



Dolar	3,464	3,155
Euro	3,706	3,708
Ibovespa	67,671	67,039
CDI	9,14%	9,06%
Selic	9,15%	9,08%

Financial Stability Report

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Preface

The Financial Stability Report (FSR) is a semiannual publication issued by the Banco Central do Brasil (BCB) that presents an overview of recent developments and the outlook on financial stability in Brazil, focusing on the main risks and on the domestic financial system resilience, as well as conveys the Financial Stability Committee (Comef) view on the policy and measures to preserve financial stability.

The BCB defines financial stability as the regular operation, over time and in any economic scenario, of the system responsible for the financial intermediation among households, non-financial corporations, and the government.

The Report consists of two chapters. Chapter 1 – Assessment of the National and International Financial Systems – presents an overview of the international financial system; of the National Financial System (SFN) – with analyses of the risks related to liquidity, credit, profitability, and solvency; of capital and liquidity stress tests and their effects on institutions' solvency; – of the Financial Stability Survey (FSS); and of the operation of systemically important financial market infrastructures (FMIs). Chapter 2 – Selected Issues – discusses relevant and not necessarily recurrent

topics that may have implications to financial stability in Brazil.

As of 2025, the FSR will disclose, in the first edition of each year, the breakdown of the cost of credit and the spread, as well as the SFN concentration indicators, previously published in the Banking Report, which was discontinued in accordance with Resolution BCB 460, of March 25, 2025.

The Statistical Annex shows charts and tables underlying data and can be found on the FSR website, <https://www.bcb.gov.br/en/publications/financialstabilityreport>, as well.

Executive Summary

The external environment remains challenging due to the macroeconomic context and economic policy in the United States, notably uncertainty about trade policy and its effects.¹ This context has generated even more doubts about the pace of deceleration and disinflation and, consequently, about growth in other countries. Central banks in major economies remain determined to promote the convergence of inflation rates to their targets in an environment characterized by tight labor markets. This scenario continues to require caution from emerging countries.

At the domestic level, although signs of an incipient moderation in growth emerged, economic activity and the labor market remained dynamic. Despite the start of the current Selic rate hike cycle in September 2024, economic activity remained resilient. As for the labor market, recent data suggests some moderation, with a marginal decrease in the employed population, but in an environment of low unemployment and improved income.

The Banco Central do Brasil (BCB) considers that there is no relevant risk to financial stability. The National Financial System (SFN) remains with comfortable capitalization and liquidity positions, and adequate provisions to the level of expected losses. Furthermore, the capital and liquidity stress tests demonstrate the soundness of the banking system.

Survey shows fiscal risks gaining even more relevance and perception of a worsening economic and financial cycle. Confidence in the stability of the SFN remains high. Fiscal risks show up as the most important threat, mainly reflecting concerns about the sustainability of public debt. Institutions surveyed are also concerned about the possibility of a sharp slowdown in the economy and an increase in defaults, in a scenario of high indebtedness among households and companies. Confidence in the stability of the SFN, however, remains close to an all-time high.

Financing to the real economy continued to accelerate in the second half of 2024,...

In bank credit to households, the acceleration was more noticeable in the vehicle financing and non-payroll deducted credit portfolios.² Credit to companies, in turn, accelerated for companies of all sizes with an increase in lending. Large companies also continue to benefit from capital markets, which keeps gaining ground as a source of financing.

... but FIs indicate more caution in risk appetite in 2025. Despite the start of monetary tightening in September 2024, credit to households continued to accelerate in higher-risk modalities and for lower-income borrowers. There was a slight deterioration in the quality of non-payroll deducted credit lending and an increase in the financing of older vehicles and with smaller down payments. Regarding companies, granting criteria did not change substantially. The Quarterly Credit Conditions Survey (PTC), however, indicates financial institutions (FIs) with lower risk tolerance in 2025. Indeed, risks related to the financial situation of households and companies continue to demand preservation of the lending standards.

¹ Minutes of the Monetary Policy Committee (Copom), issued on March 25, 2025, available at <https://www.bcb.gov.br/en/publications/copomminutes>.

² This refers to the Credit Information System (SCR)'s "non-payroll deducted credit to households" submodality.

In fact, despite the dynamism of the domestic economy, the payment capacity of households and companies remains under strain.

The recent context has been one of improvement in income, employment and a positively surprising activity level. Even in this environment, the household debt service-to-income is historically high and on the rise. Particularly, the debt service-to-income of SFN credit-borrowing households rose in almost all income brackets. Companies, in turn, are highly leveraged and their payment capacity is under pressure due to the tightening of financial conditions.

The risk materialization tends to reduce in the short term, under the influence of increasing portfolios, but the expectation for the medium term is for this scenario to change.

The portfolio growth has driven down the percentage of problem assets (PAs) in loans to micro, small, and medium-sized enterprises (MSMEs) and households. Only rural credit has seen an increase in risk materialization, and the BCB estimates that this trend will continue. Despite the positive expectation for the short term, the scenario for risk materialization tends to suffer more in the medium term. This is because the monetary tightening, that began in September 2024, intensified at the start of 2025, which should lead to a slowdown in economic activity. It should be noted that monetary tightening cycles tend to affect borrowers differently. In general, the smaller the company, the

quicker its payment capacity is affected, resulting in an increase in PAs over a shorter period. As regards households, the risk materialization in monetary tightening cycles appears to be more diffuse across the different modalities.

In aggregate terms, the SFN remains with adequate provisions. The new accounting rules will further improve coverage for estimated credit losses.

Provisioning has followed the dynamics of expected losses in most institutions. The new accounting rules for financial instruments, which came into force on January 1, 2025, require provisions for expected losses for a wider scope of instruments and regulatory levels of provisioning for incurred and expected losses. A survey by the BCB indicates that FIs will increase provisions, which will leave the SFN more robust to face future materializations of credit risk.

The SFN's profitability continues to improve, but restrictive financial conditions could limit progress in 2025.

The improvement is mainly explained by the increase in credit net interest income – recent loan cohorts with higher interest rates and lower funding costs – and by the decline in risk materialization, which contributed to reducing the cost of provisions. This gradual advance should continue, but with a milder effect. This is because credit expansion is expected to be cautious,

household and company indebtedness is high, and monetary tightening will raise funding costs.

The banking system remains sound enough to absorb regulatory changes and underpin the regular operation of financial intermediation.

Capitalization remains comfortably above regulatory minima and will continue to be moderately impacted by improvements in prudential regulation. In January 2025, the new methodologies for calculating the share of risk-weighted assets relating to operational risk and the provision for credit losses came into force. The system is capable of expanding assets without the need for capital contributions.

The banking system remains resilient, as evidenced by various risk analyses and liquidity and capital stress tests. Nonetheless, a sizable group of banks would have restrictions on distributing profits, under the simulated scenario of a confidence crisis.

The results of the capital stress tests continue to indicate that there would be no material non-compliances in the simulated scenarios. It should be noted that the crisis of confidence scenario was based on a more fragile initial economic situation than that considered in the previous FSR. This stricter scenario was relevant so that institutions that represent more than 40% of the system, although compliant, were restricted from distributing profits. Furthermore, the macroeconomic stress simulations incorporated

the regulatory changes that will take effect from 2025 onwards. Sensitivity analyses also indicate good resistance to the risk factors simulated in isolation. Liquid assets would be sufficient to withstand potential losses, even in stressed scenarios, and to comply with current regulations.

The financial market infrastructures (FMIs)³ contributed to the safe and efficient operation of the markets. The financial system held enough intraday liquidity to ensure seamless transactions in the Brazilian Payments System (SPB). Pix continues to increase its relevance in the SFN and SPB and already represents around 26% of all retail payments. Interbank market settlements took place without any significant incidents. Credit and liquidity exposures were adequately managed by the central counterparty (CCP) every single day of the period.

FIs noted that climate risks materialized more in 2024 than in 2023, but the impact was considered low. In the survey on climate risks, the number of FIs that reported the impact of materialization of climate risks on their businesses more than doubled, reflecting the extreme events recorded in Brazil in 2024, such as the floods in Rio Grande do Sul. Still, the assessment remains

that drought is the most relevant climate event in terms of expected impact on FIs assets in the long term.

The SFN's largest exposures to physical climate risk are related to drought events, the Cerrado, Atlantic Forest and Pampa biomes, as well as the basic consumer goods macro-sector, which includes agriculture and livestock. These exposures were obtained from a mapping of the SFN's exposure to physical climate risks, considering biomes, economic macro-sectors, and the severity of climate events. Although the mapping result is exploratory in nature and has limitations, it offers multiple preliminary perspectives on the SFN's exposure to physical climate risk, allowing for the development of more detailed metrics.

The average Cost of Outstanding Loans (ICC) and its spread fell slightly in 2024, due to the drop in delinquency. Despite the decline, the main component of the ICC spread is still delinquency. The average ICC of earmarked credit is still much lower than that of non-earmarked credit. However, this difference narrowed, reflecting the increase in the cost of funding earmarked credit and the slight drop in the cost of funding non-earmarked credit.

Concentration in the SFN decreased in 2024, following the trend of recent years. The analyses considered total assets, total deposits, and credit operations. The share of credit unions and non-banking institutions increased. As a result, banking institutions lost market share.

Open Finance is promoting modernization and increasing efficiency in the provision of financial services. Given the breadth and disruptive potential of Open Finance in the SFN, the BCB has been working to monitor its implementation process by institutions. Continued regulatory improvement and the greater professionalization brought about by the recently founded *Associação Open Finance* deepen the foundations for consolidating the initiative and evolving its scope. Despite the mature stage of implementation of the project, the maintenance and evolution of this technological and business apparatus will continue to demand effort, commitment, and collaboration between the regulator and the participating institutions.

The BCB estimates that the current cycle of interest rate hikes will have a strong impact on non-financial companies, although the effect

3 The FMIs refer to the set of rules, procedures, and operational structure aimed at enabling the exercise of settlement activities, centralized deposit, registration of financial assets or a combination of these activities. The systems and their functions are available at <https://www.bcb.gov.br/estabilidadefinanceira/infraestruturamercado> (in Portuguese) and at <https://www.bcb.gov.br/en/financialstability/financialmarketinfrastructures> (in English).

is expected to be more moderate than during the 2015-2016 recession. The BCB estimated the Interest Coverage Ratio (ICR) and the Return on Equity of publicly traded companies over a one-year horizon, based on data available in September 2024. Companies' payment capacity will fall significantly. However, the situation of companies with ICR less than 1 would be better than during the 2015-2016 recession and the Covid-19 pandemic. Profitability, in turn, will fall to a level lower than that seen during the pandemic, but higher than that seen in 2015-2016.

BCB's analysis found that the temporary reduction of the conservation buffer during the pandemic circumvented the stigma of using buffers, promoted the maintenance of credit and preserved regulatory capital. The cut in the conservation buffer has allowed banks with less excess capital not to restrict credit during the pandemic. The study also found that the restriction on distributing dividends has been important in signaling that the freed-up capital should not be used to distribute profits. Combined, the measures have induced banks to preserve and gradually rebuild their capital levels. After the intervention, there is no evidence of a relevant change in credit for companies considering

all banks, regardless of whether they were affected by the measure or not.

The end of FIs' overhedge (OH)⁴ contributed to a reduction in exchange rate volatility. FIs adopted OH strategies to neutralize the effect of exchange rate fluctuations on their shareholders' equity. The end of OH, with Law 14,031, of July 28, 2020, partially reduced volatility in 2021 – when OH was halved – and more intensely as of 2022. The result of the BCB's estimation indicates that the magnitude of the reduction in volatility is relevant: in 2021 the decline in volatility was around 3 percentage points (p.p.); as of 2022, volatility declines by almost 8 p.p., equivalent to more than half the average volatility of the post-OH period.

4 See item "2.3 Investment abroad and overhedge", from the October 2020 FSR, available at <https://www.bcb.gov.br/en/publications/financialstabilityreport/202010>.

Decisions of the Financial Stability Committee on the Countercyclical Capital Buffer

At its 59th and 60th ordinary meetings, on November 26 and 27, 2024, and February 18 and 19, 2025, respectively, the Financial Stability Committee (Comef) decided to hold the Countercyclical Capital Buffer for Brazil (ACCP_{Brasil}) at 0% (zero percent).⁵

The Committee deems the National Financial System (SFN) prepared to face credit risk materialization. This materialization continues to occur in operations with micro, small, and medium-sized companies and in rural credit to households. On the other hand, the downward trend in materialization in higher risk lines to households persists. Banks' loan loss provisions, liquidity and capital levels remain adequate. Given reduced exchange rate exposure and low dependence on external funding, the SFN's exposure to financial fluctuations originated abroad is low.

In the fourth quarter of 2024, bank credit maintained its growth rate, but the Quarterly Credit Conditions Survey (PTC) points prospectively to a deterioration in credit supply conditions and lower risk appetite among financial institutions (FIs). Credit raised via

the capital markets, conversely, shows no signs of inflection despite changes in financial conditions.

In the Committee's view, the scenario, characterized by a rise in the basic interest rate and the current levels of delinquency, household debt service-to-income and indebtedness, as well as corporate indebtedness, calls for additional caution and diligence when providing credit, both in terms of loan quality and risk appetite. The Comef recommends that supervised entities persist with the policy of prudent capital and liquidity management in view of the economic uncertainties and context.

The Comef monitors international financial conditions, paying particular attention to the consequences of the path of monetary and fiscal policies in advanced economies, changes to trade policies, global financial asset repricing movements, and geopolitical events.

Therefore, considering the financial conditions, asset prices and expectations regarding the credit market behavior, at the 59th and 60th ordinary meetings, the

Comef considered appropriate to hold the ACCP_{Brasil} at 0% (zero percent). If the Committee increases the ACCP_{Brasil}, FIs have twelve months to comply; if it reduces it, institutions can use the freed-up capital immediately. These decisions were made by the Comef in carrying out its duties provided for in the Regulation attached to Resolution BCB 173, of December 9, 2021, and followed the principles and objectives described in Communiqué 30,371, of January 30, 2017.

⁵ Communiqués 42,457, of November 27, 2024, available, in Portuguese, at <https://www.bcb.gov.br/estabilidadefinanceira/exibenormativo?tipo=Comunicado&numero=42457>, and 42,856, of February 19, 2025, available, in Portuguese, at <https://www.bcb.gov.br/estabilidadefinanceira/exibenormativo?tipo=Comunicado&numero=42856>.

The background is a teal-colored graphic. It features a white line chart with several peaks and valleys on the left side. On the right side, there is a white bar chart with five vertical bars of varying heights. In the center, there are several gold coins, some of which are stacked. One coin in the foreground is clearly visible, showing the word 'REAL' and the year '2013'.

I

Assessment of National and International Financial Systems

Dolar	3,1464	3,1556
Euro	3,7064	3,7085
Ibovespa	67,671	67,659
CDI	9,14%	9,06%

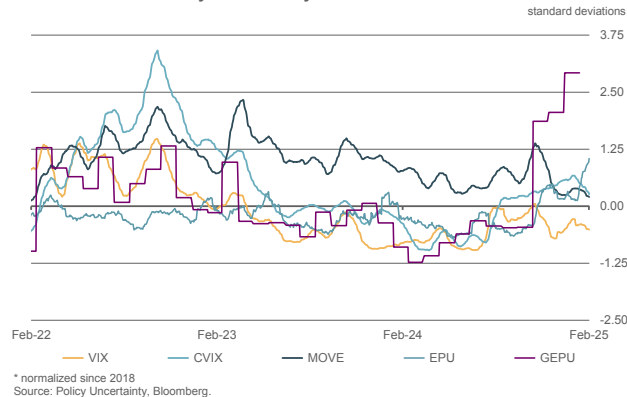
1.1 International financial markets

The international financial system continues to demonstrate resilience. Despite rising long-term interest rates, ongoing balance sheet reduction by central banks, increased volatility in certain asset classes, and heightened uncertainties stemming from shifts in global trade policies, the system remains functional and exhibits no significant signs of stress. Credit impulse remains subdued, reflecting moderate economic activity. Liquidity remains adequate to meet funding needs, though at elevated rates. Bank capitalization in major economies remains robust. Nevertheless, global financial conditions have tightened since the last Financial Stability Report (FSR).⁶

Volatility in financial asset prices remains elevated, surpassing levels observed during the reference period of the previous FSR. The announcement of trade tariffs by the new U.S. administration, coupled with doubts surrounding their implementation and the potential for retaliatory measures from other governments, has intensified uncertainty, eroded confidence and worsened expectations among market participants. This heightened uncertainty has already prompted precautionary behaviors, impacting asset

prices. In recent months, there has been a noticeable increase in uncertainty regarding economic policy in general, and trade policy in particular. This coincides with periods of heightened financial asset prices volatility, although the extent of the volatility, so far, remains smaller than what might be expected given the surge in uncertainty (Chart 1.1.1).

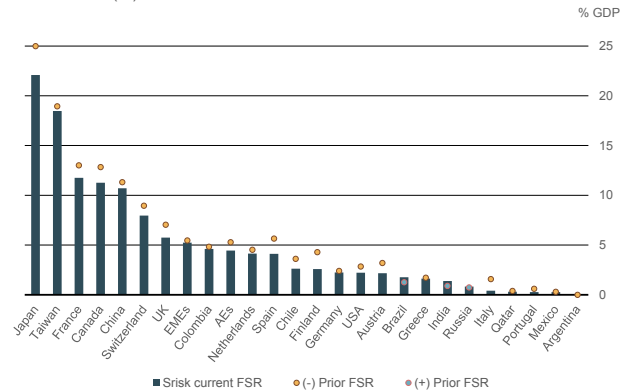
Chart 1.1.1 – Uncertainty and volatility measures*



Systemic risk (SRisk)⁷ has declined in nearly all economies since the last FSR, including all advanced economies (AEs) and most emerging market economies (EMEs) analyzed, except for Brazil, India, and Russia.

Nonetheless, these three countries are still among those with the lowest systemic risk perception. The increase in the market value of financial institutions (FIs) contributed to the SRisk reduction in most economies. SRisk is estimated at 4.4% of GDP for AEs and 5.2% of GDP for EMEs (Chart 1.1.2).

Chart 1.1.2 – Systemic Risk Analysis (SRisk)
SRisk/GDP (%)



Sources: Bloomberg, BCB staff calculations.

The profitability of most Global Systemically Important Banks (G-SIBs) has remained stable, with the continued decline in interest income being offset by varying expense reduction measures and an increase in other revenues.

⁶ In this chapter, the date used for comparison with the previous issue of the FSR is August 27, 2024. The chapter reflects information available as of February 19, 2025.

⁷ Indicator that measures the capital shortfall of financial institutions in a global stress event, as discussed in the April 2021 FSR.

Since the last FSR, financial conditions have tightened across major economies. This trend largely reflects a rise in long-term interest rates and the relative appreciation of the U.S. dollar, partially offset by an increase in stock prices (Chart 1.1.3). In China, financial conditions have also tightened, despite a more accommodative monetary policy stance. This relative tightening of financial conditions partly aligns with the more cautious stance by monetary authorities in advanced economies in easing the monetary tightening implemented in recent years, as well as with the heightened uncertainty resulting from economic measures by the new U.S. administration. Significant uncertainty persists regarding monetary policy trajectories in advanced economies, China's economic growth outlook, and geopolitical developments. While increased uncertainty reduces predictability of future prices and financial flows, risk appetite has nonetheless risen since the last FSR in both advanced and emerging market economies (Chart 1.1.4). Furthermore, U.S. hedge funds leverage has reached peak levels not seen since 2013.

Chart 1.1.3 – Financial Conditions Index

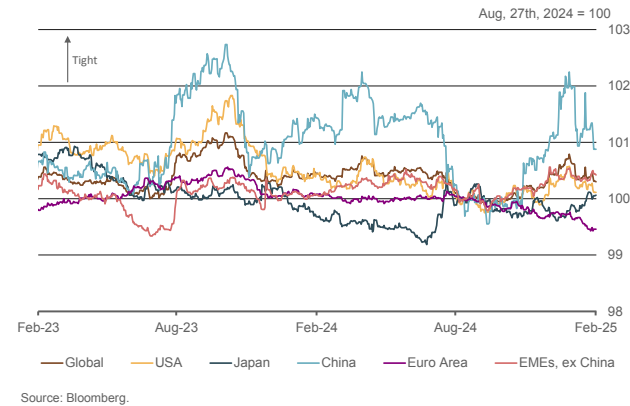
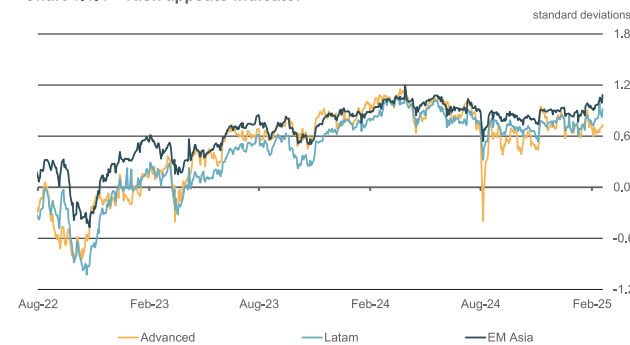


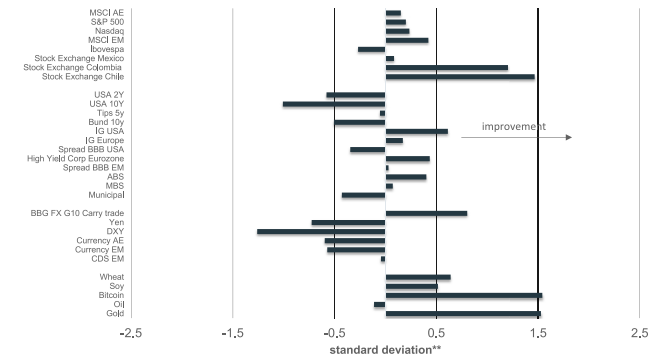
Chart 1.1.4 – Risk appetite indicator



Advanced: USA, Euro Area, Japan
 Latam: Brazil, Chile, Colombia, Mexico, Peru
 EM Asia: China, Korea, Philippines, India, Indonesia, Malaysia
 Sources: Bloomberg, Reuters, Fed St Louis, and BCB staff calculations.

Stock market indices in both AEs and EMEs have performed positively during the period, except for the Ibovespa (Chart 1.1.5). Notably, Colombia and Chile have experienced significant gains. The performance of the Morgan Stanley Capital International Emerging Markets (MSCI-EM) index surpassed that of AEs, influenced by concerns about the potential impacts of changes in global trade policies. The currencies of both AEs and EMEs depreciated against the U.S. dollar since the last FSR, although part of this trend was reversed throughout 2025.

Chart 1.1.5 – Assets Performance since last FSR *

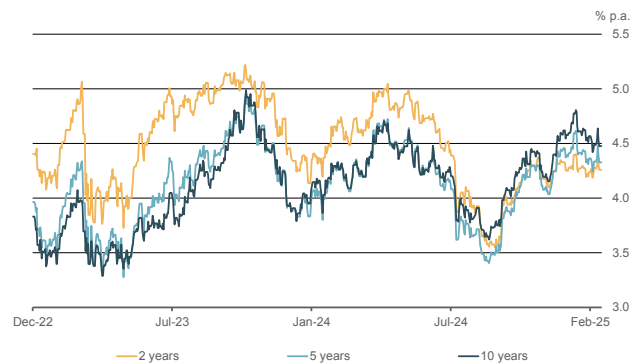


* Up to February 19th. Last FSR August, 27th, 2024.
 ** normalized to the days range in each analysis window.
 Sources: Bloomberg, Refinitiv, Fed. St Louis.

U.S. long-term interest rates have remained high and volatile since the last FSR (Chart 1.1.6), reflecting heightened uncertainty and the Federal Reserve's more cautious monetary policy stance.

In February, the yield curve was relatively flat, in contrast to the inverted shape observed during the last FSR period. This shift partly reflects the more advanced stage of the initial monetary easing cycle, the decision to pause further rate cuts, and the subsequent rise in long-term rates since late 2024. Interest rate volatility remains at historically elevated levels, driven by persistent uncertainties regarding the pace of inflation convergence to the Fed's target, the rebalancing of the domestic labor market, the expected monetary policy trajectory, and the effects of trade policies on asset risk premiums.

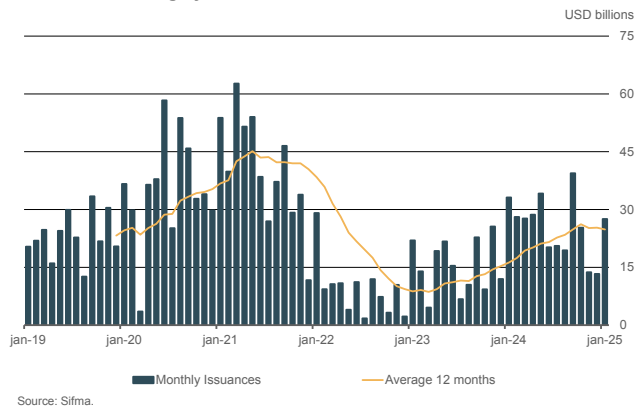
Chart 1.1.6 – US: Long term rates



Credit conditions in the U.S. remain restrictive, with a contraction in certain segments, especially those most sensitive to interest rates. Some types of credit have seen an increase in delinquency rates, although still low by historical standards.

