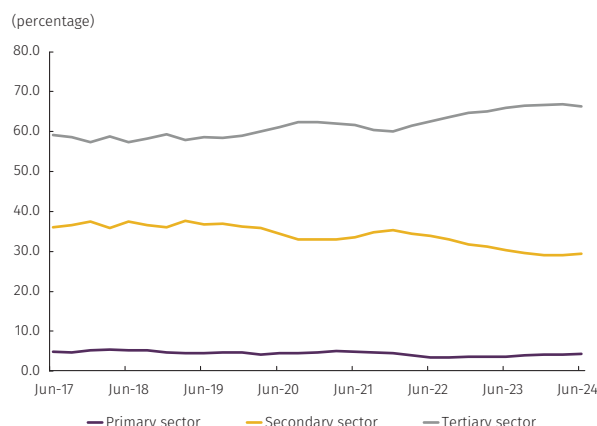
Sources: Financial Superintendency of Colombia, National General Accounting Office, Ministry of Finance and Public Credit; calculations by Banco de la República.

In line with the heterogeneous recovery of GDP by branch of economic activity, the secondary sector has lost its share in the disbursements granted by the local financial system to private firms. In contrast, the share of primary and tertiary⁵⁷ sectors has increased between 2023 and 2024 (Graph 2.34). The lower contribution of construction within the secondary sectors and the increase of the agricultural sector and financial activities not regulated by the Office of the Financial Superintendence of Colombia within the primary and tertiary sectors, respectively, stand out. This is consistent with the contribution of the services and agricultural sectors to the recent dynamics of GDP growth, as well as with the lags observed in the cumulative annual growth in sectors such as construction (see chapter 1 of this Report).

In this context, the impact of the “credit pact” launched at the end of August 2024 will depend on the capacity of sectors to absorb the projected disbursements. The “credit pact” is an agreement between the Colombian Government and *Asobancaria* to disburse for eighteen months, starting in September 2024, additional resources for COP 55 t to the housing and construction, manufacturing, agriculture, popular economy, and tourism sectors. According to figures from *Asobancaria*, it is

57 The primary sector includes agriculture, livestock, hunting, forestry and fishing, and mining and quarrying. Secondary includes construction and manufacturing. Tertiary includes trade and services.

Graph 2.34
Sectoral Composition of Disbursements Granted by the Local Financial System to Private Companies (Annual Average)



Note: Four-quarter average of disbursement share. A disbursement is defined as active credit operations with a start date in the quarter. Primary includes agriculture, livestock, hunting, forestry and fishing, and mining and quarrying. Secondary includes construction and manufacturing. Tertiary includes commerce and services.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

expected that by February 2026, a total of COP 248.6 t⁵⁸ will have been disbursed, including these additional resources. Although this initiative could boost credit supply, its final impact on the performance of CIs will depend on the evolution of sectoral demand and the capacity of the various branches of economic activity to absorb the additional resources. Indeed, the construction and manufacturing sectors account for 80% of the additional resources that CIs would grant under the Pact. However, these sectors have lagged in their economic recovery (see chapter 1 of this *Report*), which could mean lower credit demand from them. On the other hand, the measure could have adverse effects on CIs' risk management if the increased loan portfolio placement would lead to more loose granting requirements.

2.2.1.2 Recent Credit Risk Performance of the Private Corporate Sector

In the context of local economic adjustment, the private corporate sector's NPL continued to deteriorate throughout 2024, as anticipated in the previous version of this *Report*. As of June 2024, the private corporate sector's NPL stood at 4.7%, after registering an increase of 0.5 pp concerning December 2023. Thus, this indicator has approached the average of the last five years (Graph 2.35, panel A).

The non-performing loan portfolio of private corporate sector companies increased for most economic sectors⁵⁹, including commerce, construction, and manufacturing, which are the most representative segments of the commercial loan portfolio of this group of private companies (51.5% as of June 2024). Likewise, the manufacturing and commerce NPLs are at levels above the averages of the last five years (Graph 2.35, panel A)⁶⁰. The increase in the NPLs of the commerce, manufacturing,

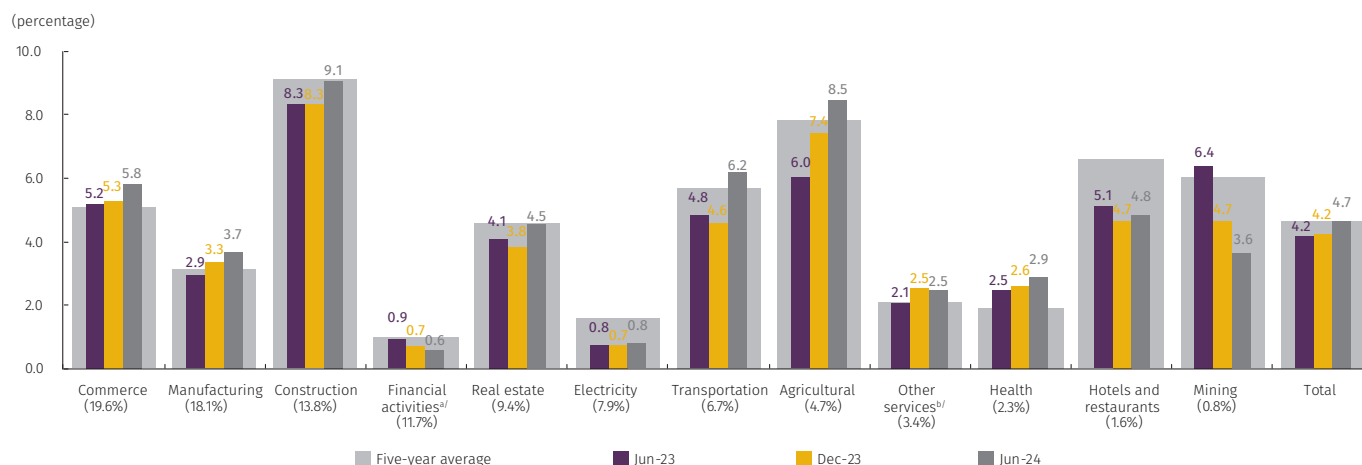
58 During the eighteen months to September 2024, the following disbursements were made by sector: housing and construction COP 31.8 t, manufacturing COP 128.2 t, agriculture COP 26.1, popular economy COP 0.7 t, and tourism COP 6.8 t. The Pact proposes to disburse to these sectors: COP 8.8 t, COP 35.2 t, COP 6 t, COP 3.4 t, and COP 1.6 t, respectively.

59 In this subsection, abbreviations will be used to refer to the following sectors: 1) real estate, renting, and business activities, as real estate; 2) agriculture, livestock, hunting, forestry, and fishing, as agriculture; 3) mining and quarrying, as mining; 4) electricity, gas, and water, as electricity; 5) transportation, storage, and communications, as transportation; 6) financial intermediation, as financial; and 7) human health care and social work activities, as health. 'Other services' include firms belonging to the following economic sectors: public administration and defense, education, compulsory health and social services, other community, social, and personal services, private households with domestic help, and extraterritorial organizations and entities. Additionally, the financial and insurance activities sector excludes firms overseen by the SFC.

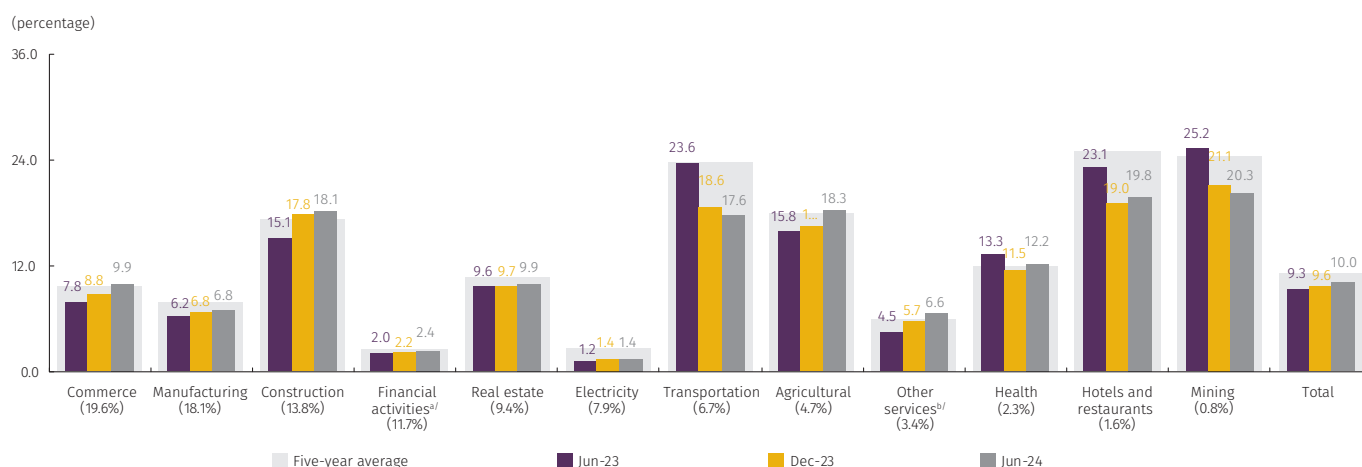
60 The increase in the commerce sector's NPL so far in 2024 is mainly explained by the deterioration in the non-performing loan portfolio of the wholesale commerce and vehicles subsectors, which in total account for 61.5% of the sector's loan portfolio as of June 2024. The deterioration in construction is mainly due to the civil works and residential construction segments (89.9% share). Finally, the increase in the manufacturing sector's NPL is mainly due to the food products and rubber subsectors (54.4% share).

Graph 2.35
Credit Risk Indicators by Sector

A. Non-performing Loans Indicator (NPL)



B. Quality Risk Indicator (QRI)



a/ In the sector of financial and insurance, entities supervised by the Financial Superintendency of Colombia are excluded.

b/ 'Other services' includes firms belonging to the following economic sectors: public administration and defense, education, compulsory health and social services, other community, social, and personal services, private households with domestic help, and extraterritorial organizations and entities.

Note: the sectors are organized from left to right from the most representative to the least representative. The share of each sector in the total private corporate sector loan portfolio is in parentheses. The NPL is calculated as the ratio between the non-performing loan portfolio and the total gross loan portfolio (non-performing loan portfolio includes the balance of loans that have not been paid for more than thirty days). The QRI is calculated as the ratio between the risky portfolio and the total gross loan portfolio (the risky loan portfolio corresponds to the balance of loans with a rating other than A, on a scale between A and E, where A is the best rating).

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

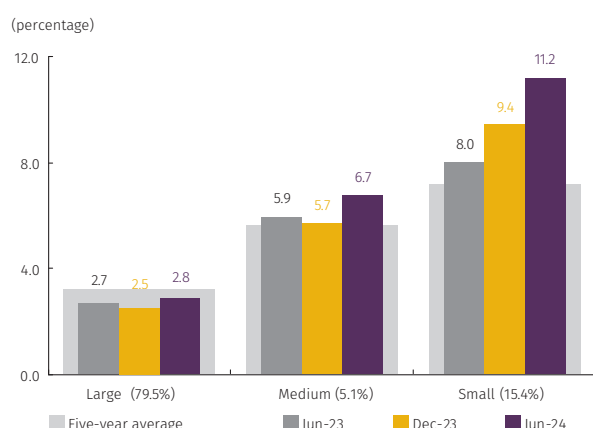
and construction sectors is consistent with the recent heterogeneous GDP growth observed by the economic sector (see chapter 1 of this *Report*) and with the pressures experienced by the housing market in recent years. The NPLs of other smaller sectors, such as agriculture, transportation, and health⁶¹, also showed significant deterioration during 2024 and stood at levels above the average of the last five years⁶². In view of this, an additional analysis was carried out, focusing on the loan

61 According to the ISIC sector classification, revision 4, the health sector collects information from firms engaged in human health care and social assistance activities. In turn, companies engaged in compulsory health plan affiliation are included in the "other services" branch (see footnote 59).

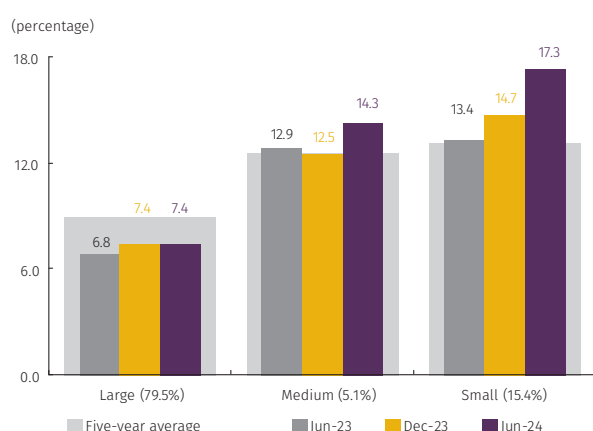
62 The annual increase in the agricultural sector's NPL is mainly due to the deterioration in the sub-sectors of agriculture, livestock, hunting, and fishing, which account for 98.6% of the sector's portfolio. In turn, the deterioration in the transportation sector is mainly due to the increase in the non-performing loan portfolio of the air and land transportation subsectors, which account for 64.6% of the sector's portfolio.

Graph 2.36
Credit Risk Indicators by Company Size

A. Non-performing Loans Indicator (NPL)



B. Quality Risk Indicator (QRI)



Notes: in the legends, the shares of each firm size of company in the total balance of the private corporate sector are presented in parentheses. Companies are classified by size using the limits established in Annex 1 of Chapter XXXI of the SFC's CBCF, where large companies are those with an asset level greater than 15,000 legal monthly minimum wage in force (SMMLV in Spanish), medium-sized companies with assets between 5,000 and 15,000 SMMLV, and small companies with assets less than 5,000 SMMLV. The NPL is calculated as the ratio between the non-performing loan portfolio and the total gross loan portfolio (non-performing loan portfolio includes the balance of loans that have not been paid for more than thirty days). The QRI is calculated as the ratio between the risky loan portfolio to the total gross loan portfolio (the risky loan portfolio corresponds to the balance of loans with a rating other than A, on a scale between A and E, where A is the best rating).

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

portfolio granted to Health Promoting Entities (*Empresas Promotoras de Salud* or EPS in Spanish) and Healthcare Service Providers (*Intituciones Prestadoras de Servicios de Salud* or IPS in Spanish)⁶³. According to this analysis, the NPL of this group of debtors continued to increase throughout the year, reaching 2.5% as of June 2024, a higher value than the average of the last five years (1.4%). However, the pace of deterioration has been lower than observed in 2023, which is explained by the loan portfolio given to IPSs. Despite this, Cls' exposure to these entities is not highly representative at the individual or aggregated level (0.7 % of Cls' total assets).

The QRI has also shown increases in the last six months. The higher risk perception in the construction sector is highlighted. Within the most representative economic sectors, the QRI of construction and commerce showed deterioration and were above the averages of the last five years (Graph 2.35, panel B). This performance explains the increase in the total QRI of the private corporate sector so far in 2024, which has been similar to the increase in the NPL, which contrasts with what was observed in 2023, a period in which the NPL increased at a faster pace than the QRI. This could indicate that Cls have increased their risk perception and expect higher delinquency materializations in the future⁶⁴. In the construction sector, the highest QRI is explained by the residential construction and civil works subsectors. The QRIs of other smaller sectors, such as agriculture, hotels and restaurants, and health, also increased during 2024. In turn, indicators for the mining and transportation sectors improved compared to those observed in December 2023. This indicates that, despite the higher delinquency observed in transportation, Cls' risk perception regarding this sector has decreased recently.

So far in 2024, the deterioration of the QRI and NPL of small and medium-sized companies⁶⁵ in the private corporate sector continued. In turn, indicators of large companies exhibited smaller increases (Graph 2.36). Thus, as of June 2024, the NPL and the QRI of medium and small-sized companies stood at values above the averages of the last five years. The loan portfolio segment of small companies has a low representativeness in the loan portfolio of the private corporate sector

63 Cls' exposure to IPSs and EPSs and the other indicators mentioned were calculated based on the registry of healthcare service providers in the Sistema Integrado de Protección Social – Sispro (Integrated Social Protection System) and the list of current EPSs published by the Ministry of Health and Social Protection. In addition, only healthcare service providers whose ISIC classification belongs to the human health care and social services sector were used for the IPS.

64 Cls can assign a higher risk rating to debtors (B or worse) based on their internal analysis and without requiring the debtor to be in default.

65 For this subsection, companies are classified by size using the limits established in Annex 1 of Chapter XXXI of the SFC's BAFC, where large companies are those with an asset level greater than 15,000 legal monthly minimum wages in force (SMMLV in Spanish), medium-sized companies with assets between 5,000 and 15,000 SMMLV, and small companies with assets of less than 5,000 SMMLV.

(14.6% of the total as of June 2024); however, these companies make up most private corporate sector debtors (93.2% of debtors).

The creditworthiness of some companies could be affected in the near future, considering the lagged effects of the economic adjustment process and the slow recovery of investment in an environment characterized by high uncertainty. Despite the recent reductions in interest rates and their favorable effects on the creditworthiness of companies (as most of their debt is at variable rates), delinquency could continue to materialize in the near future, given the slow recovery of investment and local uncertainty. In fact, the most recent NPL data for the commercial loan portfolio show that the deterioration has continued during the second half of 2024 (see section 2.1 of this *Report*). In this context, the challenges related to meeting fiscal targets (see chapter 1 of this *Report*) and the evolution and impact of the reforms submitted to Congress are factors that could affect investment decisions and future income generation by companies.

2.2.1.3 Financial Fragility of Private Corporate Sector Companies with Public Accounting Information⁶⁶

As anticipated in the previous version of this Report, the percentage of fragile companies⁶⁷ increased between 2022 and 2023, mainly due to a lower capacity to cover financial costs with operating income (Graph 2.37). Indeed, the proportion of companies with an interest coverage ratio (ICR, defined as the ratio between operating income and financial costs) less than 1 stood at 19.2% in 2023, a value 3.1 pp higher than the previous year. By economic sector, the increase in fragility was generalized, where the lower interest coverage in the commerce and agricultural sectors stands out. The loan portfolio share that has been granted by CIs to companies identified as fragile also increased in 2023. In any case, the fragility of companies is below the high values observed during the pandemic and between 2008 and 2009⁶⁸.

By 2024, and consistent with lower interest rates on commercial loans, reductions in companies' financing costs are expected. Considering that the most recent annual accounting information available is as of 2023, a simulation exercise of the companies' balance sheets as of December 2024 was carried out using the central projection scenario of *Banco de la República's* technical staff presented in the October 2024 Monetary Policy Report, statistical methods, and accounting assumptions⁶⁹. Based on this simulation and the information observed on insolvencies as

66 This subsection focuses on companies that report annual balance sheets to the Superintendence of Corporate Affairs and the SFC, which are as of December 2023. This information is complemented with quarterly balance sheets reported by securities issuers to the SFC until June 2024. Companies with balance sheet information represent 51.8% of the loan portfolio of private companies as of June 2024, and 41.0% of the commercial loan portfolio.

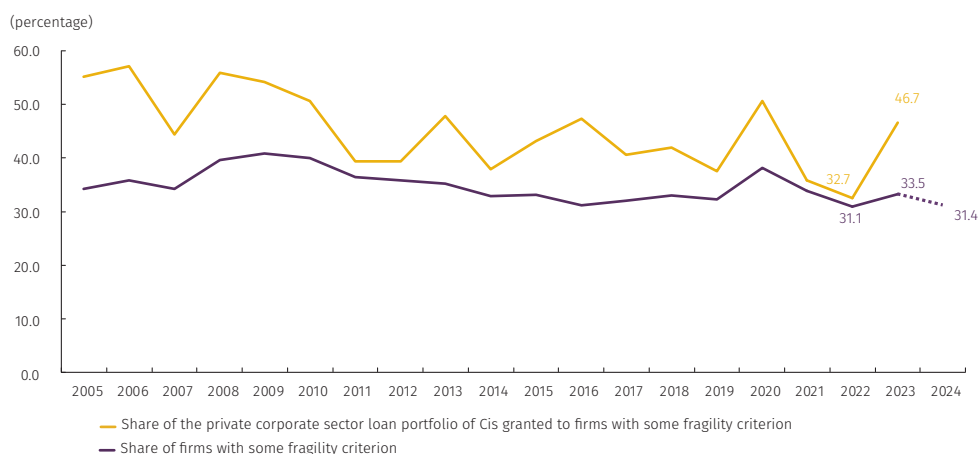
67 A company is defined as fragile if it meets any of the following criteria: 1) it enters into an insolvency proceeding with the Superintendence of Corporate Affairs (insolvency); 2) has a credit rating other than A or is thirty or more days in arrears (delinquency); 3) registers negative equity (negative equity); 4) incurs a net worth loss (bankrupt, quebranto patrimonial in Spanish); and 5) shows an interest coverage ratio (ICR) that is calculated as the ratio between earnings before taxes and interest expense, is less than 1 in the period under analysis (ICR less than 1) or for two consecutive years (consecutive ICR).

68 The share of the balance corresponding to companies in default and companies in insolvency proceedings also increased between 2022 and 2023. However, the ICR criterion of less than 1 is the main factor explaining the recent dynamics of companies' fragility.

69 The starting point was the 2023 annual balance sheets and the June 2024 quarterly balance sheets for companies that report to the SFC. For more details, see Tressel and Ding (2021), "Global Corpo-

Graph 2.37

Exposure to Financially Fragile Firms with Accounting Information from the Superintendence of Corporate Affairs and the Financial Superintendency of Colombia



Notes: A firm is defined as fragile if it meets any of the following criteria: i) it enters into an insolvency proceeding with the Superintendence of Corporate Affairs (insolvency); ii) has a credit rating other than A or is thirty or more days in arrears (delinquency); iii) register negative equity (negative equity); iv) incurs a net worth loss (bankrupt, quebranto patrimonial in Spanish) (delinquency); v) shows an interest coverage ratio (ICR) that is calculated as the ratio between earnings before taxes and interest expense, is less than 1 in the period under analysis (ICR less than 1) or for two consecutive years (consecutive ICR). The dotted lines refer to projected data for firms that do not report quarterly balance sheets to the SFC. Specifically, for 2024 the ICR criteria less than 1, consecutive ICR, bankrupt, and negative equity are not observed and were defined with the simulation of the financial balance sheets of the companies. Insolvency and delinquency data are as of August and June 2024, respectively. The yellow line only considers the private corporate sector loan portfolio granted to companies that report accounting information to the Superintendence of Corporate Affairs or that issue securities and report accounting information to the Financial Superintendency.

Source: Superintendence of Corporate Affairs and Financial Superintendency of Colombia; calculations by Banco de la República.

of August 2024 and companies' payment behavior as of June, some entities were identified as fragile. In accordance with the results, the percentage of fragile companies could be reduced in 2024 due to improved capacity to cover financing costs, in line with improved revenues due to a better performance of economic activity and cumulative interest rate reductions, and the fact that about 80% of the commercial loan portfolio is at variable rates (Graph 2.37, dotted line). However, some pressures on default and insolvency in some particular sectors persist, considering the adjustment process of the local economy and its lagging effects on these variables. Indeed, with figures as of August 2024, insolvency has continued to materialize, particularly in the construction, mining, and commerce sectors.

An additional stress test was carried out to measure the financial capacity of companies in the extreme macroeconomic scenario presented in chapter 3 of this Report, characterized by a high local risk premium, low investment, and economic growth. Based on estimated annual balance sheets as of 2023, an additional two-year horizon was simulated, and companies were classified as vulnerable in accordance with statistical techniques used to predict credit default with CIs⁷⁰. According to the test results, 3.8% of companies, which account for 3.0% of the loan portfolio of private companies with balance sheets reported to the Superintendence of Corporate Affairs and the Financial Superintendency of Colombia, would become

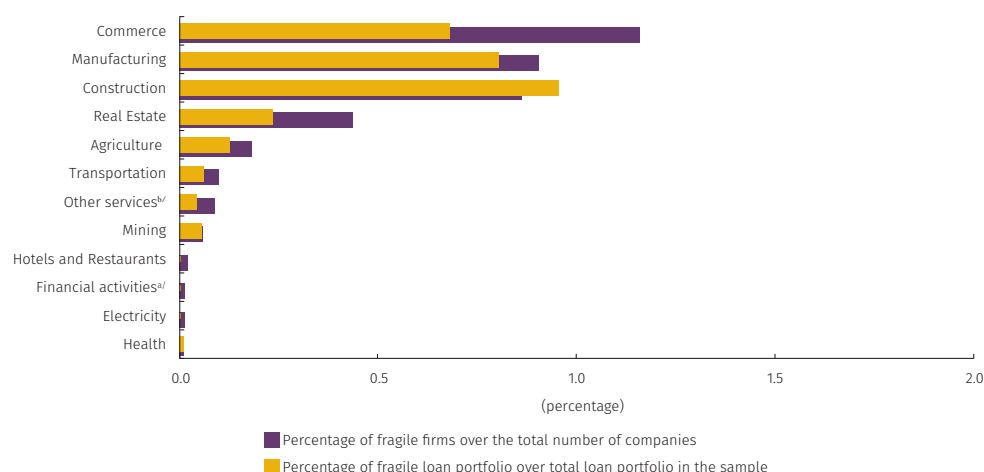
rate Stress Tests: Impact of the Covid-19 Pandemic and Policy Responses," International Monetary Fund.

70 In particular, statistical *machine learning* models were proposed for the annual information of the companies between 2006 and 2023. These models seek to predict the default status of more than thirty days in a year based on the financial indicators of the companies of the preceding year. Combining these models and the balance sheet simulations, the companies that would become non-performing loan portfolio in the stressed scenario are defined.

vulnerable under the adverse scenario⁷¹ in one of the periods of the simulation horizon. The highest percentage of companies and loan portfolios that would become vulnerable out of the total sample is found in the commerce, manufacturing, and construction sectors (Graph 2.38).

Graph 2.38

Percentage of Firms and Loan Portfolio in each Sector that would become Vulnerable to an Extreme Macroeconomic Scenario, measured on the Total Number of Firms and Loan Portfolio in the Sample



a/ In the financial and insurance activities sector, entities supervised by the Financial Superintendence of Colombia are excluded.

b/ 'Other services' includes firms belonging to the following economic sectors: public administration and defense, education, compulsory health and social services, other community, social, and personal service activities, private households with domestic service, and extra-territorial organizations and bodies.

Sources: Superintendence of Corporate Affairs and Financial Superintendence of Colombia; calculations by Banco de la República.

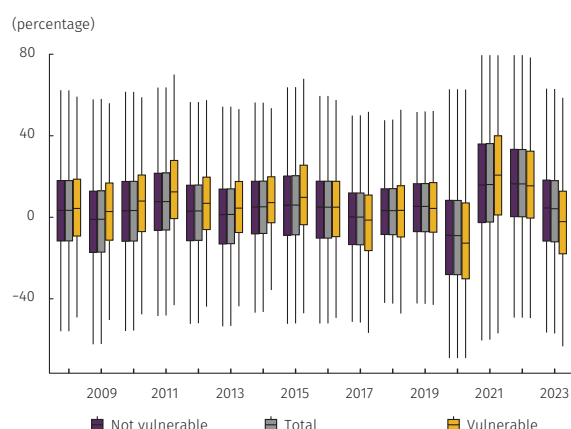
By characterizing the financial and activity situation of the companies identified as vulnerable in the stress test, it is observed that they performed weaker in 2023 compared to previous years. In terms of annual variation in sales and profitability, vulnerable companies have shown lower dynamics (Graph 2.39). Similarly, companies identified as vulnerable are characterized by higher levels of financial debt and lower interest coverage.

The financial system is resilient to the materialization of extreme and unlikely risks to the loan portfolio of companies. The stress test on the capital adequacy of CIs, presented in chapter 3 of this *Report*, evaluates the financial system's exposure to credit risk of the companies identified as vulnerable in accordance with the previous test. The results exhibit that, in the aggregate, the financial system is sufficiently solid to face a potential default of the segments identified as the riskiest. In this regard, the analysis presented in this section exhibits that, although the companies' credit cycle adjustment process has been relatively strong, it remains an orderly process with heterogeneous effects at the sectoral level. Likewise, the recent increase in economic activity, as well as the cumulative reductions in monetary policy interest rates in a scenario of inflation convergence toward its target level, favor the financial burden profile of companies since they reduce the interest payments of these agents and increase their expected income. However, the lagged effects of the economic adjustment process of recent years, as well as the slow recovery of investment in an environment marked by high uncertainty, are relevant factors for credit demand and loan portfolio deterioration going forward.