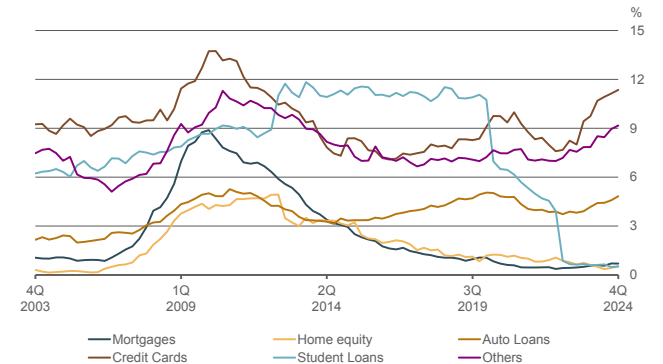
High-yield bond issuances in the U.S. continued to recover throughout most of 2024, with the twelve-month moving average returning to mid-2022 levels (Chart 1.1.7). However, there was a decline in the last quarter of 2024, followed by a subsequent recovery in early 2025. During this period, the spread relative to high-rating credit remained at historically low levels. Meanwhile, issuance of mortgage-backed securities (MBS), which saw a significant increase during the pandemic and declined until mid-2023, has stabilized since then.

Chart 1.1.7 – US: high-yield issuances



In the U.S., aggregate indebtedness and debt servicing remain well below those observed during the 2008 financial crisis and have shown no significant changes compared to the pre-pandemic period. The household savings rate remains low, as does households' available liquidity. Delinquency rates continue to rise, particularly in credit card and auto loan operations (Chart 1.1.8), but remain subdued in mortgage credit operations. Stress is disproportionately greater for lower-income brackets, which could lead to specific vulnerabilities.

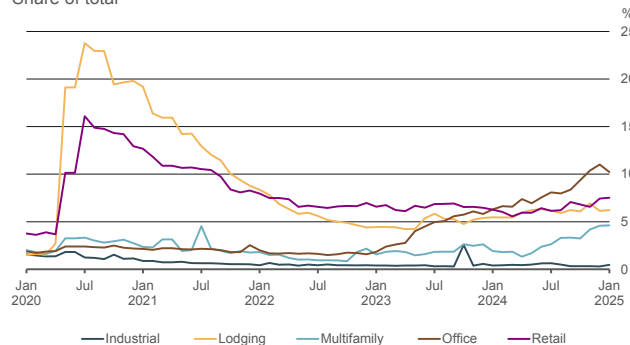
Chart 1.1.8 – US: Loans to households, 90 days past due
Share of Total Loans



One of the main areas of concern within U.S. corporate credit continues to be commercial real estate lending. Structural changes in the sector since the onset of the pandemic have led to

reduced demand, lower occupancy rates in certain segments, and declining prices for these assets, which are commonly used as collateral. While no significant risks have materialized thus far, there has been a moderate increase in delinquency rates at the margin (Chart 1.1.9). This trend raises the likelihood of a more prolonged price correction, potentially exerting further pressure on investors and financial intermediaries. Banks have managed problematic loans through short-term extensions of credit lines; however, vulnerabilities persist as new maturities approach, particularly for institutions with lower capitalization and higher lending volumes.

Chart 1.1.9 – US: Commercial mortgage backed securities 30 days past due
Share of total

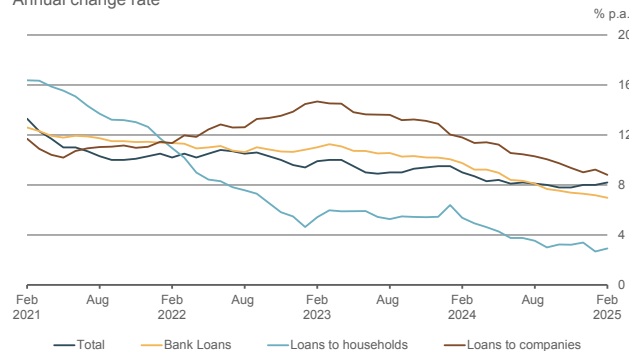


Source: Trepp.

In China, growth in financing to the real economy has stabilized after four years of deceleration and

has outpaced nominal GDP growth. This stabilization has been primarily driven by a sharp increase in government bond issuance, associated with economic stimulus measures introduced since September 2024. In contrast, bank lending continues to decelerate—across government entities, corporations, and households. Household lending recorded a year-on-year growth rate of just 3% in February, significantly below the historical trend (Chart 1.1.10). Since 2016, the share of shadow banking instruments in total credit has steadily declined, contributing to a reduction in systemic vulnerabilities within the financial system.

Chart 1.1.10 – China: Financing to the economy
Annual change rate

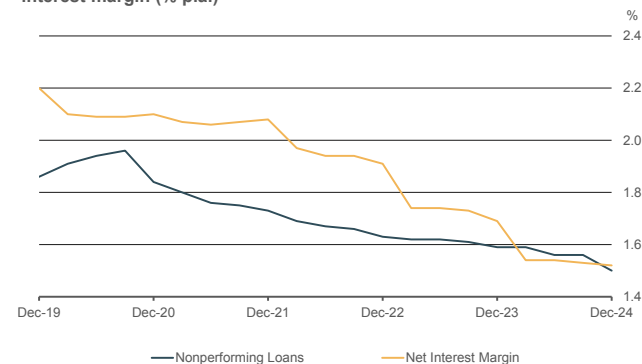


Source: Bloomberg.

Delinquency in China's financial system remains contained, though profitability has weakened. The share of non-performing loans (NPLs) has gradually

declined, reaching 1.5% at the end of last year – the lowest level in a decade (Chart 1.1.11). State-owned Asset Management Corporations (AMCs) have played an increasingly important role in absorbing distressed assets.⁸ The decline in the NPL ratio has supported an improvement in the loan loss provision coverage ratio. Liquidity ratios have also trended upward, a positive development in the mitigation of systemic risk. Despite these improvements, key profitability indicators have deteriorated: return on assets (ROA) and the average net interest margin across the banking system have both fallen to their lowest levels since 2011. Capital adequacy metrics, however, remain stable and robust, indicating that the system continues to maintain a solid buffer against potential shocks.

Chart 1.1.11 – China: Nonperforming Loans (%) and net interest margin (% p.a.)



Source: PBC.

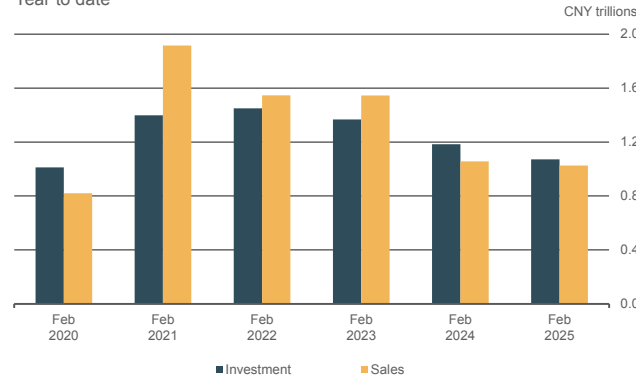
8 See Global Financial Stability Report, IMF, Oct. 2024, pg. 24.

China's property development sector remains the primary source of domestic economic vulnerability.

The sector continues to undergo a structural contractionary adjustment, reflected in the persistent decline of nominal indicators – such as investment (Chart 1.1.12) and the sale of built area – as well as real indicators, including construction starts, in progress, and completions, and the volume of built area sold. There has also been a continued accumulation of inventory in the form of completed but unsold residential units. New home prices remain on a downward trend across almost all size categories and city tiers, although some signs of price stabilization have emerged, particularly in larger cities. Additionally, concerns persist regarding the solvency of Local Government Financing Vehicles (LGFVs), which fund local public infrastructure and rely on property sales or debt issuance for financing, and the banking sector's exposure to these entities.

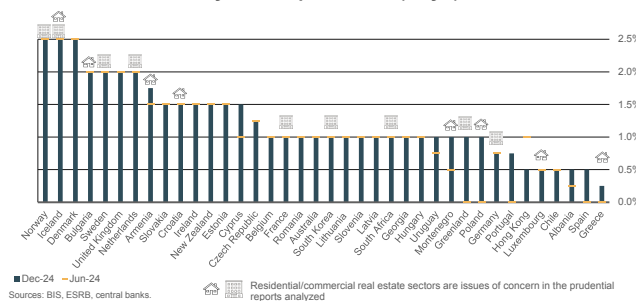
There is a growing trend across jurisdictions to implement a positive neutral countercyclical capital buffer, aimed at strengthening financial sector resilience considering persistent global financial risks, geopolitical tensions, and domestic economic uncertainties (Chart 1.1.13). Since the last FSR, most jurisdictions have kept their countercyclical capital buffers unchanged. However, a number of them have either announced increases or signaled the potential for future hikes.

Chart 1.1.12 – China: real estate development
Year to date



Source: NBS.

Chart 1.1.13 – Countercyclical Capital Buffer (CCyB)



Sources: BIS, ESRB, central banks.

Residential/commercial real estate sectors are issues of concern in the prudential reports analyzed

The prospective global environment continues to present risk factors that could trigger extreme scenarios of financial asset repricing. Chief among these are: uncertainties surrounding the outlook for major macroeconomic variables and the adequacy of

policy responses – particularly those tied to shifts in global trade policies; declining trade and capital flows, which may prompt abrupt liquidity reallocations and asset repricing; uncertainty over the equilibrium levels of long-term interest rates and the pressure exerted by interest rate differentials on currencies; concerns over asset valuation and the sustainability of both corporate and sovereign indebtedness; and the build-up of vulnerabilities across banks and non-bank financial institutions, compounded by their growing interconnectedness. Market disruptions – whether driven by economic, geopolitical, or climate-related events – could adversely impact capital costs, financing capacity, and the solvency of more fragile entities. Although emerging market economies have largely demonstrated resilience amid adverse external conditions, significant risks persist. In this context, effective risk management, prudent capital allocation, and tight control over funding costs are increasingly critical – and disproportionately more challenging – for smaller or more specialized financial intermediaries operating in impacted sectors.

The *Banco Central do Brasil* (BCB) remains vigilant to developments in the international environment and assesses that the Brazilian financial system's exposure to exchange rate risk is low, with limited reliance on external funding. The BCB also stands ready to act, if necessary, to mitigate any disproportionate spillover on domestic asset prices.

1.2 National financial system⁹

1.2.1 Liquidity

The banking system holds sufficient liquid assets to absorb potential losses, including under stress scenarios, and comply with current regulations.

The wide majority of financial institutions (FIs) remain with adequate levels of liquid assets to maintain the regular functioning of the intermediation system and to preserve financial stability. Funding kept growing even under a scenario of greater competition for resources, while FIs exhibited an increase in the loan portfolio. Treasury management has remained prudent, without significant variations to liquidity buffers or structural mismatches between assets and liabilities. FIs in the S1 prudential segment maintained a comfortable liquidity margin relative to minimum regulatory requirements, exhibiting resilience to withstand potential stress scenarios.

9 The *Liquidity* and *Profitability* sections and the *Liquidity Stress Testing* subsection analyze the banking system, i.e. conglomerates comprised by at least commercial, multipurpose, savings, foreign exchange, or investment banks. The *Macroeconomic Stress Test* subsection includes development banks, in addition to the aforementioned. The *Credit* and *Solvency* sections analyze all SFN segments, including non-banking conglomerates. At last, the *Liquidity* and *Credit* sections and the *Liquidity Stress Testing* subsection narrow their analyses to the financial conglomerate, while the *Profitability* and *Solvency* sections and the *Macroeconomic Stress Test* subsection employ information from the prudential conglomerate in their analyses.

Domestic and foreign funding

Funding maintained its growth trend, albeit at a slower pace than presented in 2023. The semester was characterized by the good performance of term deposits and the resumption of growth in tax-exempt instruments. The period was marked by the maintenance of similarity between rates practiced by the various segments. Furthermore, foreign funding remained sufficient to meet the demand for export financing.

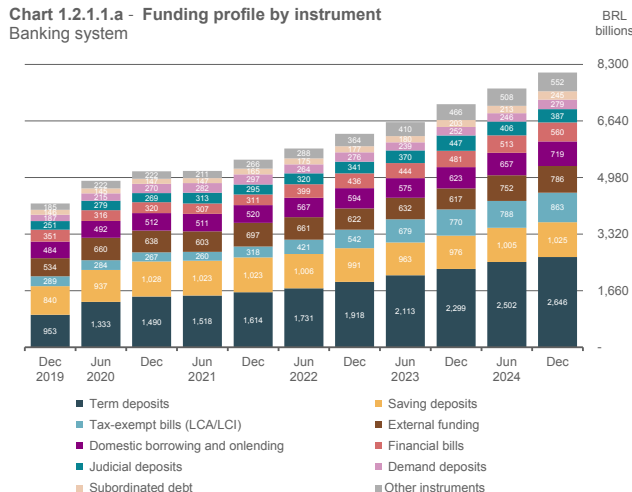
Funding continued growing at a slower annual pace than observed in 2023, even as tax-exempt instruments growth increased in the semester.

In absolute terms, funding grew more in 2024 than in the previous year (variation of BRL928.7 billion against BRL872.1 billion in 2023), although at a lower rate (13.0% against 13.9% in 2023). Observed annual growth of aggregate net funding¹⁰ also decreased compared to 2023 (10.5% against 17.0%). In the period, growth rate improved for Real Estate Credit Bill (LCI) (10% in the current semester, against 3% in the previous one) and Agribusiness Credit Bill (LCA)

10 The estimate of net funding and stock is made by excluding the appropriation of interest, based on the estimated average rates of the funding stock. For this calculation, funding with the following instruments was excluded: loans and transfers, subordinated debt not registered in custody centers, external funding, and funding instruments eligible for principal or supplementary capital (IECI and IECF).

(9% in the current one, 2% in the previous one) portfolios. It could be partly attributed to a higher Selic rate, converting these papers, which are tax-exempt instruments, into attractive options for investors. In particular, LCI issuance was also positively impacted by Resolution CMN 5,168, of August 22, 2024, which equalized the maturity between credit bills. Savings accounts grew only by 2% in the semester, below the average yield of the stock in the period and remained a point of attention for real estate credit funding (Charts 1.2.1.1.a, b and c).

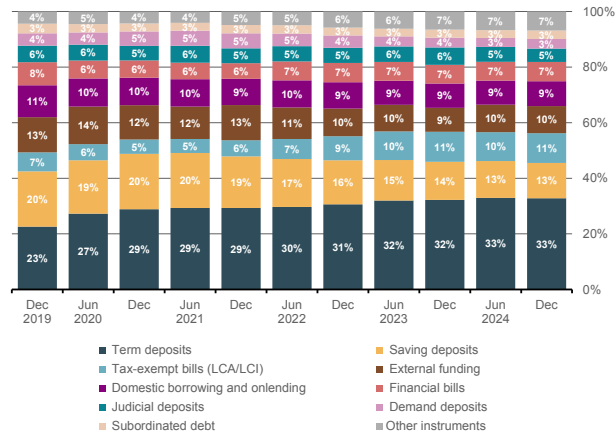
Chart 1.2.1.1.a - Funding profile by instrument
Banking system



Sources: BCB, [B]³, CRT4, CERC, CSD-Br.

Term deposits: certificates of deposit, receipts of deposit, time deposits with special guarantee by the Credit Guarantee Fund (Fundo Garantizador de Crédito - FGC). Subordinated debt: subordinated certificates of deposit, subordinated financial letters and other capital instruments. Other instruments: structured notes, bills of exchange, mortgage notes, box spread strategies with options, guaranteed real estate credit bills (LIG), interbank deposits, repurchase agreements (repo) collateralized by private-issued securities.

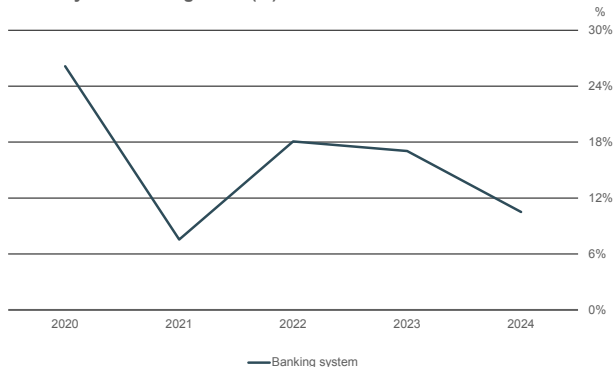
Chart 1.2.1.1.b – Funding profile by instrument
Banking system – % of total



Sources: BCB, [B]³, CRT4, CERC, CSD-Br.

Term deposits: certificates of deposit, receipts of deposit, time deposits with special guarantee by the Credit Guarantee Fund (Fundo Garantidor de Crédito – FGC). Subordinated debt: subordinated certificates of deposit, subordinated financial letters and other capital instruments. Other instruments: structured notes, bills of exchange, mortgage notes, box spread strategies with options, guaranteed real estate credit bills (LIG), interbank deposits, repurchase agreements (repo) collateralized by private-issued securities.

Chart 1.2.1.1.c – Net accum. funding on year (estimated) / previous year's funding stock (%)



Funding competition kept improving in the Brazilian financial system.¹¹ Private S1 banks reduced their share in annual comparison, while public banks maintained theirs. In contrast, the participation of digital FIs increased in the period, driven by the expansion and reach of digital channels, as well as the greater use of distribution platforms. In a longer time horizon, the estimated annual net funding¹² of digital FIs consistently surpassed that of FIs in the private and public S1 segments. Meanwhile, funding by type of investor remained practically stable in the period (Charts 1.2.1.2.a and b and 1.2.1.3).

Chart 1.2.1.2.a - Funding profile by type of segment

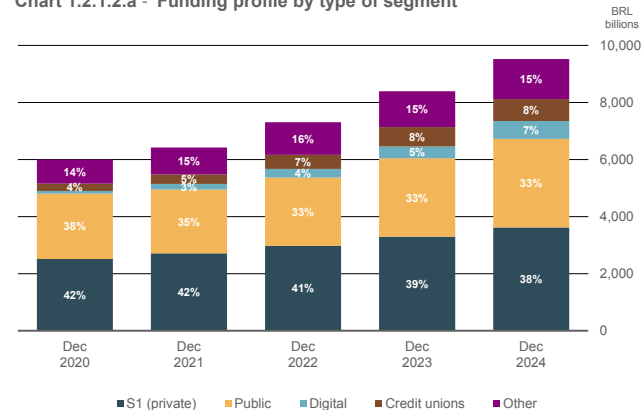


Chart 1.2.1.2.b – Net accum. funding on year (estimated) / previous year's funding stock (%)

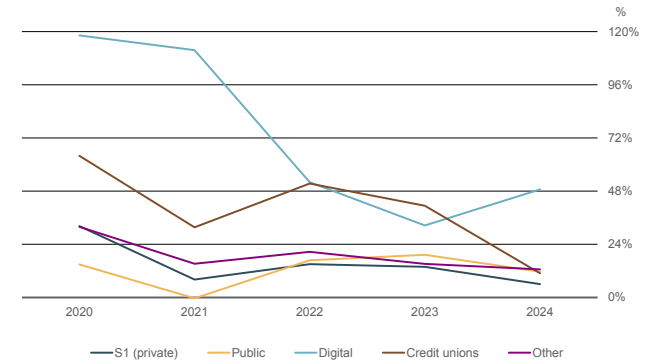
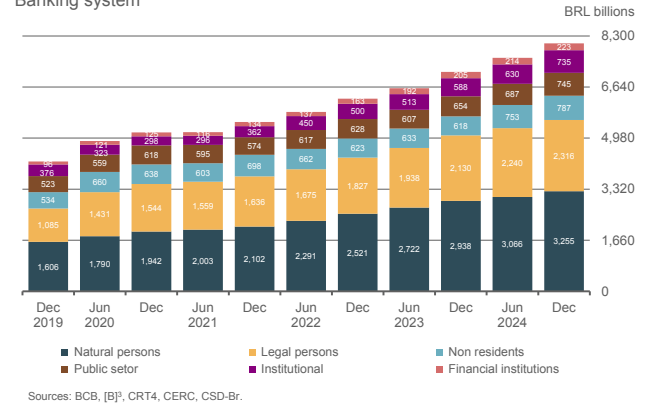


Chart 1.2.1.3 - Funding profile by type of investor
Banking system



Sources: BCB, [B]³, CRT4, CERC, CSD-Br.

- 11 The information produced in the paragraph considers the whole National Financial System (SFN), and not only institutions in the b1 and b2 banking segments.
- 12 Expressed as a percentage of the net stock on the last business day of the previous year. Estimate of net funding and stock according to the methodology described in footnote 10 above.

Funding rates¹³ practiced by the various segments remained close in the period, with an observed decrease for digital segment. At the end of the semesters, funding rates spreads remained stable when compared to the Interbank Deposit (DI) rate of private and public S1 segments. For other segments, spreads showed a slight drop, most significant in digital platforms. In turn, the cooperative segment showed a significant decrease, with a subsequent recovery within the period, due to the extension of rural credit operations offered considering the Rio Grande do Sul floods¹⁴ (Charts 1.2.1.4 and 1.2.1.5).

- 13 Charts 1.2.1.4 and 1.2.1.5 are generated considering the last registration position of each FI, which makes it possible for the rates of the same segment and for the same date to vary in versions of this Report generated at different times (an FI may have been reclassified from one segment to another, or may have been acquired or incorporated by another FI from a different segment, for example).
- 14 The variation in rates occurred due to the extension of rural credit operations, especially the National Program for Strengthening Family Agriculture (Pronaf) and the National Program to Support Medium-Sized Rural Producers (Pronamp), given because of Rio Grande do Sul floods. The funding for these operations was resources raised in the market through Interbank Deposits Linked to Rural Credit (DIR) from institutions outside the credit unions system to meet the requirement. However, they started to be financed by the system's credit unions through DIs with rates equivalent to those of credit operations because of extensions needed.

Chart 1.2.1.4 – Monthly average funding rates (*)

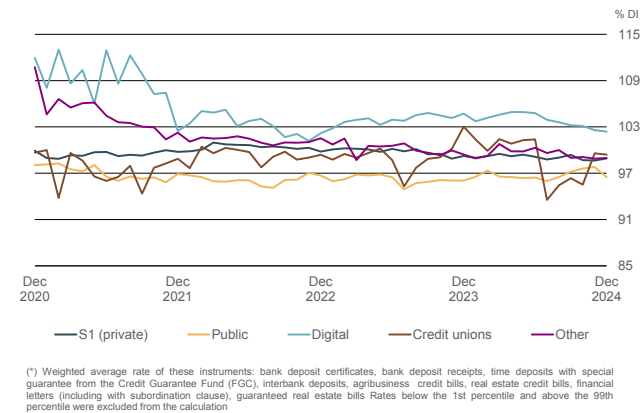
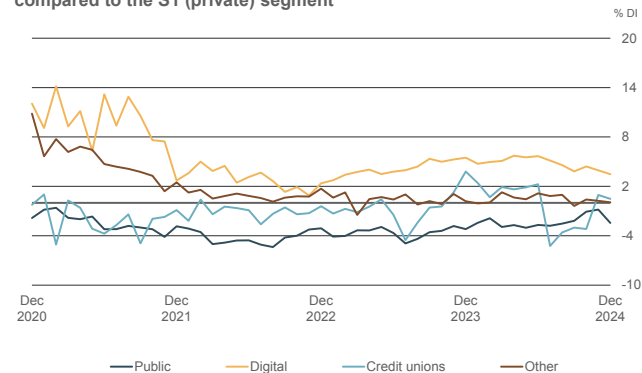
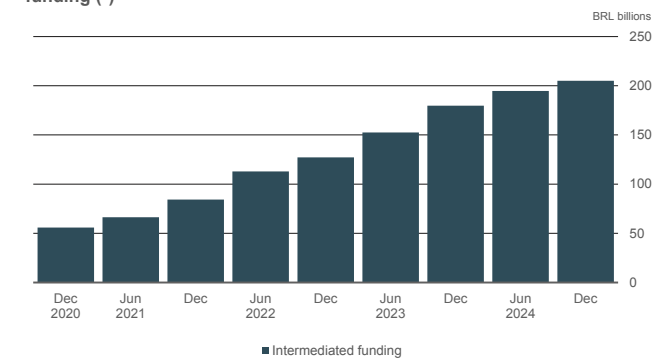


Chart 1.2.1.5 – Difference in monthly average funding rates compared to the S1 (private) segment



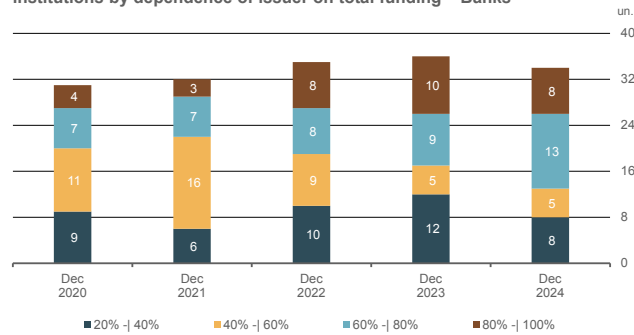
Funding through investment platforms maintained an upward trend and remain an important distribution channel for smaller institutions. This type of operation continues to be the main source of funding for a group of smaller institutions, many of which are part of the “Digital” and “Other FIs” segments and help explain a competition increase and rates reduction charged by non-S1 segments in recent semesters. The public segment has been expanding the use of platforms, seeking specific customer groups. In this way, investment platforms continue to expand the funding capacity of FIs and pressure on rates, by increasing competition between FIs and other investment options (Charts 1.2.1.6 to 1.2.1.10).