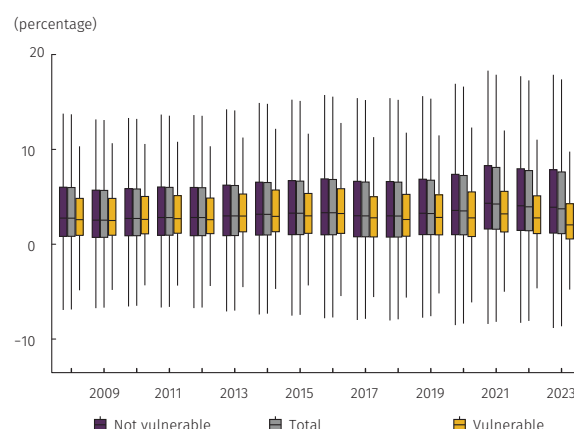
71 The percentage values of companies and loan portfolios at risk were adjusted with the model's sensitivity metric, defined as the percentage of hits over the total positive values in the test sample.

Graph 2.39
Financial Characterization of Vulnerable Firms (Stress Test)

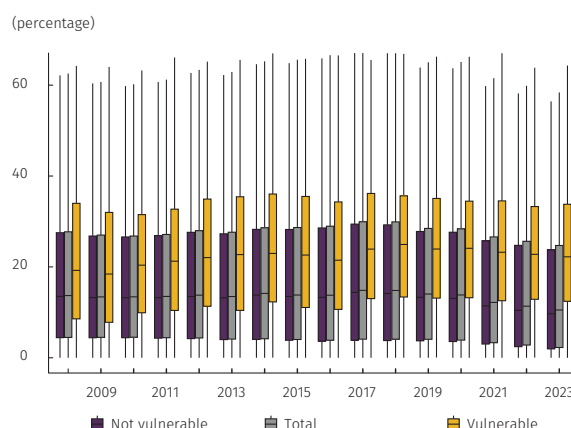
A. Annual Change in Sales



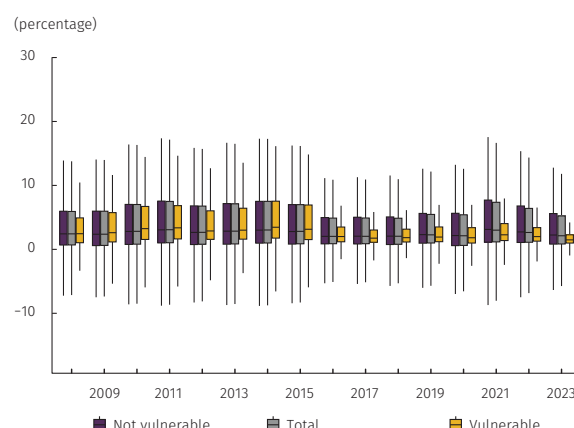
B. Net Margin (Profits/Operating Income)



C. Financial Leverage
(Financial Obligations/Assets)



D. Interest Coverage Indicator
(ICR; Operating Profit/Financial Costs)



Notes: Graphs exclude observations that present data outside 1.5 times the interquartile range of the indicator's historical distribution. Panel C only includes companies that report financial obligations. Total refers to the full sample of firms.

Sources: Superintendencia de Corporate Affairs and Financial Superintendency of Colombia; calculations by Banco de la República.

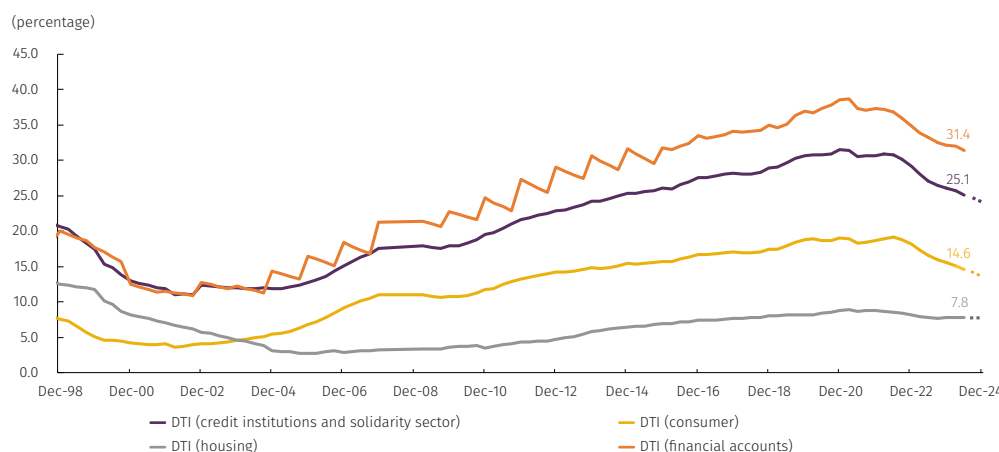
2.2.2 Households

In line with the continuation of the economy's orderly adjustment during the first half of 2024 and as anticipated in the previous Report, the household debt-to-income ratio continued to decline. As of June 2024, household debt as a percentage of disposable income⁷² (DTI) continued to decline from the peaks reached in 2021 (Graph 2.40). This dynamic is consistent with the real contraction of the household loan portfolio (consumer and housing), which in August 2024 was COP 347.5 t⁷³ and, in real annual terms, had a decrease of 6.3%, and with higher income of these agents. By type, consumer loans have contributed the most to the real contrac-

72 For this measure, the adjusted gross disposable income is used as the denominator, which refers to gross primary income, including current social transfers and excluding taxes, social contributions, and other current transfers. For these purposes, gross primary income corresponds to household remuneration from wages, net property income, gross capital surpluses, and mixed income. The annual value corresponds to the sum of the four quarters.

73 In addition to housing and consumer loans granted by CIs, it includes households' obligations to savings and loan cooperatives, the National Savings Fund, and employee funds.

Graph 2.40
Household Debt-to-Disposable-Income (DTI)



Note: The graph shows the debt-to-income indicator (DTI). To do this, the adjusted gross disposable income of households from the national accounts by institutional sector is used. The graph presents four measures of borrowing:

1. Purple line: household debt with credit institutions, savings and loan cooperatives, employee funds, and the Colombian Securitization Office.

2. Orange line: household debt from the balances of the financial accounts published by *Banco de la República*. In addition to what is included in the purple line, microcredits, and commercial loans of individuals are included, in addition to obligations with other financial institutions.

3. Grey line: housing loans with credit institutions.

4. Yellow line: consumer loans with credit institutions.

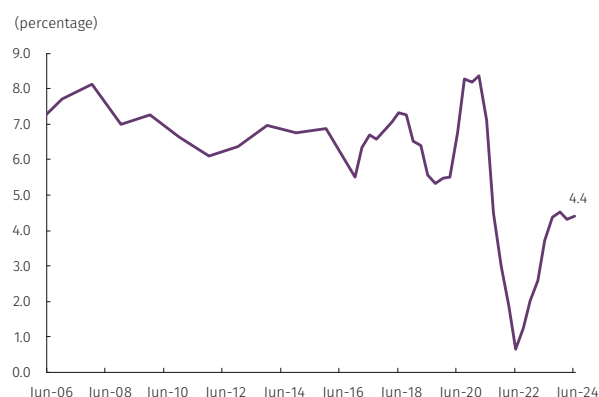
The dotted segments correspond to forecasts of the indicator prepared by the technical staff of *Banco de la República*. For the DTI for consumer and housing, it is assumed that the share of these portfolios in the total remains constant over the forecast horizon. Due to insufficient information, the DTI forecast is not estimated using the borrowing of the financial accounts published by *Banco de la República*.

Sources: Financial Superintendency of Colombia, *Superintendencia de Economía Solidaria* (Superintendence of the Solidarity Economy), Securitization of Colombia, *Banco de la República* and DANE; calculations by *Banco de la República*.

tion dynamics of household debt, while housing loans consolidate five consecutive months of annual real growth.

For the remainder of the year, the household debt-to-income ratio is expected to continue its adjustment process and be below the value observed in the first half of 2024. In order to anticipate short-term changes in the DTI, a forecasting exercise consistent with a low loan portfolio growth path that is in line with the most recent data and a favorable but moderate income dynamic was carried out for December 2024, consistent with the continuation of the economy's adjustment process. In accordance with the results of the exercise, the DTI would continue to decline progressively over the next six months (Graph 2.40, dotted lines).

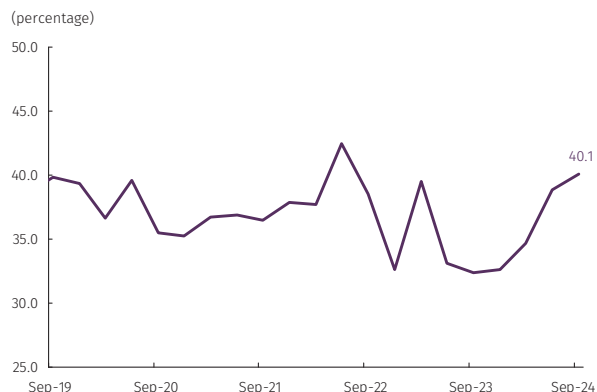
Graph 2.41
Gross Household Savings as a Percentage of GDP



Note: Annual values defined as the sum of the four quarters.
Source: DANE; calculations by *Banco de la República*.

During the first half of 2024, gross household savings as a percentage of GDP remained at historically low levels. In addition, the weighted average financial burden of debtors accessing new credit continued to increase and is at levels above its historic average. As documented in the September 2024 *Special Report on the Financial Position of Households*, as of June 2024, gross household savings as a percentage of GDP remains below its historic average (Graph 2.41). However, it is at levels well above those observed during the last two years, and although it showed a correction regarding the drop observed in March of this year, there is uncertainty regarding its future trend. On the other hand, the weighted average financial burden of debtors accessing new loans increased for the fourth consecutive quarter and reached its highest levels in the last

Graph 2.42
Weighted Average Financial Burden of Households that Accessed New Credits

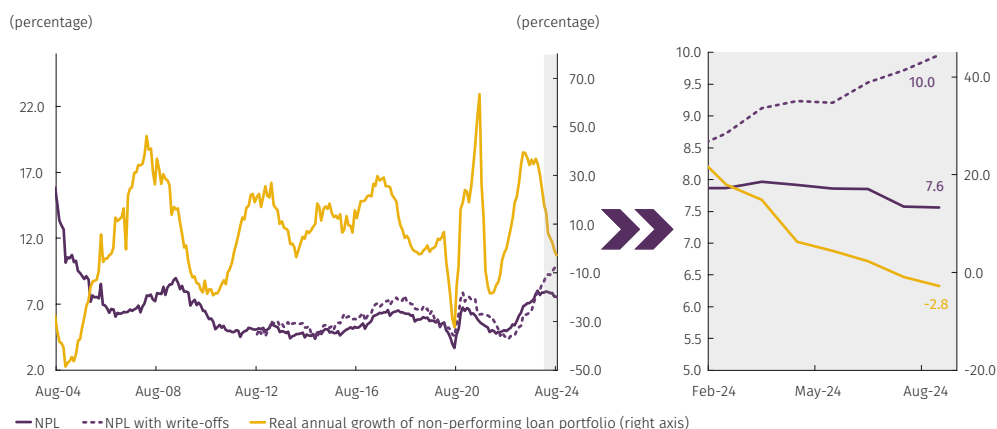


Note: the financial burden is defined as the ratio between the installments of consumer and housing financial obligations, and the debtor's income, which is added by the weighted average of the balance of loans to households of each bank.
Source: Survey on the credit situation in Colombia, September 2024; calculations by Banco de la República.

two years (Graph 2.42). This measure reflects a greater propensity of banks to grant new loans to debtors with higher leverage levels, which could translate into a greater materialization of credit risk in the future.

The NPL of households improved in the last six months, although it remains at historically high levels. As of August 2024, the NPL of the household loan portfolio stood at 7.6%, value lower than in February 2024 (7.9%) but higher than the average of the last five years (6.0%; Graph 2.43). Despite the greater deteriorations observed in mortgage loans, the improvements in the NPL of households are explained by a reduction in the consumption indicator and by a higher write-off of the portfolio in this type of loan (see section 2.2.1 of this Report). This indicates a discrepancy between the base indicator and the indicator with write-offs, which exhibits that the unrecoverable loan portfolio continues to increase. The QRI, in turn, has shown relative stability between August and February 2024 (Graph 2.44) in a context of improvements in consumer loans and deteriorations in housing loans.

Graph 2.43
Dynamics of the Non-Performing Loan Portfolio and the Non-Performing Loans Indicator (NPL) of Households

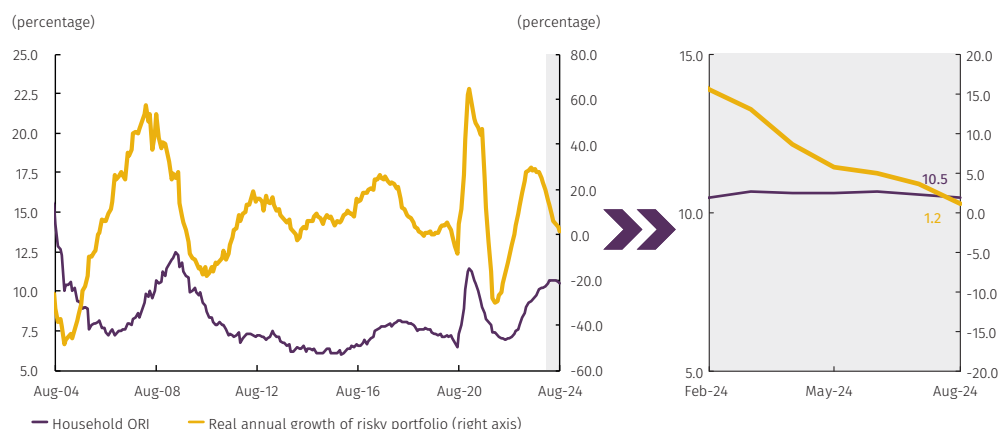


Note: the NPL of households is defined as the ratio between the housing and consumer portfolios with over 30 days past due and the total of these loan portfolios.
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

The NPL has improved for most consumer segments, except for vehicle loans. As of August 2024, the personal loans segment continues to exhibit the highest NPL of the consumer loan portfolio. However, it has gradually declined since the beginning of the year (Graph 2.45). Considering that the most recent credit vintages⁷⁴ in this segment have shown better dynamics, it could be expected that this indicator will continue to adjust orderly to lower levels. Similarly, the indicators for other segments have decreased, except for vehicle loans and loans covered by automatic payroll deductions. For vehi-

⁷⁴ The credit vintage analysis consists of monitoring the evolution over time of quality indicators for a group of loans originated in a specific month.

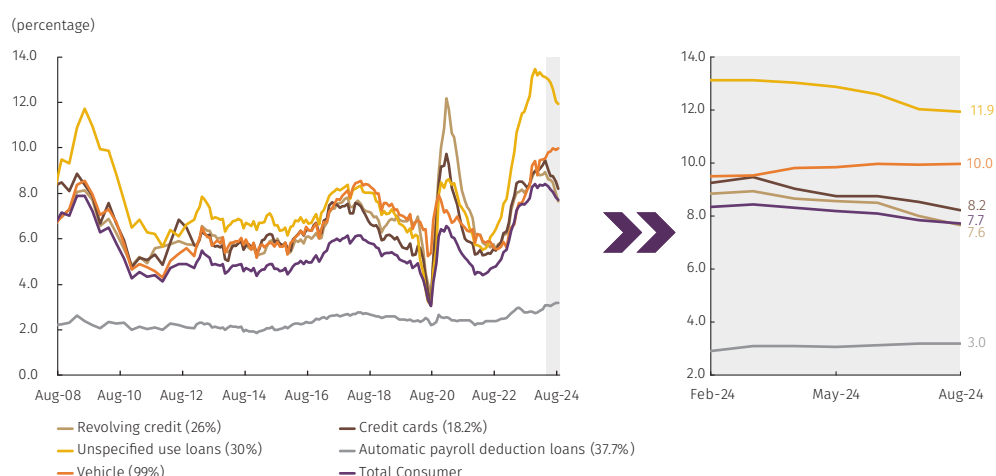
Graph 2.44
Dynamics of the Risky Loan Portfolio and the Quality Risk Indicator (QRI) of Households



Note: The QRI of households is defined as the ratio between the housing and consumer portfolios rated other than A and the total of these loan portfolios.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

Graph 2.45
Non-Performing Loans Indicator (NPL) by Consumer Portfolio Segment



Note: the NPL is defined as the ratio between the loan portfolio over 30 days past due and the total loan portfolio. In parentheses is the share of the segment in the total consumer portfolio of the CIs.

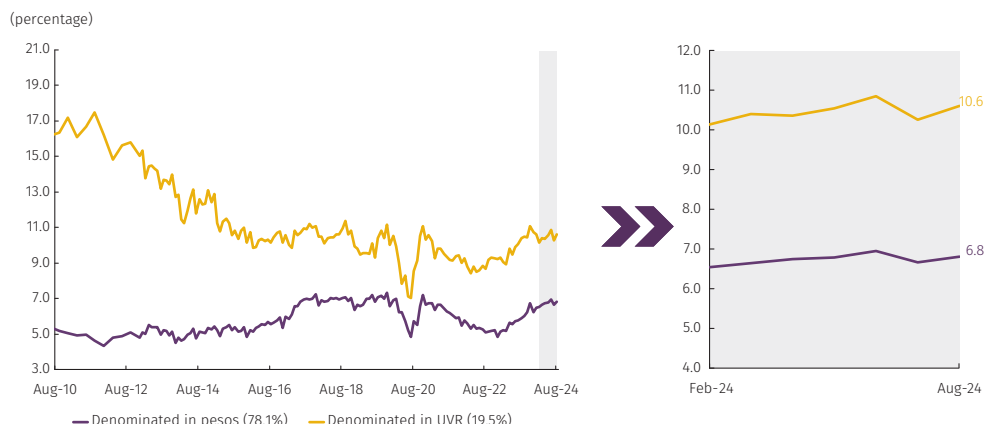
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

cle loans, the deteriorations have been increasingly lower in the last six months, which is related to the favorable dynamics of the most recent originations in this segment, as described in more detail in Box 1⁷⁵ of this *Report*. In contrast, the loan covered by automatic payroll deductions segment has accelerated its deterioration, which may be associated with the increase in unemployment in the first quarter of the year (see chapter 1 of this *Report*).

The NPL of housing loans continued to increase in the last six months, particularly those denominated in real value units (UVR in Spanish). The NPL of housing loans, both in pesos and in UVR, is close to the high levels observed at the end of 2020 (Graph 2.46). Although as of August 2024, the deterioration of UVR-denominated loans was greater than that of peso-denominated loans, the NPL of the latter has shown a more marked positive trend over the last year. This, combined with the

75 In the decomposition of the NPL performed in Box 1, the credit vintage component is associated with the factors that influenced the origination of the vintage, such as: entities' risk appetite, macroeconomic conditions, credit access conditions, among others.

Graph 2.46
Non-Performing Loans Indicator (NPL) of Housing Loan Portfolio by Denomination



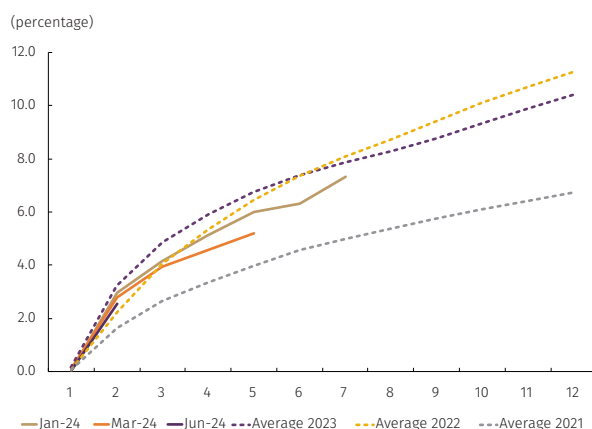
Note: the NPL is defined as the ratio between the loan portfolio over 30 days past due and the total loan portfolio. The parenthesis indicates the share of each denomination in the total housing portfolio. These do not add up to 100% because the classification by denomination does not include payroll deduction loans and employee loans for housing.
Source: Financial Superintendency of Colombia; calculations by *Banco de la República*.

significant representativeness of peso-denominated loans within the housing loan portfolio (78.2%), is reflected in the fact that their deterioration has had a greater impact on the NPL of this type of loan. As for the dynamics by segment, the NPL for LIH (low-income housing) and non-LIH⁷⁶ loans has also increased over the last six months.

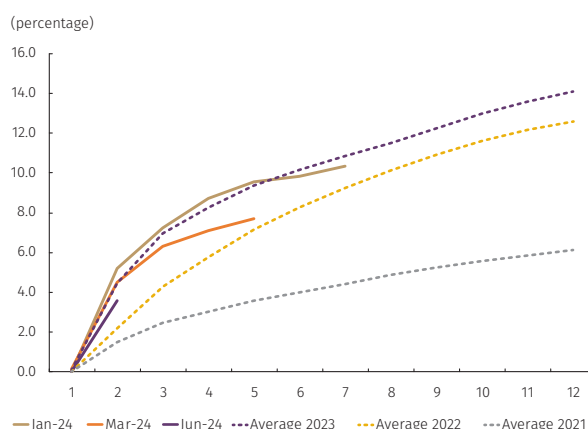
The NPL of the last credit vintages exhibits that, in general, the quality of those loans originated as of 2024 has deteriorated less than what was observed, on average, during the previous years. The vintage analysis, which consists of monitoring the quality indicators for a group of loans originated in a specific month, allows us to conclude that the quality of the consumer loan portfolio has improved in the most recent months and has approached 2022 averages (Graph 2.47, panel A). The

Graph 2.47
Non-Performing Loans Indicator (NPL) by Vintage for Consumer Loans

A. Total Consumer



B. Unspecified use loans

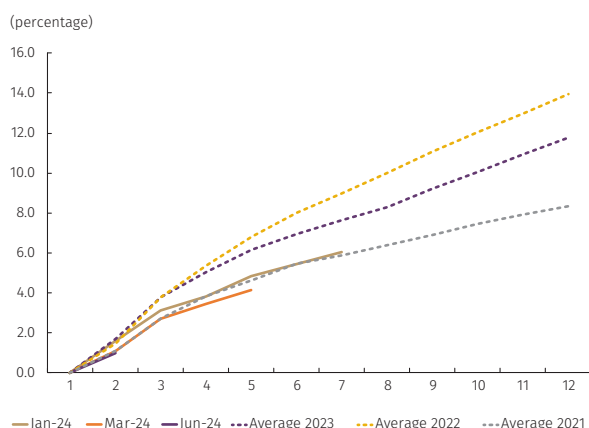


⁷⁶ The LIH segment includes elements that ensure its habitability, quality standards in urban, architectural, and construction design, and whose maximum value is 135 legal monthly minimum wages (SMMMLV in Spanish). The non-LIH segment corresponds to that which exceeds 135 SMMMLV.

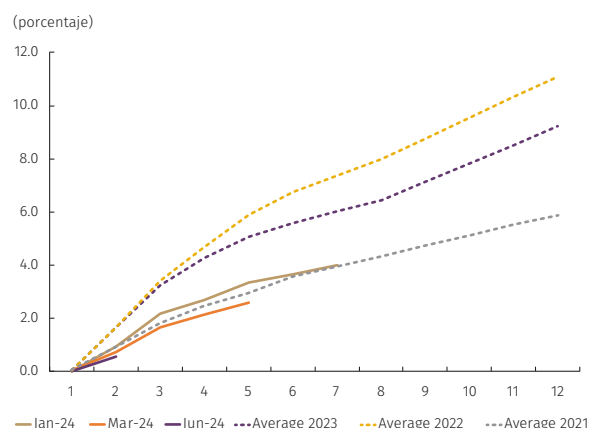
Graph 2.47 (continuation)

Non-Performing Loans Indicator (NPL) by Vintage for Consumer Loans

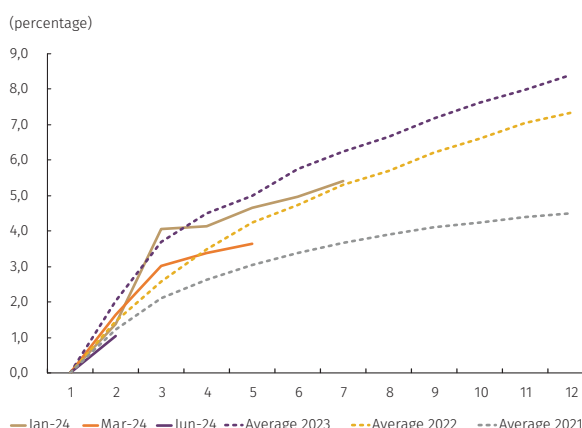
C. Credit Cards of Customers with Incomes below 2 SMMLV



D. Credit Cards of Customers with Incomes above 2 SMMLV



E. Vehicles



Note: Vintages analysis consists of monitoring the non-performing loans indicator (NPL) for a group of credits originated in a specific month. The NPL is defined as the ratio between the loan portfolio over 30 days past due and the total loan portfolio.
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

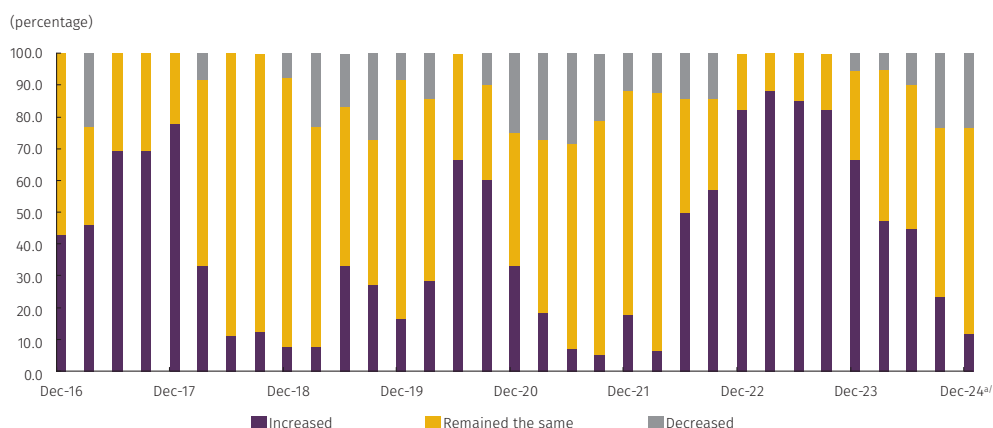
improvement has been widespread among the major consumer segments and is significant in the credit card segments (Graph 2.47, panels B to E).

Banks' stance on new loans continues to be restrictive; however, the proportion of entities that have lowered their requirements has increased. In accordance with *Banco de la República's September 2024 Report on the Credit Situation in Colombia*, banks continued to be demanding in allocating new loans to households during the third quarter of the year (Graph 2.48, panels A and B). Despite this, a larger proportion of entities are expected to reduce their requirements for new loan origination in the fourth quarter of 2024.

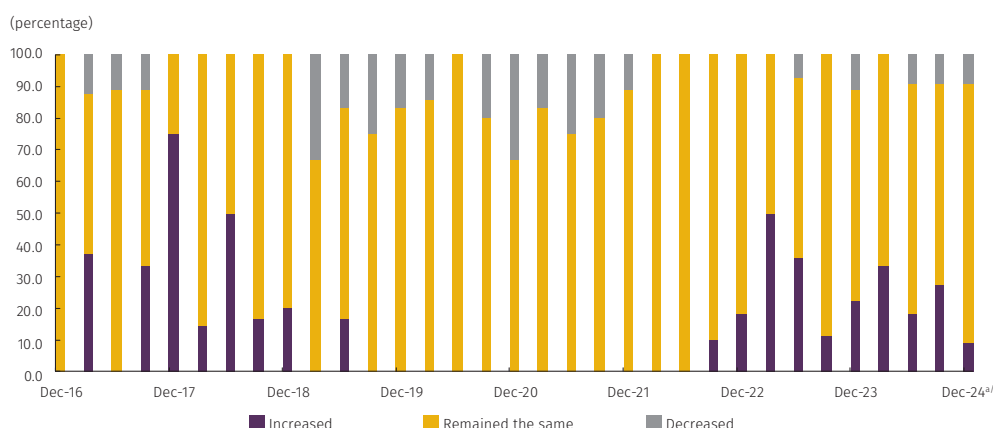
Consistent with a restrictive granting loan stance, CIs continue to concentrate their disbursements on former debtors with a low-risk profile. So far in 2024, the share of new loans of former consumer debtors, *i.e.*, those who have taken out loans in the last four years, has increased (from 94.9% in 2023 to 95.9% in June 2024). Like-

Graph 2.48
Changes in Banks' Requirements for the Allocation of New Loans
(percentage of institutions)

A. Consumer



B. Housing



a/ Expectations for the next quarter.

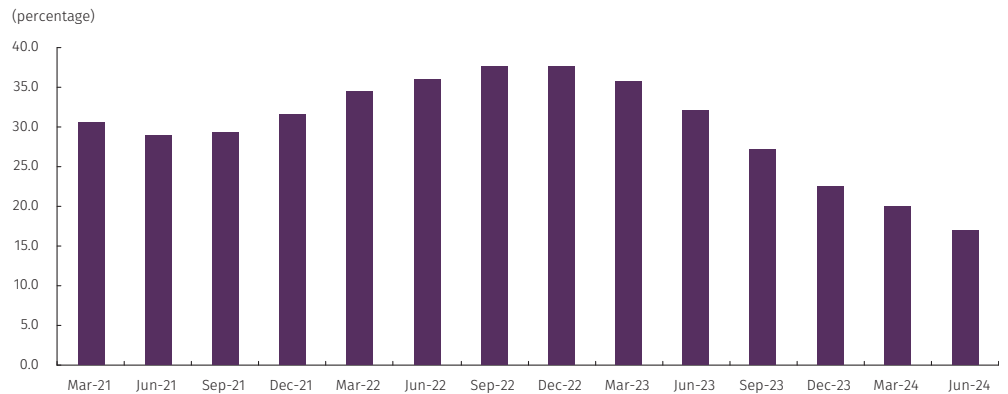
Source: Survey on the credit situation in Colombia, September 2024; calculations by Banco de la República.

wise, when the credit history of these debtors is constructed from the first quarter of 2019 to June 2024 and classified according to their risk profile⁷⁷, it is found that CIs continue to grant loans to debtors with a lower level of risk, which supports the hypothesis of better origination standards in the recent past (Graph 2.49).

Despite the improvement in the consumer loan portfolio quality indicators over the last six months, uncertainty persists regarding the future dynamics of households' creditworthiness due to several factors that may impact these agents. The increase in income in a recovery scenario in economic activity, together with the effects of the cumulative decrease in the level of interest rates, continues to favor households' creditworthiness since it reduces the value of interest payments on their new loans. Similarly, the lower negative real decreases in price indexes observed in the recent past (see *Loan Portfolio and Real Estate Market Analysis in Colombia: Special Financial Stability Report*, September 2024) could positively impact

77 Calculations based on the SFC's quarterly Form 341, "Individual Debtor Report: Lending Transactions." The most recent information available from this form is as of June 2024. Debtors with a high level of risk were defined as those who were ninety or more days in arrears in any of the periods analyzed in the household loan portfolio (consumer and housing). New debtors are excluded from the calculations.

Graph 2.49
Share of Loans Granted to High-Risk Debtors in the Balance of New Consumer Credits

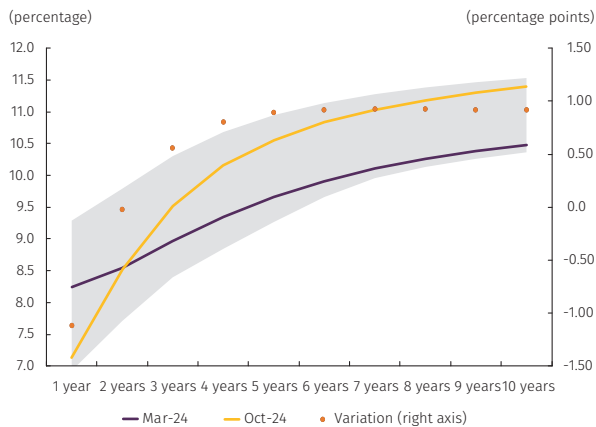


Nota: cálculos con base en el formato trimestral 341, "Informe individual por deudor: operaciones activas de crédito" de la SFC. La última información disponible de este formato se encuentra a junio de 2024. Se definieron a los deudores con alto nivel de riesgo como aquellos que presentaron una mora mayor a 90 días en alguno de los periodos analizados en la cartera de hogares (consumo y vivienda). Se excluyen los deudores nuevos de los cálculos.

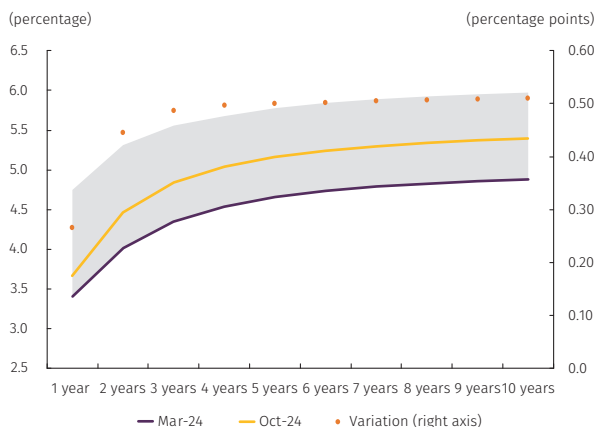
Fuente: Superintendencia Financiera de Colombia; cálculos del Banco de la República.

Graph 2.50
Public Debt Yield Curve

A. TES Pesos



B. TES UVR



Sources: DCV and Precia; calculations by Banco de la República.

the balance sheet of these. Despite this, considering that the housing loan portfolio has continued to deteriorate in recent months and households are sensitive to a possible deterioration in employment and adverse shocks affecting economic activity, the final effect on the financial health of these agents will depend, among other things, on the dynamics of the factors described in this section.

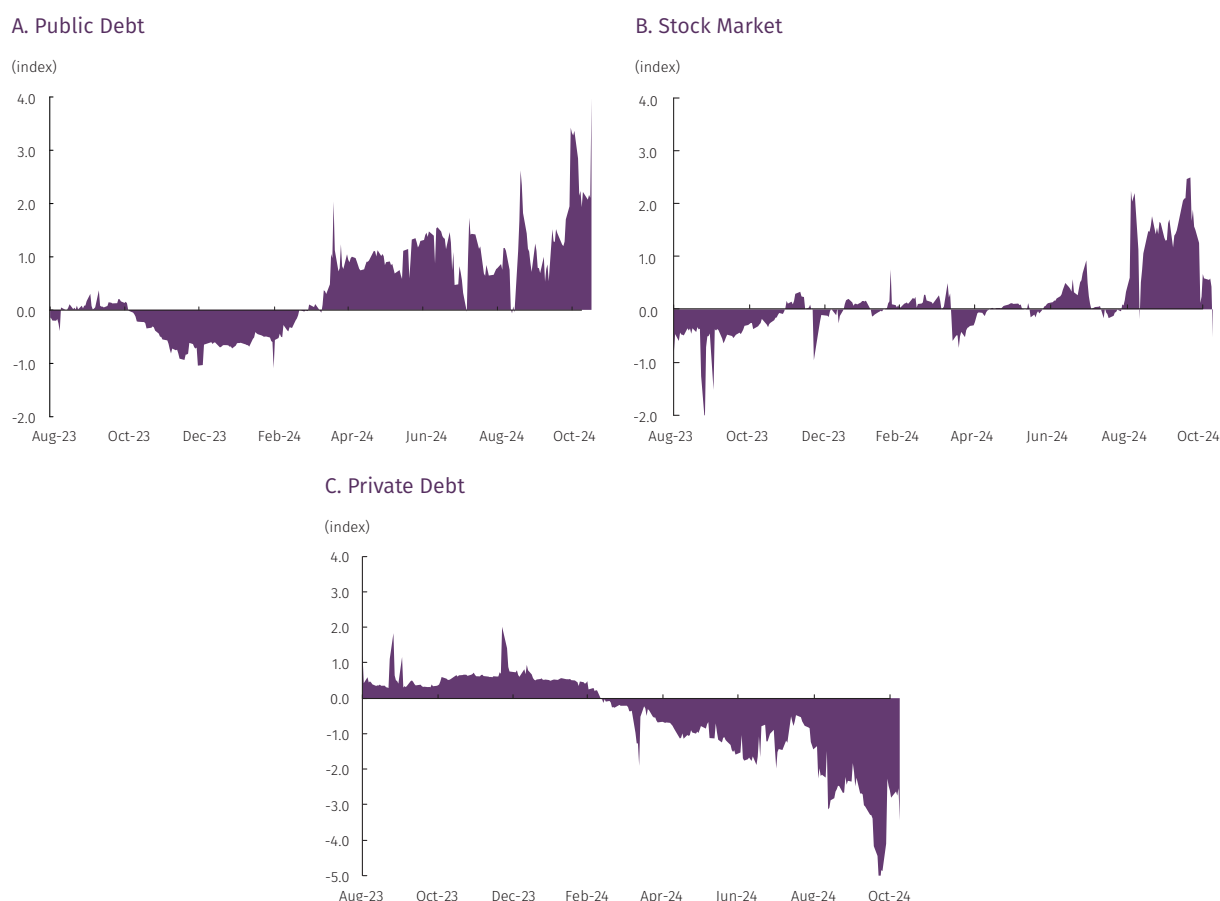
2.3 Market Risk

Since the information used for this section of the *Financial Stability Report* contains high frequency information, the analysis horizon corresponds to the period between March and October 2024.

Between March and October 2024, the public and private debt markets experienced devaluations, particularly towards the end of the evaluation window. Similarly, the stock market partially corrected its positive trend that began in the third quarter of 2023. Although, in line with the favorable performance of public debt in the region and lower international and local interest rates, public debt instruments had been valued as of September 2024, a higher risk perception, as a result of greater uncertainty regarding public finances, led to a decline in these valuations. Thus, as of October 2024, a steepening in the yield curve in pesos and an upward shift in the yield curve in UVR were observed (Graph 2.50). This greater uncertainty also negatively affected the performance of the private debt market. On the other hand, the lower liquidity in the stock market and a less favorable performance of the main shares that compose it led the MSCI COLCAP to a partial correction of the positive trend consolidated until May of this year (a 5.2% drop from the peak in that month). However, in annual terms, the index continues to show growth (25.0% compared to October 2023; for more details, see the *Financial Markets Report* for the II and III quarters).

During the analysis period, the public debt and stock markets were particularly susceptible to market risk events. The private debt market, on the other hand, was the receiver of the volatility events of these two markets. The period between March and October 2024 was marked by events of uncertainty regarding the health of public finances; a lower weighting of Colombia in the Global Bond Index - Emerging Markets due to the entry of India's bonds in the index; a context of U.S. dollar appreciation that resulted in significant depreciations of the region's currencies, and a negative performance in the stock market, particularly for Ecopetrol's shares. These events contributed to volatility peaks observed in the analysis period, especially in the public debt and stock markets, which was reflected in the volatility transmission indexes constructed following the methodology proposed by Gamba et al. (2017)⁷⁸, showing that those two markets were the net contributors of volatility, while the private debt market was the net receiver, in such a way that the trend observed in the *Financial Stability Report* of the first half of 2024 (Graph 2.51) was reversed.

Graph 2.51
Volatility Transmission Index



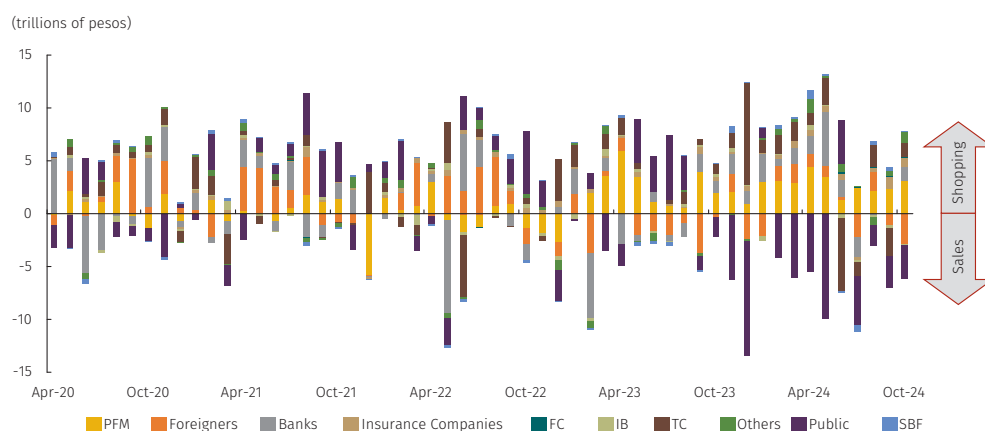
Fuentes: Precia y Banco de la República; cálculos del Banco de la República.

As of October 2024, the largest buyers of public debt were the PFMs and banks, while foreign investors maintained their selling trend. For this reason, the decisions of these three types of agents could have an impact on the dynamics of the

78 Gamba S., J. E. Gómez, J. Hurtado, L. F. Melo (2017). "Volatility Spillovers among Global Stock markets: Measuring Total and Directional Effects," *Borradores de Economía*, No. 983.

public debt market. Since December 2022, PFM has been net buyers of public debt instruments and have become the largest TES holders, with 31.2% of the total supply, followed by foreign investors and banks, which hold 18.6% and 16.5%, respectively (Graph 2.52). In this regard, since these three types of agents hold more than 60% of the outstanding TES stock, a potential risk for the public debt market arises from their investment decisions, particularly in the event of widespread sales by these agents. Additionally, if banks considerably increase their position in TES due to a higher demand for resources from the Colombian Government, this could impair their lending capacity, which would negatively affect the recovery of the loan portfolio.

Graph 2.52
Net Investment Flows in TES by Type of Investor



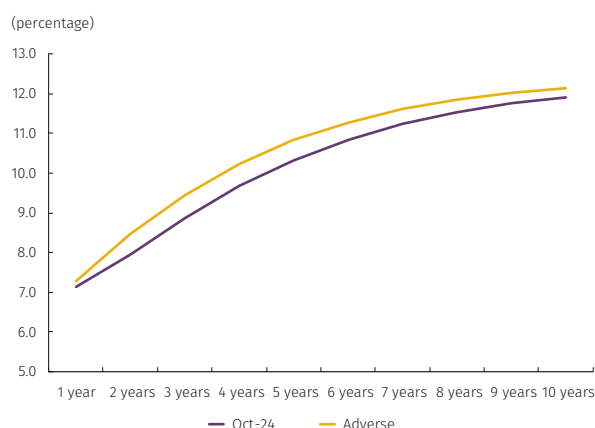
Note: Flows include issues and maturities, so they don't necessarily add up to zero.
Source: DCV; calculations by Banco de la República.

In a context of higher debt issuance by the Government and higher TES holdings by PFM and banks, the duration of the financial system's portfolio remained relatively stable in the horizon period. During 2024, the National Government has issued TES for about COP 61.0 t, mainly concentrated in the long term, with maturities up to 2050, which represents an increase of more than 20% with respect to 2023 issuances. In addition, the Government has carried out roll overs and TES sales transactions to obtain cash. Despite this, the duration of the portfolios of the major holders of these instruments and the financial system in general have not experienced significant changes. As of October, the duration of the TES portfolio was 6.4 years, slightly higher than the value observed in March (6.3 years). This indicates that new issues have not directly translated into a greater sensitivity of securities to changes in market interest rates.

Fiscal uncertainty could be reflected in a higher risk premium for Colombia, which could lead to devaluations along the yield curve. In addition to the accelerated pace of public debt issuance by the Government to address short-term⁷⁹ financial needs, the Senate recently approved a reform to the General Participation System, which will progressively transfer greater resources from the Colombian Government to regional governments. These two factors have negatively influenced the risk perception of the Colombian market, which was reflected in a higher volatility of five-year credit default swaps (CDS) in the last month. Therefore, to estimate the effect of higher risk perception on market interest rates, an adverse scenario was

⁷⁹ TES issuances were increased to COP 73,708 t for 2024. For more details, see Decree 1298 of 18 October 2024.

Graph 2.53
TES Peso Curve Under an Adverse Scenario



Source: DCV, calculations by Banco de la República.

proposed in which the CDS would increase by 50 bps in a period of one month and, using the results of the SYSMO stress model methodology presented in chapter three of this *Report*, it was estimated that the yield curve in pesos would devalue by an average of 60 bps, concentrated in the two to five-year range of the curve (Graph 2.53).

In an adverse scenario of public debt devaluations such as the one shown in the previous exercise, the financial system's TES portfolio would face losses of about COP 9.5 t, and the most affected entities would be the PFMs in third-party position and TCs. A shock and a devaluation of the public debt market of the magnitude analyzed in this section could significantly impact the financial system since TES is its main investment asset, and the proportion of these that are valued at market prices is high, particularly for the PFMs and TCs in third-party position. Taking the curve resulting from the 50-basis-point shock in CDS, the higher estimated devaluation in the peso TES curve⁸⁰ was applied to the proportion of instruments valued at market prices. The results showed potential aggregate losses of COP 9.5 t, equivalent to 0.8% of the financial system's equity (Table 2.2). Compared to the value-at-risk⁸¹ reported by entities to the SFC⁸², the losses estimated in this exercise are slightly lower than the extreme scenario used by entities in their calculations (VaR at 99% of CIs and NBFIs is 1.1% of the financial system's equity).

In a scenario of materialization of fiscal and geopolitical risks at the global level that would generate a systemic decline of the U.S. stock market, the Colombian stock market would register a similar dynamic to that of the emerging markets index. One of the channels through which the materialization of the global risks described above can be quantified is the stock market. In this regard, a scenario of systemic decline in the S&P500⁸³ equivalent to a 10% devaluation over a month was assumed, and the subsequent performance of various Latin American and emerging markets⁸⁴ was estimated (Graph 2.54). The results exhibit that the markets of Chile and Mexico tend to be less responsive to these transmission episodes, so the impact on their stock markets is lower. This could be due to their degree of deepening, where the interaction of a larger number of agents can cushion the shock. On the other hand, the stock markets of Peru and Argentina tend to be more sen-

80 The highest price drop was estimated at the fifty-month apex of the peso TES curve: 2.9% (97 bps).

81 A measure that estimates the maximum loss an investment portfolio may experience over a certain horizon and with a certain confidence level as a percentage of its portfolio.

82 Form 438 - Value at risk by factors, and Form 386 - Value at risk by modules

83 A stock index that includes 500 of the largest and most representative companies in the United States, covering various sectors of the economy.

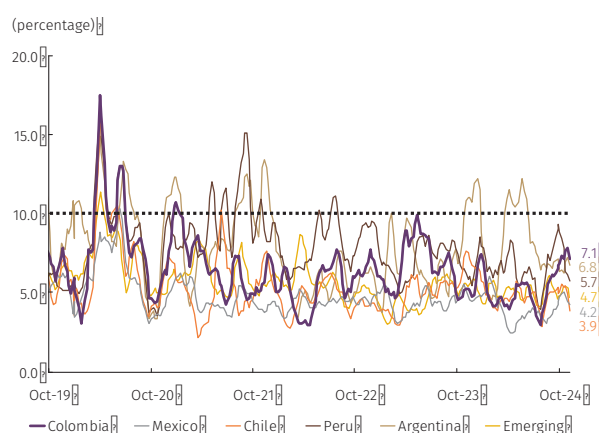
84 This methodology is known in the literature as long-run marginal expected shortfall (LRMES) and originates from the systemic expected shortfall (SES). In this exercise, the methodology of Sánchez-Quinto, C. (2022) was replicated.

Table 2.2
Potential Losses from Market Risk Events

Type of Institution	31 - Oct - 2024	
	COP t	percentage of Equity (August 2024)
Credit Institutions		
Commercial Banks	0.75	0.70
Investment Banks	0.02	0.12
Commercial Finance Companies	0.00	0.00
Financial cooperatives	0.00	0.00
Non-Bank Financial Institutions (NBFIs)		
Pension Funds in proprietary position	0.00	0.01
Pension funds third party position	4.16	0.84
Stock Brokerage Firms: proprietary position	0.00	0.00
Stock Brokerage Firms: third-party position	0.10	0.22
Trust Companies: proprietary position	0.00	0.05
Trust Companies: third-party position	4.40	0.93
Insurance and Capitalization Companies	0.07	0.30
System in proprietary position	2.99	0.25
Total Financial System	9.53	0.81

Sources: Centralized Securities Depository; calculations by Banco de la República.

Graph 2.54
Estimated Drop in Stock Indices resulting from a Stress Scenario in S&P500



Note: the dotted line is at 10% and denotes the level at which a stock market would register a stronger response than the stress scenario posed, in which the S&P500 index depreciates 10%.

Source: Bloomberg; prepared by Banco de la República.

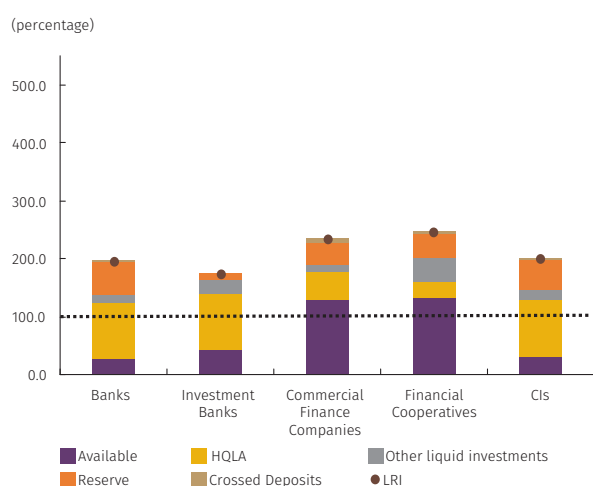
sitive, exhibiting generally stronger declines, which would be explained by idiosyncratic factors affecting their markets. Finally, the Colombian stock market, except for the 2020 episode, shows a medium level of sensitivity, which is similar to that of the emerging market stock index. In this regard, the local market is characterized by low liquidity and performance driven by the financial sector and oil prices. However, foreign investors are key players in the volume traded in the local stock market⁸⁵ and account for around 13% of the market value. Considering that a drop of more than 10% would reflect an expanded contagion effect, only the Argentine stock market has exceeded this threshold in the last two years.

The most relevant source of market risk for the local financial system is concentrated in the performance of public debt and its microstructure of participation by type of entity. Although, as indicated in the *Financial Stability Report* of the first half of 2024, the risk of a sudden and large-scale liquidation of foreigners' position in public debt instruments is lower due to the restructuring of holdings towards PFMs, uncertainty

⁸⁵ According to the Colombian Stock Exchange, as of September 2024, foreign investors accounted for 30.6% of the traded volume in the Colombian equity market.

Gráfico 2.55
Descomposición de los ALM (porcentaje del RNL)

A. 26 April 2024



B. 27 September 2024



Note 1: The liquid assets (LAM) of the LRI are composed of the aggregate available (which in the graph is broken down into reserves, cross-deposits, and available), investments in high-quality liquid assets (HQLAs), and other liquid investments. HQLAs are considered to be those liquid assets that *Banco de la República* admits for open market operations and liquidity operations for the normal functioning of the payment system. The LAMs that are computed in the calculation of the LRI are adjusted for market liquidity and exchange rate risk.

Note 2: Net liquidity requirements (NLR) refer to the estimate of net outflows of resources over a 30-day horizon.

Note 3: For this calculation, the amount of each component of the LAM was taken and expressed as a percentage of the NLRs, so that the sum of the bars is equivalent to the LRI observed by each type of entity as of 26 April 2024 in panel A, and 27 September 2024 in panel B.

Source: Financial Superintendency of Colombia; prepared by *Banco de la República*.

persists regarding the investment decisions of these entities and banks in a scenario of greater uncertainty regarding the government's finances and the outcome and implementation of its reforms. Similarly, a greater perception of sovereign risk derived from this could negatively impact the local market performance and foreign investors' appetite for Colombian instruments.

2.4 Liquidity and Trading Book Interest Rate Risk

2.4.1. Liquidity Risk

The reduction of the reserve requirement generated additional liquidity in the financial system. The reserve requirement is an economic policy instrument that requires CIs to maintain a liquidity reserve proportional to the total deposits collected from the public. On 30 August 2024, the Board of Directors of *Banco de la República* decided to reduce the applicable percentages by 1 pp, from 8.0% to 7.0% for current and savings accounts, and from 3.5% to 2.5% for term deposits (CDs with maturities of less than eighteen months). These new percentages, which ensure the proper functioning of the payment system, reduced the liquidity reserve requirement of CIs by approximately COP 6.0 t, which provided additional liquidity to the financial system in September, facilitating the expansion of its operations and, potentially, promoting the financial deepening of the Colombian economy through a reduction in intermediation costs⁸⁶.

At the aggregate level, CIs have an adequate liquidity structure, primarily composed of cash and high-quality liquid assets. Between April and September, the liquidity of the financing companies has increased considerably. To meet their liquidity requirements, CIs have sufficient high-quality liquid assets and cash to comply with the thirty-day LRI regulatory minimum, even without the need to resort to other assets, such as reserve requirements and crossed deposits⁸⁷ (Graph 2.55). By type of institution, financing companies recorded a strong increase in their liquid assets during the analysis period due to the strategy for attracting demand deposits, which has been held in cash or short-term investments. On the other hand, the cooperatives increased their liquidity while restructuring their portfolio from cash to liquid assets. For the total

86 For more details on the factors considered in the decision of the Board of Directors of *Banco de la República*, see the blog Bank Reserve and Liquidity Risk Management at www.banrep.gov.co

87 Crossed demand deposits refer to the relationship between two CIs, in which each holds a balance of demand deposits in the other. This is important because, if one of them observes liquidity pressures, one of them could withdraw the balance deposited in the other CI, but the latter, in turn, could withdraw its balance to meet the withdrawal generated by the first CI. Therefore, there is no certainty that crossed demand deposits can be used to alleviate the liquidity pressures faced by a CI.

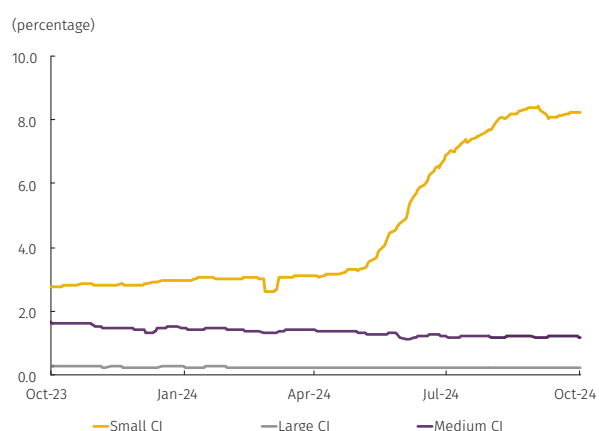
CIs, whose dynamics are mainly explained by the behavior of banks, the reduction in reserve requirements on deposits did not have a significant impact on the LRI. This is due to the fact that, although institutions did not hold this new liquidity surplus in cash, they did increase their exposure to other liquid investments.

The increased capture of demand funds has impacted the structure of the deposit market. Higher interest rates on this instrument have been the main tool of this strategy by financing companies. Since May 2024, some small CIs, mainly financing companies, have adopted a strategy for attracting demand deposits by offering high interest rates (Graph 2.56, panel A). This trend, combined with a declining path of market interest rates, contributed to a sustained monthly growth in the demand deposit balance of these institutions as of June this year. Although this growth slowed rapidly after that month, as of October, real monthly growth rates remain above 25.0%, which contrasts with the 0.6% observed for CIs, whose demand deposit rate is less than 5.0% (Graph 2.56, panel B). Despite this recent trend, according to the *Special Report on Concentration and Competition in Deposit and Credit Markets* of *Banco de la República*, this performance has not significantly affected concentration indicators in the deposit market. At the same time, no significant liquidity pressures have been observed through demand deposits outflows in CIs offering lower rates due to a potential transfer of funds to CIs offering higher rates.

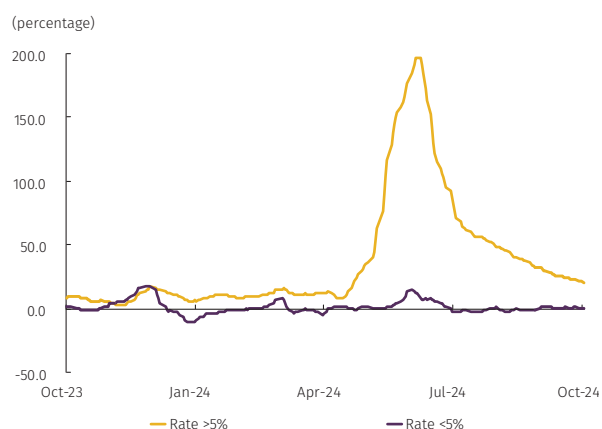
In an environment of loosening local financial conditions, the capture of demand deposits has gained relevance as a structural funding source for CIs, compared to term deposits. In line with lower funding needs, given the loan portfolio slowdown and in a context of loosening local financial conditions, the downward adjustment in the term deposit market continued in the last half of the year. In particular, the real annual growth of these deposits continued to decelerate and reached negative values between July and September 2024, consistent with the period of high maturities of these instruments between July and August and with the reduction in the issuance of new CDTs as of September. Compared to funding of demand deposits that has started to increase gradually and contribute positively to funding, which is usually observed in periods of lower interest rates. In terms of NSFR's structural funding since the beginning of the year, the real contribution of term deposit balances to available stable funding has decreased, while that of demand deposits has been positive (Graph 2.57). However, it is expected that, as the demand for credit from the real sector continues to increase, CIs will demand higher CDTs and will again boost deposits through this instrument.