Chart 1.2.1.6 – Changes in the stock of intermediated funding (*)



(*) Excluding financial institutions whose intermediated funding estimated dependence is below 20% of their total funding.

Chart 1.2.1.7 - Intermediated funding - Number of financial institutions by dependence of issuer on total funding - Banks



1/ The values on the bars refer to the number of financial institutions belonging to the corresponding interval.
Sources: BCB staff calculations, [B]¹.

Chart 1.2.1.8 – Intermediated funding stock by segment

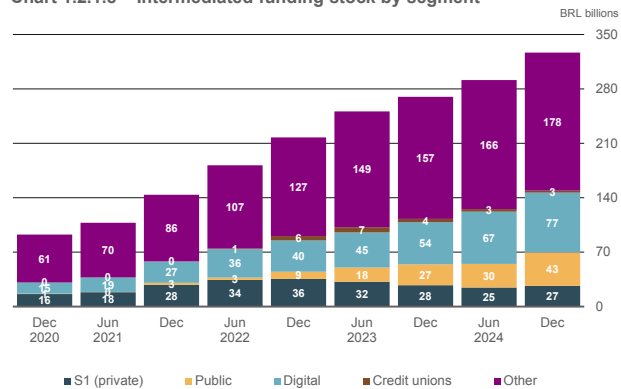


Gráfico 1.2.1.9 – Intermediated funding stock by segment (% of total)

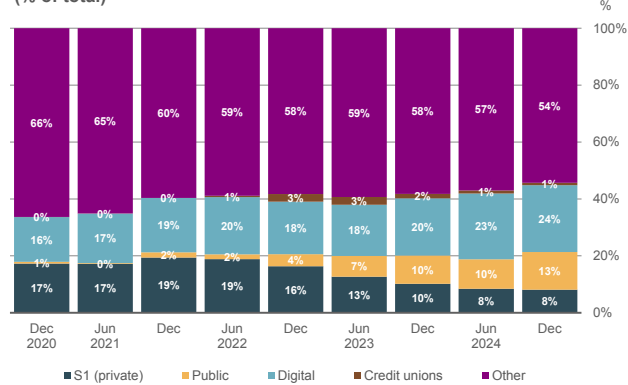
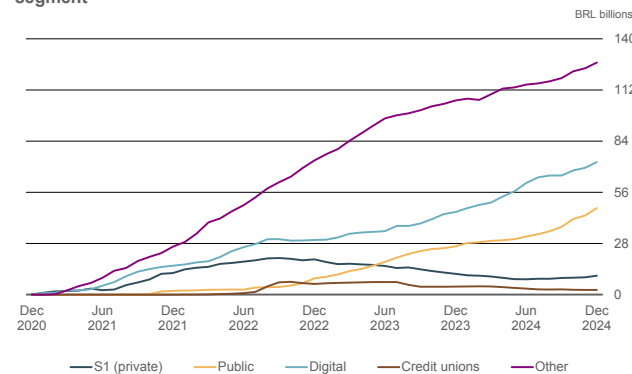
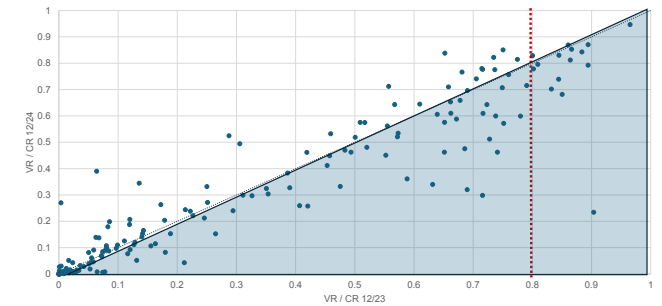


Chart 1.2.1.10 – Net accumulated intermediated funding by segment



Most institutions reduced their percentage of funding guaranteed by the Credit Guarantee Fund (FGC). Resolution CMN 5,114, of December 21, 2023, aimed to discourage the use of the FGC guarantee for fund raising by FIs. Among the institutions that reached or were close to the limits, most showed a reduction in the insured funding indicator,¹⁵ decreasing the dependence on funding covered by the guarantee fund (Chart 1.2.1.11).

Chart 1.2.1.11 – Insured funding indicator
Comparison Dec/23 x Dec/24



¹⁵ Insured funding is defined as the ratio of the Reference Value to the Reference Contribution, according to Resolution BCB 102, of June 7, 2021.

Short-term liquidity

The banking system's liquidity remains comfortable for the regular functioning of the intermediation system. The FIs in the S1 segment exhibit a Liquidity Coverage Ratio (LCR)¹⁶ significantly higher than the regulatory minimum, demonstrating substantial capacity to comply with their obligations even under stress scenarios. Liquidity buffers remained stable, reflecting lending growth compatible with funding growth. These factors indicate that FIs' liquidity management remains conservative to ensure the preservation of stability in the financial system (Chart 1.2.1.12). Using another approach¹⁷ encompassing all individual FIs – considering the effects of stress scenarios and bank-runs – it is possible to observe the resilience of liquidity levels in the system. Although there was a drop in liquidity levels of FIs belonging to the upper quartile, this reduction is due to lending growth and does not represent any additional risk. There was no relevant variation in this period for the FIs which operate with lower liquidity ratios (Chart 1.2.1.13).

Chart 1.2.1.12 – Liquidity Coverage Ratio (LCR)^{1/} and Loan-to-Deposit Ratio (LTD)^{2/}
Public vs. private banks

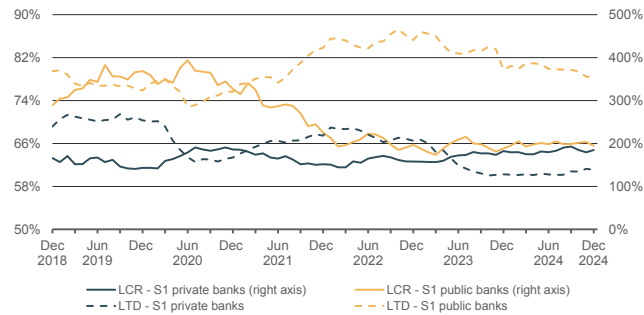
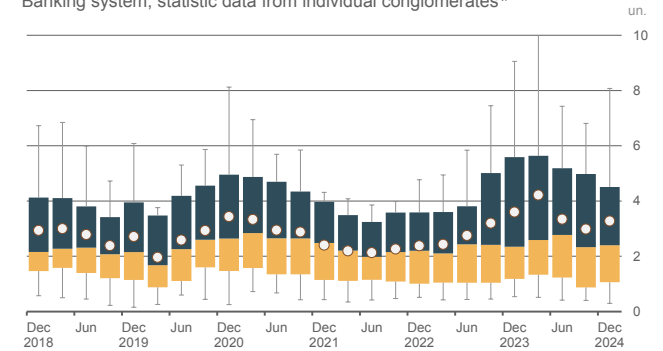


Chart 1.2.1.13 – Short-Term Liquidity Ratio (IL)
Banking system, statistic data from individual conglomerates^{1/}



1/ The IL is capped at the level of the 80th percentile in each month, after capping each index the statistics are calculated. The values along the box and whiskers refer to the percentiles 10%, 25%, 50%, 75% and 90% respectively. The mean is represented by the circles.

Long-term liquidity

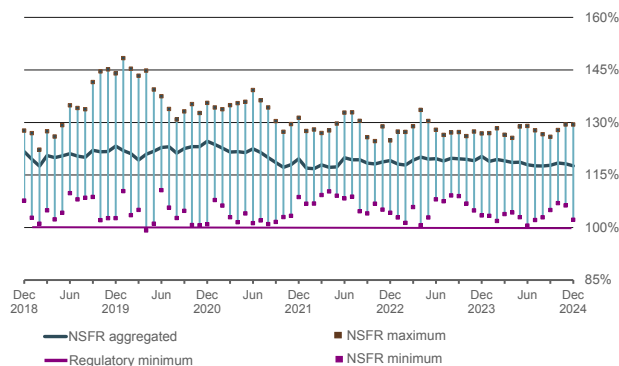
FI's funding structure remains compatible to finance long-term assets. The banking system's structural liquidity refers to FI's capacity to maintain a sustainable balance between assets and liabilities over time, avoiding excessive dependence on short-term funding sources. All the FIs in the S1 segment comply

16 The LCR is a ratio whose compliance is mandatory for all FIs belonging to the S1 segment, pursuant to art. 2 of Resolution CMN 4,553, of January 30, 2017. The indicator requires institutions to maintain High-Quality Liquid Assets (HQLAs) to support net cash outflows in the next 30 days, considering the stressed scenario defined by the Basel Committee on Banking Supervision (BCBS) (www.bis.org/publ/bcbs238.htm). See domestic regulation – Resolution CMN 4,401, of February 27, 2015, and Circular BCB 3,749, of March 5, 2015.

17 This approach considers an asset loss scenario under market stress, deposits run-offs and the withdrawal of the main depositors (concentration risk) in the calculation of a single indicator. It is named Short-Term Liquidity Ratio (IL), metric that covers the entire financial system and measures whether banks have sufficient liquid assets to cover its short-term cash outflows (subsequent thirty days) under a hypothetical stressed scenario, defined and calibrated by the BCB. These resources outflows arise from the possibility of redeeming funding maturing under the next 30 days or with immediate liquidity, exposures to market risk such as margin calls and daily derivative adjustments and still, other scheduled contractual outflows. For an overarching understanding of the metric, see the Concepts and Methodologies annex.

with the regulatory limit defined by the Net Stable Funding Ratio (NSFR),¹⁸ which aims to mitigate those risks (Chart 1.2.1.14). Using the Structural Liquidity Ratio (ILE, in its Portuguese acronym), a simplified calculation of the NSFR, applied to all bank prudential conglomerates individually, it is possible to verify that there was no relevant variation in the FIs' capacity to fund their activities (Chart 1.2.1.15).

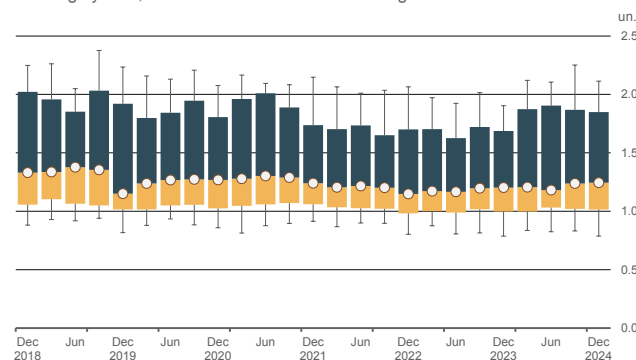
Chart 1.2.1.14 – Net Stable Funding Ratio (NSFR)
High, low and aggregated^{1/}



^{1/} NSFR and ILE data series comprise institutions classified in the prudential segment S1 (currently 6 banks).

18 The NSFR was implemented in Brazil by Resolution CMN 4,616, of November 30, 2017, with its methodology given by Circular BCB 3,869, of December 19, 2017, having started its effects from October 1, 2018. It is an indicator that corresponds to the ratio between the amount of Available Stable Funding (ASF) and the amount of Required Stable Funding (RSF). The numerator is mainly composed of regulatory capital and stable funding, and the denominator of credit portfolio. All FIs classified in the S1 segment must comply with the regulatory minimum requirement of 100% under the terms of the art. 2 of Resolution CMN 4,553, of January 30, 2017.

Chart 1.2.1.15 – Structural Liquidity Ratio (ILE)^{1/}
Banking system, statistic data from individual conglomerates



^{1/} The ILE of each FI is capped at the level of the 80th percentile in each month, after capping each index the statistics are calculated. The values along the box and whiskers refer to the percentiles 10%, 25%, 50%, 75%, and 90% respectively. The mean is represented by the circles.

1.2.2 Credit^{19,20}

Introduction

Financing to the real economy continued to grow, despite an environment marked by an increase in the basic interest rate. For household bank credit, the acceleration was more pronounced in vehicle and non-payroll deducted credit portfolios. For companies,

credit accelerated for MSMEs, with an increase in credit granting in the second half of the year, as well as for large companies. These also benefited from the high growth of the capital markets, which continued to gain ground as a relevant funding source.

Despite favorable economic signs, companies' and households' payment capacity remains challenging. The labor market has been highly dynamic recently, with favorable evolution of occupation level, unemployment rates, and income. Even in this environment, household debt service to income ratio remains at an elevated historical level and increasing for almost all income brackets. In the case of companies, despite the still positive impact of the economic activity, the tightening financial conditions put pressure on their payment capacity in the end of the semester, in an environment where the degree of leverage is already perceived as high.²¹

FIs risk appetite increased on the semester. Regarding households, in addition to acceleration in higher risk modalities, there was a slight decline in quality of non-payroll deducted credit granting, which is increasing especially for unsecured loans. In addition, vehicle financing remains at an elevated historical level, and granting standards still denote a

19 Throughout this section, when we talk about bank credit or credit portfolio, we are referring to the domestic bank credit portfolio.

20 Regarding bank credit, numbers presented here can differ from those in time series from BCB because the data source is the credit outstanding balance from identified clients in the Credit Information System (SCR).

21 See section 1.3 Financial Stability Survey.

risk appetite by the financial system. For companies, the credit growth rate increased, but credit granting standards were not significantly changed. Looking forward, however, the Financial Stability Survey (FSS) indicates worsening credit granting standards and lower risk tolerance by FIs. This scenario meets an environment that demands additional caution and diligence in credit granting standards in face of risks related to economic activity, household debt service to income ratio, and households' and MSMEs' debt to income ratios.

Risk materialization tends to decrease in the short term due to an increase in the credit portfolio. For households, the effect of credit portfolio growth led to a reduction in the percentage of problem assets for all modalities, except for rural credit. Except for this modality, reduction or maintenance of materialization is expected, with portfolios continuing to grow. This effect should also help to reduce the percentage of problem assets (PA) for MSMEs, especially for micro and small enterprises. The evolution of materialization of large companies still has no definite trend, being affected by idiosyncratic effects of some borrowers. In general, despite a positive expectation for the evolution of risk materialization of the credit portfolio in the short term, this scenario tends to change in the medium term, given the current monetary tightening cycle and a deceleration in economic activity in accordance with this process.

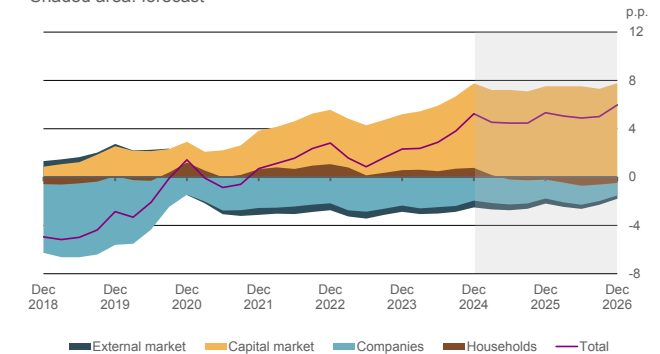
Provisions remained above the expected credit losses estimated for the credit portfolio as a whole and in the main segments. The stock of provisions is in line with the expected risk materialization, remaining at an adequate level to support expected losses in the credit portfolio, estimated by the BCB based on proprietary models of Probability of Default (PD) and Loss Given Default (LGD), applied to the SCR data. In addition, an improvement in the coverage ratio of expected losses is expected, given the increase in provisions due to the entry into force of Resolution CMN 4,966, of November 25, 2021.

Broad credit and long run trend

The broad credit-to-GDP ratio increased due to the capital market, which remained highly dynamic. The broad credit-to-GDP gap²² kept expanding in the second semester of the year (Chart 1.2.2.1), and the capital market was the main cause for this growth. It continued increasing its share in broad credit (Chart 1.2.2.2), mainly for large companies, and its recent

development and continuous dynamism strengthen the growth of the gap, with no signs of inflection to this point. In this market, recent highlights were debentures, which remained the most important bond, with issuances with longer terms and spreads at historical low levels,²³ and credit rights of Credit Rights Investment Funds (FIDCs), which grew strongly and are accelerating (Chart 1.2.2.3).²⁴

Chart 1.2.2.1 – Broad credit-to-GDP gap
Shaded area: forecast



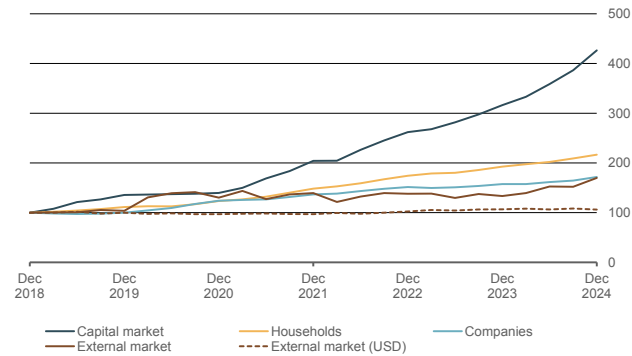
Sources: B3, CERC, BCB, CVM, and BCB staff calculations.

22 For further information, see “Concepts and Methodologies”.

23 According to Boletim de Mercado de Capitais (source: Anbima – *ANBIMA Data – Publicações*), funds raised with debentures were mainly for investment in infrastructure, ordinary business management, and debt payment.

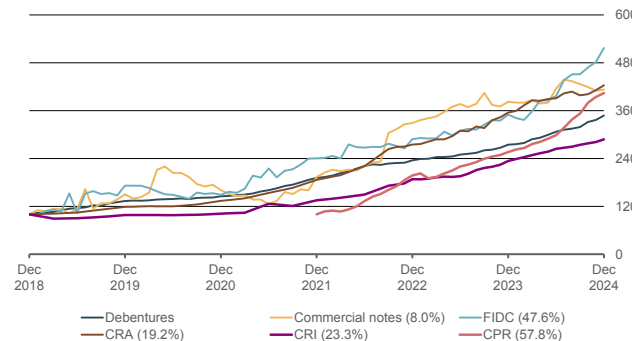
24 For Rural Product Notes (CPR), the chart starts at December 2021. The reason is that Resolution CMN 4,927, of June 24, 2021, established a phase-in for the registry of CPRs that only ended in 2023. Even though the CPR series starts in 2021, the information about this period is only available for CPRs whose registry was obligatory. Thus, the increase in the values of the series is due both to the organic growth of the product, as well as to the growth in the registry and availability of the data.

Chart 1.2.2.2 – Broad credit
Dec/2018 = 100



Sources: B3, CERC, BCB, CVM, and BCB staff calculations.

Chart 1.2.2.3 – Capital market^{1/}
By instrument – Dec/2018 = 100



^{1/} Sources: B3, CERC, CVM, and BCB staff calculations. For CPR, Dec/2021 = 100. The number between parentheses after the name of the series represents its YoY growth rate in Dec/2024.

The growth projection of the broad credit-to-GDP gap still demands attention, but there are caveats to consider.²⁵

Even though the growth expectation of broad credit suggests a gap at lower levels than those projected in the last issue of this Report, it is noted that there is still an increase in the medium term. However, even though the broad credit-to-GDP gap is the reference indicator proposed by the Basel Committee on Banking Supervision (BCBS) to support CCyB decisions, the BCBS itself do not advise the mechanical use of this indicator, even with empirical evidence of its predictive power, as this metric shows limitations that are particularly important for emerging economies. There are documented cases, especially in these economies, where jumps due to economic factors or statistical revisions impacted the broad credit-to-GDP gap for long periods (around 10 years), according to simulations made by researchers cited by the BIS.²⁶ The authors of this paper warn about the impact of these events in the broad credit-to-GDP gap signaling function, which should be understood before the series is used in the context of the countercyclical capital buffer. In this sense, it should be noted that the recent development

of capital markets in Brazil after legal and regulatory changes is an event that potentialized the growth of the broad credit-to-GDP gap, either by the expansion and consolidation in the market of instruments like debentures (especially those with tax benefits), or by the possibility of capturing new information for rural bonds (Rural Product Notes – CPRs), for instance.

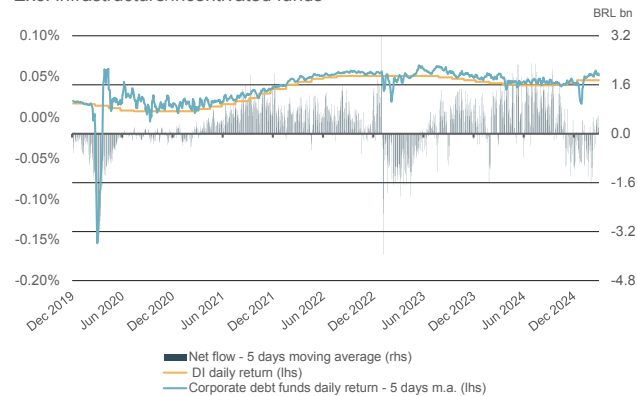
Corporate debt funds,²⁷ which finance corporate debt, had net outflows between the last quarter of 2024 and the beginning of 2025. Investment funds, or more specifically corporate debt funds, are important holders of domestic corporate debt. These funds had net outflows from mid-October onwards (Chart 1.2.2.4), a movement initiated in a scenario of low but stable returns. During this window, spreads widened, and profitability declined in December, while gains were above DI in January and February 2025, when spreads tightened. The outflow movement lasted throughout this period, only showing signs of reversal at the end of February. These withdrawals were paid mainly with liquid assets, whose volume increased since the second quarter of 2024 (Chart 1.2.2.5).

²⁵ Market players themselves increased the perception of a downward trend of broad credit-to-GDP gap, despite many answers considered the gap in a high level (see section 1.3 – Financial Stability Survey).

²⁶ Drehmann, M., and Tsatsaronis, K. (2014). The credit-to-GDP gap and countercyclical capital buffers: questions and answers, BIS Quarterly Review.

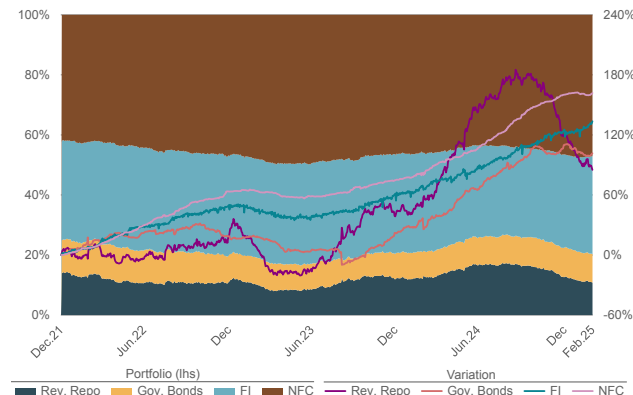
²⁷ Corporate debt funds are defined as fixed income financial investment funds governed by Resolution CVM 175, of December 22, 2022, that have the expression “private credit” in their names and that possess more than 50% of the portfolios composed of corporate debt securities (such as debentures, promissory notes, commercial papers, export notes, CCB, CPR, WA, NCA, CDA, and CDCA) and FI term deposits and other securities issued by FIs.

Chart 1.2.2.4 - Corporate debt funds return and net flow
Exc. infrastructure/incentivated funds



Sources: BCB, CVM.

Chart 1.2.2.5 - Cumulative net purchase, by issuer type
Fixed income corporate debt funds, % portfolio as of Dec. 31st 2021



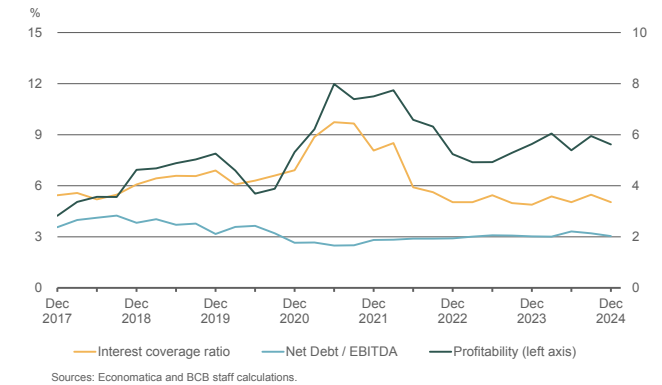
Companies

The payment capacity of companies has shown some negative effects under the influence of tightening financial conditions. Despite a contractionary monetary policy, economic activity has maintained its dynamism, which positively influenced the increase in revenues, Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA), and the profitability of larger companies. The tightening of financial conditions has not yet significantly influenced the overall numbers of Net Debt/EBITDA and Interest Coverage Ratio (ICR) for these companies in the last quarter (Chart 1.2.2.6), although the ICR showed a marginal reduction in the last quarter and it is expected to deteriorate in the medium term.²⁸ For MSMEs, the level of delinquent companies is a sign of payment capacity in a still challenging moment, especially for micro and small businesses (Chart 1.2.2.7). Overall, this scenario tends to be negatively affected by the current monetary tightening cycle, which impacts the payment capacity of companies both due to the slowdown in activity and the increase in financial expenses. This is in a scenario where the perception among National Financial System

28 Regarding the impact of the growth in financial expenses, see the exercise conducted in Chapter 2, section 2.6 Effects of interest rate increases on the indicators of non-financial companies.

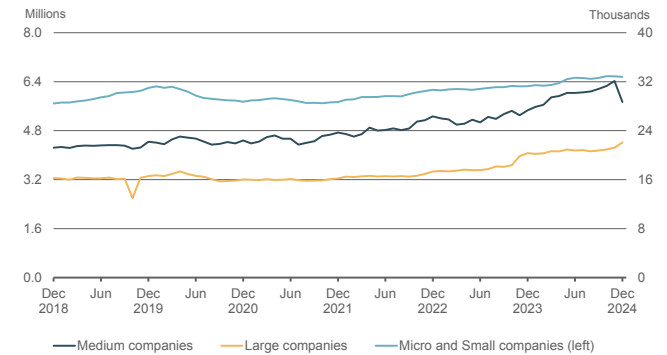
(SFN) institutions is that the degree of leverage of companies is high.²⁹

Chart 1.2.2.6 – Financial-economic indicators (medians)
Publicly traded companies



Sources: Economática and BCB staff calculations.

Chart 1.2.2.7 – Companies
Delinquency acts – By company size



Source: Serasa.

29 See section 1.3 Financial Stability Survey.

Companies' bank credit has accelerated again in a widespread manner across different company sizes.

For large companies, annual growth was progressive throughout the year, with the current value close to that of mid-2022, the last post-pandemic growth peak (Chart 1.2.2.8). For MSMEs, credit grant increased in the semester, with the highest accelerations in annual growth rates occurring in small and medium-sized companies³⁰. In terms of financial institution segments, the credit portfolio of private banks in the S1 prudential segment and public banks continued to accelerate; both movements are relevant for credit to companies, as these segments together account for more than 70% of bank credit to companies (Chart 1.2.2.9). Digital entities³¹ and Credit unions remained the segments with the highest portfolio expansion, contributing to the reduction of concentration in the SFN.³² Prospectively, the Quarterly Credit Conditions Survey (PTC) indicates a general deterioration in supply conditions for various company sizes, which

may lead to a slowdown in growth rates observed until December 2024.³³

Chart 1.2.2.8 – Bank Credit – Year over year growth
By company size

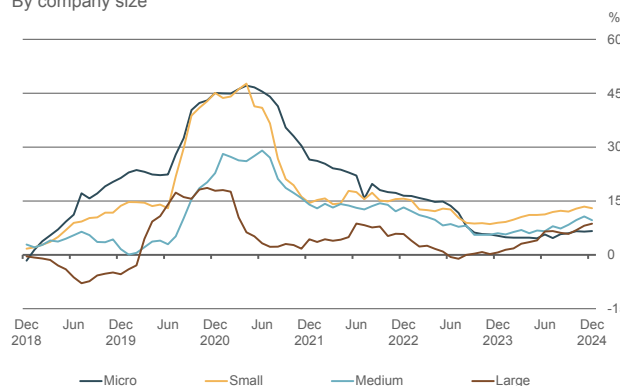
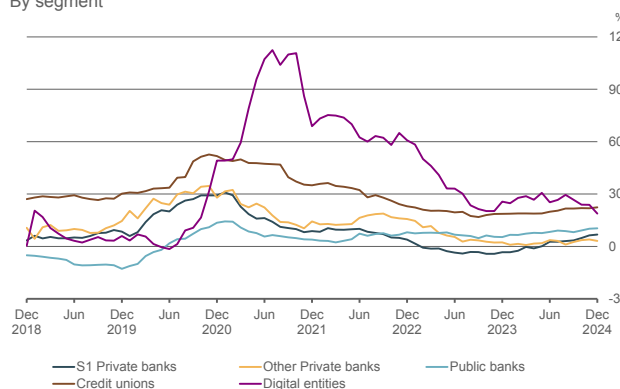


Chart 1.2.2.9 – Bank credit – Year over year growth
By segment



The risk appetite of financial institutions showed some increase in the second semester of 2024.

Rising credit growth rates in the various company sizes indicated an increase in risk appetite, although there were no significant changes in the quality of credit granted^{34, 35} for MSMEs (Chart 1.2.2.10); for large companies, the worsening in the quality of credit granted was due to idiosyncratic events of specific borrowers, with no generalized effects yet. Although the rising rates of credit growth across various sizes may indicate some increase in risk appetite going forward, the FIs themselves indicate an expectation of a more restrictive supply of credit in the first quarter of 2025: for large companies, factors such as clients' perception of risk, risk tolerance, the delinquency level in the market, and the general conditions of the economy, the company, or its sector, among others, are considered. For MSMEs, factors such as delinquency, risk tolerance, and the specific conditions of clients are considered.³⁶

30 For these company sizes, there was also a clearer expansion in the credit grant of emergency credit programs, specifically the Emergency Credit Access Program (PEAC).

31 Despite the high growth, the portfolio of the Digital segment still has little representation and, in December 2024, accounted for about 1.6% of the total credit portfolio for legal entities.

32 See section 2.4 Concentration indicators.

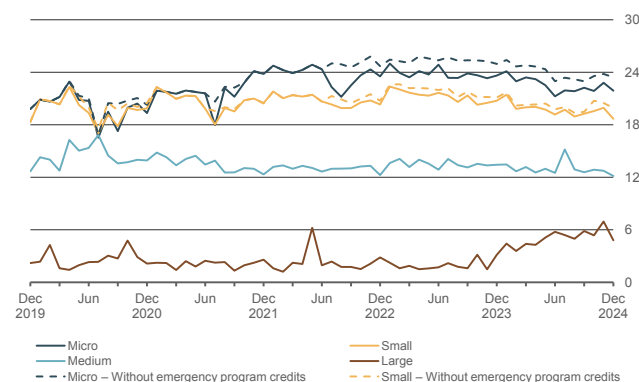
33 See "PTC – Resultados de dezembro de 2024", available at <https://www.bcb.gov.br/content/publicacoes/ptc/202412/RelatorioPTC-Dezembro2024.pdf>

34 The credit granting average score is a measure that quantifies the credit risk of new granting in the reference month, determined by a proprietary statistical BCB model. The higher the score, the riskier the operations.

35 For companies, the model is based on borrowers' variables. The scores of micro, small, and medium-sized companies cannot be directly compared, given that different models were used to generate them. For large companies, the variable is the percentage of the credit granting for companies that either are already deteriorated or with a high chance of deteriorate within a period of three months.

36 For expectations of credit supply and demand by company size for the next quarter, See "PTC – Resultados de dezembro de 2024", available at <https://www.bcb.gov.br/content/publicacoes/ptc/202412/RelatorioPTC-Dezembro2024.pdf>.

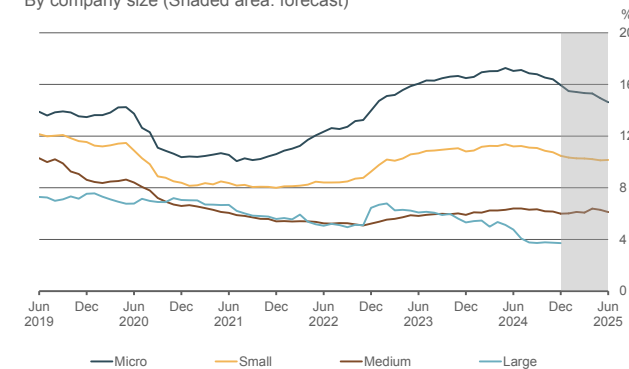
Chart 1.2.2.10 – Credit granting average score
By company size



The credit risk materialization has decreased primarily due to the growth of the portfolio. The short-term expectation is that this will remain for micro and small enterprises. The reduction in the percentage of problem assets (PA) occurred more clearly throughout the semester for MSMEs, while large companies, affected by specific reductions in PA for some companies at the beginning of the semester, have had relatively stable percentages in recent months (Chart 1.2.2.11). This movement in large companies helped to reduce the risk materialization, especially in the private banks of S1 prudential segment (Chart 1.2.2.12). All other segments also experienced a reduction in the percentage of PA in companies, except for the Digital segment. Prospectively, the decompression in the default probabilities of the

non-problematic portfolio^{37, 38} of micro and small companies suggests that the risk materialization should continue to decline for these company sizes, at least in the short term (Chart 1.2.2.13), which is also corroborated by PA forecasting^{39, 40} (Chart 1.2.2.11). For medium-sized enterprises, the expectation is for relative stability in the percentage of PA, while there is no clearly defined trend for large companies. However, despite the expectation of still positive effects for the evolution of PA in the short term, in the current monetary tightening cycle the expectation is that the materialization of risk will increase again in the medium term, and this effect will probably occur first in smaller companies.⁴¹

Chart 1.2.2.11 – Problem Assets
By company size (Shaded area: forecast)



37 The probability of default (PD) is a measure that quantifies, for operations in the portfolio that are not problem assets, the percentage that would migrate to default (here defined as entering in PA). This measure is based on the scores of each credit operation, which are used for risk ranking. The default rate for portfolios of the same risk in the recent period is then taken as the default estimate for that risk group. It is therefore a non-conditional estimate on the economic cycle and, by construction, depends on the recent performance of same-risk portfolios.

38 For companies, the calculation is made at the borrower level, considering a 12-month horizon for MSMEs or a short-term PA projection for large companies.

39 The PA forecasting models seek to (i) estimate the numerator of the percentage of PA (the stock of future PA) based on an analysis of the homogeneous risk groups from the expected loss models and their migration to PA; and (ii) estimate the denominator based on a growth rate that reflects the behavior closest to the last available portfolio. Several models are generated for each company size, and the one with the lowest mean squared error is chosen to evaluate the projected PA. These projections are not conditional on the economic cycle and, by construction, depend on the recent performance of portfolios with the same risk.

40 There is still no PA forecasting model available for large companies.

41 See box in this section, “Monetary tightening cycles and the evolution of problem assets”.

Chart 1.2.2.12 – Problem Assets
By segment

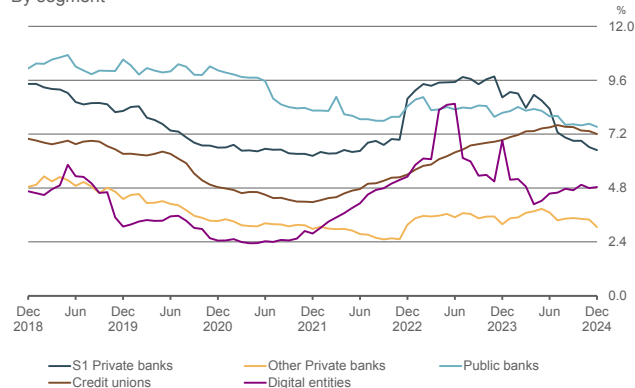
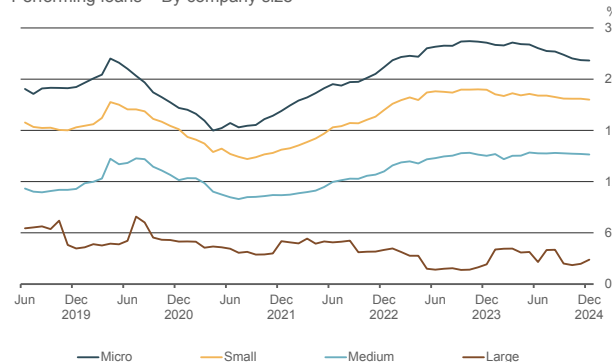


Chart 1.2.2.13 – Credit outstanding – Probability of default
Performing loans – By company size



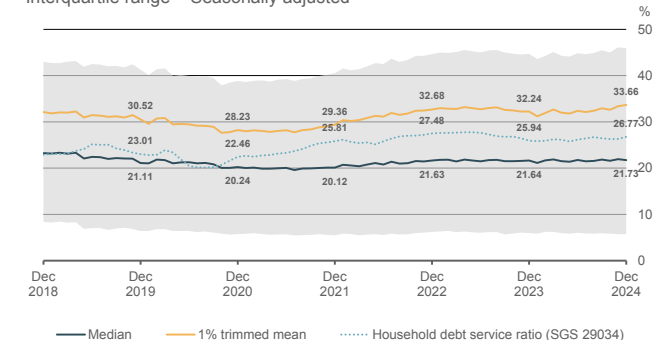
Households

Household payment capacity remains challenging due to the share of more expensive modalities.

The distribution of individual debt service-to-income ratio (DSTI),⁴² based on data for each borrower reported in SCR, showed an increase in the mean value in the second half of 2024 (Chart 1.2.2.14), remaining at a historically high level. Recently, there is an influence of the growth of non-payroll credit loans, which feature shorter terms and higher interest rates, but also credit card operations,⁴³ whose share on DSTI remains high and with no decrease since 2022 (Chart 1.2.2.15). The increase in DSTI was observed in all income brackets, except for those above 10 minimum wages (Chart 1.2.2.16). This occurred regardless of a favorable economic context, where there was an improvement in income, unemployment rate and a level of economic activity that surprised positively. Regarding household indebtedness, the distribution of individual indebtedness of SFN credit borrowers slightly increased in the second semester (Chart 1.2.2.17).⁴⁴ Prospectively,

the current monetary tightening cycle, together with some softening in the economic activity, tend to negatively impact the payment capacity of households in the next quarters, which is recognized by economic agents recently: the PTC of December 2024, for the segment “household consumption”, brings a perception of factors worsening, and one of the highlights in this aspect is the debt service-to-income ratio.

Chart 1.2.2.14 – Individual debt service-to-income ratio^{1,2/}
Interquartile range – Seasonally adjusted



1/ The interquartile range, the median and the 1% trimmed mean refer to the distribution of the individual debt service-to-income ratio of SFN borrowers. For this calculation, borrowers with credit outstanding lower than BRL200 or with debt service only in credit card purchases or credit card installments financed by merchants were excluded. For the calculation of debt service, credit card purchases or credit card installments financed by merchants were not included.

2/ The household debt service-to-income ratio, SGS time series 29034 of BCB, is an aggregate measure that compares the debt service of SFN borrowers to the restricted households gross disposable national income. For this measure, credit card installments financed by merchants are included in the debt service.

- 42 As displayed on the Selected Issue 2.2 Household debt-to-income and debt-service-to-income ratios from the October 2021 FSR, indebtedness and debt service-to-income measures can be calculated for household as a whole (on an aggregate basis) or individually, considering data from each credit borrower. Calculation on aggregate basis compare total debt service to households' gross disposable national income – restricted (see Time Series 29034). Concerning calculations of individual metrics, see “Concepts and Methodologies” at the end of this report. For a better understanding of the difference between metrics, see notes 1 and 2 of Chart 1.2.2.14.
- 43 For DSTI calculation, credit card operations only encompass revolving operations and installments financed purchases. For further information about the calculation, see “Concepts and Methodologies”.
- 44 About individual indebtedness methodology, see notes 1 and 2 of Chart 1.2.2.17.

Chart 1.2.2.15 – Individual debt service-to-income ratio
1% trimmed mean – By credit modality – Seasonally adjusted

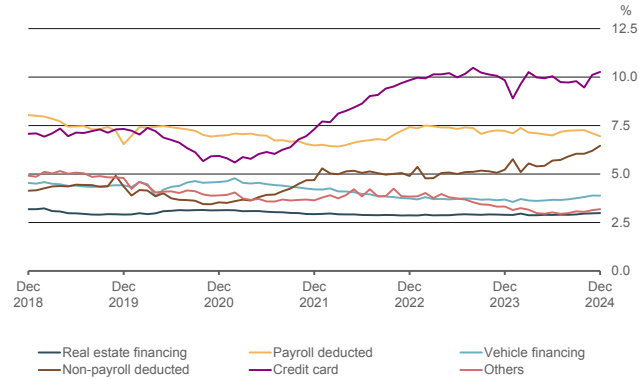


Chart 1.2.2.16 – Individual debt service-to-income ratio
1% trimmed mean – By income bracket – Seasonally adjusted

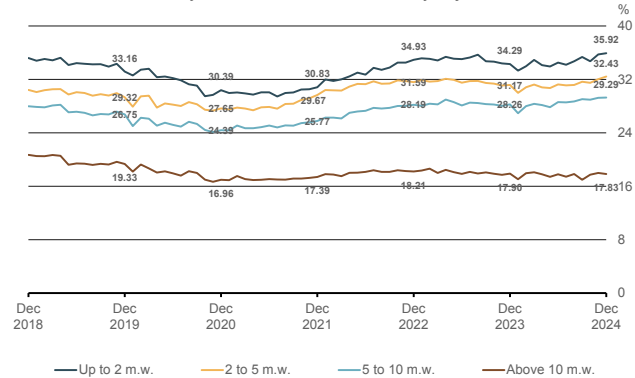
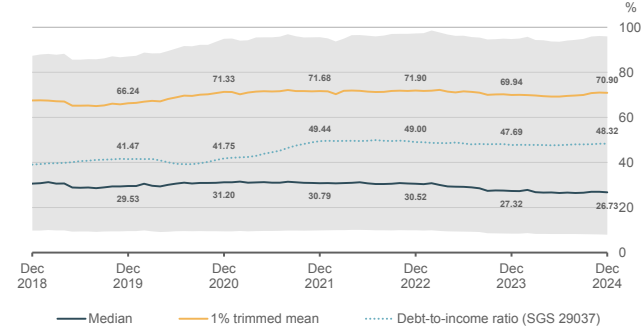


Chart 1.2.2.17 – Individual debt-to-income ratio^{1,2/}
Interquartile range – Seasonally adjusted



^{1/} The interquartile range, the median and the 1% trimmed mean refer to data of the distribution of measures of the individualized debt-to-income of SFN borrowers. For this individualized calculation, all credit of individuals are considered, except rural and corporate operations. The amount of these operations is then compared to the debtor's annual income.

^{2/} The household debt-to-income ratio, SGS time series 29037 of BCB, is an aggregate measure that compares the debt of SFN borrowers to the restricted households gross disposable national income accumulated in the last 12 months.

Household bank credit continued to accelerate due to higher risk modalities.

In line with it, the highlight of the semester was non-payroll deducted credit, whose year over year growth rate was the largest of all modalities (Chart 1.2.2.18). Credit cards also increased their year over year growth rate during the semester, reaching values which were not observed since mid-2023. Even among lower risk modalities, vehicle financing, which is the riskier in the group, showed high levels of year over year growth given its historical levels – the drop seen at the margin is due to extraordinary events of portfolio transfer, and should not be treated as an inflection point. Another point of attention is the fact that bank credit accelerated

for the lowest income bracket, which show the largest year over year growth rate at the margin (Chart 1.2.2.19) – this is the bracket that consistently presents the highest levels of risk materialization. In terms of FIs, Digital banks have seen a decrease in their year over year growth rate, but it is still at a higher level than their peers, especially for higher risk modalities (Chart 1.2.2.20). Private banks also accelerated in the semester, while public banks showed lower rates, especially at the margin. This fact is related to the recent deceleration of rural credit and with the reduction at the margin of real estate financing credit granting (Chart 1.2.2.21),⁴⁵ whose expectation by FIs is of worsening of the supply factors, such as cost and funding availability.⁴⁶

⁴⁵ The numbers of real estate financing credit granting from this issue differ from those published in the last issue, because now the full value of the credit loan is considered, and not only the credit outstanding. For real estate under construction, the first value is larger than the second, so the numbers shown now are larger than previously.

⁴⁶ PTC, December 2024.

Chart 1.2.2.18 – Credit outstanding – Year over year growth
By credit modality

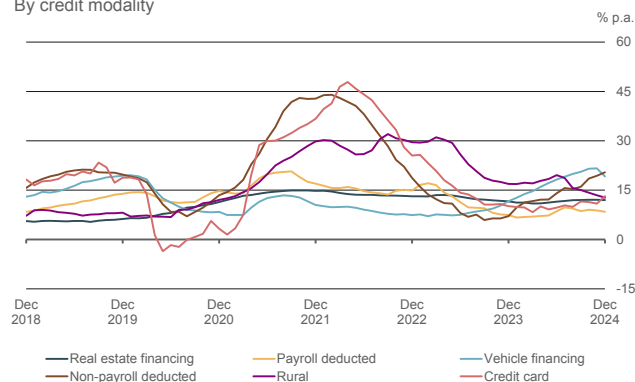


Chart 1.2.2.19 – Credit outstanding – Year over year growth
By income bracket

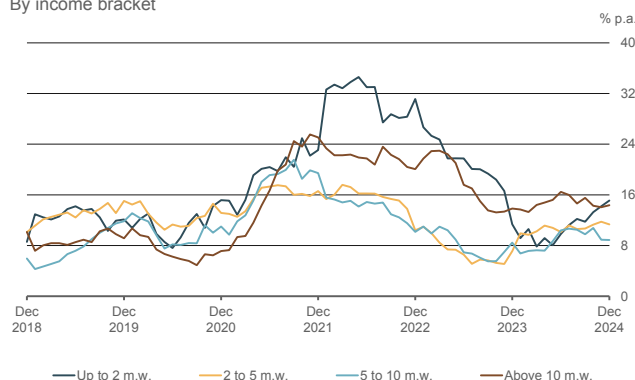


Chart 1.2.2.20 – Credit outstanding – Year over year growth
By segment

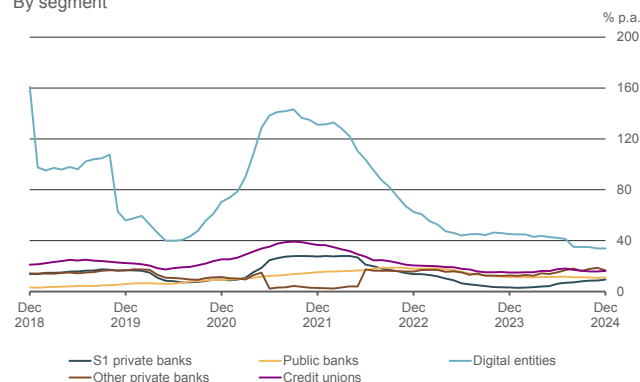
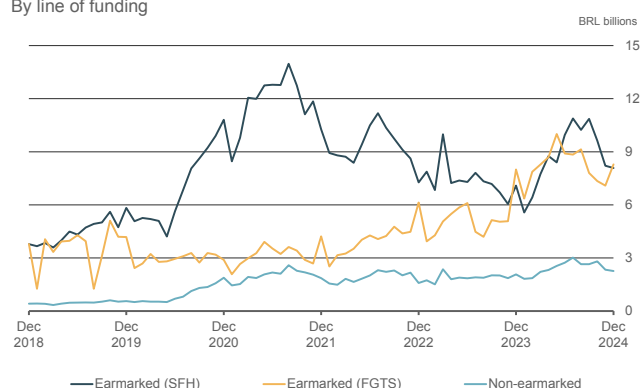


Chart 1.2.2.21 – Real estate financing – Credit granting
By line of funding



Fls risk appetite for household credit granting was higher than in the previous semester.

In addition to the increases in growth rates of some higher risk modalities, there was some worsening in credit granting standards⁴⁷ of non-payroll deducted credit (Chart 1.2.2.22), with an increasing share of credit loans with no guarantee⁴⁸ (Chart 1.2.2.23) and acceleration of the portfolio of lower income brackets (Chart 1.2.2.24). For vehicle financing, higher credit granting values for higher loan-to-value (LTV) ratio brackets (Chart 1.2.2.25) and older vehicles (Chart 1.2.2.26) denote that risk appetite elements are still present, and in a credit modality that is experiencing its largest historical growth rates. For both non-payroll deducted credit and vehicle financing, it is noted an increase at the margin in the credit granting interest rates, which make these credit modalities more expensive for borrowers and can compromise even more households payment capacity.