Graph 2.56
Rate and Growth of Demand Deposit
Balances of Individuals

A. Average Rate Deposits by Size of CI



B. Real Monthly Growth of the Balance by Deposit Rate

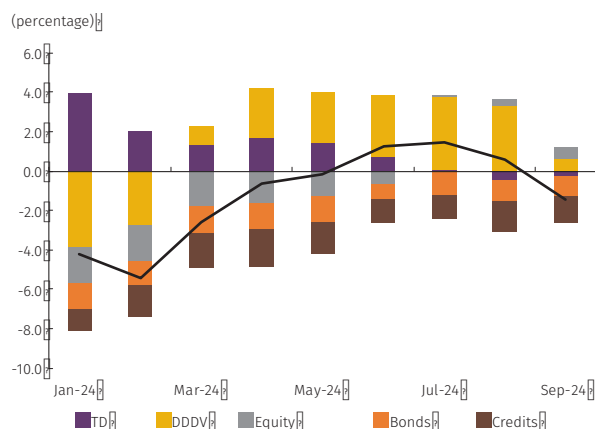


Note 1: The division by size in panel A was made by classifying the first five institutions in assets as of August 2024 as *large*, the next ten as *medium-sized*, and the others as *small*.

Note 2: Monthly growth was calculated on the five-day moving average of observed balances.

Source: Financial Superintendency of Colombia; prepared by Banco de la República.

Graph 2.57
Contribution to the Real Annual Growth of Available Stable Funding (ASF) of CIs by Type of Funding Source



Note 1: The total of CI refers to the set of institutions in groups 1 and 2 of the NSFR. Group 1 comprises banks whose assets represent 2.0% or more of the total assets of the banking sector. Group 2 includes banks whose assets represent less than 2.0% of the total assets of the banking sector, financing companies, financial corporations, financial cooperatives, and special official institutions indicated in subparagraph i) of numeral 5.3.1 of chapter XXXI of the BAFC, provided that such institutions have as a group of significant assets the loan portfolio and leasing operations.

Note 2: "TD" refers to term deposits and "DD" to demand deposits.

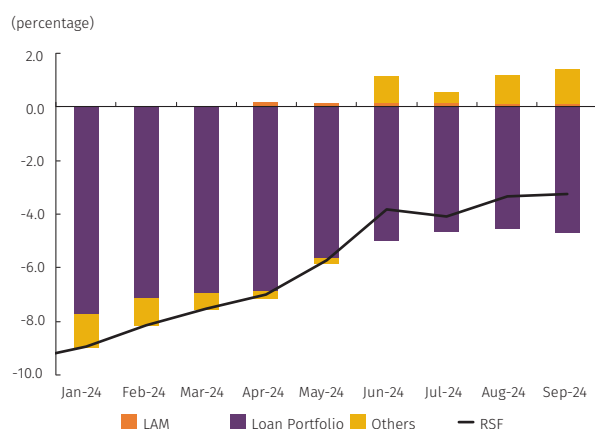
Source: Financial Superintendency of Colombia (Form 238); prepared by Banco de la República.

In line with the entry into force of the regulatory changes on the NSFR in September 2025 and the expected recovery of the loan portfolio, entities should continue to properly manage structural funding risks. In accordance with the convergence process towards Basel III standards in liquidity risk management, in September 2025, the instructions issued by the SFC in External Circular 013 of 2023, which modifies the NSFR⁸⁸ calculation methodology, will enter into force. As of September 2024, the NSFR's required stable funding (RSF) has registered real annual reductions, given the contraction of the loan portfolio (Graph 2.58). As the economy's growth increases in a scenario of lower interest rates, it is expected that the loan portfolio will show greater dynamics and that the RSF will increase and put downward pressure on the NSFR. This, together with the entry into force of the regulatory change in 2025, highlights the need for CIs to continue managing their funding towards stable sources.

In response to the issues raised in the previous version of this Report, CIs have adjusted downward the cost of term liabilities and have adequately navigated periods of high long-term CDT maturities. However, they face the dilemma of short-term financing and lower rates while adjusting funding to more stable sources, in accordance with the future NSFR requirements.

In the previous version of this *Report*, the need for a triple task in the management of CI funding was raised, consisting of the downward adjustment of the cost of term liabilities, the management of the refinancing risk associated with shorter terms issues, and finally, the control of the maturity mismatch in accordance with the NSFR. With respect to the first point and in line with the decrease in market rates, broader financing conditions and lower funding needs in the face of slow credit dynamics, the rates of new CDT issues showed, in general, a reduction for all maturities (Graph 2.59). In terms of issuance maturities, an increase is observed from May 2024 to August, driven by a higher share of issues with maturities longer than one year, consistent with the period of high maturities of long-term securities between July and August (Graph 2.60). As of October, the average term fell again in line with higher issuance at terms of less than six months, and in line with expectations of lower market rates, it is expected that this term will remain at low levels during the next few months, which keeps the task of CIs to manage refinancing risk at shorter terms in force. This, together with an expected better loan portfolio performance in 2025, which would result in higher financing needs, generates a dilemma in the management of the CIs' funding structure. On the one hand, they have incentives to finance

Graph 2.58
Contribution to Real Annual Growth of the Required Stable Funding (RSF) of the CIs by Type of Funding Source



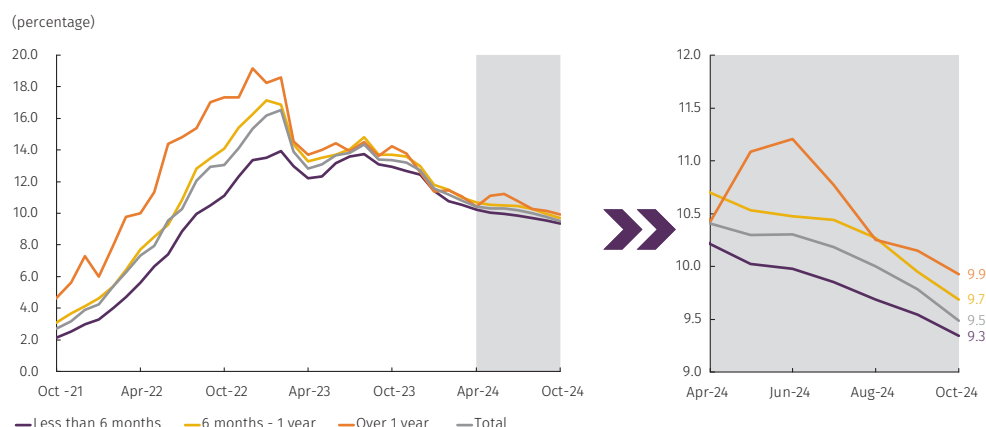
Note 1: The total of CI refers to the set of institutions in groups 1 and 2 of the NSFR. Group 1 comprises banks whose assets represent 2.0% or more of the total assets of the banking sector. Group 2 includes banks whose assets represent less than 2.0% of the total assets of the banking sector, financing companies, financial corporations, financial cooperatives, and special official institutions indicated in subparagraph i) of numeral 5.3.1 of chapter XXXI of the BAFC, provided that such institutions have as a group of significant assets the loan portfolio and leasing operations.

Note 2: LAMs comprise cash, reserve requirements, and high-quality liquid assets (HQLAs).

Source: Financial Superintendency of Colombia (Form 238); prepared by Banco de la República.

88 The SFC established that CIs and the Special Official Institutions (SOIs) for which the regulation applies must differentiate from September 2025 the demand deposits of wholesale customers of the real sector, OEICFs and financial institutions supervised by the SFC, between operating and non-operating deposits, according to an internal classification methodology.

Graph 2.59
Average Monthly CDT Issuance Rates Per Term of the CIs



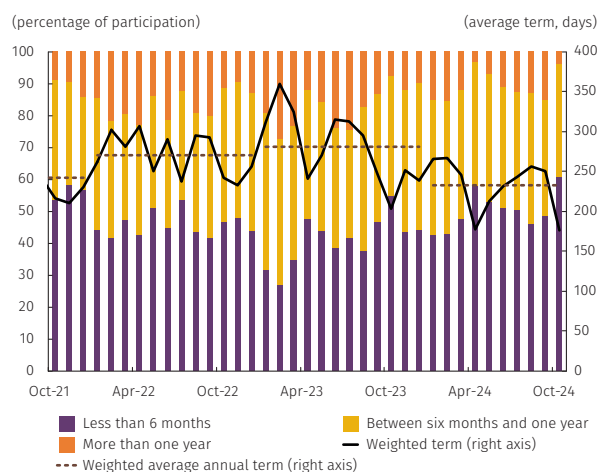
Note 1: Average monthly rates are weighted by issuance amounts.

Note 2: The increase in the issuance rate greater than one year during May and June is mainly because two large CIs raised funds on some days at high rates compared to the rest of the CIs.

Note 3: Issues of less than six months are considered to be all those whose term is equal to or less than 179 days. Issues between six months and one year are considered to be those whose term is between 180 and 360 days. Greater than one year, includes issues with terms of more than 360 days.

Source: Financial Superintendency of Colombia; prepared by Banco de la República.

Graph 2.60
Average Term of CDT Issuances



Note: Issuances of less than six months are considered to be all those whose term is equal to or less than 179 days. Issues between six months and one year are considered to be those whose term is between 180 and 360 days. Greater than one year, includes issues with terms of more than 360 days.

Source: Financial Superintendency of Colombia (Form 441); prepared by Banco de la República.

themselves in the shorter term, but at the same time, they must direct their search for financing towards more stable sources to adjust adequately to the CFEN requirements that come into effect in September 2025.

2.4.2. Interest Rate Risk in the Banking Book

This section analyzes the interest rate structure of the balance sheet of CIs and calculates a measure of exposure to the interest rate risk in the banking book (IRRBB). IRRBB refers to the potential impact on an entity's capital and earnings arising from movements in interest rates that affect banking book positions⁸⁹. Managing IRRBB is essential because its materialization can have a significant effect on the profitability and capital of financial intermediaries, as observed in the United States with the Silicon Valley Bank (SVB) incident and some

⁸⁹ Interest rate risk has two dimensions: the first is analyzed in the market risk section and refers to the risk of devaluations of assets in the treasury book in the event of interest rate movements. According to Chapter XXXI of the SFC's Basic Accounting and Financial Circular (BAFC), the treasury book is composed of the set of positions, resulting from treasury operations, that the entity holds in order to benefit in the short-term form fluctuations in asset prices, as well as those investments sensitive to fluctuations in market variables. In this order, the treasury book includes, among others, all marketable and available for sale investments. The second, which is analyzed in this section, corresponds to the risk of variations in interest rates on the net interest income of entities, considering the information in the banking book. The BAFC defines the banking book is made up of the set of positions arising from the entities' deposits through current and savings accounts, term deposits, bond issuance, etc. Assets include the loan portfolio, guarantees and collateral, investments to maturity and, in general, any transactions that is not part of the treasury book. The balance sheet of the banking book represents around 81% and 83% of the total assets and liabilities of CIs, respectively.

regional banks in March 2023. Banking supervision has emphasized the management and regulation of IRRBB under the Basel Pillar III (BIS, 2019)⁹⁰. In Colombia, this regulation was socialized by the SFC in 2022 and began to be implemented in December 2023. The measurement of IRRBB under the new SFC regulation will take place between December 2024 and July 2025⁹¹.

Because banks usually have a maturity mismatch due to their intermediation activity (they lend long-term and fund short-term), interest-rate increases can negatively affect net interest income and equity, if banks do not quickly adjust their balance sheet to the interest rate cycle, or if they do not use interest rate hedges. However, balance sheet adjustment also depends on credit and deposit market factors (*i.e.*: demand, competition, risk, etc.) that may slow down their response to monetary policy cycles⁹².

Interest rate risk in the banking book (IRRBB) is the potential impact on banks' capital and profits of interest rate movements affecting banking book positions. In order to measure the exposure of credit institutions to IRRBB, the Weighted Average Term to Maturity (WATM) gap has been calculated, which is defined as the difference between the weighted assets and liabilities that make up the banking book, sensitive to changes in interest rates for different maturities. The evolution of the WATM gap depends on balance sheet composition, fixed and floating rate indexation and duration. The WATM gap tends to be negative since traditionally in the activity of CIs (*i.e.*: lending and deposit-taking) the duration of assets is greater than that of liabilities, which generates a negative duration gap⁹³. The WATM gap depends mainly on two factors: the proportion of assets and liabilities agreed at a floating rate (which is immediately repriced in response to changes in interest rates), and the term of fixed-rate assets and liabilities (which is repriced according to their duration). The reduction of the WATM gap (in absolute terms) occurs to the extent that the portion indexed to floating rates increases, both in assets and liabilities increases, which makes their adjustment to short-term interest rates faster. In a scenario of rising interest rates, the reduction of this gap would occur to the extent that the indexation of assets to floating rates increases and the indexation to floating rates of the liabilities remains stable (or decreases), assuming that the

90 BIS (2019). *Interest Rate Risk in the Banking Book*, Basel Committee on Banking Supervision SPR31, Bank for International Settlements, Basel.

91 In December 2023, the IRRBB regulation came into force, which incorporates the explicit measurement of this risk and its quantification in terms of the impact on the economic value of equity (EVE) and net interest margin (NIM). The regulation incorporates different scenarios of interest rate shocks and makes a granular measurement of IRRBB exposures. The standard was informed by the SFC's External Circular 25 of 2022 and is discussed in the *Financial Stability Report* of September 2022.

92 In the box "Interest Rate Risk in the Banking Book and Monetary Policy Normalization" of the September 2023 *Financial Stability Report*, an analysis of IRRBB by type of institution, its evolution during different interest rate cycles and its relationship with the profitability of CIs is made.

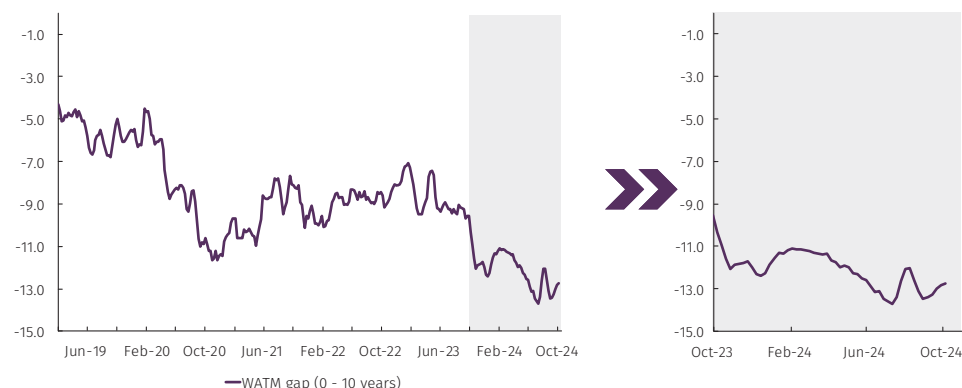
93 The indicator is defined as: $WATM\ Gap_T = ASR_T - PSR_T$ where $ASR_T = \sum_i AF_i \left(\frac{T-D_i}{T} \right) + \sum_i AV_i x E_{TR,PM}$ and $PSR_T = \sum_j PF_j \left(\frac{T-D_j}{T} \right) + \sum_j PV_j x E_{TR,PM}$. Where ASR_T corresponds to the assets i that make up the banking book and which is divided into fixed rate indexed assets AF_i that have a duration D_i that is compared in time T and variable rate indexed assets AV_i that are affected by changes in the monetary policy rate, an effect that is captured by the elasticity between the benchmark rates and the interbank interest rates (TIB in Spanish) ($E_{TR,PM}$). The liabilities of the banking book PSR_T are composed of two elements, the fixed rate liabilities PF_j that are affected by the duration of D_j in time T and the variable rate indexed liabilities PV_j that are also affected by changes in the monetary policy rate. Demand deposits (savings and current accounts) of legal entities and special official institutions (SOIs) are incorporated in the variable rate liabilities component according to their observed share (given the greater bargaining power of these depositors vis-à-vis the bank). On the other hand, demand deposits of individuals are included in the fixed-rate component of liabilities. This distinction is made on the assumption that depositors with deposit insurance (*i.e.* individuals) react less to changes in interest rates or bank risk than institutional depositors. For further details, see Section 4.2. of the September 2023 *Financial Stability Report*.

fixed-rate indexation of assets and liabilities remains unchanged. In an interest rate reduction scenario, on the other hand, the gap is expected to narrow as long as the fixed-rate indexed assets and liability portions remain unchanged, and the floating-rate liability portion increases more than the floating-rate asset portion. This would reduce the cost of funding while maintaining the profitability of the assets. However, achieving such adjustments in the duration and composition of the balance sheet depends on the banks' strategy, as well as on the structure of competition in the credit and deposit markets. The performance and development of financial markets are also an important factor (Caballero *et al.*, 2023; Drechsler *et al.*, 2021; McPhail *et al.*, 2023)⁹⁴.

The evolution of the WATM gap depends on the compositions of fixed-rate and floating-rate indexed assets and liabilities, and the observed duration of the intermediaries' balance sheet components. Between April and October 2024, the WATM increased in absolute terms and is currently above the average level of the last five years, indicating a higher probability of IRRBB materialization. During the six-month period, the WATM gap widened by 1.4 pp, from -11.4% in April to -12.8% at the beginning of October 2024. While the indicator is below the level observed in July 2024, when it registered its highest level in absolute terms (-13.7%), it continues at levels above the average of the last five years (-9.4%) (Graph 2.61). This suggests that, despite the recent reduction in interest rates, the IRRBB gradually materialized during the last half of the year. The performance of the indicator is mainly explained by the fixed-rate indexed component (*i.e.*: the spread between the fixed-rate assets and liabilities), which has the largest contribution in determining the

Graph 2.61
WATM Gap of the CI^{a/}

(gap on assets)



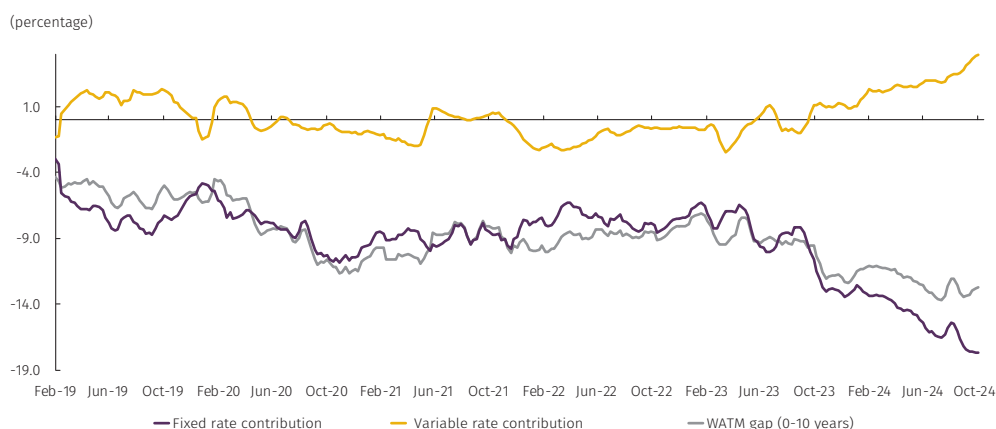
a/ WATM gap as a percentage of the asset. 4-week moving average.

Source: calculations by Banco de la República with weekly information from Form 473 of the Financial Superintendency of Colombia.

gap compared to the floating-rate indexed component. Between April and October 2024, the floating rate indexed component increased by 2.4 pp, while the fixed rate component increased by 3.8 pp, leading to a widening of the WATM gap by 1.4 pp (Graph 2.62). In October 2024, the portion of fixed-rate assets in total assets stood at 55.7%, while the fraction of fixed-rate liabilities over total liabilities reached 56.5%. As the floating-rate indexed component increases and the duration of the balance sheet remains unchanged, the WATM gap tends to reduce, since both sides

94 Caballero, J.; Maurin, A.; Wooldridge, P.; Xia, D. (2023). "Interest Rate Risk Management by EME Banks", *BIS Quarterly Review*, September. Drechsler, I.; Savov, A.; Schnabl, P. (2021). "Banking on Deposits: Maturity Transformation without Interest Rate Risk," *Journal of Finance*, vol. 76, no. 3, pp. 1091-1143. McPhail, L.; Schnabl, P.; Tuckman, B. (2023). "Do Banks Hedge Using Interest Rate Swaps?", working paper, no. W31166, National Bureau of Economic Research.

Graph 2.62
Contribution of Asset and Liability Components to the WATM Gap by Type of Interest Rate^{a/}

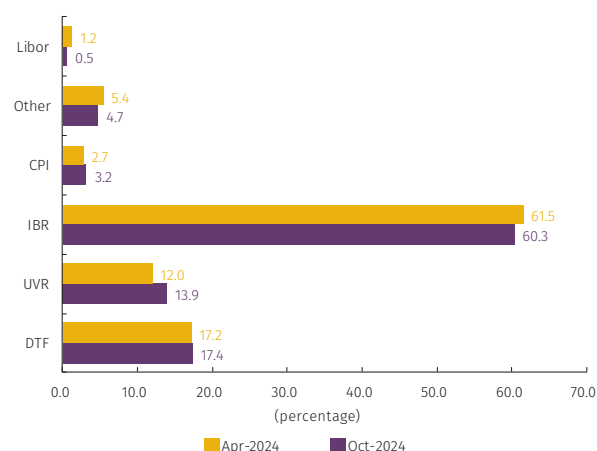


a/ WATM gap between 0 to 10 years as a percentage of assets. The contribution is calculated as the change in the spread between assets and liabilities for the variable-rate and fixed-rate indexed components, respectively. 4-week moving average.

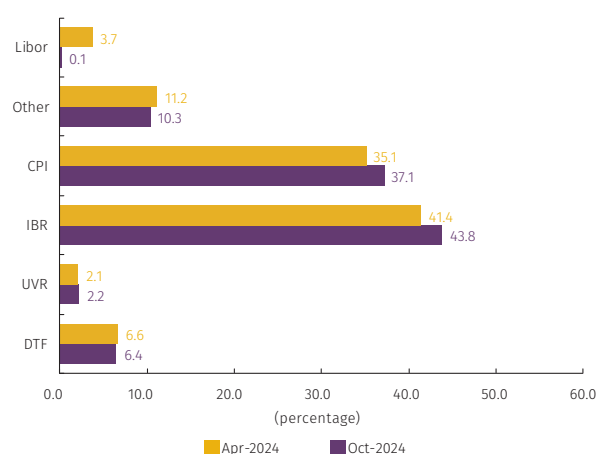
Source: calculations by Banco de la República with weekly information from Form 473 of the Financial Superintendency of Colombia.

Graph 2.63
Breakdown of Balance Sheet Contracted at Variable Rates by Type of Rate

A. Assets



B. Liabilities



Note: Share of the variable-rate indexed assets (panel A) and liabilities (panel B) as a percentage of total variable-rate indexed assets and liabilities, respectively.

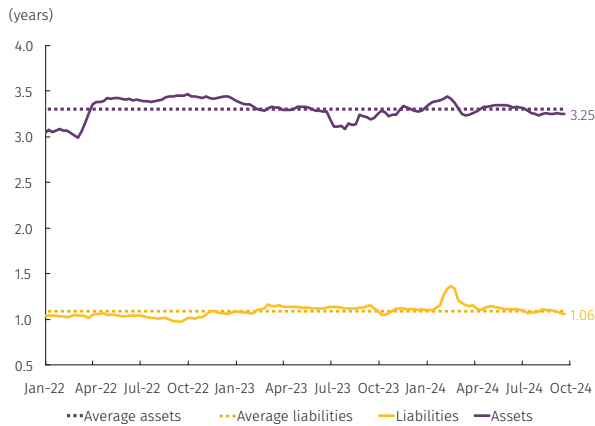
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

of the balance sheet adjust to short-term interest rates. However, as shown below, CIs shortened the duration of liabilities and maintained higher fixed-rate indexation on both sides of the balance sheet, which widens the maturity mismatch and thus increases exposure to interest rate risk.

On the asset side of the CIs, the share of instruments indexed to the fixed-term deposit (DTF in Spanish) and the benchmark interbank rate (IBR in Spanish) is maintained. On the liability side, indexation to consumer price index (CPI) and the IBR gradually increased. On both sides of the balance sheet, indexation to the IBR predominates, which generates a faster adjustment to changes in the monetary policy interest rate. Between March and October 2024, the indexation of assets to the IBR contracted by 1.2 pp, while that of liabilities increased by 2.5 pp. In turn, the indexation of assets and liabilities to the DTF remained stable. The reduction in instruments indexed to the Libor rate and the increase towards other external reference rates continues, although the share is low in both assets (4.7%) and liabilities (10.3%) (Graph 2.63). The share of variable rate indexed assets over in total assets remained stable at 44.3% and that of liabilities contracted by 2.5 pp, to 43.5%.

During the last six months, the average duration of CIs' liabilities gradually contracted; while that of assets remained stable, which widened the maturity mismatch and, therefore, the exposure to IRRBB. The duration of assets increased from 3.24 to 3.25 years, while the duration of liabilities increased from 1.15 to 1.06 years. The average duration of liabilities decreased by 0.09 years during the six-month period and was below the average duration for the period (1.09 years); while the duration of assets increased by 0.01 years, at a level below the average for the period (3.30 years). As mentioned in the previous section, there has been an increase in demand for demand deposits and a contraction in term deposits during

Graph 2.64
Average Duration of CI Assets and Liabilities^{a/}



a/ Average duration in years and weighted by the amount of assets and liabilities for the total CIs. 4-week moving average.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

the six-month period (Graph 2.64), which explains the reduction in the duration of CIs' liabilities. Indeed, the shorter duration of liabilities versus the relative stability of assets led to a gradual increase in the maturity mismatch, which increases the exposure to IRRBB.

In summary, during the last six months, the WATM gap of CIs widened, suggesting a greater exposure to IRRBB. The indicator is higher than the average for the last five years. The widening of the gap was mainly explained by the gradual increase in maturity mismatches, given the stability in the indexation of the balance sheet at floating rates. While CIs continue to increase the indexation of both sides of the balance sheet to the IBR, fixed-rate indexation of the balance sheet predominates, preventing further adjustment of the balance sheet to changes in short-term interest rates. CIs will need to continue to rebalance their balance sheets and adjust their duration to the interest rate cycle in order to reduce their exposure to interest rate risk, which tends to materialize in periods of rising interest rates. This adjustment will depend on economic dynamics and competition in deposit and lending markets. In addition, the transition to the SFC's new IRRBB regulation should contribute to better management of this risk and encourage the use of hedging instruments (interest rate derivatives) to reduce exposure to this risk.

Shaded Section 2: Financial Overview of Savings and Loan Cooperatives in Colombia

Since the last *Financial Stability Report* (see Cely *et al.*, 2024), an analysis on savings and loan cooperatives (SLCs) monitored by the *Superintendencia de Economía Solidaria* (Superintendency of Solidarity Economy, SES) that perform financial intermediation tasks, that is, those that have a savings and credit division. This analysis is relevant given that they carry out their activities in 23 out of the 32 departments of the national territory (71.9% of the total) and, in addition, it has been observed that in around 40 municipalities cooperatives are the only financial intermediary with a physical presence, which makes them the gateway to the financial system for a large number of people.

When carrying out a financial intermediation activity, cooperatives face multiple financial risks, including credit and liquidity risks. Considering their wide diversity, high geographical reach, their market niche, and their microfinance work, as they serve a segment of the population that is sometimes unbanked, the study of cooperatives is relevant not only for issues of financial inclusion and banking penetration but also to strengthen the assessment of the country's financial stability, understanding the different actors that are part of the system. In addition, the assets of these entities as of August 2024 amount to COP 21.3 trillion (t), equivalent to 2.1% of the assets of the CIs.

This shaded section updates the financial and risk indicators of SLCs, and is divided into four sections, including this introduction. The second section describes the sector and analyses the historical evolution following its balance sheet data. Then, in the third part, the performance of some of their risk indicators is shown and, finally, in the last part, the connection between these entities and the CIs is evaluated.

Landscape of the Solidarity Cooperative Sector

In August, investments recovered from the decline they had experienced for almost two years, and their growth rate currently exceeds that of the loan portfolio. In terms of liabilities, Term Savings Deposit Certificates (CDATs in Spanish) maintain a stable dynamic and are the ones that contribute the most to the growth of liabilities. The SLCs sector is composed of 172 cooperatives¹ with assets of COP 21.3 t, of which 86.8% correspond to the loan portfolio. In August of this year, investments showed the highest annual real growth² followed by cash (Graph S2.1, panel A; 29.7% and 27.3%, respectively). In turn, the loan portfolio has shown decreases, although not as pronounced as those observed for the CIs, which could indicate that the credit conditions tightening for the SLCs has not been as strong. On the other hand, CDATs and demand deposits are the main sources of funding (together they represent 89.4% of total liabilities; Graph S2.1, panel B). CDATs are the largest contributors to funding with a growth rate of 5.0% that has remained stable for about a year. On the other hand, demand deposit growth rates continue to recover from the negative trend they showed until mid-2023, although they remain in negative. As of August 2024, the real annual growth rate of liabilities was 1.0%.

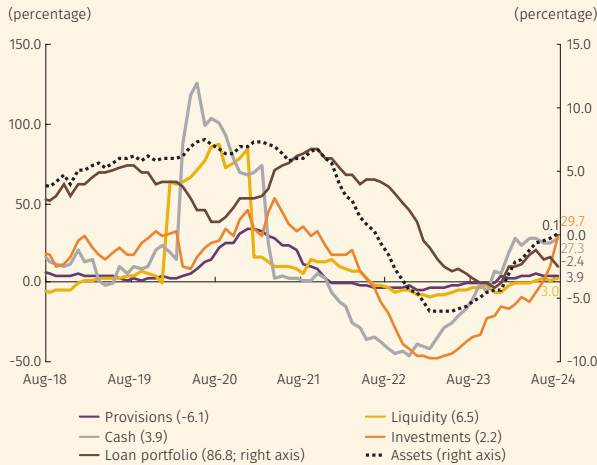
The loan portfolio of the cooperative sector is concentrated in the consumer loan, a type of loan that continues to show decreases. On the liability side, CDATs with a

¹ The cooperative sector considered here consists of 173 institutions. However, one entity was excluded due to inconsistencies in its data.

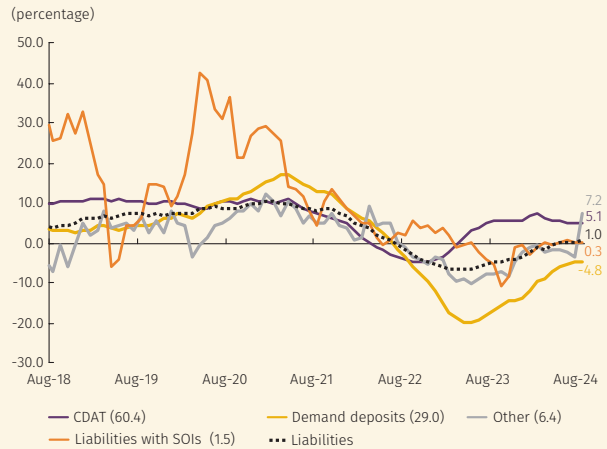
² The real series used in this document are obtained using the aggregate CPI excluding food.

Graph S2.1
Main Balance Sheet Accounts of the Cooperative Sector

A. Real Annual Growth of Asset Components



B. Real Annual Growth of Liability Components



Note 1: Real growth is calculated using the consumer price index excluding food.

Note 2: The shares of each component are shown in parentheses.

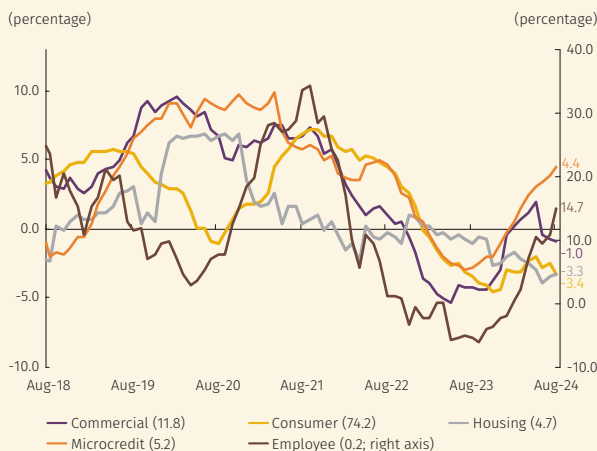
Note 3: In panel B, the credit series (2.8% of liabilities) is excluded due to its high volatility. However, its performance will be discussed in more detail in section 3 of this shaded section.

Source: Fogacoop; calculations by Banco de la República.

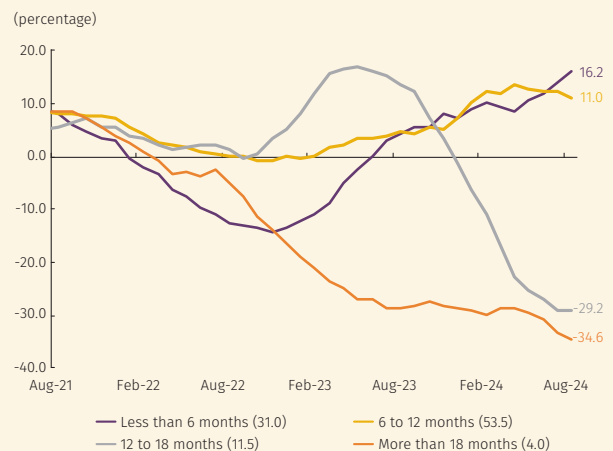
term of less than one year, the main source of funding for SLCs, continue to grow. The consumer loan, which by August 2024 accounted for 74.2% of the loan portfolio, grew -3.4%, thus continuing the negative trend it had exhibited since the end of 2022 (Graph S2.2, panel A). By August 2024, the commercial and housing loans also show contractions. Regarding term deposits, the main source of funding for SLCs, it is observed that the cooperative sector is concentrated in the term of less than one year, where the segment of CDAT of less than six months grew at a real annual rate of 16.2%, while the segment of 6 to 12 months grew at a rate of 11.0% (Graph S2.2, panel B). As anticipated in the previous *Report*, this movement towards shorter terms deepened in line with the cycle of interest rate reductions and the decrease in the cost of funding. On the other hand, deposits with term of more than one year register the strongest contrac-

Graph S2.2
Real Annual Growth of the Main Components of the Balance Sheet

A. Portfolio Evolution by Type of Loan



B. CDATs Evolution by Term

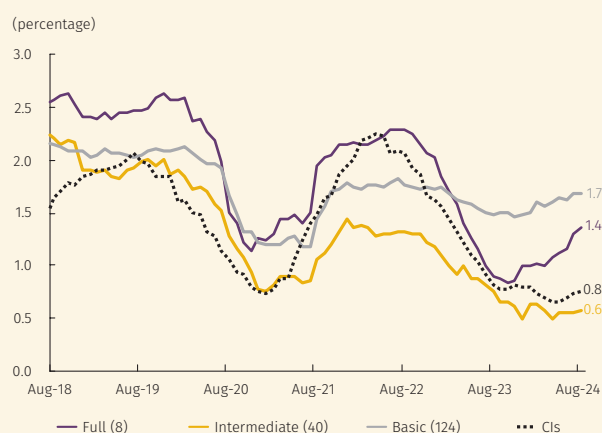


Note 1: Real growth is calculated using the consumer price index excluding food.

Note 2: The shares of each component are shown in parentheses.

Source: Fogacoop; calculations by Banco de la República.

Graph S2.3
Return on Assets (ROA)



Note 1: Return on assets (ROA) is calculated as the value of annualized earnings over average assets.

Note 2: The values in parentheses indicate the number of SLCs that make up each category.

Source: Fogacoop; calculations by Banco de la República.

tions that have been observed in their recent history. If this trend continues, the structural funding of these entities could be affected and make them more dependent on short-term instruments renewals, which could create vulnerabilities.

The profitability of most SLCs has recovered after the low levels seen at the end of 2023. When calculating the return on assets (ROA; Graph S2.3), it is found that SLCs classified as intermediate³ exhibit a similar performance to that of Cls. On the other hand, the profitability of those classified as basic has gradually increased and is close to reaching the mid-2022 levels. In the case of full-category SLCs, the recovery in profitability has been more pronounced and has already reached a level of 1.4%. Overall, as of August 2024, the sector's ROA stood at 1.1%.

Risk Indicators

This section provides an exploratory analysis of credit risk and the equity robustness of this sector, which also carries out financial intermediation tasks.

The non-performing loans indicator (NPL)⁴ shows a deteriorating trend since the second half of 2022 (Graph S2.4, panel A). Except for housing, this performance is observed in all types of loans. In addition, when considering the write-offs⁵, an average increase of 1.1 pp on the NPL is observed, i.e., an additional deterioration on the loan portfolio. When examining the capital adequacy ratio by category of cooperative, it is observed that the median of the institutions has ratios above 20%; however, there are also some institutions whose indicators are close to the regulatory minimum (Graph S2.4, panel B). This edition also introduces the liquidity coverage ratio (LCR), calculated using the Guarantee Fund for Cooperative Entities (Fogacoop in Spanish) methodology⁶. The results exhibit that the median of

3 The categorization of the institutions was carried out following the current draft decree of the Financial Regulatory Unit (URF in Spanish), where it is proposed that cooperatives with a total value of assets less than 315,000,000 of real value units (UVR) will be considered as basic; between 315,000,000 and 1,400,000,000 UVR will be considered as intermediate, and those with more than 1,400,000,000 UVR, as full.

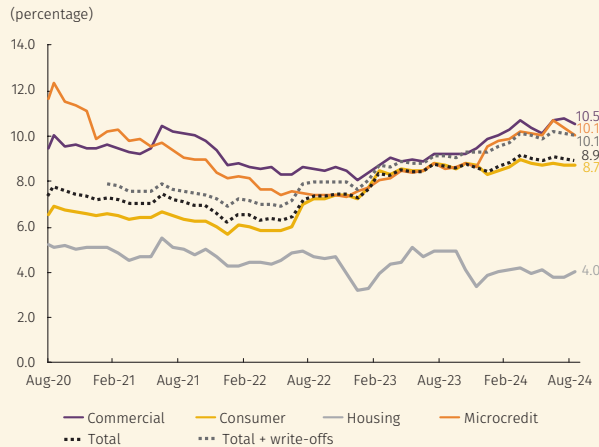
4 Calculated as the percentage of the gross loan portfolio that is in arrears for more than 30 days.

5 The loan portfolio that a financial institution writes off refers to a loan portfolio that was in default and that the institution decides that the recovery of the resources has a very low probability, so it uses its provisions to pay off the debt of that loan portfolio and thus be able to exclude it from its balance sheet. By doing this, this loan portfolio ceases to be included in the default portfolio (and therefore the NPL). Thus, taking write-offs into account allows the NPL to be presented considering this element.

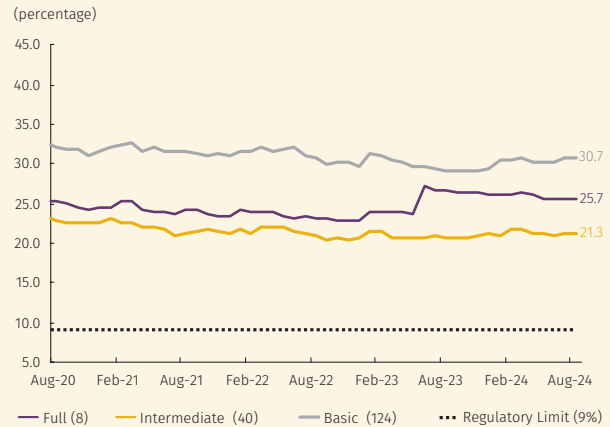
6 The indicator is under review on the definition of the concepts of renewal of deposits and their reporting. For more information on its calculation, see: <https://www.fogacoop.gov.co/para-cooperativas/indicador-de-riesgo-compuesto-irc>

Graph S2.4
Loan Portfolio, Solvency, and Liquidity Risk Indicators

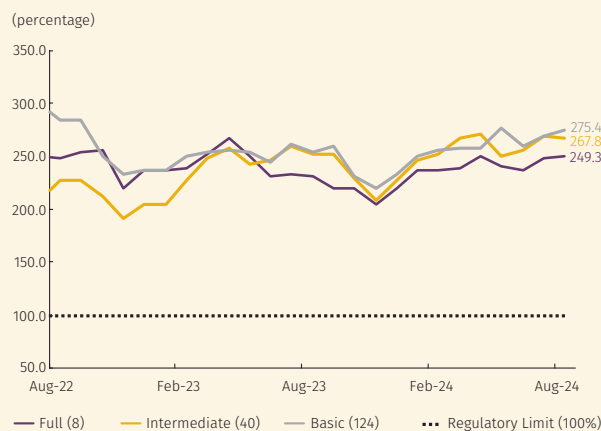
A. Non-Performing Loans Indicator (NPL)



B. Capital Adequacy Ratio



C. Liquidity Coverage Ratio (LCR)



Note 1: The non-performing loans indicator is calculated as the loan portfolio over 30 days past due divided by the gross loan portfolio balance.

Note 2: The capital adequacy ratio is calculated as technical equity divided by risk-weighted assets.

Note 3: The liquidity coverage ratio is calculated as the sum of net liquid assets and expected income divided by the sum of expected contractual and non-contractual outflows.

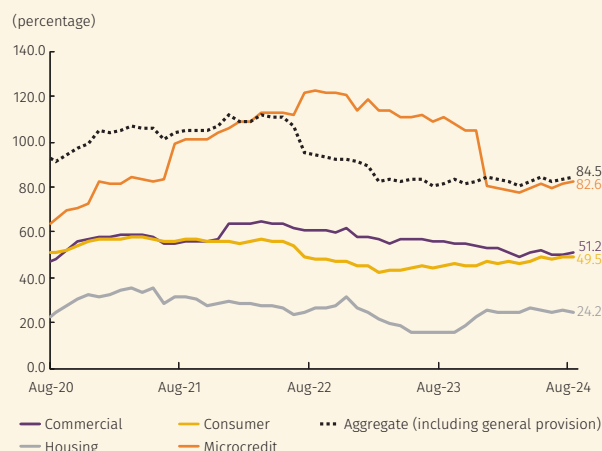
Source: Fogacoop; calculations by Banco de la República.

institutions has comfortable levels of liquidity that exceed twice their requirement (Graph S2.4, panel C).

In the last six months, there has been a stable performance of the indicator of provisions coverage of non-performing loans in the cooperative sector in all types of loans. The provisions coverage indicator⁷ remains at levels below 100% for all types of loans, and presents its lowest level in housing loans, a performance expected due to the condition that this type of loan has to account for provisions. When including general provisions, the aggregate coverage ratio stands at 84.5% as of August 2024 (Graph S2.5), which denotes lower credit risk coverage in this sector compared to CIs and other entities in the financial system that have provisions that exceed the non-performing loan portfolio.

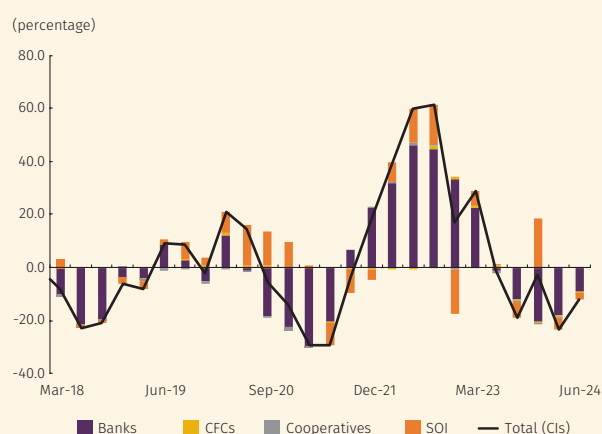
⁷ The coverage indicator is calculated as the stock of provisions expressed as a percentage of the loan portfolio rated other than A.

Graph S2.5
Loan Portfolio Provisions Coverage Indicator



Note: the loan portfolio coverage indicator is calculated as the stock of loan portfolio provisions over the total portfolio over 30 days past due.
Source: Fogacoop; calculations by Banco de la República.

Graph S2.6
Real Annual Growth of the Loan Portfolio of the CIs Granted to the SLCs



Note: Real growth is calculated using the consumer price index excluding food.
Acronyms: credit institutions (CIs), savings and loan cooperatives (SLC), commercial finance companies (CFC), special official institutions (SOIs).
Source: Financial Superintendency of Colombia; calculations by Banco de la República.

Connection with Credit Institutions

SLCs are decreasingly turning to CIs to apply for loans in order to leverage their operations. With data as of June 2024, the total amount of loans of the SLCs with CIs amounts to COP 0.8 t (as of December 2023, it stood at 0.9 t in June 2024 pesos). These loans are distributed among those requested from banks for COP 442.9 billion (b), operations granted by special official institutions (SOIs)⁸ totaling COP 343.2 b, loans with financing companies totaling COP 4.9 b and, finally, loans with financial cooperatives for COP 99.0 m. This source of funding has shown real annual growth in negative territory for five semesters, with a value of -18.4% as of June 2024. Loans with banks are the main explanation for this trend (Graph S2.6). This could be explained by the level of interest rates of these institutions as well as by the decrease in the loan portfolio, which makes it less necessary to resort to the CIs for resources that leverage lending operations.

Conclusions

The cooperative sector has many user-members, and its importance in terms of geography and assets has grown, which makes it crucial to include it in the analysis of the Colombian financial sector. Solidarity cooperatives focus on consumer loans on the asset side, and on CDATs on the liability side. In terms of profitability, some categories of cooperatives have shown an improvement that is not yet reflected in the CIs supervised by the SFC. On the other hand, credit risk indicators remain high and with an upward trend, although their loan portfolio coverage levels have remained constant over the last six months. In addition, the inclusion of the capital adequacy ratio and the LCR in the analysis of the sector has made it possible to establish that, in aggregate, the sector has adequate levels, but at the individual level there are entities close to the regulatory minimums. Regarding their relationship with CIs, it is observed that their exposure to SLCs is low with respect to the total loan portfolio. Finally, given its broad coverage and the growing trend of its assets, Banco de la República will continue to monitor this sector within the *Financial Stability Report*.

References

Cely, J.; Laguna, K.; Sánchez, C.; Yanquen, E. (2024). "Box 2: Financial Panorama of Savings and Credit Cooperatives in Colombia" in *Financial Stability Report* for the first half of 2024, accessed at: <https://doi.org/10.32468/rept-estab-fin.sem1-2024> on 15 November 2024.

⁸ The SOIs that have granted loans to solidarity cooperatives are: Banco de Desarrollo Empresarial (Bancóldex), Financiera de Desarrollo Territorial (Findeter), and Fondo para el Financiamiento del Sector Agropecuario (Finagro).

Box 1: Decomposition of the Performance of Credit Vintages

Juan David Roa
Eduardo Yanquen*

The cohort of credits that are originated in a particular period (generally one month) and are related to each other as they have been originated by credit institutions (CIs) under particular allocation conditions, risk appetite of the institutions, and economic situation¹ is called vintage. Generally, the evolution of the non-performing loans indicator (NPL), which is defined as the percentage of loan portfolio in default over gross loan portfolio, is used to evaluate the payment trend of debtors who obtained credits in each of these vintages and to anticipate the future performance of the aggregate indicator. In this context, the analysis of vintages is a tool that could produce early warnings that would support the making of possible decisions for the activation of prudential measures by local financial authorities².

The *Financial Stability Report* for the first half of 2024 mentioned a deterioration in the credit risk indicators of the consumer and microcredit loan portfolio, which were the credit modalities that registered the highest NPLs of all loan portfolios (8.4% and 10.1%, in their order); even for the microcredit loan portfolio this indicator has been the highest observed in its history. This box seeks to identify the determinants of the deterioration of these types of loans, through the decomposition of the NPL into factors that can help to understand their performance; in this way, it is possible to observe whether the dynamics of the NPL that have been observed in recent months are due to a particular factor or if it is an aggregation of different determinants, which can help financial authorities to better understand the dynamics of the indicator and take targeted measures to reduce the materialization of credit risk.

1. Methodology

The test is carried out using the methodology of decomposition of the NPL of vintages proposed by Gamba *et al.* (2021), based on three components³: age, period, and cohort or vintage, as follows:

$$ICM_{i,n,t} = \mu + \alpha_i + \beta_t + \gamma_n + \varepsilon_{i,n,t}$$

Where the coefficient associated with age, α_i , corresponds to the time that has passed since the origin of the vintage, and can be interpreted as the expected deterioration of the loans of the modality of analysis given their age⁴; the coefficient associated with the period, β_t , corresponds to the common factor that affects all vintages in a particular month, regardless of how much time has passed since their origination, and therefore this factor may be associated with the state of the economy: for example, if inflation increases, some customers may find it difficult to cover their previously acquired expenses and financial obligations. Finally, γ_n it is the specific factor associated with each vintage, that is, it represents the impact of

1* The authors are part of the Financial Stability Department. The opinions do not commit Banco de la República or its Board of Directors.

1 This box provides an aggregate analysis of the type of loans of all CIs, since with the available information it is not possible to disaggregate the loans assigned by the type or the granting entity.

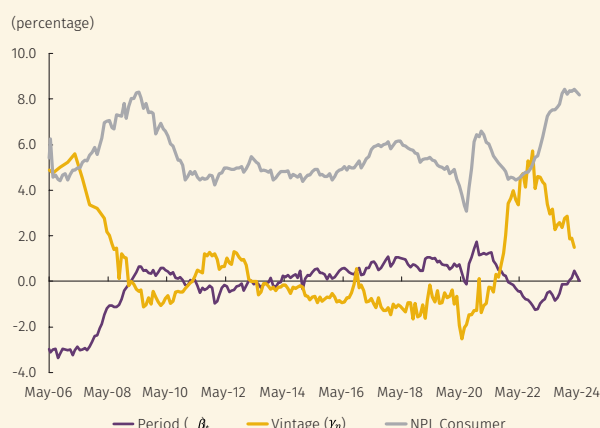
2 This monitoring in previous periods allowed, for example, to timely detect a deterioration in consumer loans, which is why the Financial Superintendency of Colombia issued External Circular 26 of 2022, which increased provisions for this type of loan as a macroprudential measure.

3 Note that there are no interactions between these components, so the effect derived from the performance of the economy in which each vintage originated individually is not considered.

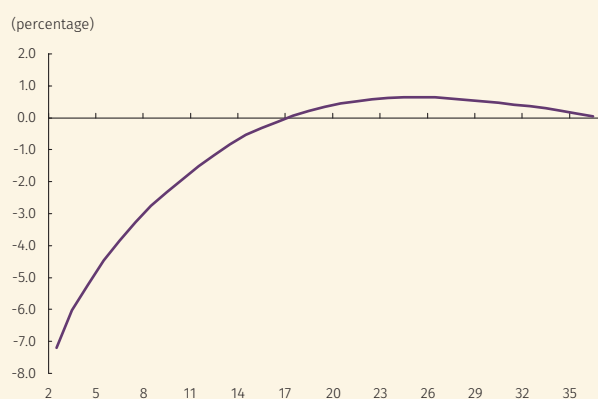
4 It is also known as vintage height.

Graph B1.1
Breakdown of the NPL of the Consumer Loan Portfolio

A. NPL and Period, and Vintage Factors



B. Age Factor



Source: Financial Superintendency of Colombia (SFC); calculations by Banco de la República.

the economic context of the origination, as well as the conditions of credit allocation and risk appetite of the institutions under which the loans belonging to this cohort were originated; for example, in search of greater credit origination, CIs could have lowered the score⁵ from which loans of a particular type of loan are granted. For the analysis, only the dynamics of the period and vintage (cohort) components are used, since the age component represents the average observed deterioration of all vintages given their height and, therefore, their performance is invariable over time.

2. Results

When analyzing the vintages of the consumer loans following this methodology, it is observed that the vintage component γ_t , was the one that contributed the most to the NPL, which, after reaching a peak in mid-2022, has shown a decreasing trend (Graph B1.1). This could indicate that after the credit boom that occurred since 2022 and part of 2023, driven by an increase in demand and a relaxation of credit allocation conditions, institutions increased the requirements in this type of loan, considering the high materialization of credit risk that was observed at the end of last year. This increase in requirements was observed in the June 2024 Report on the Credit Situation, where the indicator reached levels below -80.0%⁶ during 2023.

The reduction in the contribution of the vintage component could be a result of these dynamics and would indicate which loans from the most recent vintages are being granted to customers with better risk profiles. On the other hand, the period component, which had made negative contributions over the past two years, began to contribute positively in recent months. This performance could indicate that customers of this type of loan that had been benefiting from good local macroeconomic conditions are beginning to face the effects of the adjustment that the Colombian economy has presented (which can be seen in more detail in Chapter 1 of this Report) and that the improvements in the labor market have not yet materialized for these customers.

For the sub-modalities of free investment (30.2% of the total consumer loans) and vehicles (9.9% of the total consumer loans), a similar performance is observed to that of the aggregate: the relaxation of credit conditions drove positive peaks in the vintage component towards the second part of 2022, which lost importance in favor of the period component in the face of stricter credit allocation conditions. Regarding credit cards (18.2% of the consumer loans), it is observed that, in the case of loans for high-income customers, the dynamics are similar to those described above; in contrast, for low-income customers, the vintage component did not reach such a high contribution and was surpassed by the period component months before this performance occurred for high-income customers, which could indicate that the CIs took a more conservative position when allocating credit to this type of customer. In the case of payroll credits (37.4% of the total), although there is a peak in the vintage component in mid-2022, since the beginning of 2023 the period component has contributed positively, while

5 A credit score is a measure that results from a statistical model that uses multiple factors, which is usually used by CIs to determine which customers are viable for granting loans; generally, those with a lower score indicate a higher probability of default.

6 In this indicator, negative values indicate greater restrictions in the granting of loans.

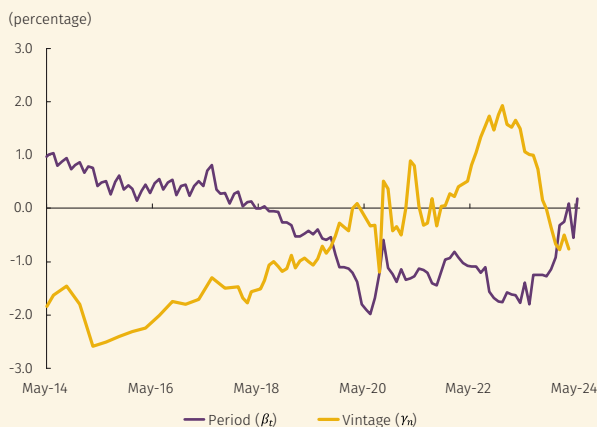
the vintage component has done so in the opposite direction, which could be explained by a better selection of customers for these credits and, possibly due to a faster transmission of labor market conditions, given the nature of these credits.

In turn, for the low-value microcredit loans,⁷ it is evident that the vintage component has made a greater contribution to the NPL since 2020. However, as of February 2024, the period component was the one that predominated, and its contribution began to be positive (Graph B1.2, panel A). This could indicate a recent tightening of conditions for accessing this type of loan. For high-value loans of this type of loan, a similar performance is observed, although, in this case, the period component has been contributing positively more strongly and for a longer time (Graph B1.2, panel C). These differences could indicate that customers with high-value loans have been more affected by the economic adjustment process.