47 For households, score models are based on borrowers' variables and specific credit operation characteristics.

48 Even though the non-payroll deducted credit portfolio currently presents a better mix of operations than previously, with a larger share of FGTS yearly withdrawal anticipation advance operations and operations with non-fidejussory guarantee, the largest contribution for its recent growth came from operations with no guarantee.

Chart 1.2.2.22 – Average credit granting score
By credit modality

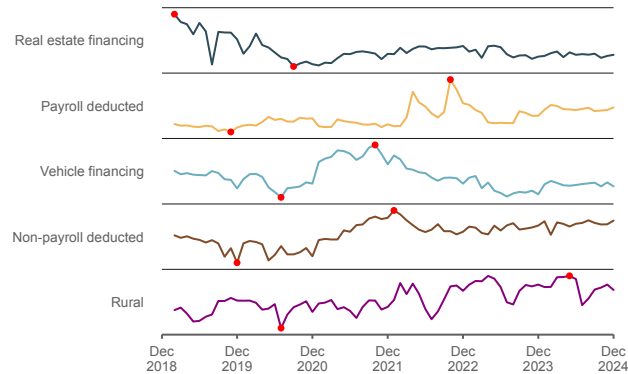


Chart 1.2.2.24 – Non-payroll deducted credit – Year over year growth
By income bracket

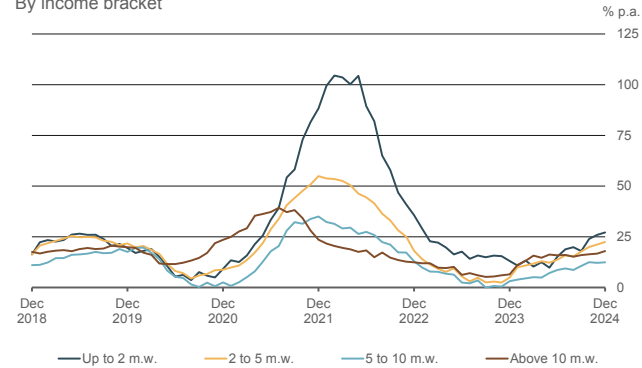


Chart 1.2.2.26 – Vehicle financing – Credit granting
By age of vehicle

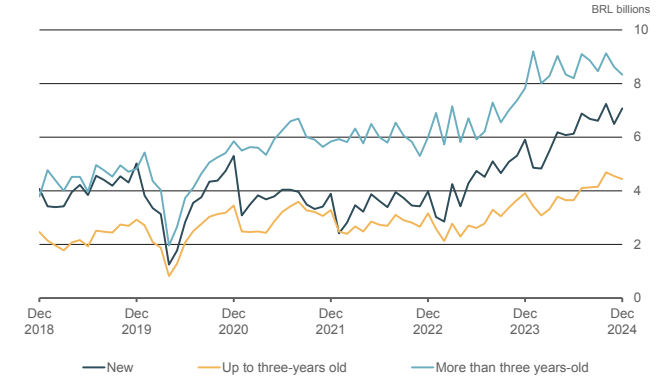


Chart 1.2.2.23 – Non-payroll deducted credit – Decomposition of year over year growth
By type of guarantee

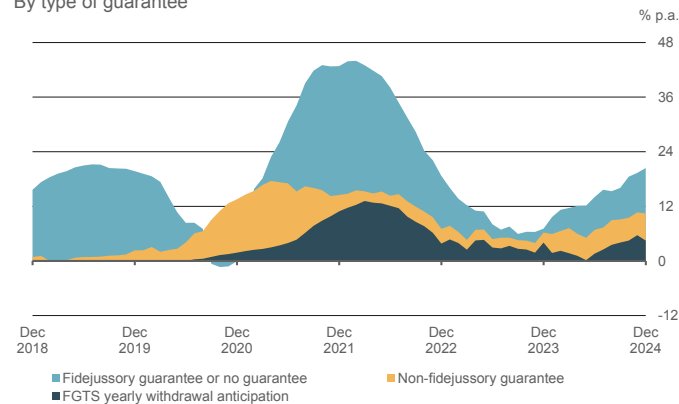
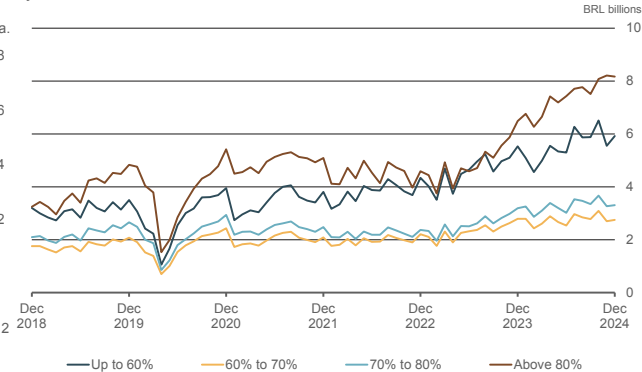


Chart 1.2.2.25 – Vehicle financing – Credit granting
By LTV ratio bracket



Credit risk materialization decreased due to credit portfolio growth and should remain so in the short term. The increase of the credit portfolio was the most significant effect for the decrease in the percentage of PA in almost all credit modalities, except for rural credit (Chart 1.2.2.27). PA forecasts for the next six months (shaded area of Chart 1.2.2.27) as well as credit outstanding probabilities of default estimates⁴⁹ (Chart 1.2.2.28) indicate that this downward trend should remain for real estate financing and vehicle

49 Although the PD metric is the same for all diverse modalities, a more adequate comparison is between current PD to historical PD in the same modality, or, alternatively, comparison between current PD to problem assets ratio for the same modality.

financing, with stability for payroll deducted and non-payroll deducted credit portfolios, and an upward trend for rural credit. However, both stability and improvement trends in the short term should be taken with caution, given that, in the medium term,⁵⁰ monetary tightening tends to affect economic activity, with possible impacts in credit risk materialization, in an environment where households' debt-to-income and debt service-to-income ratios are already high. Regarding credit risk materialization by banking segments, in general, percentages of PA decreased in the semester, except for credit unions, for whom risk materialized especially in the non-payroll deducted credit portfolio (Chart 1.2.2.29).

Chart 1.2.2.27 – Problem assets
By credit modality – Shaded area: forecast

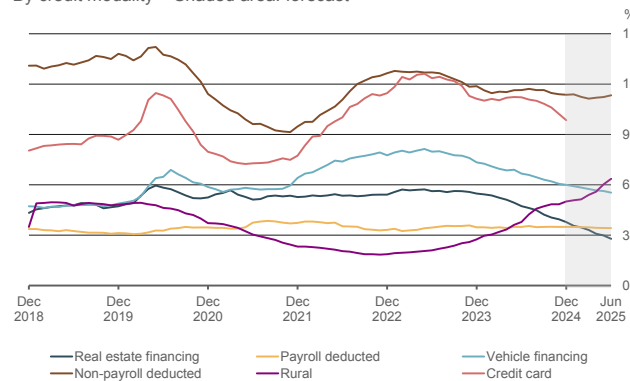


Chart 1.2.2.28 – Credit outstanding probability of default
Performing loans – By credit modality

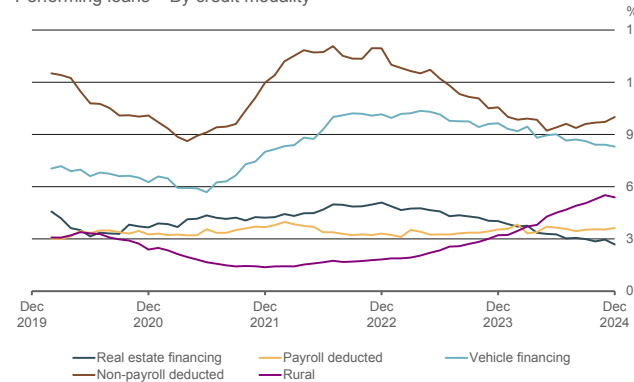
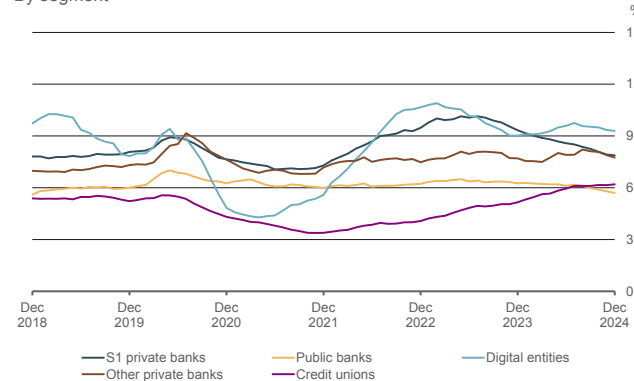


Chart 1.2.2.29 – Problem assets
By segment



⁵⁰ See box "Monetary tightening cycles and the evolution of problem assets".

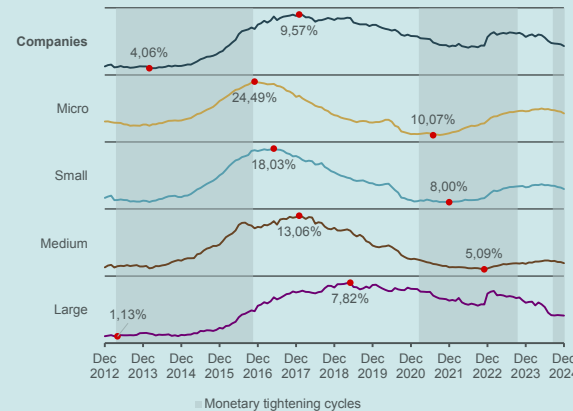
Box – Monetary tightening cycles and the evolution of problem assets⁵¹

Monetary tightening cycles⁵² impact households' and companies' credit risk materialization in distinct manners. The basic interest rate of the economy went through three hike cycles in the last twelve years, starting in April 2013, March 2021, and September 2024. Monetary policy transmission, in its tightening phase, involves a deceleration of economic activity, necessary for the inflation rate to converge to its target. This process affects the payment capacity of households and companies, and impacts in different ways the credit risk materialization, depending on households' credit modalities and companies' sizes.

During the monetary tightening period, the smaller the size of the company, the faster its payment capacity is affected, which translates to higher peaks of problem assets in a shorter time frame. In previous cycles of basic interest rate hikes, an increase in the percentage of PA for MSMEs was observed,⁵³ and in a more pronounced and faster manner for micro and small companies (Chart 1.2.2.30). They are affected faster because they have shorter debt

rollover periods, which leads directly to an increase in their interest expenses. In addition, FIs usually do not renegotiate as much with smaller companies and are more likely to write off losses when compared to larger companies.

Chart 1.2.2.30 – Problem assets
Companies



Short term forecasts indicate a decrease in PA, but this trend is likely to revert throughout the year. Current short term PA forecasts indicate a reduction of the percentages for micro and small companies and stability for medium ones, but, in the medium term, given the current monetary tightening cycle, a reversal of this trend is expected. Regarding large companies, despite the important effect seen after the tightening cycle starting in April 2013, the next cycle, starting in March 2021, did not generally impact borrowers, with an increase in PA occurring due to specific cases. Thus, it is difficult to establish any kind of forecast, even in the medium term.

For households, the evolution of materialization after the monetary tightening cycle seems more blurred among credit modalities. Even though higher risk modalities, like non-payroll deducted credit and credit card, seemed more affected by previous monetary tightening cycles, credit modalities like real estate financing, rural credit and payroll deducted credit do not seem to establish this relation

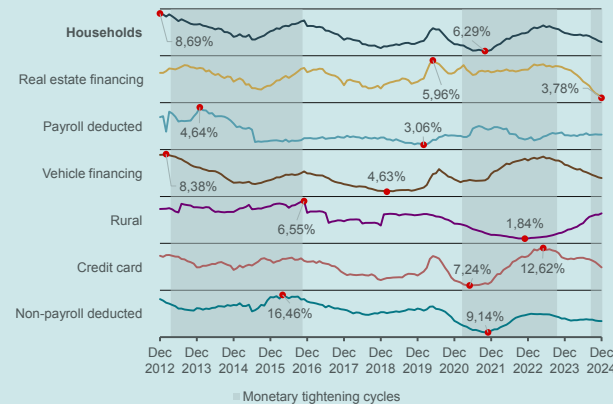
51 Many factors interfere in risk materialization, so the objective of this box is to observe what happened to PAs after previous monetary tightening cycles, and not to establish a deterministic relation between them.

52 For this specific analysis, a "monetary tightening cycle" was considered the time interval in which the Selic rate was first raised until the moment it decreased again.

53 Even considering the recent increases in PA for MSMEs, the current levels are reasonably lower than those seen during the economic crisis of 2015 and 2016.

as clearly (Chart 1.2.2.31). For vehicle financing, a behavior like those of higher risk modalities was observed after the start of the penultimate monetary tightening cycle, in March 2021.⁵⁴ For those higher risk modalities, the economic activity component seems relevant, considering the materialization increases seen during the pandemic, when there was no monetary tightening cycle occurring. In any case, decreases or stability forecast in the short term for PAs of vehicle financing and non-payroll deducted credit should also be taken with caution, given the materialization behavior of these credit modalities in previous monetary tightening cycles.⁵⁵ In addition, it is important to consider the high level of debt service-to-income ratio already present in the beginning of the current monetary tightening cycle.

Chart 1.2.2.31 – Problem assets
Households



⁵⁴ For vehicle financing, the decrease in PA after the beginning of the first cycle of interest rate hike seems to be related to the increase in risk appetite of FIs in the previous period and its posterior risk materialization peak – in the time series shown here, the largest value of PA in vehicle financing occurs in the beginning of 2013. In this sense, see section 2.4 Overview of vehicle financing to households, FSR, October 2021.

⁵⁵ The current level of PA in non-payroll deducted credit is relatively far from the worst moment of the time series, likely due to a better mix of less risky products in the credit modality today than in previous periods. Currently, there are more FGTS yearly withdrawal anticipation and operations with non-fidejussory guarantees.

Provisions for credit losses

Provisions remained higher than the expected losses of the credit portfolio. Provisions constituted by entities remained compatible with the expected loss estimates made by the BCB for the SFN and for the main segments (Chart 1.2.2.32). The loss coverage by provision in the SFN reached 1.06 in December 2024, with slight variation in expected loss estimates and a slight reduction in provisions, which followed the decline in PAs.

New rules for accounting financial instruments change the criteria for constituting provisions for expected losses associated with credit risk and expand the scope of instruments subject to it. The regulations⁵⁶ come into effect on January 1, 2025, and establish that, in addition to constituting provisions for expected losses calculated by their models, entities must observe regulatory levels of provisions for incurred losses. In the case of entities using the simplified methodology, regulatory levels of additional provisions for expected losses must also be observed.

Research conducted by the BCB and accounting publications of FIs indicate an increase in provisions for credit losses.

The impact of the new accounting rules on provisions for credit losses was assessed based on a survey conducted by the BCB with entities from S1 to S4⁵⁷ and information published by FIs in the financial statements for the fiscal year 2024.⁵⁸ Entities reported an aggregate increase of BRL 58.9 billion in provisions for credit losses of financial instruments, of which BRL 43.1 billion was in the credit portfolio.⁵⁹

The impact of the increase in provisions on regulatory capital will be deferred over four years.

To mitigate the effect of the new provisioning rules for credit risk based on expected losses, the CMN instituted a transition schedule for incorporating the impact of the increase in provisions into regulatory capital, in line with the recommendations of the Basel Committee.⁶⁰

New accounting rules lead to an increase in credit loss coverage by provision, contributing to the stability of the financial system.

To assess the effect of the new accounting rules on credit loss provisioning, an estimate was made of the provisions that should be constituted by entities, considering the expected losses estimated by BCB models and the regulatory levels of provisions for incurred losses and additional provisions for expected losses⁶¹. This estimated provision was compared with the adjusted provision, formed by the sum of current provisions with the increase in provisions reported by entities in the survey or published financial statements. This indicator was called the Provision Sufficiency Index, which differs from the current Expected Loss Coverage Index by considering regulatory levels of provision and the expectation of increased provision from 2025. The estimates made indicate an adjusted

57 The second edition of the survey was conducted as of October 2024. The first edition was conducted as of June 2024, and the main results were presented in the FSR published in November 2024.

58 The financial statements for the fiscal year 2024 of the largest entities, published until March 7, 2025, were examined.

59 This includes only the values of entities that reported an increase in provisions. The net impact, considering increases and reductions in provisions, is BRL 56.3 billion in financial instruments, of which BRL 40.2 billion is in the credit portfolio.

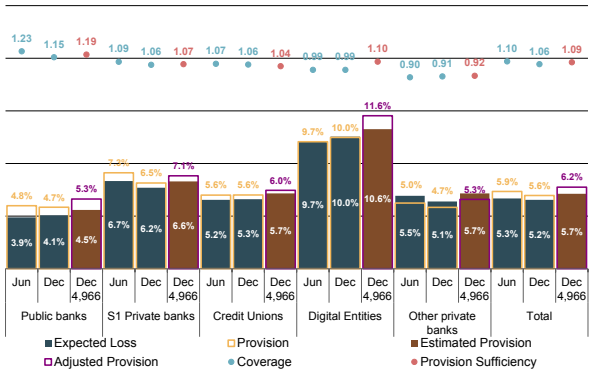
60 According to Resolution CMN 5,199, of December 23, 2024, the negative adjustment determined on January 1, 2025, and recorded in equity, resulting from the application of the criteria for constituting provisions for expected losses provided for in Resolution CMN 4,966, of November 25, 2021, must be added to the core capital, according to the following percentages: 75% until December 31, 2025, 50% between January 1 and December 31, 2026, 25% between January 1 and December 31, 2027, and 0% from January 1, 2028.

61 For each credit operation in December 2024, the higher value between the expected loss estimated by BCB models and the regulatory levels of provisions for incurred losses and additional provisions for expected losses, established by Resolution BCB 352, of November 23, 2023, was calculated. The regulatory levels of provisions consider the portfolio, days past due, and PA condition of the operations.

56 Resolution CMN 4,966, of November 25, 2021, and Resolution BCB 352, of November 23, 2023.

provision greater than the estimated provision in the aggregate of the SFN and in most of the analyzed segments (Chart 1.2.2.32).^{62, 63}

Chart 1.2.2.32 – Expected Loss and Provision
By segment



62 In addition to the increase in provisions for credit losses, the reclassification of financial assets between categories can also generate an equity impact for entities in the implementation of the new accounting rules. Information disclosed by some of the largest FIs in the financial statements for the fiscal year 2024 showed a positive impact on equity, mainly due to the reclassification of financial assets from the “available-for-sale securities” category (Circular BCB 3,068, of November 8, 2001) to the “amortized cost” category (Resolution CMN 4,966, of November 25, 2021).

63 The “Dec 4,966” series refers to the projection of provision sufficiency for the criteria of Resolution CMN 4,966, of November 25, 2021, considering data from December 2024.

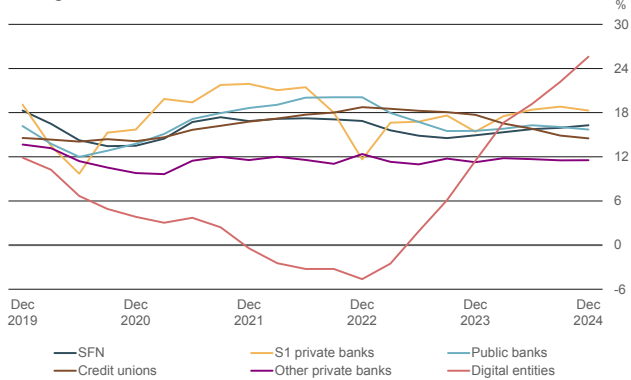
1.2.3 Profitability

The profitability of the National Financial System (SFN)⁶⁴ continues to improve, but restrictive financial conditions may limit further advances in 2025. The SFN segments showed distinct performances in the second half of 2024. Entities with low or negative Return on Equity (ROE) once again reduced their representation in the system’s total assets. Credit Net Interest Income⁶⁵ (NII) in the banking system continued its growth trend, while service revenues slowed down in the second half of 2024. The materialization of risk continued to weaken, contributing to the reduction in provisioning costs. The operational efficiency of the SFN remained stable, given the balance between the growth of administrative expenses and operational revenues. The outlook for the coming periods is for a continued gradual improvement, but with limited profitability advances, given the expectations of more restrictive financial conditions in 2025.

The segments of the SFN recorded distinct performances in the second half of 2024. The “Digital entities” once again presented the highest profitability advance (Chart 1.2.3.1). As observed in the

previous edition, the recovery has been significant in this segment due to the positive effects of operational leverage in some entities and the lower pressure of provisioning expenses in recent periods. This trend continued, with more entities in this segment improving profitability. The “Credit unions” segment showed a further reduction in profitability, a trend that has been observed since the end of 2022 due to the high materialization of risk in non-payroll credit. The ROE of the “S1 Private banks”, “Public”, and “Other Financial Institutions” segments remained practically stable in the second half of 2024.

Chart 1.2.3.1 – ROE
Trailing twelve months

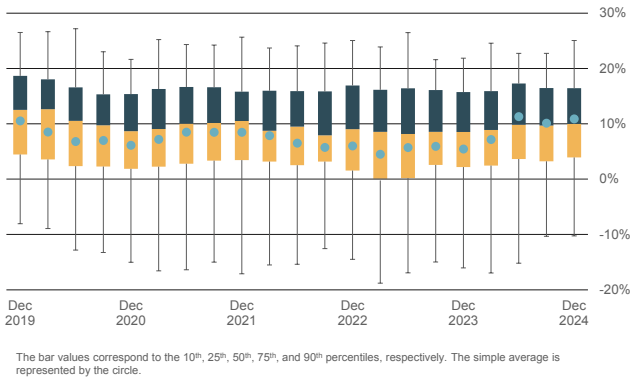


64 The analyses in this section were carried out considering the scope of the SFN, unless otherwise indicated for issues related to data availability or quality.

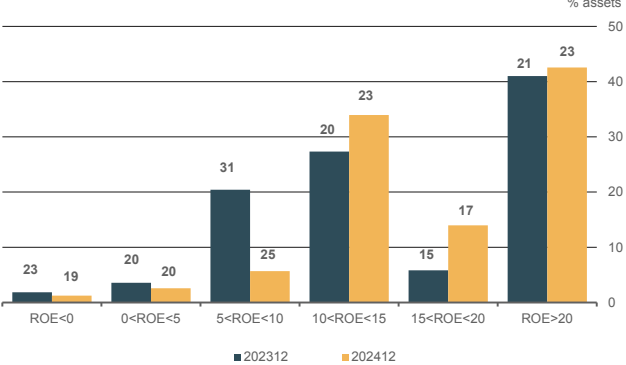
65 Refers to the difference between interest income and interest expenses, without considering the effects of loan loss provisions. Interest income derives from interest-earning assets (mainly treasury and credit assets) and interest expenses derive from interest-bearing liabilities (mainly funding).

The ROE distribution in the banking system has improved, and entities with low or negative ROE reduced their representation in the total assets of the system. The median ROE of the banking system did not present significant change in the second half of 2024, and there was a migration of entities to higher ROE ranges when compared to December of the previous year (Charts 1.2.3.2 and 1.2.3.3). Despite some entities recording negative ROE, they represented about 1% of the system's total assets at the end of 2024. On the other hand, entities with ROE above 10% represented more than 90% of the total assets of the banking system at the end of the year.

Chart 1.2.3.2 – ROE Dispersion
Trailing twelve months



1.2.3.3 – ROE Frequency Distribution
Trailing twelve months



1/ The values above the bars indicate the number of institutions that fall within the respective ROE interval.

Credit NII in the banking system recorded another period of growth. Since the second half of 2022, continuous growth in credit NII has been observed. This growth is largely due to the improvement in the credit margin, which measures the difference between the return on the credit portfolio and the cost of funding (Chart 1.2.3.4). The improvement was driven by recent credit granting with higher interest rates and by a reduction in funding costs. (Chart 1.2.3.5). The contribution of portfolio growth (volume) to the increase in NII has been gradually slowing down, and this trend is expected to continue with the anticipated lower credit growth in 2025. The portfolio mix continued to negatively contribute to NII growth, but this trend may reverse due to the acceleration of lending in higher-risk modalities. The expectation for 2025 is that the growth of credit NII will decelerate due to the

anticipated lower credit expansion and the impact of a higher Selic rate on the credit margin.

Chart 1.2.3.4 - Credit NII
Annual growth and factor decomposition
Trailing twelve months

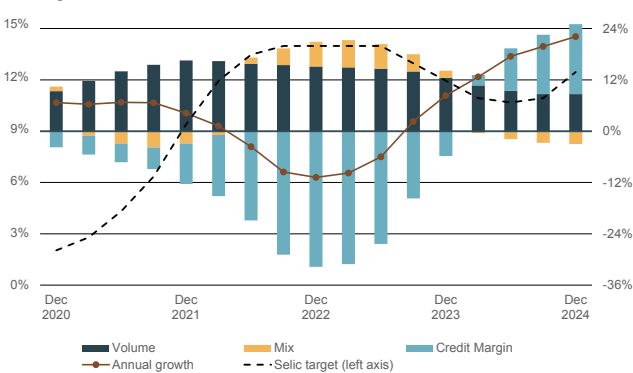
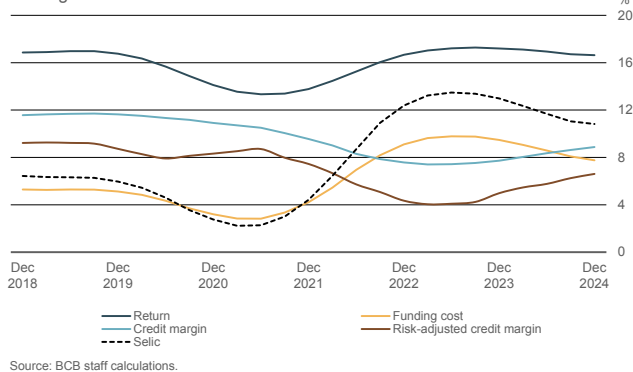
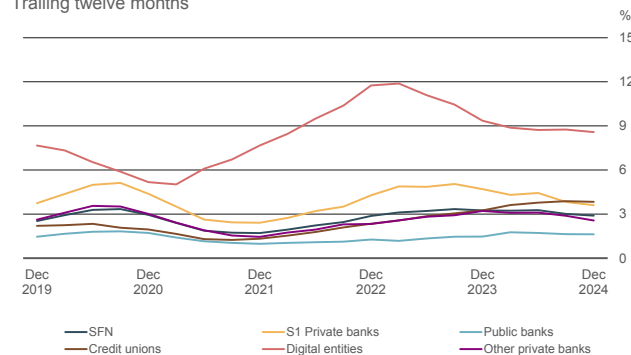


Chart 1.2.3.5 - Credit margin
Components
Trailing twelve months



The materialization of risk continued to weaken, contributing to the reduction in provision costs throughout the second half of the year.⁶⁶ Most segments of the SFN continued to present a reduction in provisioning costs⁶⁷ (Chart 1.2.3.6). The “Credit unions” was the only segment that has been recording an increase in provisioning costs since the end of 2021. This segment has been affected by the rise of problem assets in non-payroll credit. Internal estimates indicate that the provisions made are adequate and remain above the projection for expected losses.⁶⁸ However, the current environment, marked by restrictive financial conditions and high household and corporate debt, requires caution in lending to avoid compromising profitability in future periods.

1.2.3.6 - Provisioning costs^{1/}
Trailing twelve months



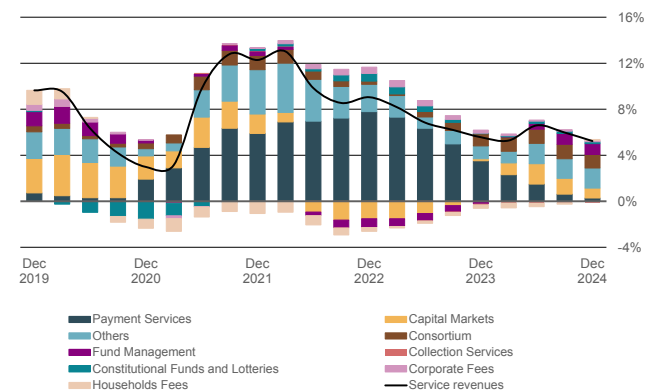
Source: BCB staff calculations.

1/ Refers to the ratio between provision expenses and the average balance of the credit portfolio.

After rising in the second quarter of 2024, service revenues slowed down again in the second half of the year. The main reason was the lower growth in payment revenues and, to a lesser extent, the reduction in capital market revenues in the second half of the year (Chart 1.2.3.7). The slowdown in payment revenues, which has been occurring for some time, is associated with the growth of alternative payment methods, such as Pix, increased competition, and innovations in the SFN. Although capital market revenues decreased in the second half of the year,

they recorded significant growth in 2024, supported by high volumes of fixed-income securities issuance.⁶⁹ The decline in these revenues was partially offset by the increase in investment fund and consortium revenues. The expectation for 2025 is that service revenues will continue to slow down gradually, in line with economic activity.

1.2.3.7 – Service revenues
Annual growth and factor decomposition
Trailing twelve months



The operational efficiency⁷⁰ of the SFN remained virtually stable. The administrative expenses of the SFN increased in the second half of the year,

66 Any adjustments to provisioning and reclassification of financial assets – resulting in changes to equity value, from fair value to amortized cost or vice versa – arising from the new accounting regime for financial instruments (Resolution CMN 4,966, of November 25, 2021) should be applied prospectively from the effective date of the Resolution. The accumulated effects of the transition are recorded against the retained earnings or loss account at the net value of tax effects, without impacting the entities’ results.

67 Provision costs refer to the ratio between provision expenses and the average balance of the credit portfolio.

68 See subsection 1.2.2 for more detail.

69 The growth in capital market-related income is primarily linked to commissions from the placement of debt securities.

70 The operational efficiency of the system is measured by the Operational Efficiency Index (IEO), calculated by dividing administrative expenses by operational results, excluding the effects of provision expenses.

mainly due to collective wage agreements and seasonally year-end effects (Chart 1.2.3.8). Despite this, personnel expenses are under control, growing in line with inflation since the end of 2023.⁷¹ There is also a continued trend of improvement in operational efficiency in the “Digital entities” segment (Chart 1.2.3.9), reflecting gains from operational leverage of institutions that have been successful in monetizing their customer base. The digitalization of banking services will continue to be a relevant factor for improvements in the operational efficiency of SFN. The reduction of the branch network continued throughout 2024, a trend that is expected to persist in the coming years. This movement of reducing the branch network, along with the increasing digitalization of financial services, tends to lower the cost to serve for entities and generate operational efficiency gains in the medium and long term.

1.2.3.8 - Administrative expenses
Annual growth and factor decomposition
Trailing twelve months

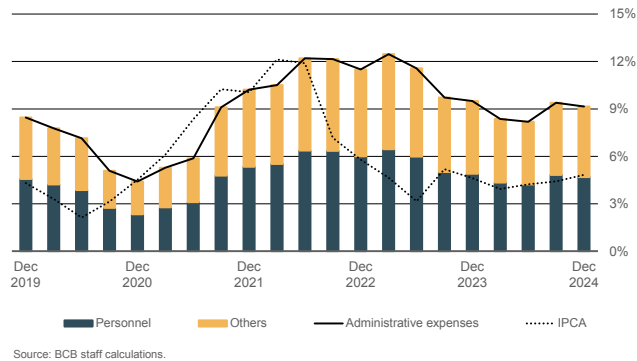
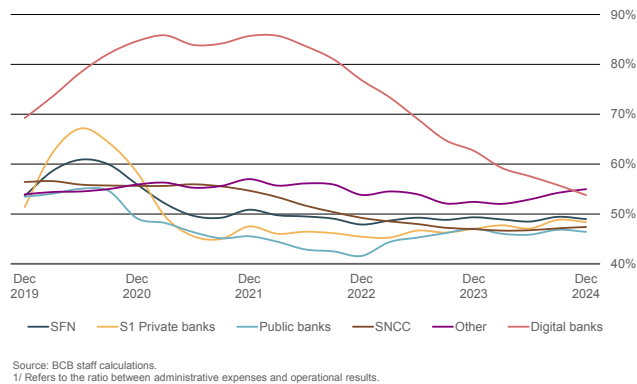


Chart 1.2.3.9 - Operational Efficiency Index (OEI)^{1/}
Trailing 12 months



1.2.4 Solvency

The banking system remains solid and able to sustain regular functioning of the financial intermediation system. Although there was a slight decline over the semester, aggregate capitalization ratios remain comfortably above the regulatory requirements (Charts 1.2.4.1 and 1.2.4.2). The frequency distribution of the Regulatory Capital Adequacy Ratio (RCAR)⁷² shows that about half of the institutions have more than double the required capital, and that the asset representativeness of institutions with insufficient capital to meet prudential requirements⁷³ is less than 1% (Chart 1.2.4.3). Solvency does not pose a risk to financial stability.

⁷² The RCAR consists of the quotient between the Regulatory Capital (RC) and the total required RC, including the capital buffers and Basel Pillar 2. This ratio allows for the joint analysis of entities with different minimum RC requirements. For a detailed description of the capital requirements applicable to various entities within the system, see Concepts and Methodologies.

⁷³ Even considering the requirements applicable to other levels of regulatory capital (Tier I and Common Equity Tier I), the capital shortfall of 59 institutions that hold 0.8% of the system's assets totals BRL2.3 billion, corresponding to only 0.15% of the consolidated RC.

⁷¹ There was no significant impact from exchange rate variations on the expenses of subsidiaries and branches of banks abroad in the second half of 2024.

The chart displays four financial ratios over time. The CET1 Ratio (blue) starts at approximately 14.2% and ends at 14.4%. The T1 Ratio (orange) starts at approximately 15.2% and ends at 15.5%. The Total Capital Ratio (green) starts at approximately 17.5% and ends at 17.2%. The Leverage Ratio (brown) starts at approximately 8.2% and ends at 8.0%.

Ratio	Dec 2021	Jun 2022	Dec 2022	Jun 2023	Dec 2023	Jun 2024	Dec 2024
CET1 Ratio	14.2	14.1	14.1	14.2	14.3	14.4	14.4
T1 Ratio	15.2	15.1	15.0	15.1	15.2	15.5	15.5
Total Capital Ratio	17.5	17.4	17.3	17.4	17.5	17.7	17.2
Leverage Ratio	8.2	8.1	8.1	8.1	8.1	8.1	8.0

A bar chart comparing the number of respondents by age group for two time periods: June 2024 (dark blue bars) and December 2024 (orange bars). The x-axis represents age groups: < 1.0, 1 - 1.2, 1.20 - 1.5, 1.5 - 2.0, and > 2.0. The y-axis represents the number of respondents, ranging from 0 to 400. The data is as follows:

Age Group	June 2024	December 2024
< 1.0	57	60
1 - 1.2	105	106
1.20 - 1.5	254	231
1.5 - 2.0	263	275
> 2.0	693	721

The distribution of capital remuneration in an amount higher than the historical average and the prudential adjustments of the semester resulted in lower growth of Common Equity Tier 1 (CET1) and a decrease in its share in the regulatory capital (RC). Although retained earnings in relation to net profit are seasonally lower in the second half of the year, the percentage of 34% observed in the second semester of 2024 was the lowest in the last five years due to the distribution of dividends and interest on equity (Chart 1.2.4.4). CET1 was also affected by prudential adjustments, especially those related to deferred tax, actuarial and intangible assets. On the other hand, Additional Tier 1 Capital showed a growth of 21.9%, explained by new issuances and appreciation of instruments issued in

A = Capital ratio - Jun 2024	F = RWA - Credit operations
B = Half-year net profit	G = Credit RWA - Others
C = Paid-up capital, retained earnings and profits	H = Market RWA
D = Additional Tier 1 Capital	I = Others
E = Prudential Adjustments	J = Capital ratio - Dec 2024

foreign currency. The variations resulted in a slight decrease in the share of CET1 in RC, interrupting the trend observed in previous semesters (Chart 1.2.4.5).

Chart 1.2.4.4 – Profit retention by ownership^{1/}

The system's capitalization indices will continue to be moderately impacted by the enhancement of prudential regulation.

In January 2025, the transitional rules of the prudential framework for conglomerates led by payment institutions (PIs) will end. On the same date, new methodologies for calculating the portion of risk-weighted assets (RWA) related to operational risk and for determining provisions for losses associated with credit risk will come into effect. Based on the current capital structure of the entities, it is estimated that the impact of these regulatory changes on the system's Total Capital Ratio (TCR) will be a reduction of 0.45p.p. in 2025.⁷⁴

⁷⁴ The estimated reduction in the TCR in January 2025 due to recent regulations can be divided into the following installments: 0.27p.p. due to the increase in RWA for operational risk by applying the methodology established by Resolution BCB 356, of November 30, 2023, with phased implementation between 2025 and 2028; 0.12p.p. due to the application of the rules for the constitution of expected losses established by Resolution CMN 4,966, of November 25, 2021, with a gradual impact on CET1 between 2025 and 2028; and 0.06p.p. due to the end of the transitional rules for conglomerates led by PIs as provided by Resolutions BCB 198, 199, and 201, of March 11, 2022.

Table 1.2.4.1 – RWA composition

BRL billions	System			Var. (%) Dec/Jun	
	Jun 24	Dec 24	Var. (%)	Public	Private
Total RWA	8,605	9,208	7.0%	7.6%	6.7%
Credit RWA	7,166 83.3%	7,609 82.6%	6.2%	7.4%	5.5%
Credit operations	3,577	3,802	6.3%	6.7%	6.0%
Leasing	26	28	8.5%	37.3%	8.0%
Interbank investments	215	234	9.0%	12.3%	8.1%
Securities	626	611	-2.3%	11.6%	-6.8%
Derivatives	178	217	22.0%	56.8%	18.1%
Fixed Assets	466	474	1.6%	-0.1%	2.6%
Non-cancellable credit commitments	152	149	-1.8%	-3.4%	-1.3%
Guarantees provided	406	418	3.0%	0.0%	3.9%
Tax assets	435	466	7.2%	6.3%	7.7%
Other	1,025	1,150	12.2%	14.5%	11.3%
Market RWA	458 5.3%	549 6.0%	19.9%	18.6%	20.2%
Operational RWA	912 10.6%	973 10.6%	6.7%	6.3%	7.0%
Payment Services RWA	69 0.8%	77 0.8%	12.0%		12.1%

The system has sufficient capital margin to continue expanding the supply of credit, despite the prospect of its reduction due to regulatory changes. The RWA expanded more than the capital as a result of the growth of exposures in the semester, especially in credit operations (Table 1.2.4.1). In relative terms, the growth in required capital was greater in the portion related to market risk, partly

explained by the incorporation of credit risk of financial instruments classified in the trading book (RWA_{DRC}). However, the system has a capital margin⁷⁵ of BRL477 billion, equivalent to 30% of its aggregate RC. The excess capital can provide significant asset expansion without the need for capital contributions, even in the face of the implementation of the mentioned regulatory changes.

⁷⁵ The capital margin of each institution corresponds to the smallest margin across all prudential requirements.

1.2.5 Stress tests

Macroeconomic stress test

Capital and liquidity stress tests⁷⁶ results indicate that the banking system presents adequate levels of capital and is resilient in all adverse scenarios simulated, although a considerable group of banks reach capital ratios that trigger constraints on capital distribution. Due to solid capital ratios at the onset of the tests, non-compliance⁷⁷ events are not that relevant, when adverse macroeconomic scenarios are simulated. Sensitivity analyses also point to a good resilience to risk factors, when simulated on a solo basis. The liquidity stress test indicates a comfortable amount of liquid assets in the event of cash outflows in adverse conditions or shocks to market parameters in the short term.

⁷⁶ Details on methodology and scope of the macroeconomic test, sensitivity analyses, interbank direct contagion and liquidity stress test can be found in the Concepts and Methodologies annex.

⁷⁷ A bank is considered non-compliant if any of the three capital adequacy indices are not met: Total Capital Ratio (TCR), Tier 1 Capital Ratio (T1 Ratio) and Common Equity Tier 1 Ratio (CET1 Ratio).

Box – Scenarios used in the macroeconomic stress test⁷⁸

The scenarios used in the macroeconomic stress test are named “Acute Recession” and “Confidence Crisis” (Charts 1.2.5.1 to 1.2.5.5).

The acute recession scenario supposes a relevant drop in domestic demand, together with a strong decline in the global economy, from the second quarter of 2025 onwards. The magnitude of the external economic activity slide resembles that of the Covid-19 pandemic, together with a strengthening US dollar and falling commodities prices. In the domestic economy, household consumption and gross fixed capital formation would significantly decline, and a slow recovery would follow, so that mid-2024 GDP levels would be recovered only by mid-2027. Reduced economic activity would trigger relevant increases in unemployment rates. Economic idleness would lead to reduced inflation, in spite of the currency depreciation. In accordance with a Taylor rule, falling inflation would lead to Selic rate cuts by the BCB, aiming at achieving inflation convergence to inflation targets. In summary, the scenario depicts falling economic activity, inflation, and interest rates.

The confidence crisis scenario is characterized by a significant increase of uncertainty in the economy starting on the second quarter, 2025, together with expectations of fiscal and monetary deterioration, leading to increases of risk premia, steep currency depreciation, elevation of the neutral interest rate and economic activity contraction. The building of such a confidence crisis scenario utilized as reference the fiscal deterioration and economic uncertainty seen in the past, between mid-2014 and the beginning of 2016. Despite the GDP drop and increased unemployment, inflationary effects of currency depreciation would prevail. Foreign exchange (FX) rate peaks in the third quarter, 2025 and then starts appreciating, in response to an increased interest rate differential to international markets. In accordance with a Taylor rule, to pursue convergence of inflation rates to the target, the significant rise of inflation would lead the BCB to hike the Selic rate. Output recovery occurs more gradually than in the acute recession scenario. In summary, this scenario is characterized by falling economic activity and raising inflation and interest rates.

Stress scenarios are built upon realized data, appended with Focus report projections up until the quarter preceding the onset of the “crisis”. For this FSR, realized data and Focus projections up to January 31, 2025, were used, with the last pre-crisis quarter being the first quarter, 2025.

Previously, as per the last FSR published on November 21, 2024, stress scenarios took as a starting point the values available up to August 2, 2024, with the last pre-crisis quarter being the third quarter, 2024. Between August 2, 2024, and January 31, 2025, a sensible deterioration of expectations was registered in the Focus report, which led to stress scenarios drawn from a more fragile initial economic status.

⁷⁸ For both scenarios, the Selic rate movement described is solely intended to keep macroeconomic consistency and does not represent any indication or compromise if any of the described scenarios materialize.

Chart 1.2.5.1 – Inflation

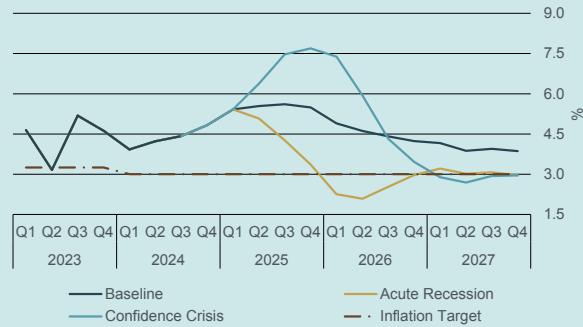


Chart 1.2.5.2 – Exchange Rate

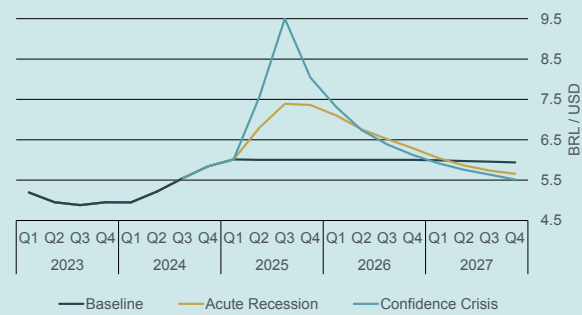


Chart 1.2.5.3 – GDP Change

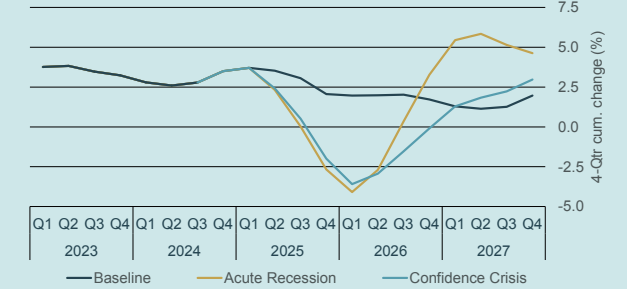


Chart 1.2.5.4 – Unemployment

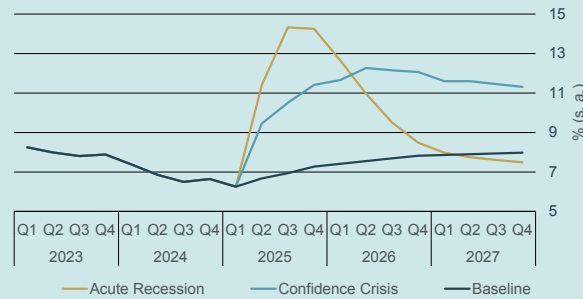
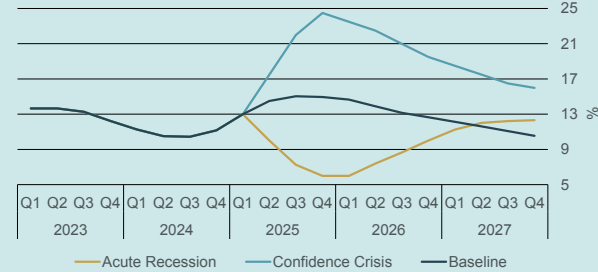


Chart 1.2.5.5 – Selic Rate



Solvency stress test

The estimated system capital shortfall⁷⁹ is moderate in the confidence crisis scenario, confirming the adequate loss absorption capacity of the banking system. Institutions that together account for 46% of system total assets would continue to show capitalization ratios above regulatory minimum of 10.5% (Chart 1.2.5.6), in the confidence crisis scenario, whereas 44% of the system's assets are represented by institutions with restrictions to capital distribution due to non-compliance to the Capital Buffer (ACP) requirements.

Capital adequacy ratios reach their minimum value in March 2026, at 13.5%, having remained above the 10.5% regulatory minimum in the confidence crisis scenario, which attests system's resilience. Interest rates and FX rates applied to current study have been greater than those used in the previous FSR. Furthermore, regulatory changes⁸⁰ due through the next years have been incorporated

to the macroeconomic stress simulations. However,⁸¹ the adoption of a transition schedule for the new provisions rules has reduced its total impact and distributed it over time.

The increase of system capital shortfall, when compared to the former FSR, is due to a stricter confidence crisis scenario and to lower projected profit retentions resulting from, among other factors, higher fundraising costs stemming from increased interest rates in the baseline scenario projection. The largest capital shortfall would be 9.9% of the current regulatory capital of the system at the 12th simulated quarter of the confidence crisis scenario (Chart 1.2.5.7). This figure is almost double the 5.3% capital shortfall presented at the previous FSR, also in the last simulated quarter. For the acute recession scenario, capital shortfall reaches 2.7% of the current regulatory capital of the system at the last simulated quarter, which compares to the 2.2% figure at the previous tests.

⁷⁹ The concept of capital shortfall encompasses amounts necessary to fully comply with minimum requirements, as determined by Resolution CMN 4,958, of October 21, 2021, and includes all capital buffer requirements (ACP) applicable. Particularly, systemically important banks are subject to the systemic capital buffer (ACP_{Sistémico}).

⁸⁰ Regulations scheduled to be enacted which have effects on this stress test are: Law 14,467, of November 16, 2022, which brings tax deductibility rules closer to accounting provisioning criteria; new provisions calculus procedures for credit risk expected losses, established by Resolution CMN 4,966, of November 25, 2021, with a transition schedule established by Resolution CMN 5,199, of December 23, 2024; the new framework for computing operational risk risk-weighted assets (RWA_{OPAD}).

⁸¹ As per Resolution CMN 5,199, of December 23, 2024 (see footnote 60), which altered Resolution CMN 4,955, of October 21, 2021, the impact of new regulations has been distributed to 25% of the total impact each year, beginning in the first quarter of 2025. Currently, 75% of total effects are applied over the projection horizon of twelve quarters.