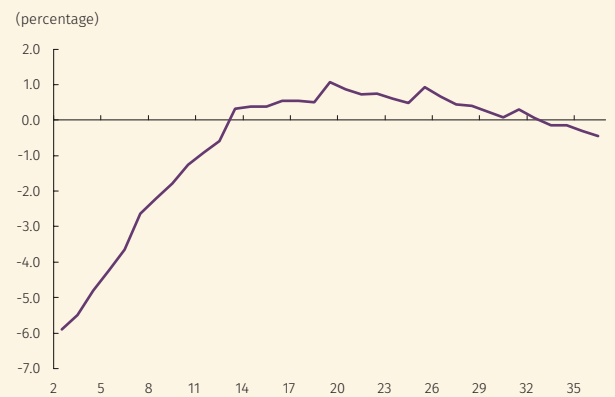
Graph B1.2

Breakdown of Vintages by Loan Amounts from the Microcredit Loan Portfolio

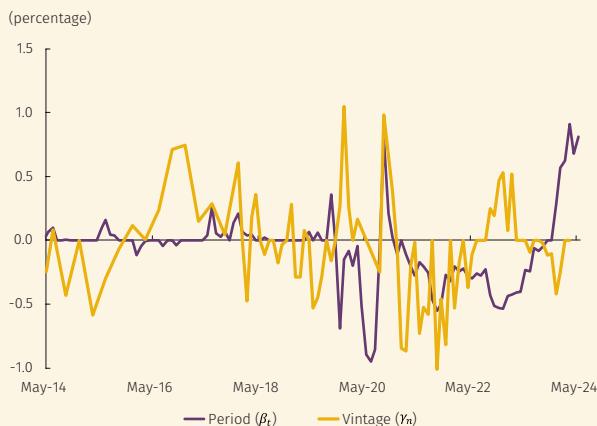
A. Factors for Low-Value Microcredit NPL



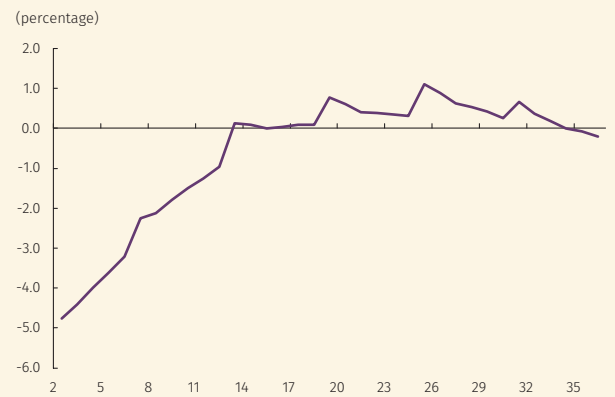
B. Age Factor for Low-Value Microcredit NPL



C. Factors for High-Value Microcredit NPL



D. Age Factor for High-Value Microcredit NPL



Note: Some periods in 2020 that show positive and negative peaks are excluded from the graphs that are considered extreme points caused by particular situations that do not contribute to the analysis.

Source: Financial Superintendency of Colombia (SFC); calculations by Banco de la República.

3. Conclusions

In the type of loans analyzed, consumer and microcredit, the component that had contributed the most in the recent past to the NPL was the vintage component (Table B1.1), which means that until a few months ago the performance of the indicator was explained by the conditions in which the credits were originated, such as the risk appetite of the institutions,

7 In the case of the microcredit loan, there are no aggregate data, but only on its sub-modalities.

Table B1.1
Contribution of Period and Vintage Components to the NPL

Product	Peak Vintage Factor	Peak Duration	Contribution Component Period	Contribution Vintage Component	NPL
Total consumer	Sept.-21 to today	31	0.03	1.50	7.71
Free investment	Nov.-21 to Feb.-24	28	0.89	0.74	11.93
Revolving	Sept.-21 to today	29	-4.47	3.34	7.65
Low-income card	Sept.-21 to Feb.-23	18	2.77	-1.39	8.22
High-income card	April-21 to Oct.-23	31	0.99	-0.26	8.22
Payroll	April-22 to Dec.-22	9	1.57	-1.22	3.18
Vehicle	Nov.-21 to Oct.-23	24	1.18	0.00	9.96
Microcredit high amount	May-22 – Sep.-23	17	0.81	0.00	9.81
Microcredit low amount	June-20 to Dec.-23	43	0.19	-0.77	9.81

Notes: 1. For credit card and microcredit products, the NPL values are taken in an aggregate form considering the available information. 2. Peak vintage factor refers to the most recent period in which the vintage factor was greater than the period factor. 3. Peak duration is the number of months in which this performance occurred.
Source: Financial Superintendency of Colombia (SFC); calculations by Banco de la República.

the performance of the economy at that time, and the inflation and unemployment conditions in which these customers were at the time of origination. However, its contribution has decreased (after reaching historical highs in part of 2022 and in 2023), while the contribution of the period component has increased, which may be influenced by current macroeconomic conditions and affecting all active credits in the economy. These conditions include inflation, economic growth, interest rate performance, unemployment, among others.

This performance is possibly explained by increases in the credit allocation requirements of the CIs, which were relaxed in 2022 and part of 2023, but which in the recent past have become more restrictive; In addition, this dynamic may also be explained by the adjustment process that the economy has faced, and the labor market dynamics faced by customers of these types of loans.

It is also observed that the vintage factor, obtained using the above methodology, tends to anticipate increases in the aggregate NPL, which is why it could be used as an early warning indicator by the authorities to activate macroprudential measures aimed at reducing a greater materialization of credit risk. In this way, the financial stability risks that could arise from this materialization could be contained in a more timely manner.

References

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- Rodríguez-Novoa, D.; Rozada, A.; Roa, J. D. (2024). *Report on the credit situation in Colombia*, June, *Banco de la República*, available at: <https://www.banrep.gov.co/es/publicaciones-investigaciones/reporte-situacion-credito-colombia>

Box 2: Countercyclical Provisioning Scheme: Credit Cycle Adjustment Considerations

Juan Sebastián Mariño
 Juan Carlos Mendoza
 Carlos Quicazán
 Juliana Uribe*

1. Introduction

Credit institutions (CIs) are exposed to credit risk, which can be understood as the possibility of incurring losses arising from a debtor or counterparty defaulting on its obligations. To mitigate this risk, CIs must constitute provisions based on the balance of loan disbursements loan portfolio and adjust its level based on the credit risk of the latter. To this end, the Financial Superintendency of Colombia (SFC) establishes, within its regulatory framework, the rules that the CIs must use for the constitution and adjustments of the provisions of the different types of loans.

A fundamental part of this framework is the countercyclical provisions, which have been in operation since 2007 for the commercial loan portfolio and since 2008 for consumer loans, representing approximately 80% of the total loan portfolio. This mechanism allows CIs to accumulate more provisions at times when credit risk does not materialize (cumulative phase) and use this buffer to smooth out the expense on provisions that can be generated in phases of lower growth and higher non-performing loans in the credit cycle (de-accumulative phase).

The scheme is based on individual provisions and depends on the performance of each CI's loan portfolio so that its different phases are activated. Although this is based on the performance of each institution's own business, allowing institutions facing difficulties to de-accumulate provisions and reduce their derived expenses (even in a favorable economic scenario), the scheme may leave aside macroeconomic factors that affect the credit cycle and potentially impact the financial health of CIs.

At the international level, the most widely used macroprudential tool to mitigate the procyclicality between the financial health of institutions and the credit cycle is the requirement for countercyclical capital buffers (CCyB). This was introduced as part of the changes to the Basel III regulatory standards proposed by the Basel Committee on Banking Supervision after the 2008 international financial crisis¹. Unlike the countercyclical provisioning scheme in Colombia, the phases of this usually depend on indicators that measure the aggregate conditions of the credit cycle to accumulate capital in periods in which credit growth is above its long-term trend, associated with an accumulation of risk, to seek anticipation of possible episodes of financial stress. On the other hand, capital would be de-accumulated during cooling periods in the credit cycle to absorb losses and avoid a reduction in the supply of loans. In addition, unlike countercyclical provisions, where their accumulation affects the cost of making new disbursements through higher expenditure on provisions, countercyclical capital is implemented by increasing the minimum requirement of the solvency ratio that institutions must have, which has a general impact on the capital strategy.

* The authors are members of the Office for Monetary Operations and International Investment of *Banco de la República*. The opinions contained herein are the sole responsibility of the authors and do not commit *Banco de la República* or its Board of Directors.

1 BCBS. (2010). "Guidance for National Authorities Operating the Countercyclical Capital Buffer." Bank for International Settlements. December. <https://www.bis.org/publ/bcbis187.pdf>

Since the end of 2022, in line with the orderly adjustment of the economy, there has been a significant slowdown in the dynamics of the credit cycle in Colombia, especially in consumer loans, accompanied by increases in loan portfolio deterioration. During this period, some CIs have de-accumulated countercyclical provisions to smooth out the expenditure generated by the greater materialization of credit risk. Despite the above, the current scheme has some inflexibilities that have led to the need to make transitory changes in the provisioning regulations to be more in line with the credit cycle². This, together with the latest recommendations of the FSAP to Colombia and the convergence to Basel III, motivates the need to carry out a structural review of the countercyclical prudential scheme, bringing with it the discussion on the effectiveness of the current countercyclical provisioning scheme in identifying the credit cycle, to analyze the advantages and disadvantages of a countercyclical capital scheme, much more common in both developed and emerging countries.

This box analyzes the current countercyclical provisioning regime and the advantages and disadvantages of an alternative to a countercyclical capital requirement. In addition to this introduction, this document consists of four sections. The second describes the current operation of the countercyclical provision requirement. The third analyzes the activation of the phases of the mechanism at different times of the local credit cycle. The fourth compares the local scheme with countercyclical capital, and finally, the fifth presents the conclusions of this analysis.

2. Countercyclical Provisioning Scheme in Colombia

Currently, the prudential scheme in Colombia follows a rules-based mechanism, where the required countercyclical provisions depend on a series of metrics per entity. The scheme has two components:

1. Procyclical Individual component (PIC): fraction that reflects the current credit risk of each debtor.
2. Countercyclical individual component (CIC): fraction that reflects possible increases in debtors' credit risk during times of deterioration in asset quality. This component is created to mitigate the impact on financial results in the event of risk materialization.

In particular, countercyclical provisions may be subject to two phases: accumulation and de-accumulation. The logic lies in the fact that, during periods of economic expansion, when credit is growing rapidly, larger provisions should be made than would be necessary under such conditions (i.e., cumulative phase), so that they can be used in periods of deterioration in credit quality (i.e., de-accumulative phase).

Thus, the scheme establishes the constitution of individual provisions (per loan) based on an expected loss model for commercial and consumer loan portfolios. For its calculation, the SFC, the regulatory body in charge, constructs two risk scenarios (A and B), with B being the highest risk. This analysis produces two default probability matrices for each type of credit and borrower. With this, the expected loss model is defined as:

$$PE = \underbrace{PI_A \cdot EA \cdot PDI}_{\text{CIP}} + \underbrace{(PI_B - PI_A) \cdot EA \cdot PDI}_{\text{CIC}}$$

Where:

PE it is the expected loss;

PI_A the probability of default calculated with matrix A;

PI_B the probability of default calculated with matrix B;

EA the exposure of the asset;

PDI the loss given the default.

2 External Circulars 017 of 2023 and 014 of 2024 of the Financial Superintendency of Colombia.

Within the scheme, the activation of the phase (accumulation/de-accumulation) depends on four specific indicators for each CI.

1. Portfolio deterioration: Real quarterly change (deflated by the total CPI) of individual provisions in the total loan portfolio B, C, D, and E³:

$$\Delta provisiones_t = \left(\frac{provisiones_t}{provisiones_{t-3}} \right) - 1 \geq 9\%$$

2. Efficiency: Cumulative quarterly net provision from recoveries of the loan portfolio and leasing (PNR) as a percentage of the cumulative quarterly income from the loan portfolio interest and leasing ($I \cdot C$):

$$\left(\frac{PNR}{I \cdot C} \right)_t \geq 17\%$$

3. Stability: Cumulative quarterly net provisions from recoveries of the loan portfolio and leasing as a percentage of the cumulative quarterly adjusted gross financial margin (MFB_a):

$$0 \leq \left(\frac{PNR}{MFB_a} \right)_t \geq 42\%$$

4. Loan portfolio growth: Real annual growth rate of the gross portfolio (CB):

$$\Delta CB = \left(\frac{CB_t}{CB_{t-1}} \right) - 1 < 23\%$$

The indicators are designed to detect signs of a recessionary phase of the economic cycle. In the default scenario, if any of the four indicators are not met, the institution will be subject to the accumulation of countercyclical provisions. This will correspond to an expansion phase of the cycle, where the PIC calculation uses the risk scenario A, and the CIC calculation corresponds to the maximum between the countercyclical value of the previous period and the difference between the expected losses calculated with matrices A and B.

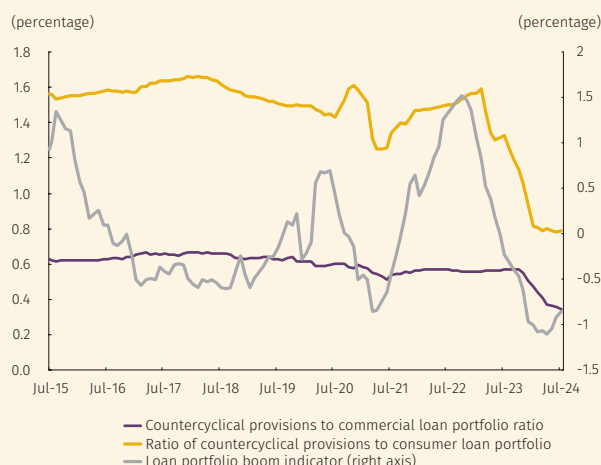
If the four indicators are met for three consecutive months, the institution may decide to enter the de-accumulation phase for six months. This results in a lower expenditure on provisions, since it could use the buffer of countercyclical provisions to cover part of it. In this phase, a combination of matrix A and B is used for the calculation of the PIC depending on the credit rating. Once the six months of the de-accumulation phase have passed and the conditions for continuing in this phase are not maintained, institutions must move on to the accumulation phase and establish a reconstitution plan for the countercyclical provisions that were spent. For this, in accordance with the provisions of chapter XXXI of the FABC of the SFC, the institutions have a period of eighteen months⁴.

In this regard, the scheme constitutes a macroprudential tool based on each institution's individual results, with some consideration of the systemic risks that may arise from the aggregate performance of the economic cycle. However, since the de-accumulative phase has a set duration of six months, a lag can be generated to the extent that individual metrics could indicate the need to accumulate, even when the credit cycle is in its low phase.

³ Understood as the time for the evaluation of the indicators.

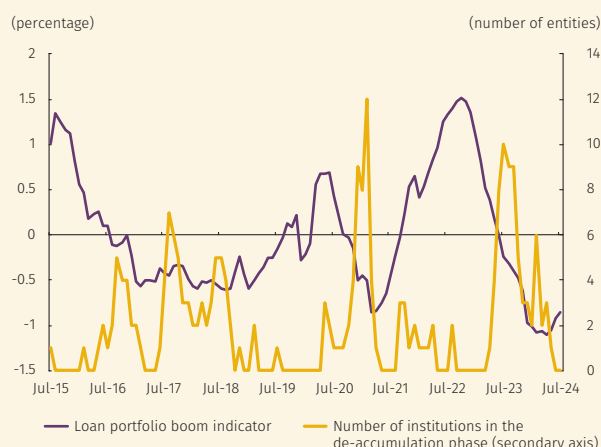
⁴ This term was implemented as of June 2023, when the Comprehensive Risk Management System (SIAR) came into force. Due to the current credit cycle, the SFC temporarily extended this term to twenty-four months through EC 017 of 2023, which was in force until June 2024.

Graph B2.1
Ratio of Countercyclical Provisions to Loan Portfolio, and Credit Boom Indicator



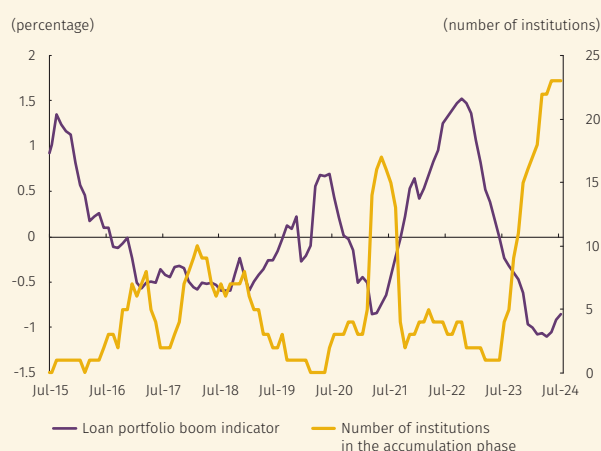
Source: Financial Superintendency of Colombia (SFC); calculations by Banco de la República.

Graph B2.2
Number of Institutions in the De-Accumulation Phase and Credit Boom Indicator



Source: Financial Superintendency of Colombia (SFC); calculations by Banco de la República.

Graph B2.3
Number of Institutions in the Accumulation and Reconstitution Phase and Credit Boom Indicator



Fuente: Superintendencia Financiera de Colombia (SFC); cálculos del Banco de la República.

3. Countercyclical Provisioning Scheme and Credit Cycle

As of July 2024, the balance of countercyclical provisions reached COP 2.8 trillion (t), of which COP 1.2 t corresponded to the commercial loan portfolio and the remaining COP 1.6 t to the consumer portfolio. Graph B2.1 exhibits the ratio of these provisions to the gross loan portfolio for the two types of loans and is compared with an indicator that seeks to measure the credit cycle (credit boom indicator⁵). As can be seen, between 2015 and 2023 the share of countercyclical provisions in the total loan portfolio showed stability in both types of loans, despite the fact that the credit boom indicator showed significant variations in the credit cycle, with expansions in 2015, 2020, and 2022, followed by a cooling in the credit market between 2016 and 2018, and 2021 and 2024. Although countercyclical provisions were reduced in the current contractionary phase of the credit cycle, they have historically remained stable due to different factors, such as the inflexibility of the parameters of the four activation criteria and the reconstitution time, the costs derived from the reconstitution of the countercyclical component, and the absence of macro financial factors of the credit cycle in the definition of these criteria.

To measure the capacity of the current regime for defining the phases of accumulation, de-accumulation, and reconstitution of the countercyclical component of provisions to react to the different phases of the credit cycle, an exercise was carried out that compares the credit boom indicator with the number of institutions that met the conditions for de-accumulation at each point in time. Intuitively, the number of institutions authorized to de-accumulate provisions would be expected to increase in the contractionary phases of the cycle and decrease in expansionary phases. As can be seen in Graph B2.2, increases in the number of institutions in the de-accumulative phase are identified in the cooling periods of the credit market in 2016-2019, 2020 and 2024. However, the correlation between both indicators is relatively low, and there are a significant number of institutions that fail to meet the tool's activation criteria.

Although there is some degree of correlation between the activation of de-accumulations and the credit cycle, the accumulation and reconstitution phases of the countercyclical component of provisions are less sensitive to the situation of intermediaries and the credit cycle. Assuming that all institutions that met the criteria choose to de-accumulate their countercyclical provisions and decide to rebuild them within the maximum term allowed, a negative correlation would be observed between the stage of the credit cycle and the number of banks in reconstitution (Graph B2.3). In other words, many institutions would be reconstituting and accumulating their countercyclical provisions in contractionary phases of credit, so their ability to reactivate the loan portfolio may be affected, thus resulting in procyclical performance.

Considering the low correlation between the credit cycle and the phases of the current countercyclical provisioning scheme and the rigidities in several of its parameters, the SFC has issued some measures in recent years to correct these shortcomings.

In March 2023 (Circular Letter 19), to promote preventive actions that would allow supervised institutions to face particular economic conditions and preserve the healthy growth of the loan portfolio, they

5 The credit boom indicator allows measuring the expansionary and contractionary phases of the credit cycle. It is defined as the sum of the real annual growth of the loan portfolio per capita and its cyclical component. High records of the indicator imply expansionary phases, while low records reflect contractionary phases.

were allowed to activate the portfolio impairment indicator by modality instead of for the total loan portfolio, as stipulated until then.

From November 2023 (External Circular 17), until 30 June 2024, CIs that met three of the four conditions established to enter the phase of de-accumulation of countercyclical provisions were temporarily allowed to submit a plan to apply the de-accumulation methodology for three consecutive months. Also, after using the de-accumulative phase of provisions for six months, CIs were allowed to request the constitution of the additional provisions in the cumulative phase that resulted from applying the methodology no more than twenty-four months, a term longer than the eighteen months that were required until that moment. Finally, institutions in the de-accumulation phase were allowed to continue using matrix A (lower risk) in the procyclical individual component.

Finally, in September 2024 (External Circular 14), considering the macroeconomic context, the effects it has had on the financial system, and to mitigate the impact of the credit cycle, the SFC considered it necessary to adopt additional transitional measures that would allow supervised institutions to face this context. To this end, institutions were given the possibility of not accumulating the individual countercyclical component until March 2025, provided that certain requirements were met, and CIs that met three of the four conditions established to enter the phase of de-accumulation of countercyclical provisions for three consecutive months were again allowed to present a plan to apply the de-accumulation methodology.

Although the current regulation on credit risk management contemplates measures aimed at reducing procyclicality and sustaining stable loan portfolio growth in the medium and long term, through a countercyclical provisioning scheme that compensates for the increase in provisioning expenses when credit risk increases, these transitional measures are a reflection of some opportunities for improvement that the current scheme has presented. In particular, given that the constitution of countercyclical provisions affects the marginal cost of originating new loan portfolios, impacting the profits of the CIs, the scheme mustn't increase the expenditure on provisions at times of low growth and low risk accumulation. Therefore, the activation of the different phases of the scheme must be synchronized with the financial cycle.

4. International Standard: Countercyclical Capital

Unlike what is established in the Colombian regulatory framework, at the international level, to mitigate the cycles faced by CIs, the most widely used macroprudential countercyclical tool is the CCyB, which, under the Basel standard, ranges between 0% and 2.5% of assets weighted by risk level, where the required value must be associated with growth periods in aggregate credit that could be excessive or with an accumulation of risk across the board. In turn, the capital requirement could be reduced or deactivated during periods of financial stress, thus helping to preserve the supply of credit and avoid the amplification of shocks.

In accordance with Basel III, this policy tool is implemented as an extension of the capital conservation buffer and should be composed only of capital tier 1 (CET1). In addition, it recommends some restrictions when the CCyB requirement is not met by an entity, such as restrictions on the distribution of dividends. At the international level, there are many jurisdictions that have implemented regulations on countercyclical capital, specifically 78, compared to only four that adopt the provisioning scheme⁶. Among those that use the CCyB, the following stand out:

- United Kingdom: In 2016 a CCyB above zero was established before an increase in the level of risks was observed (positive “neutral” rate). In particular, the CCyB was set at 1.0% in a neutral risk scenario. In 2019, the requirement was increased to 2.0%, due to considerations of the difficulty of assessing systemic risk.
- United States: A series of indicators are considered for activating the CCyB, such as asset price pressures, risk appetite, leverage in both the financial and non-financial sectors,

⁶ In accordance with the most recent *Macroprudential Policy Survey* of the International Monetary Fund.

and the transformation of liquidity maturities in the financial sector. In practice, the percentage of CCyB has been set at 0.0% since its implementation in 2013.

- European Union: The percentages of the CCyB in the jurisdictions of the European Union are established by the national authorities using different methods. Some members have a positive “neutral” rate, while others have chosen a CCyB percentage of 0.0% in the absence of risk accumulation. However, a particular feature is that the European Central Bank can request an addition from the national authorities.
- Latin America: Jurisdictions such as Mexico and Chile have CCyB. In particular, in May 2016, the *Junta de Gobierno de la Comisión Nacional Bancaria y de Valores de México* (Governing Board of the Mexican National Banking and Securities Commission) approved a 0.0% countercyclical capital charge. In turn, in Chile in 2021, the General Banking Law confers on the Central Bank of Chile (BCCh in Spanish) the responsibility of determining the activation or deactivation of the CCyB, which can be established between 0.0% and 2.5% of the assets weighted by risk level. In May 2023, the BCCh decided to activate the CCyB by 0.5% within twelve months after identifying a higher than usual degree of uncertainty about the future evolution of financial conditions at the global level and the relevance of continuing to make progress in rebuilding the economy’s capacity to face adverse scenarios.

5. Conclusions

Prudential countercyclical buffer schemes are relevant to smoothing the impact of economic and financial cycles on the performance of CIs, while helping to maintain the provision of credit in the economy at different stages of the cycle. In Colombia, the countercyclical provisioning scheme has been in operation for more than seventeen years and has helped financial institutions face episodes of adverse shocks to the financial system. However, from the above analysis, it can be concluded that it is necessary to review the scheme of this countercyclical measure within the framework of the Financial System Coordination and Monitoring Committee (CCSSF in Spanish) so that it can be better adapted to the financial cycle and the performance of systemic risks.

Internationally, the countercyclical prudential standard has converged to the use of capital buffers, whose implementation usually depends on aggregate variables that indicate the state of the financial cycle and seek to increase the financial system’s resilience as a whole. Likewise, the value of the countercyclical capital buffer required depends on cycle’s intensity and the risks that are accumulating in the financial system.

Although the current scheme in Colombia establishes general rules for all CIs, it defines stages based on the performance of each institution’s loan portfolio. This has the advantage of recognizing each institution’s niche and business model, but it makes it difficult to address more general measures when the economy and the financial system face adverse shocks. This has led to the need to make changes in the scheme at times of low dynamics and greater credit risk in the loan portfolio of credit institutions.

Thus, given the financial cycle’s constant fluctuations and changes in nature, such as duration and intensity, strengthening the current countercyclical prudential scheme in Colombia by considering the factors mentioned above is relevant. In addition, it is worth studying the convenience of complementing this measure with requirements such as the CCyB to strengthen the system and adequately prepare it for adverse scenarios.

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Box 3: A Characterization of the Exchange Rate Risk of Real Sector Firms in Colombia in 2023

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Jorge Niño Cuervo
Mateo Hernández Peñaloza
Camilo Gómez*

1. Introduction

During 2023, Colombian firms that turned to international financing sources faced interest rate increases and an appreciation of the peso against the dollar of 21.5%.¹ Despite the positive effect on firms' balance sheets due to the appreciation of the local currency, the presence of exchange rate mismatches is a factor of external vulnerability of the economy due to its potential impact on investment, growth, liquidity, and solvency of the firms that are subjected to this phenomenon. Likewise, by potentially affecting the creditworthiness of firms, these vulnerabilities can impact the local financial system and generate pressures on loan portfolio quality indicators.

This box characterizes the negative exchange rate mismatch² of firms in the real private and public sectors in Colombia. First, a description of the recent dynamics of negative exchange rate mismatches is presented³. Second, an estimate of the level of risk⁴ faced by Colombian firms is presented based on their balance sheets. Finally, the exposure of credit institutions (CIs) to firms with negative exchange rate mismatches is analyzed, and conclusions are presented.

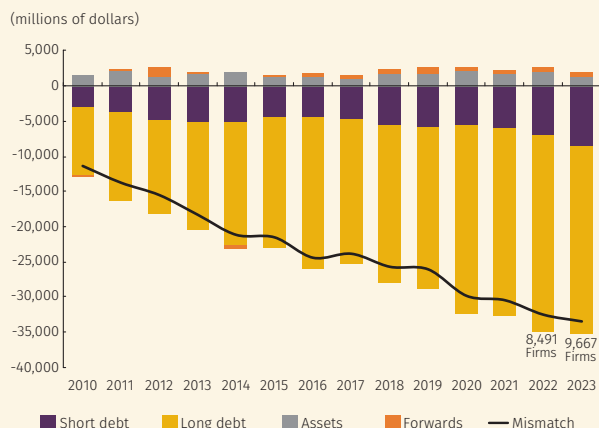
2. Results of the Negative Exchange Rate Mismatch: General Outlook

The results of the negative mismatch of private companies in the Colombian real sector are described below⁵. In the last ten years, the negative exchange rate mismatch measured in dollars has tended to widen. This dynamic is explained by the growth of economic activity, which means that firms require greater working capital and by their greater financing needs to make productive investments. Greater access to international markets, links with parent companies, and greater liquidity needs in foreign currency have led to an increase in foreign currency debt contracted by Colombian firms without their assets in this denomination increasing in the same proportion.

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- 1 Representative Market Exchange Rate (TRM) at the end of 2023 vs. at the end of 2022.
- 2 A company has a negative currency mismatch when its currency liabilities are greater than its foreign currency assets. In this regard, a negative currency mismatch financially exposes firms to unexpected depreciation of the local currency.
- 3 In Box 1 of the *Financial Stability Report* for the first half of 2022, the sources of information and the calculation methodology are detailed.
- 4 In Box 3 of the *Financial Stability Report* for the second half of 2022, the sources of information and the methodology for calculating the risk of firms with a negative currency nominal mismatch are detailed.
- 5 This analysis does not include credit institutions or non-banking financial institutions; likewise, some firms that have financial leasing liabilities are excluded because they are secured by a real asset (capital asset) of the same value.

Graph B3.1
Disaggregation of the Negative Currency Mismatch



Sources: Banco de la República, DANE, DIAN, MHCP; calculations by Banco de la República.

In 2023, 64.6% of real sector firms with external borrowing presented a negative currency mismatch. This percentage groups 9,667 firms, which accumulate a negative currency mismatch worth USD 33,387 million (m). This percentage increased compared to 2022, when 8,491 firms accumulated a negative currency mismatch of USD 32,444 m (Graph B3.1). The 10% of firms with a negative currency mismatch account for around 90.4% of this value. The high concentration of the negative currency mismatch has occurred recurrently in the different years of study. By component, this annual increase in the negative currency mismatch is mainly explained by the increase in short-term debt (USD 1,585 million) and the decrease in financial assets in foreign currency (USD 760 million), effects partially offset by a decrease in long-term debt (USD 1,367 million) and the higher net position of forwards⁶ (USD 27 million).

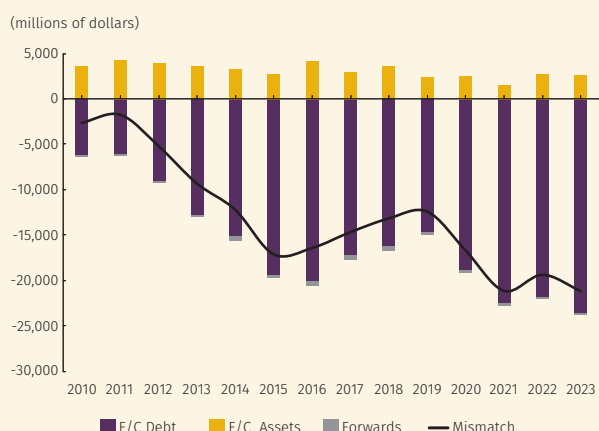
By economic sector, the negative currency mismatch is mainly distributed, in order, in transportation, storage and communications, manufacturing, commerce, hotels and restaurants, and administrative and professional services (Table B3.1). Companies operating in these sectors represent 72.5% of the total value of the negative currency mismatch in 2023.

Table B3.1
Negative Currency Mismatch by Economic Sectors

Economic Sector	Negative Mismatch (millions of dollars)	Percentage of negative mismatch	Percentage of firms with FDI
Transportation, storage, and communications	7,682	23.0%	33.5%
Manufacturing industries	6,729	20.2%	14.8%
Commerce, hotels, and restaurants	4,918	14.7%	13.5%
Administrative and professional services	4,871	14.6%	27.1%
Electricity, gas, and water	3,433	10.3%	55.2%
Other sectors	5,754	17.2%	31.8%

Note: The percentage of the negative mismatch corresponds to the percentage of the total negative mismatch concentrated in this sector. Sources: Banco de la República, DANE, DIAN, MHCP; calculations by Banco de la República.

Graph B3.2
Negative Mismatch of Public Sector Companies



Sources: Banco de la República, DANE, DIAN, MHCP; calculations by Banco de la República.

In 2023, the negative currency mismatch of public sector companies, totaling fourteen firms, amounted to USD 21,119 m (Graph B3.2). About 96.2% of this mismatch is concentrated in three conglomerates that belong to the mining, energy and electricity, gas, and water supply sectors. The firms that concentrate the mismatch actively participate in the export of goods, so they have natural coverage⁷. In general, these companies have significant direct investments abroad, particularly in Central and South America, and have a high share within their respective markets, which allows them to pass on to their consumers

6 Foreign currency assets correspond to active loans, bonds, and deposits, while the net position of forwards foreign exchange is the difference between buying and selling transactions. When the net result of purchases minus sales of forwards of foreign exchange is positive, this amount is included within the assets, while if it is negative, they are included in the liabilities.

7 In these cases, the risks associated with a negative mismatch are mitigated by incomes derived from its export operation.

the higher costs associated with a depreciation of the peso. With respect to 2022, the increase in the mismatch was 9.2% (USD 1,776 m), mainly explained by the contracting of external debt by firms in the hydrocarbons sector.

3. Results of Negative Currency Mismatch Risk Classification

This section describes the results of the calculation of the risk indicators of the negative currency mismatch of private companies in the Colombian real sector. These indicators measure the relative importance of the individual mismatch of firms with respect to their balance sheets (assets, revenues, etc.) and are intended to classify firms by their level of risk of negative currency mismatch. In this classification, level 1 is interpreted as the highest risk, while level 3 is the lowest risk. The risk indicators are: level of mismatch as a proportion of total assets, trade balance as a proportion of operating income, and percentage of foreign capital participation.

Of the total of 9,667 firms with a negative currency mismatch in 2023, there is balance sheet information for 34.5% of them, which represent 64.8% of the total amount of the negative currency mismatch. These proportions are similar to those observed since 2016 in the number of firms, while the amount of mismatch ranges from 49% to 75% (Graph B3.3). From this sample of firms, the indicators are calculated and classified according to their level of risk.

The results exhibit that, for 2023, in terms of the total value of the negative currency mismatch, the main risk factor for firms is the proportion of the mismatch to total assets (Graph B3.4, panel A). Only 189 companies (5.7% of the total) showed a high level of risk according to this indicator. However, these firms account for 30.2% of the total amount of currency mismatch for companies that reported balance sheets.

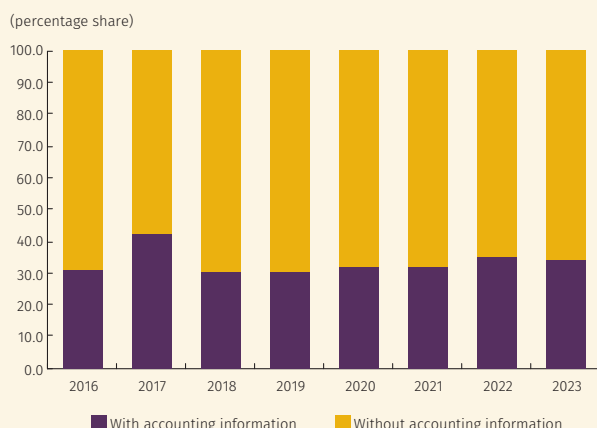
Regarding the participation of foreign capital (Graph B3.4, panel B), although 59.4% of the firms are classified at the highest level of risk (1,978 firms), the value of the currency mismatch that they accumulate is lower than the sum of the other two levels of more moderate risk (levels 2 and 3). In these, a smaller number of firms are classified, but with higher levels of foreign capital participation.

Finally, the balance of trade indicator as a proportion of operating income (Graph B3.4, panel C) shows that 41.7% of firms and 38.2% of the currency mismatch value are classified at the lowest risk level, i.e., these companies have a positive trade balance, so in the event of a depreciation they would receive higher income. Only 329 firms (9.9%) have a negative trade balance greater than 50% of their operating incomes.

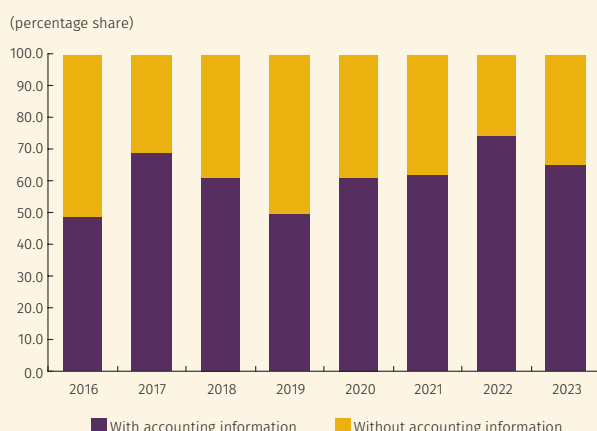
From the three components, the global risk indicator was constructed, which averages and approximates the three indicators described (Graph B3.4, panel D). The results suggest that, both by level of mismatch and by number of firms, the main classification obtained for the firms analyzed is the medium risk level. Firms with a high exposure (which may have liquidity or solvency problems), which puts their stability at risk in the face of depreciation, represent a low proportion

Graph B3.3
Negative Currency Mismatch: Accounting Information

A. Negative Currency Mismatch



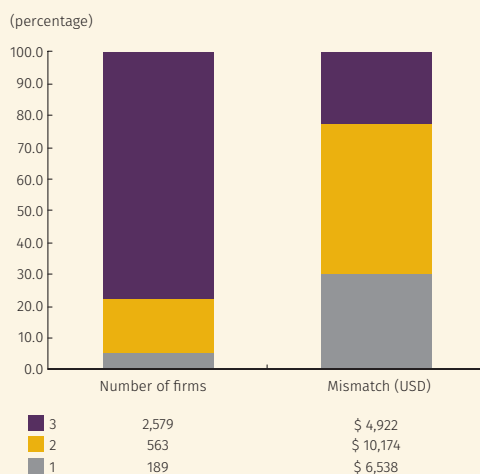
B. Number of Firms with a Negative Currency Mismatch



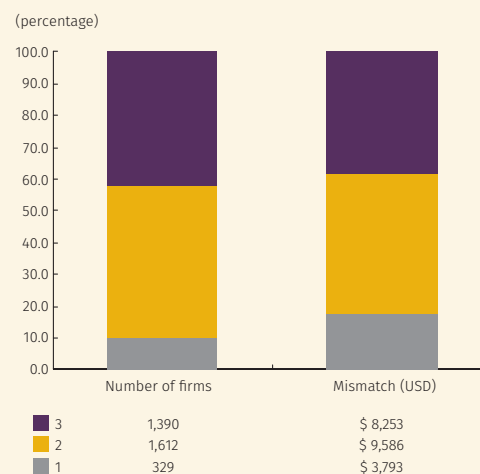
Source: Author's own elaboration.

Graph B3.4
Risk Indicators

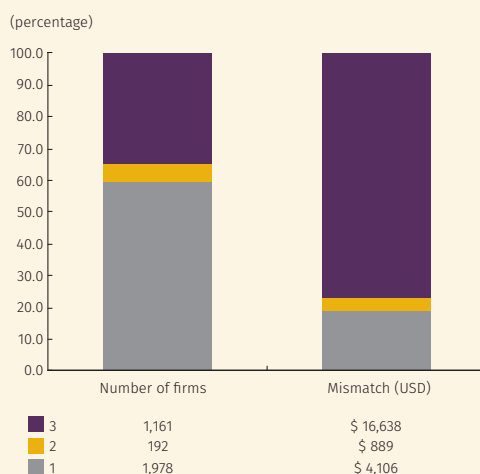
A. Mismatch as a Proportion of Total Assets



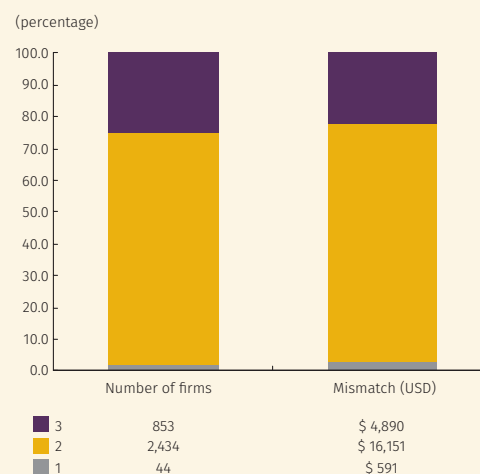
B. Share of Foreign Capital



C. Balance of Trade

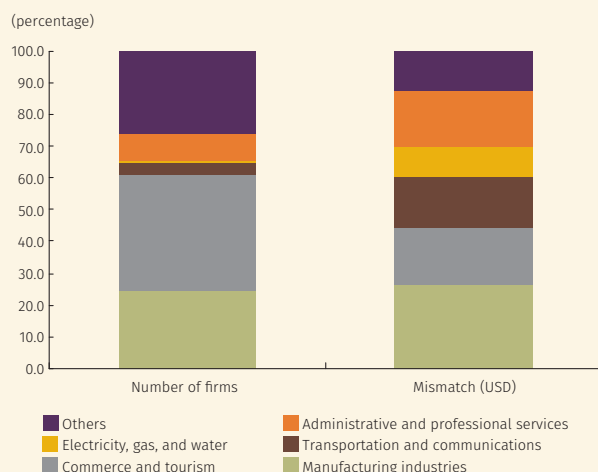


D. Total Indicator



Sources: Financial Superintendency of Colombia and Banco de la República; author's own elaboration.

Graph B3.5
Classification by Economic Sector Firms
in Risk Group 1 and 2

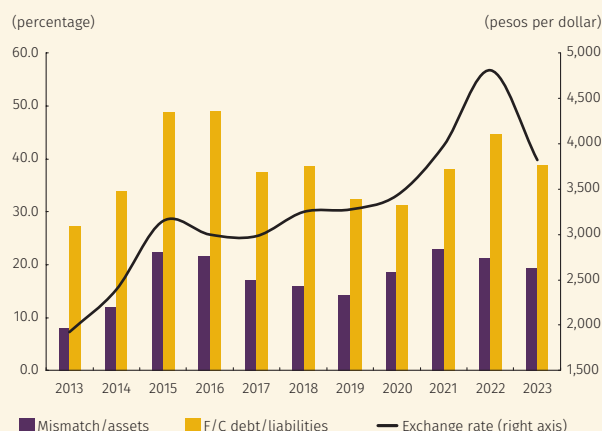


Source: Author's own elaboration.

both in number of firms (1.3%) and in amount of mismatch in dollars (2.7%). This indicates that, on average, companies with a negative mismatch seek to mitigate their exposure to sudden depreciation of the Colombian peso by compensating between their trade imbalance, the relative size of their negative mismatch, and their ability to obtain foreign currency from a parent company abroad.

In order to identify the economic activities most exposed to a sharp depreciation of the exchange rate, the firms with medium (2) or high (1) risk indicators were disaggregated by sector. Two of the five main sectors, which account for 60.9% of firms and 44.3% of the mismatch value, are manufacturing, trade, and tourism (Graph B3.5). On the other hand, activities dedicated to the supply of public services (transportation and communications, and electricity, gas, and water) do not have natural coverage due to the absence of foreign exchange revenues; however, the high concentration of production in a few firms in these sectors allows them to use the resources from their domestic sales to leverage their commitments in dollars.

Graph B3.6
Public Sector Companies: Exchange Rate Vulnerability Indicators



Sources: Banco de la República, MHCP, financial statements; calculations by Banco de la República.

For public sector companies, the mismatch as a proportion of total assets reached 19.4% in 2023, a value 2 percentage points (pp) lower than in 2022 (Graph B3.6). Regarding the risk indicator, the fourteen public firms analyzed showed a homogeneous performance and were located in the lowest risk group. The same can be said if the information is gathered by business conglomerates. The low level of risk is because they do not have foreign trade deficits or because they register a mismatch with respect to assets of less than 20.1%.

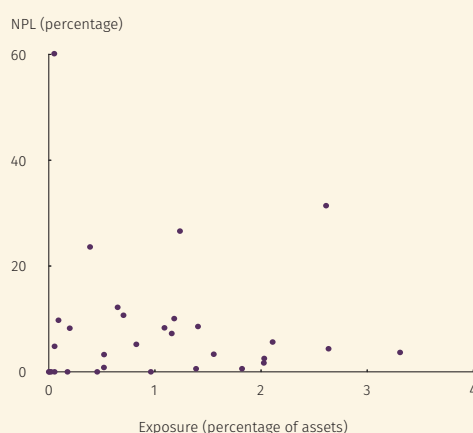
4. Exposure of the Local Financial System to Private Firms with a Negative Currency Mismatch

This section discusses the individual exposure of CIs to private corporate sector firms with a negative currency mismatch. To this end, the analysis focuses on: 1) firms with accounting information classified in risk level 1 (highest risk), and 2) the group of firms that do not have accounting information and therefore their risk level cannot be calculated. This is an acid measure of the exposure of CIs to credit risk of firms with a negative currency mismatch. However, it is a more complete metric of the exposure of CIs, considering the absence of accounting information for some firms. In the calculations, the balance sheets and individual exposures are used for those CIs with outstanding credits with the group of firms described as of 2023⁸.

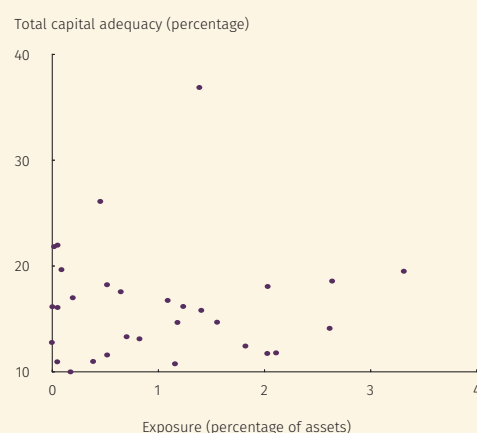
In accordance with the results, the individual exposure of CIs to firms with a negative currency mismatch is less than 3.0% of assets for most institutions, with an average exposure of 1.0% (Graph B3.7, panel A). This represents a slight reduction compared to the exposure of CIs in 2022 (1.2% on average). Likewise, there is no high concentration of firms with currency mismatch and high levels of the quality indicator for non-performing loans indicator (NPL) in this segment. In other

Graph B3.7
Exposure of CIs to Firms with Negative Currency Mismatches

A. NPL and Loan Portfolio Exposure of Firms with Negative Currency Mismatch



B. Total Capital Adequacy and Loan Portfolio Exposure to Firms with a Negative Currency Mismatch



Source: Financial Superintendency of Colombia; calculations by Banco de la República.

⁸ Form 341, "Individual Debtor Report: Lending Transactions," of the Financial Superintendency of Colombia. The analysis focuses on the information for 2023, considering that the information on mismatches is on an annual basis. However, if exposures are calculated using the latest information from the CIs, i.e., June 2024, the conclusions are similar.

words, CIs with high NPLs of firms with currency mismatch (greater than 20%) have exposures to this segment, on average, close to 1.0% of the assets. In terms of capital, the most exposed CIs tend to have higher levels of total capital adequacy, although this ratio is not very strong (Graph B3.7, panel B). In any case, Chapter 3 of this *Report* measures the capacity of the financial system to face the materialization of extreme and unlikely risks for the loan portfolio of companies with currency mismatch and finds that, in general, the system is resilient.

5. Conclusion

Despite the phenomenon of nominal appreciation of the peso between 2022 and 2023 (21.5%), there is an increase in the total amount of the negative currency mismatch (2.9%) in the same period. This can be explained by a lower growth of the firms analyzed within a context of economic slowdown, which has an impact on a fall in their assets denominated in foreign currency. Results of the classification of private firms with a negative currency mismatch suggest that most of the firms evaluated are classified as medium risk and accumulate the highest value of the total mismatch. A small portion is located within the group with the highest exchange rate risk, with a total mismatch that represents 2.7% of the total amount of the negative mismatch, 7.3 pp less than in the previous year. High- and medium-risk firms belong to the manufacturing industry, trade, and tourism, as well as to regulated sectors with a market share concentrated in a few companies (transportation and communications, and electricity, gas, and water). On the other hand, firms that concentrate the mismatch of the public sector are located in the lowest risk group since they have natural coverage, high participation within their respective markets, and low levels of mismatch with respect to assets. Finally, it is found that CIs have a moderate exposure to firms with currency mismatch classified as high risk and that this exposure was reduced compared to 2022.

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- Carmona-Duarte, A.; Martínez-Osorio, A.; Niño-Cuervo, J. (2022). Box 3: “A Characterization of the Exchange Risk of Real Sector Firms in Colombia in 2021,” *Financial Stability Report*, second semester.

3. Stress Tests

This chapter presents two exercises that assess the resilience of the CIs and OE-CIFs in the event of the hypothetical materialization of relevant risks identified in the previous chapters of this *Report*. The first one, known in international literature as stress test, is a quantitative assessment tool of the capacity of the CIs to maintain capital levels that allow them to face the hypothetical materialization of adverse, extreme, and unlikely shocks for eight quarters¹. The second one consists of a liquidity test on the OECIFs, whose objective is to evaluate their capacity to face various withdrawal shocks without failing to comply with regulatory liquidity requirements.

3.1 CI's Stress Test

This section presents the scenarios and results of the stress test on CIs, which Banco de la República conducts every six months, with the purpose of measuring the resilience of these entities on a hypothetical, adverse, and unlikely macroeconomic context.

The results indicate that, in the aggregate, CIs have sufficient equity capacity to absorb the potential losses derived from a hypothetical, adverse, and unlikely macroeconomic scenario, characterized by a contraction of economic activity, in a context of high uncertainty regarding the fiscal situation, which would be reflected in a high local risk premium. In this hypothetical scenario, a further deterioration of the loan portfolio of the CIs and a contraction of credit would be observed, which would negatively impact their financial income and increase their loan-loss provisions. As a result, profitability and loss-absorbing capital would decrease, which would reduce the aggregate Tier 1 capital and total capital adequacy ratios, although they would remain above the regulatory limits throughout the test. At the individual level, however, some entities could face difficulties in meeting the minimum capital requirements².

In a complementary test carried out on the CIs with consolidated financial statements that have subsidiaries in Central America, it is found that these entities would maintain adequate levels of capital to face losses derived from the stressed scenario and an additional shock of devaluation of the assets of their subsidiaries. Considering the exposure of the main financial conglomerates to the region³, based on the results of the stress test of the CIs, the capacity of the consolidated capital of those entities that have positions in Central America to face different levels of asset devaluation of their subsidiaries is evaluated. In the face of these additional shocks, consolidated capital adequacy would remain at levels above the minimum required, although it would decrease.

1 The information is available until June 2024 and from that date the test is simulated for eight quarters ahead.

2 In the hypothetical, adverse, and unlikely macroeconomic scenario, the CIs that could face difficulties in complying with the minimum capital requirement are those that would register a total capital adequacy ratio below the regulatory limit (9.0%).

3 For further details, see *Special Report on the Macroeconomic and Financial Situation in Central America*, September 2024.

The stress test presented in this section is constructed based on a set of restrictive assumptions. If any of these were avoided, it could be expected that the magnitude of the losses on the system will be cushioned so that the impact of the adverse scenario would be smaller. On the one hand, although the scenarios are constructed based on the macro-financial risks presented in this *Report*, they do not constitute a prediction of the expected performance of the economy since they include various shocks that occur simultaneously and reflect a very adverse atypical situation. On the other hand, the test does not present a forecast of the future performance of the CIs because it is assumed that neither the economic authorities nor the entities take corrective measures in the face of the deterioration of the financial situation. Specifically, CIs do not make changes in their business strategy, and shareholders do not provide additional capital or seek synergies or mergers between entities to cope with financial stress. Consequently, the results should be interpreted exclusively as a quantitative assessment tool of the resilience of CIs in an adverse⁴ and highly unlikely counterfactual scenario.

3.1.1 Hypothetical Macroeconomic Scenario⁵ and Materializing Risks

The stress test on the CIs is based on a hypothetical, adverse, and unlikely macroeconomic scenario, characterized by high-risk perception indicators, in a context of high uncertainty regarding the fiscal situation. This scenario was constructed by considering the main fiscal risks for emerging economies identified in the October 2024 versions of the WEO and the IMF's Global Financial Stability Report⁶. To illustrate a hypothetical environment characterized by greater uncertainty about local and external fiscal soundness, a significant increase in the local risk premium was assumed. In this context, the country's external financing would become more expensive and there would be high volatility in the national financial markets, which would be reflected in devaluations in debt instruments. The sale of TES by foreign investors would deepen, which would generate funding difficulties in the economy. At the same time, a depreciation of the Colombian peso against the U.S. dollar would be observed, which would generate inflationary pressures through the price of imported goods and given a high persistence of the initial shock, inflation expectations would be unanchored. Consequently, the monetary policy interest rate would deviate from its expected path in response to higher inflation. These effects, together with the assumption that in an environment of high uncertainty investment and consumption would contract, would negatively impact local economic growth, credit demand, and employment.

In terms of market risk⁷, during the first year of simulation, devaluations of debt instruments would be observed followed by slight recoveries. In the environment of high uncertainty and high local risk premium, it is assumed that foreign investors would initially liquidate 40% of their TES holdings by June 2024 (the period in which the simulation exercise begins). This, together with greater volatility in local financial markets and upward pressure on the policy interest rate, would lead to

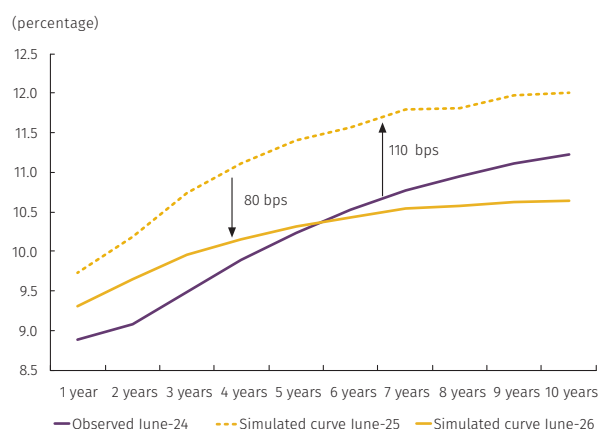
4 Technical details on the model used in this test, including the characterization of the performance of entities in a hypothetical scenario and the channels through which their financial health could be affected, are presented in the series Working Papers No. 1028: "Sysmo I: A Systemic Stress Model for the Colombian Financial System," *Banco de la República*.

5 The paths of the adverse macroeconomic scenario are consistent with a general equilibrium model. To construct them, Patacon, *Banrep's* central forecasting model, was used. For more detail, see González, A., Mahadeva, L., Prada, J. D., & Rodríguez, D. (2011). "Policy analysis tool applied to Colombian needs: PATACON model description". Working Papers on Economics, 29(66), 222-245.

6 See chapter 1 of this *Report*.

7 For more details, see section 2.3 of this article. *Report*.

Graph 3.1
TES Curve in Pesos in the Adverse Hypothetical Scenario



Sources: DCV and Precia; calculations by Banco de la República.

the upward shift of the zero-coupon curve of public debt instruments (yellow dotted line; Graph 3.1) and the private fixed income curve⁸. By the middle of the second year of simulation, the local risk premium would stabilize, although at high levels, so it is assumed that foreign investors would liquidate an additional 10% of their initial holdings⁹. However, there would be slight valuations of debt instruments (yellow solid line; Graph 3.1), to the extent that the monetary policy rate would be reduced in a context of lower inflation expectations and economic recovery.

Upward pressure on the monetary policy interest rate in the first year of simulation and smaller economic growth would impact lending and deposit rates, loan portfolio growth and its deterioration. Lending and deposit interest rates would increase in the expectation of increases in the monetary policy rate during the first simulation year, and afterwards they will slowly decrease¹⁰. The performance of lending rates and the context of high uncertainty, which would discourage consumption and investment, would negatively impact credit growth. In turn, the contraction of economic activity and the increase in unemployment would lead to a greater default in the payment of credit obligations by debtors, which would cause the materialization of credit risk. The endogenous response of the CIs to this scenario would unleash the appearance of interest rate risk in the banking book, and liquidity and contagion¹¹ risks, which depend on the dynamics and financial interconnectedness of the different entities.

The materialization of credit risk would be intensified by the idiosyncratic characteristics of debtors identified as vulnerable in the macroeconomic scenario considered. In all loan portfolios, it is assumed that some debtors would present a greater deterioration in their creditworthiness, which would be reflected in a two-level drop in their credit rating¹². This would have a negative impact on the profitability and, consequently, the total capital adequacy of the CIs, to the extent that interest income would be reduced on account of a smaller productive loan portfolio, and expenditure on loan-loss provisions would

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- 8 The private fixed income curve would move upwards due to the high degree of correlation that this market presents with the movements of TES.
- 9 It is assumed that foreign investors would liquidate a total of 50% of their holdings of public debt instruments (COP 54.9 t as of June 2024). This percentage corresponds to the average annual outflows of foreigners in local public debt from different emerging countries and is close to the maximum annual outflow that Colombia has experienced (56% in February 2009). Arslanalp, S.; Tsuda, T. (2019). "Sovereign Debt Investor Base for Advanced Economies" [Database], Washington, D.C.: International Monetary Fund, Monetary and Capital Markets Department.
- 10 Details of the interest rate models used are presented in Box 4 of the second half of 2021 *Financial Stability Report*.
- 11 Contagion risk refers to the spread of financial difficulties from one or more entities to others through the financial system.
- 12 In Colombia, the loans granted by the entities supervised by the SFC have a rating on a scale ranging from A to E, where A is the best rating. The worse the credit rating, the higher the provisions required.

increase. In the corporate sector, the contraction in investment and higher interest rates would lead to the deterioration of firms identified as vulnerable in the section 2.2.1.3 of this *Report*, as well as those belonging to the subsectors of energy distribution and gas production, residential and non-residential construction, real estate, and agriculture¹³. Additionally, in the face of the depreciation of the Colombian peso, firms exposed to foreign exchange risk¹⁴ would be affected¹⁵. In turn, in the consumer and housing loan portfolios, the debtors whose creditworthiness would deteriorate would correspond to those who, together, recorded a financial burden greater than or equal to 100% as of June 2024, received credit disbursements during 2024, and had a rating of A in June 2024¹⁶.