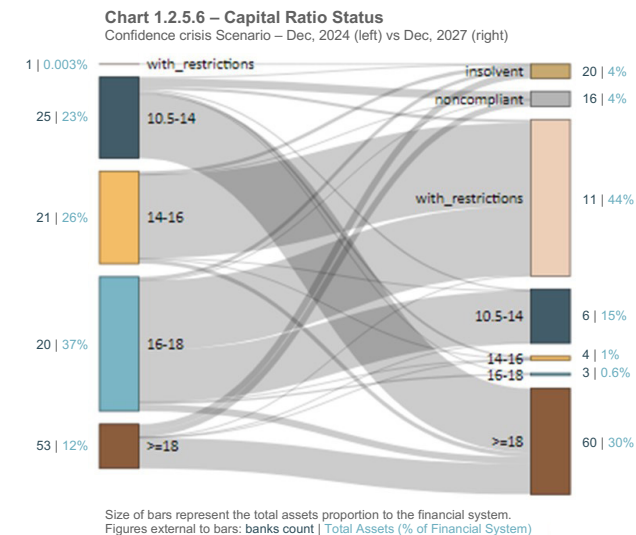
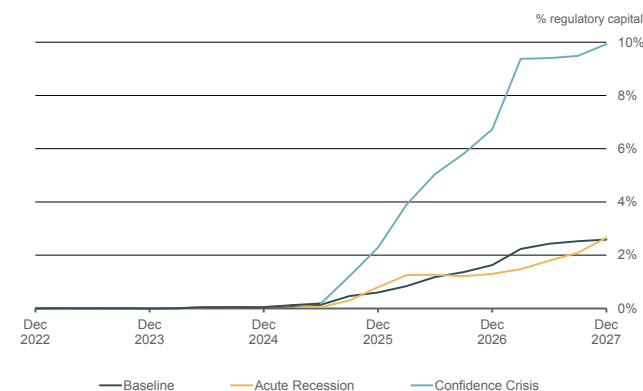


Chart 1.2.5.7 – Capital Shortfall (% of regulatory capital)



Sensitivity analysis

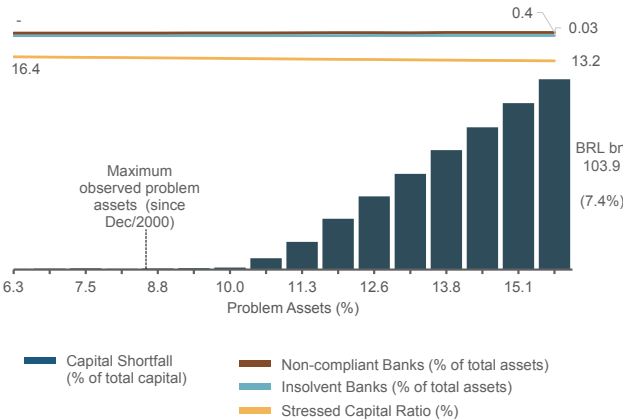
The system has low sensitivity to shocks in the exchange rate. Non-compliances, if the exchange rate increases a 100% over the rate observed by end of December 2024, occur for institutions representing 0.003% of system’s regulatory capital. The low net exposure observed inhibits greater adverse effects resulting from drastic fluctuations in the exchange rate.

Only very large positive shocks in the interest rate could generate some capital shortfall. A shock equivalent to the greater variation observed⁸² through the last 26 years would result in a capital shortfall of 1.4% of the regulatory capital, affecting banks accounting for 2.3% of system assets. Hedge policies aiming at limiting exposure to trading book assets that are sensitive to interest rates, reduce the risk of losses arising from interest rate shocks.

Incremental credit risk shocks point to a low capital shortfall if problem assets reached their highest historical mark. Capital shortfall, if problem assets reach 8.6%, the historical maximum level observed in May 2017,⁸³ would be 0.035% of system’s regulatory

capital (Chart 1.2.5.8). In an extreme situation, if the proportion of problem assets reached 15.7% of the credit portfolio there would be a capital shortfall equivalent to 7.4% of system’s regulatory capital. These institutions would represent 0.43% of system assets.

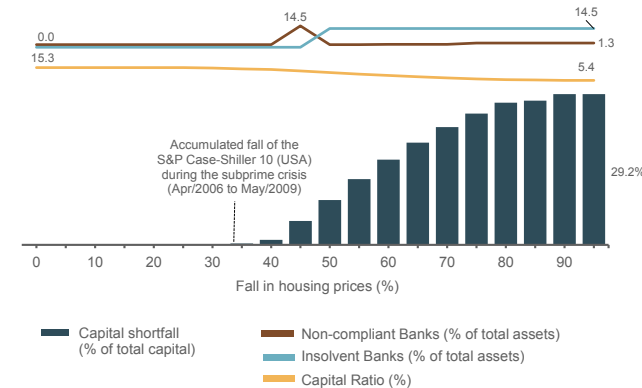
Chart 1.2.5.8 – Sensitivity analysis
Credit risk



Simulation of reductions in residential property prices shows a very low possibility of non-compliances. There would only be any capital shortfall in the event of nominal prices drop more than 30% of collateral prices of real estate credit operations,

compared to the 36-month average of the Residential Real Estate Collateral Value Index (IVG-R).⁸⁴ This shock is similar to the 33% drop observed in the S&P Case-Shiller during the subprime crisis in the U.S. Only a 50% reduction or more in nominal prices would lead to insolvency, characterized by negative CET1. In December 2024, the stock of the residential real estate loan portfolio had an average LTV of 54.3%, considering collateral prices updated by IVG-R and outstanding balances updated by interests and amortizations. Origination criteria with moderate LTVs and the low share of real estate loans to the total credit portfolio reduce impacts of housing price shocks in extreme scenarios (Chart 1.2.5.9).

Chart 1.2.5.9 – Sensitivity Analysis
Housing Prices Risk



82 In 21-day windows, since 1999, the maximum change of the six-month rate was circa 83.5%.

83 Prior to January 2012, for comparative purposes, the share of E-to-H classified loans in the total portfolio is considered.

84 The IVG-R is calculated and disclosed by the BCB, based on property appraisals carried out for the granting of housing loans.

Simulation of direct interbank contagion

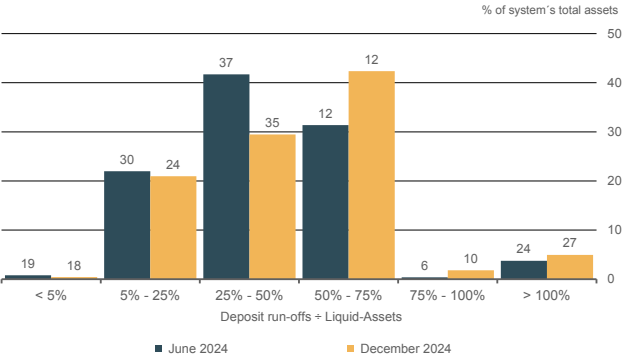
The contagion simulation suggests a low need for resources to recapitalize the system due to contagion caused by the bankruptcy of each financial institution individually. Impact from the failure of one bank is transmitted to other institutions through direct links, such as loans and interbank deposits. In the worst case simulated, the capital shortfall resulting from contagion would be below 1% of system’s regulatory capital. This low impact is explained by the appropriate level of capitalization of the system and the existence of an exposure limit per client, which restricts exposures between institutions. In addition, some direct interbank exposures are collateralized, such as repurchase agreements backed by Federal Public Securities (TPF), thus reducing the likelihood of contagion.

Liquidity stress testing

The banking system holds enough liquid assets to absorb potential losses under stress scenarios and comply with current regulations. The wide majority of FIs, including the largest ones, exhibit a liquidity buffer large enough to withstand depositor run-offs and potential market losses under adverse scenarios.

Depositor’s runoff stress tests indicate the system is resilient enough to withstand funding withdrawals. The depositor run-off scenario for the thirty-day horizon applies standardized run-off percentages to funding sources, considering the client profile and the type of funding instrument. Additionally, it uses a methodology that captures the effect of deposit volatility to estimate supplementary run-offs, considering a 21-day holding period.⁸⁵ Furthermore, it considers the total withdrawal of all instruments maturing over a thirty-day horizon, as well as withdrawal of all eligible instruments by their three largest counterparties, capturing concentration risk. Simulation results indicate that only a small subset of institutions representing 5% of the system’s assets have deposit run-offs representing more than 100% of their liquid assets. (Chart 1.2.5.10)

Chart 1.2.5.10 – Frequency distribution off deposits run-offs^{1/}



1/ The values on the top of the bars refer to the number of financial institutions with the value of the expected earlier redemptions for next 30 days (run-offs) as a share of its liquid assets belonging to the corresponding interval.

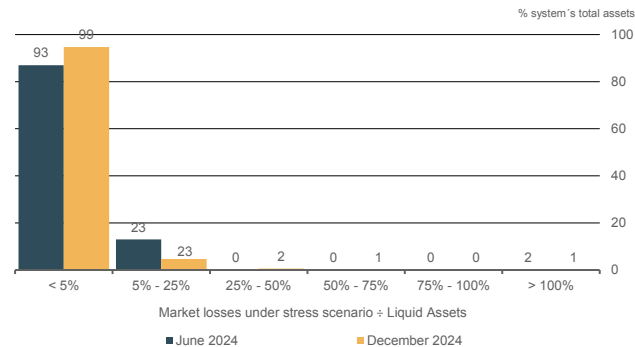
The result of shocks to market parameters demonstrates that banks remain resilient to withstand potential cash outflows in the short term, and meet margin calls and guarantees, as well as a devaluation of liquid assets.⁸⁶ Greater interest and foreign exchange rate volatilities, notwithstanding a greater degree of risk aversion combined with the preservation of liquidity, contributed to a modest

85 The deposit run-off stress test aggregates a subset of components of the Short-Term Liquidity Ratio methodology (IL) associated with unexpected deposit outflows: deposit profile, early redemption and brokered deposits. For further details about IL’s methodology, please refer to the Concepts and Methodologies annex (the Stressed Cash Flow component of the Liquidity Ratio).

86 This simulation is based on forecasts of shocks to market parameters through different scenarios for yield curve, exchange rate, currency coupons and inflation price indices. The stress tests consider the worst impact of high/low shock scenarios for the different market risk factors independently for each institution; that is, we may have two independent scenarios, one shock resulting in an increase for a certain risk factor for an institution A and a decrease for the same risk factor for an institution B.

improvement in the ratio of market stress and liquid assets compared to June 2024 (Chart 1.2.5.11). These simulations estimate the amount necessary to cover losses resulting from fluctuations in market prices of liquid assets, derivatives, and other instruments.⁸⁷ Liquid assets, in turn, are marked to market regardless of their accounting classification, eliminating potential problems arising from the revaluation of securities classified as Held to Maturity (HTM) and accounted for at amortized cost.

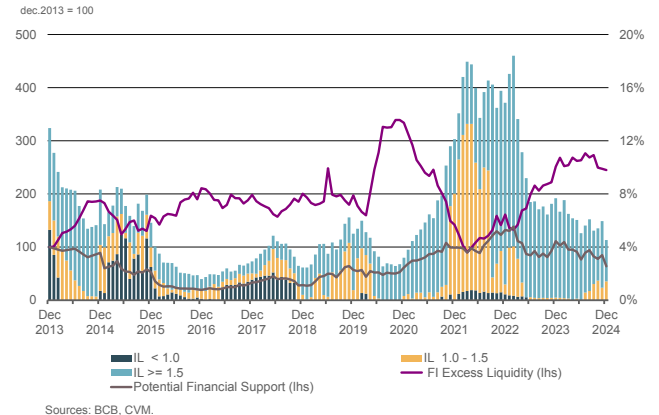
Chart 1.2.5.11 – Frequency distribution for market losses under stress scenarios^{1/}



^{1/} The values on top of the bars refer to the number of institutions with estimated market losses under stressed scenarios as a share of liquid assets belonging to the corresponding interval.

The impact of eventual liquidity support to investment funds⁸⁸ managed by bank-linked managers on the banking system participants is not a relevant matter of concern. The step-in risk is the ratio between the value of potential liquidity support to investment funds provided by their bank-linked managers—estimated in a scenario of strong withdrawals in investment funds – and the excess liquidity of their linked FIs – estimated from the liquidity stress tests performed by the BCB. The indicator showed a decline throughout 2024, representing 5% of the excess liquidity of the linked FIs. Despite the reduction in the excess liquidity of the linked FIs in the last quarter of the year (to BRL675 billion), there was also a significant reduction in the value of the eventual liquidity support to funds (to BRL31 billion), contributing to the drop of the indicator (Chart 1.2.5.12). Furthermore, most of this need occurs in managers that have an IL greater than 1.5, which indicates a very comfortable situation regarding the step-in risk.

Chart 1.2.5.12 – Investment funds' step-in risk
Potential support as a proportion of excess of liquidity of bank-linked managers, segregated by Short-Term Liquidity Ratio (IL) range



87 Resource losses/cash outflows include: (i) additional margin calls deposited in clearing houses; (ii) disbursements in positions of derivative markets; (iii) loss of value of liquid assets used as collateral for repurchase agreements or pledged as guarantees to clearing houses and BCB.

88 The concept and methodology for assessing potential liquidity support to investment funds were presented in the October 2017 FSR, available at <https://www.bcb.gov.br/publications/financialstabilityreport/201710>. Investment funds considered in the estimation of the potential support are those under Instruction CVM 555, of December 17, 2014, managed by entities belonging to the banking system, open-end and non-exclusive, not fund of funds, having a redemption no longer than thirty days and whose financial statements are not consolidated into prudential conglomerates.

1.3 Financial Stability Survey⁸⁹

Compared with the August 2024 survey, fiscal risks have become even more relevant, accompanied by a worsening perception of the economic and financial cycles. More than half of respondents named fiscal risks as the most important (Table 1.3.1). Concerns about delinquency and economic activity risks have also increased, reflected in their increased average expected impact. Risks stemming from the global scenario remain relevant but have lost strength at the margin. Most respondents now consider the economy to be in contraction. In terms of financial cycles, there was a lower willingness to take risks and a worsening assessment of asset prices and access to funding and means of liquidity, accompanied by an increased perception of a downward trend in the credit/GDP gap. Most

respondents still expect and suggest that the ACCP^{Brasil} value should be kept at 0%.

Risks to financial stability⁹⁰

The greater relevance of fiscal risks mainly reflects concerns about the public debt sustainability and the impacts of fiscal policy on asset prices and on the monetary policy. The percentage of respondents naming fiscal risks as the most important rose from 41% in August 2024 to 52% in February. Concerns about the sustainability of public accounts and the impact on the yield curve, the exchange rate, and the conduct of monetary policy stood out. In this scenario, the rise in funding costs and the increase in market risk would negatively impact the balance sheets of financial institutions.

Mentions to global scenario risks as the most important fell but concerns about geopolitical risks and U.S. economic policy persisted. Respondents listed the risk of geopolitical conflicts escalation, as well as its impact on commodity prices and global inflation. U.S. economic policy continues to be deemed a source of uncertainty. There is concern about an

increase in migration barriers and the possibility of a tariff war. The restrictions imposed by the monetary policy in central economies contribute to the increase in risk premia and the search for higher-quality assets, reducing capital flow to emerging market economies.

Mentions to delinquency and economic activity risks were slightly higher. There is concern about a sharp economic growth slowdown and increase of delinquency rates amid a scenario of high household and corporate indebtedness.

Operational risks continue to be mentioned, with concerns focused on cyber-attacks and electronic fraud in an increasingly digitalized financial services environment. Respondents believe that cyber-attacks could affect confidence in the financial system. Technological changes that incorporate new financial intermediation modalities, despite boosting competition, may also translate into sources of diffuse risks that are harder to mitigate (Table 1.3.2).

⁸⁹ The BCB conducts a quarterly survey to identify and monitor risks to financial stability according to the perception of SFN's institutions. It is noteworthy that the BCB has started publishing a [quarterly FSS report](#) (in Portuguese) since 2023Q4. The survey is published on the Thursday of the subsequent week to the Comef meeting. Opinions reported here come from the respondent financial institutions. Since the previous FSS edition, two surveys have been conducted, one from October 21 to November 2, 2024, and another from January 13 to February 5, 2025, respectively with 89 and 91 financial institutions responding out of a total of 100 institutions invited (of this total, 75 are regulated by the BCB, 12 by the CVM, 8 by Previc and 5 by Susep). In February 2025, the sample with the BCB's segment of regulated institutions that responded to the latest FSS accounted for almost 92% of the assets in this segment.

⁹⁰ Questions: "In the next three years, which risks to financial stability does your institution deem as most relevant, considering the probability of occurrence and their impact on the SFN?" and: "For each of the three mentioned risks, indicate the probability and the impact, considering the following classes: i) probability: low (<1%); medium-low (1%-10%); medium-high (10%-30%); high (>30%); ii) impact (SFN's total assets): very low (<0.1%); low (0.1%-1%); medium (1%-5%); high (5%-10%); very high (>10%)".

Table 1.3.1 – FSS – Risk considered most important by financial institutions

Risk	Frequency (%)			Probability	Impact
	Aug 2024	Nov 2024	Feb 2025	Feb 2025	
Fiscal risks	41	42	52	Medium-High	High
Global scenario	23	27	16	Medium-High	High
Delinquency and economic activity	12	12	13	Medium-High	High
Liquidity risk	3	3	4	Medium-Low	Medium
Market risk	3	2	3	Medium-Low	Medium

Table 1.3.2 – FSS – Three risks mentioned by financial institutions

Risk	Frequency (%)			Probability	Impact
	Aug 2024	Nov 2024	Feb 2025	Feb 2025	
Global scenario	0.92	0.84	0.86	Medium-High	Medium
Fiscal risks	0.66	0.72	0.74	Medium-High	High
Delinquency and economic activity	0.39	0.43	0.44	Medium-High	High
Operational risk	0.19	0.19	0.19	Medium-Low	Médio
Domestic inflation	0.13	0.09	0.15	Medium-High	Medium

Note: Financial institutions answer the following question: "In the next three years, which risks to financial stability does your institution deem as most relevant, considering the probability of occurrence and their impact on the SFN? Describe the three risks in order of importance (the most important first, considering the product between the probability of the event occurring and the magnitude of losses as a fraction of the total SFN's assets)". The BCB then classifies these descriptions into different risk categories for analytical purposes. Table 1.3.1 presents information referring only to the most important risk according to each institution, while Table 1.3.2 refers to the three risks listed by each of them.

Textual analysis of the most important risk corroborates the increasing concern regarding the fiscal policy and its repercussions. Despite reducing when compared with the previous two surveys, "inflation" and "interest" are the most mentioned terms by financial institutions regarding the answers about the key risks to stability,⁹¹ followed by "delinquency" and terms related to the fiscal situation. When comparing the last three surveys, the occurrence of terms related to the conduct of fiscal and monetary policies, such as "risk_of_fiscal_de-anchoring", and to economic activity, such as "slowdown", increased. Conversely, references to global scenario terms such as "war", "U.S.A.", and "middle_east" decreased (Charts 1.3.1 e 1.3.2).⁹²

91 It should be noted that terms such as "inflation" and "interest" may refer to both domestic and international variables.

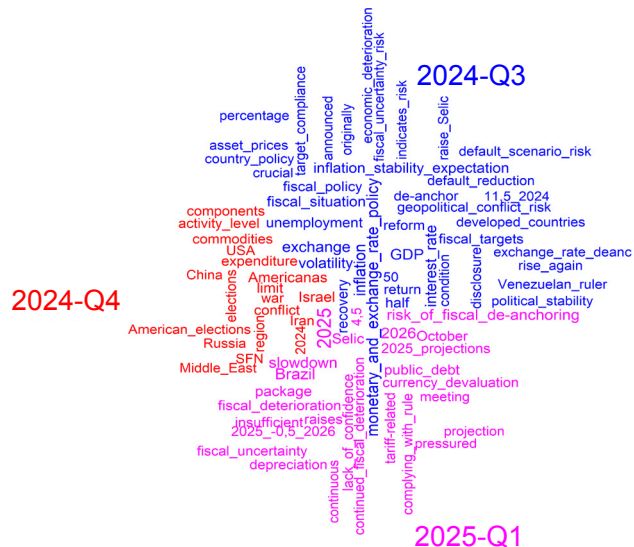
92 In many cases, the word cloud does not allow to distinguish whether the variable refers to Brazil or abroad. However, the assessment is complemented with a more granular analysis.

Chart 1.3.1 – FSS – Word cloud describing the most important risk



Note: The word cloud is compiled from the textual analysis of the most important risk described by each respondent. The size of the word is proportional to its frequency.

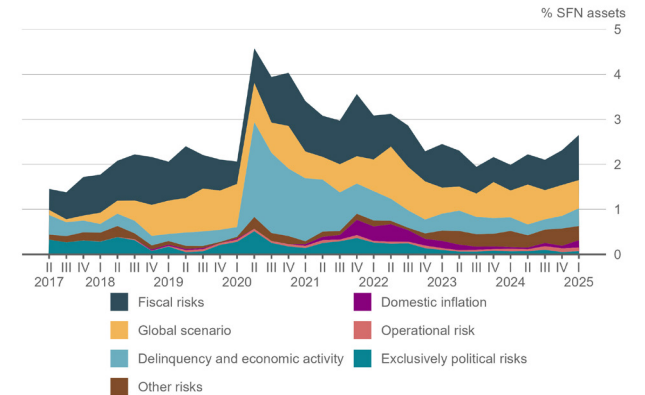
Chart 1.3.2 – FSS – Evolution of risk perception



Note: The comparative word cloud is compiled from the textual analysis of the most important risk described by each respondent. The color of the word indicates the FSS in which the word frequency was predominant. The size of the word is proportional to the difference between the word frequency in the corresponding FSS and the average frequency of the same word in the three surveys depicted in the chart.

The average expected impact of risks on the SFN increased compared with the last two surveys, mainly driven by fiscal risks and delinquency and economic activity risks. The sum of the average expected impact of all risks rose to 2.65% of the SFN's assets, compared with 2.1% in the August 2024 survey. On the same basis of comparison, the average expected impact of fiscal risks increased from 0.67% of SFN assets to 1.00% and that of delinquency and economic activity risks also rose, from 0.28% to 0.39%. In turn, although the average expected impact of global outlook risks fell from 0.69% to 0.63%, they remain the most mentioned risk when considering the three risks mentioned by financial institutions (Chart 1.3.3). When observing separately the probability of materialization and the impact of risks in the universe of financial institutions that mentioned these risks, the increase in the probability of fiscal risks and delinquency and economic activity risks and the increase in the impact of domestic inflation stand out (Charts 1.3.4.a to 1.3.4.e).

Chart 1.3.3 – FSS – Average expected impact



Note: The average expected impact of risk r is computed as $I_r = \frac{1}{n} \sum_b \text{probability}_{br} * \text{impact}_{br}$, where n is the number of financial institutions; and probability and impact are values assigned by the respondents to the r risk mentioned in the FSS. Risks are assumed to be independent so they can be aggregated into a single indicator. Hence, $I = \sum_r I_r$. All three risks pointed out by financial institutions are considered. The measure I_r refers to the expected impact of a risk type from the point of view of the group of respondents. It is not a feature of the r risk class itself but of the group's expectation about the materialization of that risk. For example, there could be a risk class with a very high expected impact mentioned by only one respondent. In this case, the average expected impact of the risk from the respondents' point of view would be low.