3.1.2 Results

This section presents the results of the stress test on CIs, which considers two different scenarios of credit risk materialization. In the first (adverse 1), the quality deterioration of the loan portfolio would be caused by the hypothetical adverse macroeconomic scenario of economic slowdown, higher interest rates and unemployment. In the second scenario (adverse 2), credit risk also increases due to the macroeconomic conditions described and the idiosyncratic effect of the default of the vulnerable debtors identified in all credit loan portfolios.

In terms of credit performance, the total balance of the gross loan portfolio would show real contractions and a significant deterioration in its quality throughout the year. In adverse scenarios 1 and 2, the annual real growth rate of the total loan portfolio would remain at negative levels; however, it would decrease at a slower pace than that observed at the end of 2023 (around -3.5% during the first year and -1.3% in the second). In general, this dynamic would be a little more pronounced in adverse scenario 2 due to the limited capacity of CIs to disburse loans in the face of the higher volume of losses due to the additional default of vulnerable debtors. Regarding the deterioration of the loan portfolio, in both scenarios the QRI would continue to increase to levels above the historical average (9.7%). However, for adverse scenario 1, this indicator would be slightly below the peak observed during the pandemic (yellow dotted line, Graph 3.2), while for adverse scenario 2, the QRI would reach values that have not been observed since 2003 (orange dotted line; Graph 3.2). The indicator for all modalities would be well above the levels recorded as of June 2024. However, due to the inertia of its recent performance, the con-

¹³ The firms belonging to these subsectors, whose rating was reduced by two levels, are those that, as of June 2024, had unsecured credit operations with any CIs.

¹⁴ The companies exposed to exchange rate risk are those with a negative currency mismatch (liabilities in foreign currency greater than assets in foreign currency). They are classified as vulnerable based on three indicators: 1) value of the currency mismatches to total assets, 2) trade balance to operating income, and 3) share of foreign capital in the total capital of the company. Each one of these indicators is classified from 1 to 3 based on specific thresholds for each, with 1 being the highest risk level. Finally, the risk levels for each indicator are averaged. If the average for a company is less than or equal to 2.5 and the exchange rate mismatch is less than or equal to -20.0% of total assets, the company is classified as vulnerable. For companies without public accounting information, those with the largest gross mismatch that have accumulated 90% of the total mismatch for this group are taken. For more details on the calculation of currency mismatches, see Box 3 of this *Report*.

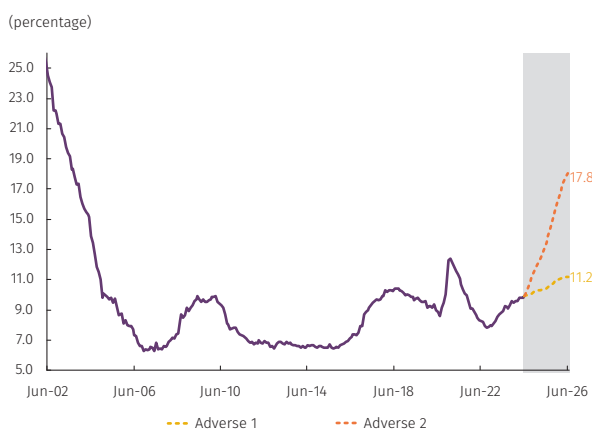
¹⁵ As of June 2024, the total number of firms whose rating would be reduced by two levels represents 11.0% of the commercial portfolio and 1.1% of the microcredit portfolio.

¹⁶ The analysis on stressed financial burden was carried out together with the Financial Superintendency of Colombia. As of June 2024, the identified vulnerable debtors represent 5.1% of the consumer loan portfolio and 8.0% of the housing loan portfolio.

sumption QRI would show slight reductions at the beginning of the year before the effects of the initial adverse shocks materialize.

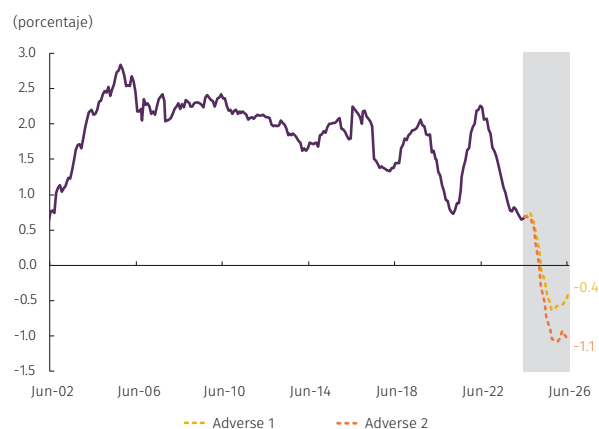
In aggregate, losses would be recorded mainly due to the materialization of credit risk and lower loan portfolio growth. In both scenarios, ROA would decrease and exhibit negative levels from the third quarter of simulation (Graph 3.3). In adverse scenario 1, the indicator would reach a minimum of -0.6%, and in adverse scenario 2, it would be -1.1%. The drop in ROA would be due to lower growth and greater deterioration of the loan portfolio, which would reduce net interest income (Graph 3.4). Likewise, a higher expenditure on provisions would be observed from the fourth quarter of simulation, a period that coincides with the increase in the QRI of all loan portfolios. This higher expenditure, together with the reduction in income from investment valuation, in line with the devaluations of debt instruments, and

Graph 3.2
Aggregate Quality Risk Indicator (QRI)



Source: Financial Superintendency of Colombia (as of June 2024); calculations by Banco de la República (September 2024 to June 2026).

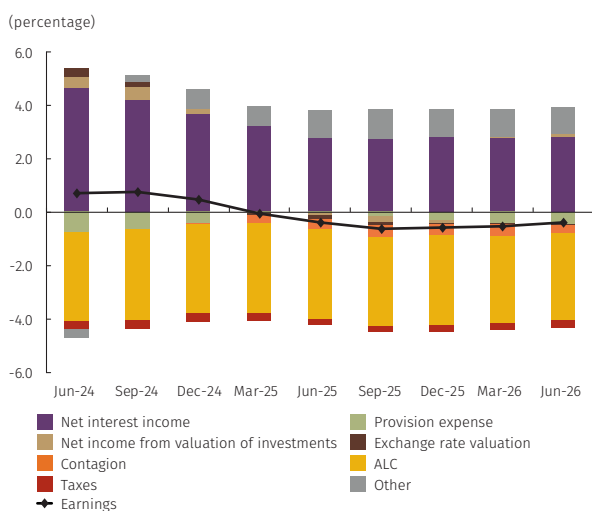
Graph 3.3
Return on Assets (ROA)



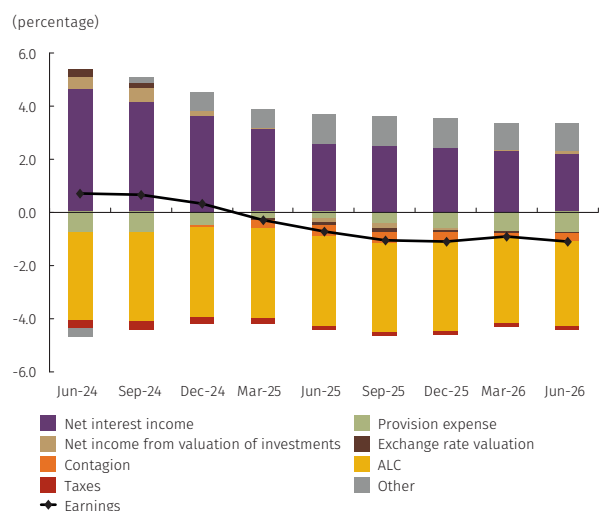
Source: Financial Superintendency of Colombia (as of June 2024); calculations by Banco de la República (September 2024 to June 2026).

Graph 3.4
ROA Breakdown

A. Adverse 1



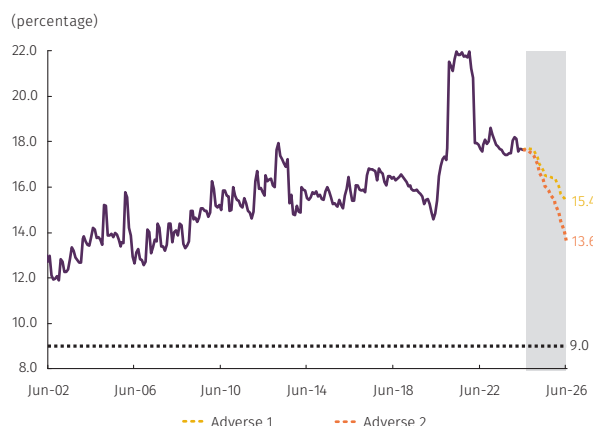
B. Adverse 2



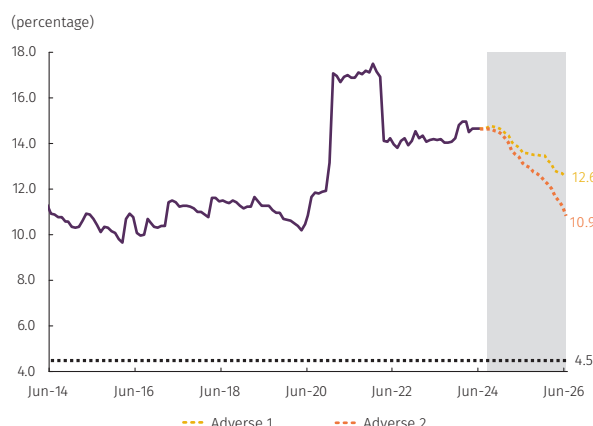
Note: 'Other' item includes net income from money market operations and equity participations, income from commissions and fees, and tax expenses.
Source: Financial Superintendency of Colombia (as of June 2024); calculations by Banco de la República (September 2024 to June 2026).

Graph 3.5
Aggregate Solvency Ratios

A. Total Capital Adequacy

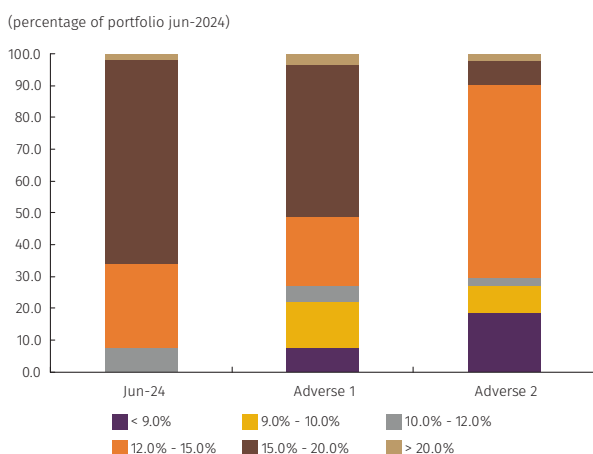


B. Tier 1 Capital



Note: the dotted line indicates the regulatory minimum for each indicator.
Source: Financial Superintendency of Colombia (as of June 2024); calculations by Banco de la República (September 2024 to June 2026).

Graph 3.6
Distribution of the Individual Total Capital Adequacy Ratio by Loan Portfolio Share



Note: To construct the graph, institutions were organized according to the solvency level ranges presented in the legend. The bars indicate the share in the loan portfolio as of June 2024 of the institutions by solvency group for the initial period (June 2024) and the simulated scenarios (adverse 1 and adverse 2).
Source: Financial Superintendency of Colombia (as of June 2024); calculations by Banco de la República (June 2026).

the second-round effects associated with the risk of contagion from the CIs¹⁷, would deepen the losses for the year in both scenarios. These dynamics would intensify in adverse scenario 2 due to the additional default of vulnerable debtors.

In aggregate, CIs would maintain adequate capital levels to face losses associated with the adverse scenario considered to insofar as the total and core capital adequacy ratios would remain above the regulatory limits¹⁸, although they would decrease. The accumulated losses for the year would reduce the total capital adequacy ratio over the entire simulation horizon. However, at the end of the period analyzed, the ratio would be above the minimum required at 6.4 pp in the adverse scenario 1 and 4.6 pp in adverse scenario 2 (Graph 3.5, panel A). Likewise, in both cases, the core capital adequacy ratio would fall, but would remain above the regulatory minimum (Graph 3.5, panel B).

At the individual level, some entities would register greater effects on their available capital to face losses. In both scenarios, some CIs could face difficulties in complying with the minimum capital requirement. At the end of the year, the group of institutions that would have a total capital adequacy ratio below the regulatory limit accounted for around 7.5% of the total loan portfolio as of June 2024 (Graph 3.6). In turn, those identified in adverse scenario 2 participated with 18.5%. In general, the entities classified by the SFC as systemically important¹⁹ are resilient to the aforementioned shocks.

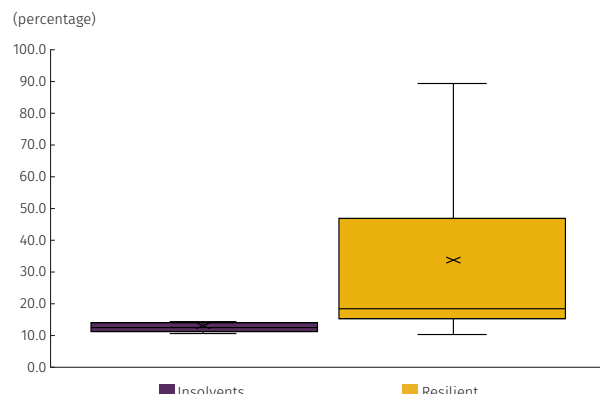
The initial solvency conditions of the institutions are relevant since they could exacerbate the shocks of the test. Some institutions that, in accordance with the results of the simulation test, could face difficulties in complying with the minimum capital requirements, are those that, as of June 2024, had less comfortable solvency levels with respect to the regulatory limit compared to those CIs that were resilient in the adverse scenario (Graph 3.7). This highlights the need for CIs to maintain prudential capital levels that allow them to absorb various shocks without potentially affecting their operation.

17 The contagion component of exercise includes two elements. The first corresponds to direct contagion and is determined by direct exposures between CIs. The second element corresponds to indirect contagion, which considers losses due to depreciation generated by the abrupt sale of assets by entities that are close to regulatory solvency limits.

18 The regulatory limits do not include conservation buffers and correspond to 9.0% for total capital adequacy and 4.5% for tier 1 capital.

19 The institutions identified as systemically important correspond to those that are larger and more interconnected (too big to fail). To identify them, their size, interconnectedness, substitutability, and complexity are considered.

Graph 3.7
Distribution of the Initial Total Capital Adequacy of Credit Institutions



Note: the lower (upper) limit of each box denotes the 25th (75th) percentile of the distribution of total capital adequacy recorded at the beginning of the year (June 2024) by insolvent (those whose total capital adequacy indicator would be below 9.0% in the stress test) and resilient CIs. The X and the horizontal line inside the box correspond to the mean and median, respectively.

Source: Financial Superintendency of Colombia (as of June 2024); calculations by Banco de la República (September 2024 to June 2026).

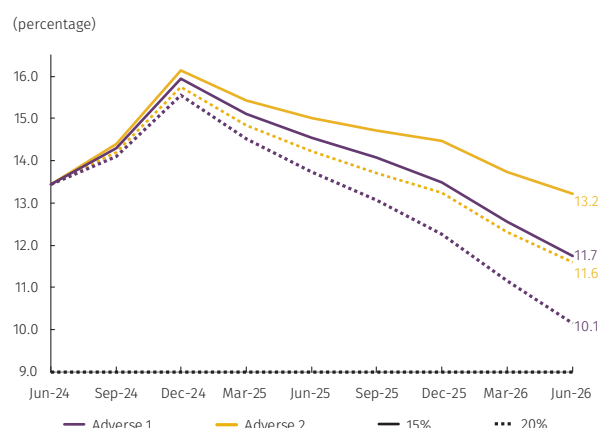
3.1.3 Stress Test of Investments in Central American Subsidiaries

Considering the relevance of subsidiaries in Central America in the aggregate assets of Colombian financial conglomerates²⁰, this section presents the results of the stress test on investments in these subsidiaries. The analysis is based on the results presented in section 3.1.2 and seeks to evaluate the resilience of Colombian CIs with consolidated financial statements to asset impairments in their subsidiaries in Central America.

The purpose of the exercise is to evaluate whether the consolidated capital is adequate to face the adverse macroeconomic scenario described and additional shocks of devaluation of its positions in Central America. Based on the solvency levels resulting from adverse scenarios 1 and 2, devaluations of 15% and 20%²¹ of assets in dollars are included for those CIs that consolidate subordinated banks in Central America. These additional shocks occur gradually from the first simulation period and are modeled directly on the consolidated balance sheet in pesos of the entities, which is simultaneously affected by the positive effect of the depreciation of the Colombian peso from the adverse macroeconomic scenario²².

In both adverse scenarios, CIs with consolidated financial statements are resilient in terms of solvency. Aggregate consolidated capital levels would be adequate to deal with the exchange rate shock and the different magnitudes of asset devaluation (Graph 3.8). In all cases, the total capital adequacy indicator would remain above the regulatory limit, although there would be reductions compared to the levels observed in June 2024.

Graph 3.8
Consolidated Total Capital Adequacy Ratio



Note: The black dotted line indicates the regulatory minimum of the consolidated indicator of total capital adequacy.

Source: Financial Superintendency of Colombia (as of June 2024); calculations by Banco de la República (September 2024 to June 2026).

3.2 Stress Test on Open-end Collective Investment Funds

Contributions and outflows faced by OECIFs can be volatile as they respond to market conditions, expectations and liquidity needs. Although these funds must comply with regulatory limits, which help manage liquidity risk adequately, a scenario of massive and unexpected capital withdrawals could adversely

20 This share is calculated as the sum of the external banking assets of the banking subsidiaries of Colombian entities over the total consolidated assets. In this calculation, the numerator does not exclude interrelated transactions between subsidiaries and the parent company. The distribution of this participation by country is as follows: Panama 10.3%, El Salvador 3.4%, Guatemala 2.1%, Costa Rica 1.4%, Honduras 0.8%, and Puerto Rico 0.2%. For further details, see *Special Report on the Macroeconomic and Financial Situation in Central America*, September 2024

21 The shocks of -15% (-20%) correspond to the 5th (1) percentile of the devaluations registered in Central American subordinates during 2016, a period in which sovereign rating downgrades were presented in some of the jurisdictions with the greatest exposure.

22 Considering that the effect of shocks is measured on the consolidated balance sheet in pesos, a greater depreciation of the Colombian peso against the dollar increases the value of the exposure.

affect the sector and the financial system²³. In this regard, this section presents a reverse²⁴ stress test that seeks to quantify the level of daily withdrawals that would cause OECIFs, which represent 20% of the total managed assets²⁵, to breach the regulatory liquidity limit. The objective is to provide an insight on the potential resilience of these funds in the face of different levels of withdrawals, without considering possible mitigation measures or second-round effects.

The stress test on OECIFs consists of simulating different daily withdrawal shocks to assess the impact on their liquidity. With information on the cash level of each of the funds²⁶, the LRI²⁷ that they would present in the event of daily withdrawals of between 1.0% and 30% of total assets is calculated. For this purpose, the exercise assumes that the OECIFs would face these redemptions only with their liquid resources²⁸, which would reduce their HQLAs²⁹. For each withdrawal level, those funds that would fail to meet the minimum required for the liquidity indicator are identified³⁰, and their combined share of the total assets managed by these investment vehicles is calculated. Graph 3.9 presents the results of the test; each color represents the combined share in the total assets of the funds that would breach the liquidity requirement. In this regard, higher values (dark purple tones) correspond to a greater impact of the withdrawal shock on the liquidity of the OECIFs.

The aggregate dynamics of the OECIFs' LRI are relevant as it can anticipate their resilience to daily withdrawal shocks. Between April and September 2024, the dispersion of OECIFs' LRI increased, mainly due to the fact that smaller funds registered significant increases in their liquidity, contrary to those with larger participation. Therefore, when analyzing the effects of withdrawals of a high magnitude (about 20% of total assets), it is observed that the combined participation of funds that would not comply with the regulatory minimum of LRI decreased from 90% to 70% during that period. On the other hand, given that the largest OECIFs recorded declines in their LRI as of September 2024, a daily withdrawal shock of 3.0% would cause funds that together represent 20% of total assets to fail to comply with the LRI requirement. This value of withdrawals is lower than what would have been required in April 2024 (6.5%). Although the results suggest less resilience, if funds were allowed to face redemptions with liquid instruments, such as their holdings

23 For further details, see section 2.1.3 of this Report.

24 Reverse stress exercises are used to determine the level or combination of stress shocks that would lead institutions to a situation of non-compliance with regulatory requirements or bankruptcy.

25 The 20% corresponds to approximately double the participation in the total assets managed by OECIFs that failed to comply with the LRI requirement on 12 March 2020, in the midst of the economic shock caused by the COVID-19 pandemic.

26 Cash information is obtained from Form 519 of the Financial Superintendency of Colombia.

27 The calculation of the liquidity risk indicator (LRI) corresponds to the ratio between high-quality assets (HQLA) and the maximum liquidity requirement, which results from multiplying the net value of the CIF by the maximum probable net withdrawal.

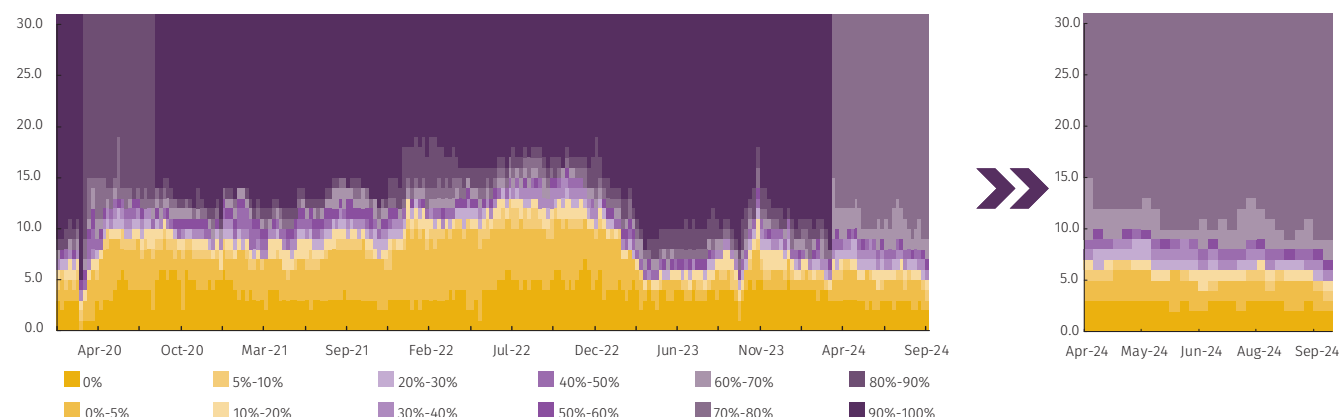
28 Liquid resources include net contractual flows available on a business day basis and demand deposits.

29 The high-quality liquid assets of the OECIFs correspond to negotiable investments in local public debt instruments received by *Banco de la República*, negotiable securities in shares, and investment-grade sovereign debt instruments, among others.

30 A default corresponds to an LRI value of less than 100%, which is the regulatory limit according to the Financial Superintendency of Colombia.

Graph 3.9
Results of the Stress Test on OECIFs

Withdrawals (percentage of assets)



Note: the shades of the graph correspond to the share in the total assets of the OECIFs that do not comply with the regulatory limit of the LRI to different withdrawal shocks (vertical axis). Thus, the darkest purple indicates that the funds that default represent between 90% and 100% of the total assets.

Source: Financial Superintendency of Colombia; calculations by Banco de la República.

of securities issued by the U.S. government³¹, their ability to meet withdrawals would increase.

Results suggest that OECIFs are resilient to daily withdrawals shocks of an unlikely magnitude. The level of withdrawals shock required to negatively impact the liquidity of the OECIFs sector is within the 1st percentile of the historical distribution of their net contributions (contributions minus withdrawals). However, given the volatile nature of the contributions and withdrawals faced by these funds, it is desirable for them to maintain liquidity buffers.

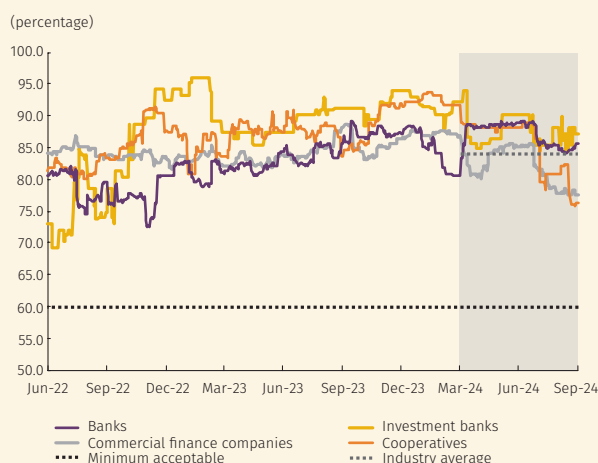
³¹ For further details on the composition of the investment portfolio instruments of the OECIFs, see subsection 2.1.3 of this Report.

Shaded Section 3: Cyber Risk Indicator

In line with the important role of financial infrastructures in the proper functioning of the financial system, cyber risk represents a source of risk to financial stability that requires monitoring. The importance of financial infrastructures lies mainly in the fact that they allow the clearing, settlement, and recording of transactions between the participants of the financial system, so it is essential to ensure that the systems that make them up operate safely, efficiently, and without disruptions. Likewise, as these systems become increasingly dependent on information technologies, exposure to cyber risk increases, so cyberattacks that interrupt their operation could prevent compliance with obligations, generate loss of confidence in the security of systems and their agents, and even cause economic losses, among others. In this regard, the monitoring of cyber risk indicators is a work in continuous evolution.

The cyber risk indicator (IRC in Spanish) of cooperatives and finance companies (FC) has deteriorated since the beginning of August, although it remains above the minimum acceptable. The IRC is based on the methodology presented by Escobar *et al.* (2023) in which ten factors¹ representing different dimensions of cyber risk are added. This aggregation is carried out using weights that are determined by machine learning techniques that result in a score from 0 to 100 where 100 represents a high resilience to cyberattacks for the entity analyzed. Since March 2024, the IRC has remained stable and close to the average of the aggregate financial industry indicator for banks and financial corporations (Graph S3.1).

Graph S3.1
Aggregate Cyber Risk Indicator by Institution Type



Source: Security Scorecard; calculations by Banco de la República.

The decrease in the aggregate indicator of cooperatives and financing companies is due to idiosyncratic factors of some of the CIs that are part of these groups. In the case of FC, the IRCs of two institutions show a decreasing trend due to their patching cadence factor, i.e., there is a delay in the speed with which these organizations are implementing security updates. In addition, one of these institutions also has presented a deterioration in its network security indicator, which suggests that there are network ports on its servers that are classified as insecure, open or misconfigured. This institution also has an IRC below the minimum acceptable. As for cooperatives, it is observed that the IRC of two institutions has worsened mainly due to a

1 Application security; Cubit score; DNS Health; Safety of the Endpoint; Hacker chatter; IP reputation; Information leakage; Network security; Patching cadence and Social Engineering.

decrease in the application security indicator, which means that there are possibly vulnerabilities, misconfigurations or incoming threats through public web applications. In addition, the endpoint security factor of one of these cooperatives, which measures data related to the security of the equipment that entities have connected to their network, decreased. Despite this decrease in their aggregate indicators, these continue to be above the minimum acceptable for most institutions, therefore they do not represent a risk signal.

Banco de la República has worked on additional studies on the dynamics of cyber risk, which help to understand the risks to which the financial system is exposed.

Banco de la República (2024) conducted a study on the consequences or impacts that participants in the Deposit Account System (CUD) would face if any of the systemically important institutions were to fall victim to a cyberattack. Through different scenarios, the resulting payment defaults (value and number of affected institutions) are evaluated in each of the scenarios described, and a series of measures that should be considered to mitigate the risks associated with a cyberattack are also proposed. The simulations carried out allow us to conclude that the effects of a cyberattack can be significant on the operation of financial institutions and infrastructures. However, there is a mitigating effect, thanks to greater efficiency in the use of liquidity, when institutions assume an active reaction, that is, when they retry to comply with blocked payments, once they have funds in their accounts.

In conclusion, cyber risk is a relevant aspect when analyzing the vulnerabilities to which CIs are exposed.

The aggregate IRC indicates that most institutions in the Colombian financial system have sufficient tools to deal with cyberattacks and other possible events that compromise their computer security. In addition, some institutions present deterioration in their indicators, so their monitoring will continue. The review of studies carried out by other institutions that may complement the analysis of cyber risk in the Colombian financial system will also continue.

References

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