Chart 1.3.4.a – FSS – Global scenario:
probability, impact and frequency

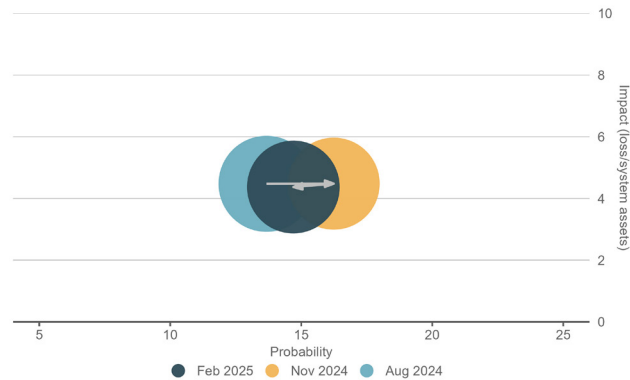


Chart 1.3.4.b – FSS – Fiscal risks:
probability, impact and frequency

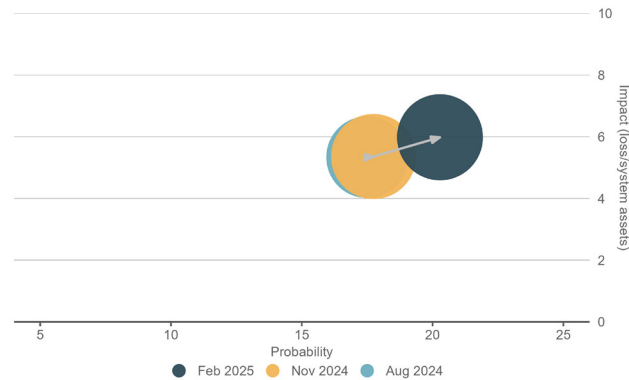


Chart 1.3.4.c – FSS – Delinquency and economic activity:
probability, impact and frequency

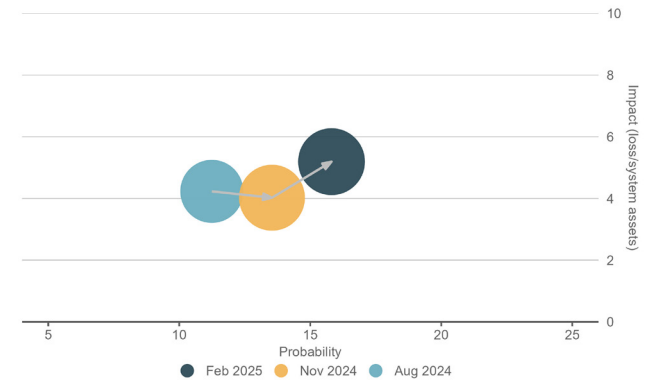


Chart 1.3.4.d – FSS – Operational risk:
probability, impact and frequency

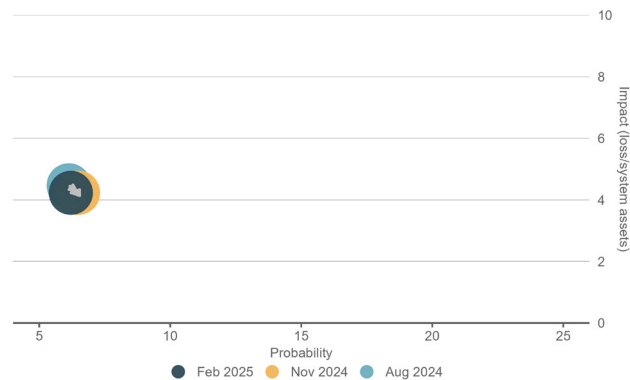
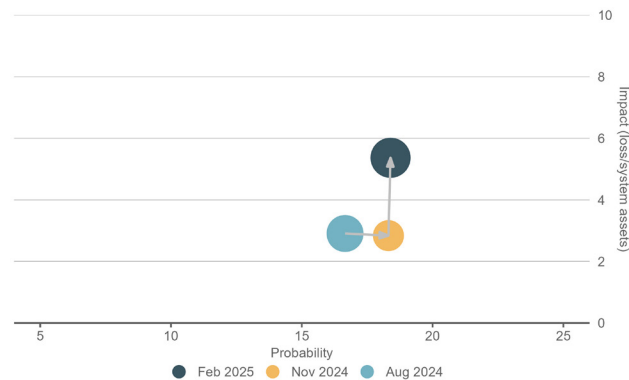


Chart 1.3.4.e – FSS – Domestic inflation:
probability, impact and frequency

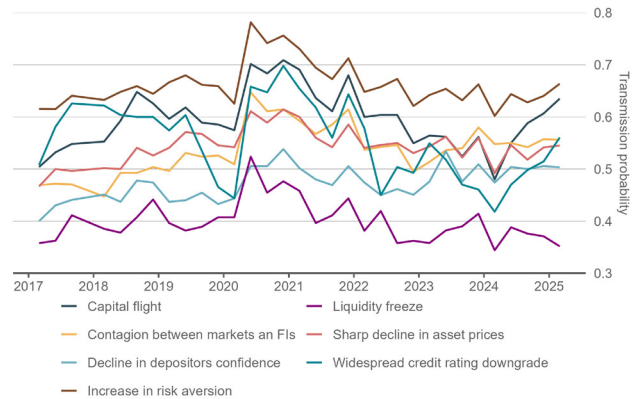


Note: The size of the circle represents the frequency of the risk. The x and y coordinates represent the midpoint of the probability and the impact classes, respectively.

“Increase in risk aversion” and ‘capital flight’ continued to be the most likely channels for transmitting shocks, with the ‘rating downgrade’ channel also gaining strength. Compared with the August survey, the probability of transmission of an “increase in risk aversion” raised slightly, remaining the most relevant channel. The most significant rises in the probability of shock transmission were in the “capital flight” and “rating downgrade” channels. Conversely, the probability of transmission of “liquidity freeze”

fell, remaining the least relevant channel. The other channels remained relatively stable (Chart 1.3.5).

Chart 1.3.5 – FSS – Transmission channels of high-impact events

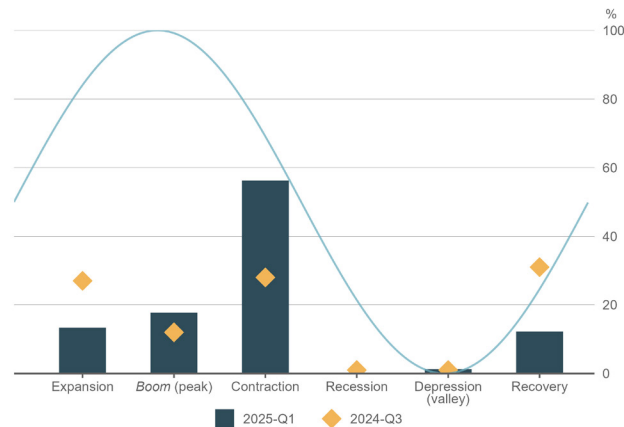


Note: Financial institutions answer the following question: “In the case of the occurrence of the event described as the most relevant to financial stability, what is the probability of this shock being carried through the channels below?”

Economic and financial cycles⁹³

The perception of the economic cycle changed significantly, with increased assessment of contraction and reduced of expansion and recovery. The share of respondents assessing that the economic cycle is in “contraction” increased from 28% to 56% from August 2024 to February 2025. The percentage of respondents assessing that the economic cycle is in “recovery” fell from 31% to 12%. The prospect of “expansion” also dropped, from 27% to 13% (Chart 1.3.6).

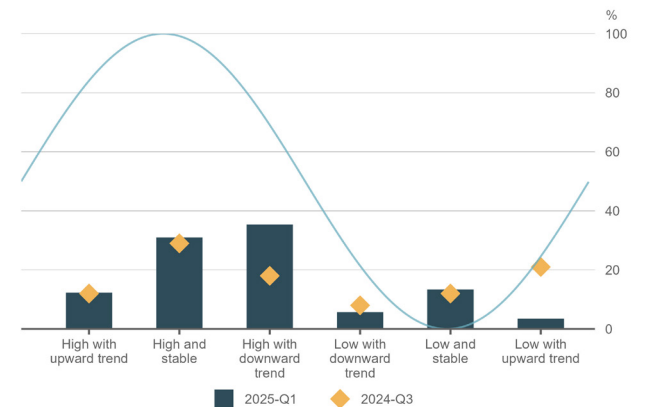
Chart 1.3.6 – FSS – Economic cycle



The perception of the credit/GDP gap as high has increased and the willingness of financial institutions to take risks is on a downward trend.

The share of financial institutions that consider the credit/GDP ratio to be at a high level rose to 78% in February 2025, from 59% in August 2024. Conversely, the perception of a downward trend increased (Chart 1.3.7.a). Despite a slight increase in the “high level” perception, the willingness of financial institutions to take risks is still considered low by most respondents (76%). The perception of a downward trend increased substantially, from 15% to 42% (Chart 1.3.7.b).

Chart 1.3.7.a – FSS – Financial cycles
Credit-to-GDP gap



⁹³ Questions: “How would your institution classify the current phase of the economic cycle? Classifications: Expansion; Boom; Contraction; Recession; Depression; and Recovery.” and “Classify your institution’s assessment of the following financial cycle factors: Credit/GDP gap; Access to funding and means of liquidity; Degree of corporate leverage; Degree of household leverage; Asset prices in relation to economic fundamentals; Willingness to take risks of institutions in your segment. Classifications: High/increasing; High/stable; High/declining; Low/declining; Low/stable; and Low/increasing”.

Chart 1.3.7.b – FSS – Financial cycles
Risk appetite

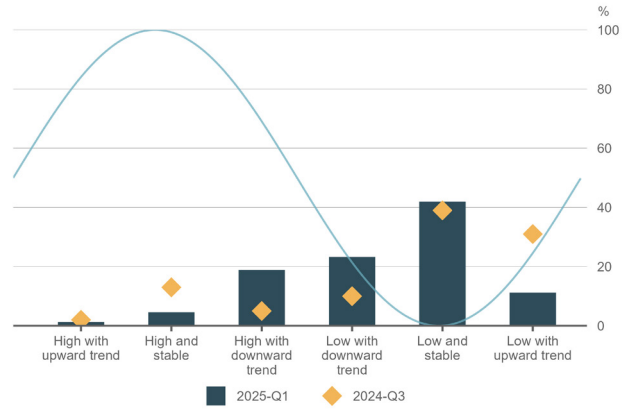


Chart 1.3.7.d – FSS – Financial cycles
Companies leverage

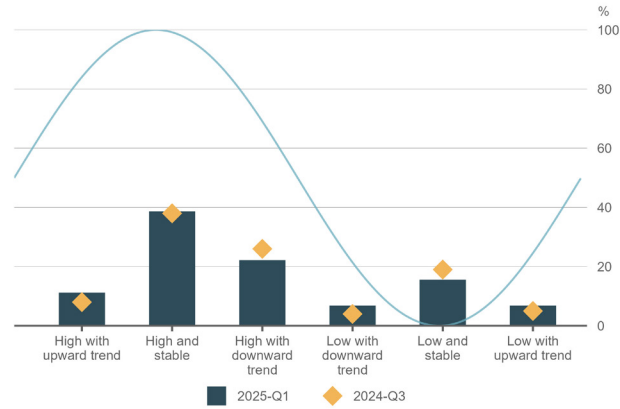


Chart 1.3.7.f – FSS – Financial cycles
Asset prices with respect to the fundamentals of the economy

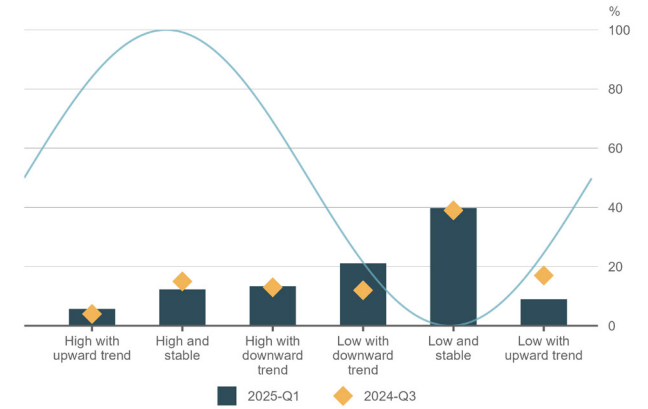


Chart 1.3.7.c – FSS – Financial cycles
Households leverage

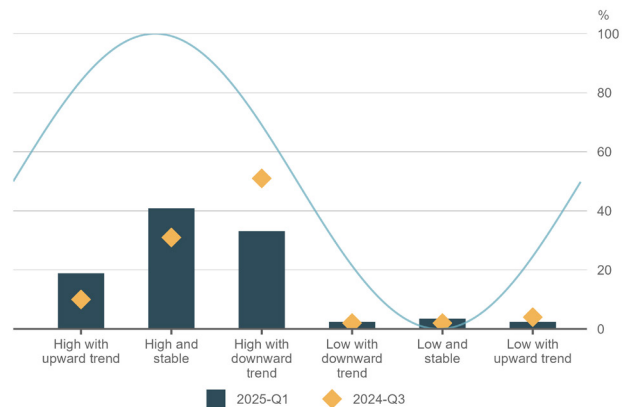
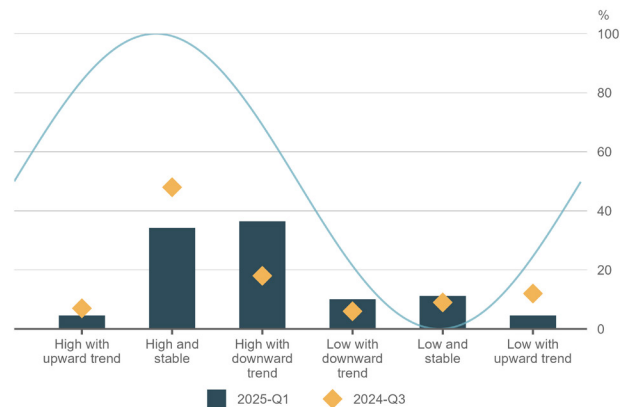


Chart 1.3.7.e – FSS – Financial cycles
Funding and liquidity



The degree of leverage of households and companies is still mostly perceived as high. The share of respondents assessing the household leverage as high remains elevated (92%). However, the share of respondents assessing that there is a stability trend increased from 33% in August 2024 to 44% in February 2025 (Chart 1.3.7.c). Regarding companies, 71% of respondents believe that the leverage is high (72% in August 2024). The perception of an upward trend rose to 18% in February, from 13% in August (Chart 1.3.7.d).

The perception of a downward trend in access to funding and means of liquidity and in asset prices increased. The share of respondents assessing that

there is a downward trend in the access to funding and liquidity increased from 24% in August to 46% in February (Chart 1.3.7.e). The perception of a downward trend in asset prices in relation to economic fundamentals also increased, from 25% to 34% (Chart 1.3.7.f).

Resilience and confidence in the financial system stability

Confidence in the SFN stability remains high. According to respondents, confidence in the stability of the financial system continues at a high level, close to the historic high. Most financial institutions are very or fully confident in the SFN's resilience (85% in February, compared with 80% in August). Similarly to the previous two surveys, there were no negative mentions – “little confidence” or “no confidence” (Charts 1.3.8.a to 1.3.8.b).

Expectations for the Countercyclical Capital Buffer (CCyB)

The financial institutions regulated by the BCB subject to the CCyB expect and suggest an ACCP_{Brasil} at 0%. Of those, around 95% expected the ACCP_{Brasil} to remain at 0% and 97% and recommended that this level is maintained (Charts 1.3.9.a and 1.3.9.b). This result has remained relatively stable during all the surveys.

Chart 1.3.8.a – FSS – Index of confidence in the stability of the financial system
Evolution of confidence indexes

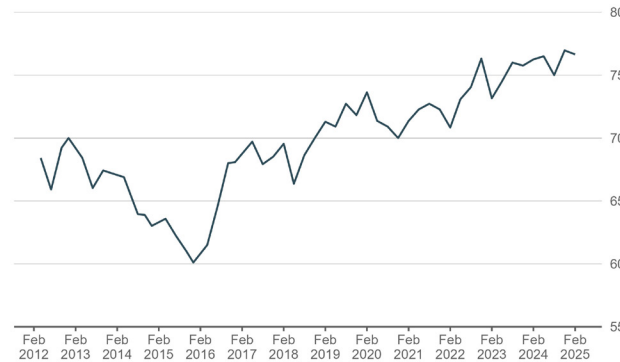


Chart 1.3.8.b – FSS – Index of confidence in the stability of the financial system
Relative distribution of confidence perceptions

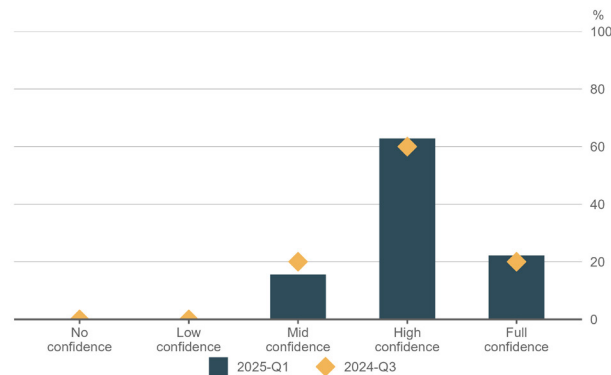


Chart 1.3.9.a – FSS – Expectations and suggestions for the Countercyclical Additional Buffer (Brazil)
Expectations

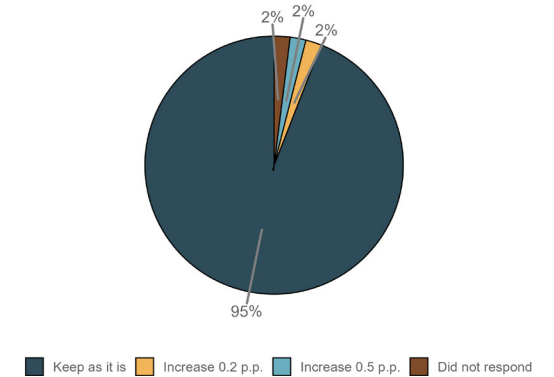
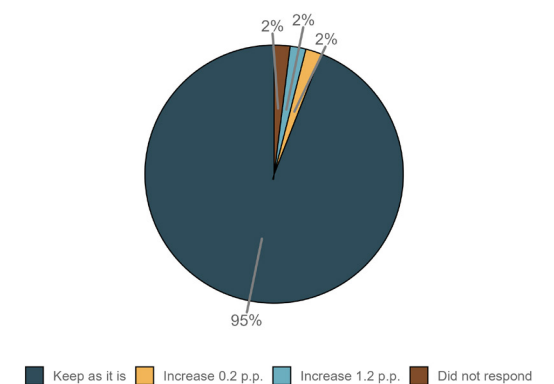


Chart 1.3.9.b – FSS – Expectations and suggestions for the Countercyclical Additional Buffer (Brazil)
Suggestions



1.4 Financial market infrastructures

In the second half of 2024, FMIs contributed to the safe and efficient functioning of the markets. The systems were compliant with regulatory requirements and applicable international principles. These are necessary conditions for the stability of the SFN.

The financial system held enough intraday liquidity⁹⁴ to ensure seamless transactions in the Brazilian Payment System (SPB).⁹⁵ Interbank market transactions were settled without any relevant issues and under low risk of intraday fund insufficiency throughout the semester (Chart 1.4.1).⁹⁶ Every two and a half days the Reserves Transfer System (STR) managed a turnover that roughly equals to the Brazilian GDP. During the semester, the average need for funds for daily payments (NEL) was 2.7% of total available liquidity, with a peak of 9.8%. The Instant Payment System (SPI) reached 252 million transactions on a single day. In more than 96% of time, institutions demanded no more than 25% of

their liquidity to settle payments off the STR's operating timetable (Chart 1.4.2).

Chart 1.4.1 – Liquidity Potential and Effective Liquidity Needs

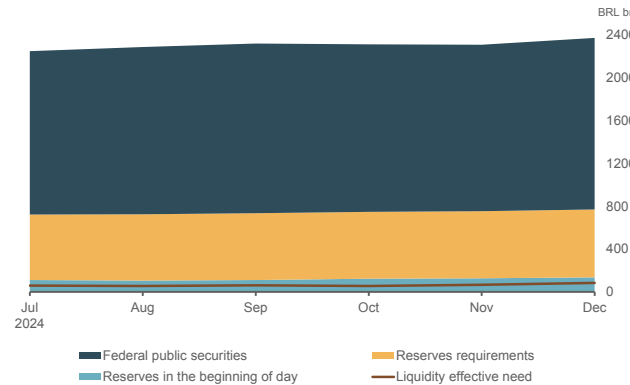
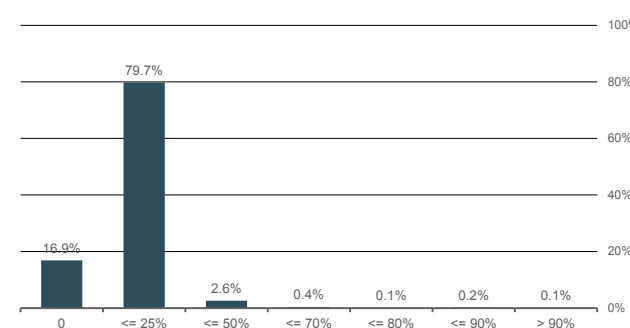
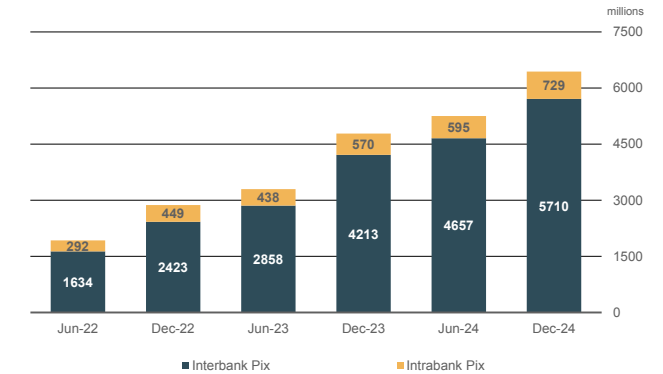


Chart 1.4.2 – After-Hours Liquidity Needs



Pix continues to increase its relevance in the SFN and SPB. In the past semester, this instant payment tool accounted for 25.8% of total retail payments. The transaction volume grew by 22.6% (Chart 1.4.3), and most transactions were between individuals (P2P), as shown in Chart 1.4.4, although there is a continuous increase in the participation of other use cases. The SPI maintained availability above 99.9% throughout the period, with 99% of transactions processed by the SPI within 0.581 seconds.

Chart 1.4.3 – Interbank Pix (settled by SPI) and Intra-bank Pix

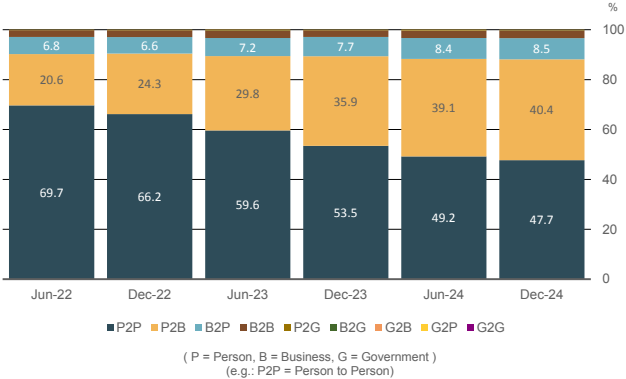


⁹⁴ Aggregate balance of funds available for interbank payments and transfers.

⁹⁵ Real-time gross settlement systems: Reserves Transfer System (STR), Instant Payment System (SPI) and Funds Transfer System (CIP-Sitraf).

⁹⁶ FIs can transfer required reserve balances to the Reserves Account and convert Brazilian government bonds into *Banco Central do Brasil* (BCB) money by doing repo operations, both without intraday financial costs.

Chart 1.4.4 – Pix transactions types (Interbank Pix)
Transaction percentage



The financial risks associated with financial assets, securities, and foreign exchange markets were properly managed by the FMIs. B3 S.A. acts as CCP in two systems: the B3 Clearinghouse and the B3 FX Clearinghouse. In both cases, the initial margin model’s confidence level exceeds 99%, in accordance with the Principles for Financial Market Infrastructures (PFMI).⁹⁷ The stress scenarios employed by B3 were more severe than the variations observed in the main Primitive Risk Factors (PRF)⁹⁸ in the period (Table 1.4.1). The margins

required by B3 Clearinghouse were sufficient to cover the risk of a high percentage of investors’ portfolios, as assessed by the BCB (Chart 1.4.5).

Table 1.4.1 – B3 Clearinghouse

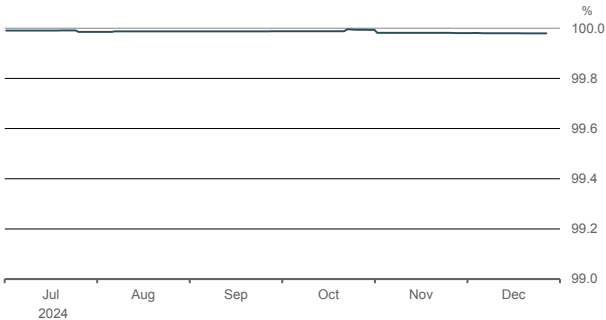
Primitive Risk Factors (PRF)	Discrimination	
	Low ^{1/}	High ^{1/}
Ibovespa spot	23%	14%
USD spot	27%	32%
Fixed rate 42	4%	19%
Fixed rate 126	14%	23%
Fixed rate 252	31%	26%
Fixed rate 756	53%	32%
DDI ^{2/} 180	22%	15%
DDI 360	30%	20%
DDI 1080	33%	31%

Sources: [B]³ and BCB. BCB staff calculations.

1/ Highest percentage of accumulated variation over 2 days considering the low and high scenarios in the 2nd semester of 2024.

2/ Foreign exchange coupon.

Chart 1.4.5 – B3 Clearinghouse
Accuracy statistics of the individual margin calculation model^{1/}



1/ Simply put, the statistic corresponds to an average, over a moving period of 63 working days, of the ratio between (i) the number of portfolios that would not have suffered losses greater than those calculated by the individual margin model used by the CCP; and (ii) the total number of portfolios.

Sources: [B]³, BCB, and BCB staff calculations.

The credit and liquidity exposures were adequately managed by the CCP on all days of the period.⁹⁹ In the B3 Clearinghouse, individual margin and prefunded additional resources would be sufficient to cover B3’s credit exposure to the two participants whose joint default would cause the largest aggregate credit exposure (Chart 1.4.6). The liquid resources maintained by the B3 Clearinghouse would be sufficient to ensure the timely settlement of obligations for the two participants with the largest net debt positions. In the B3 FX Clearinghouse, the required collateral would be sufficient to cover its credit exposures associated

97 This confidence level relates to the estimated distribution of future exposure to settled financial instruments.

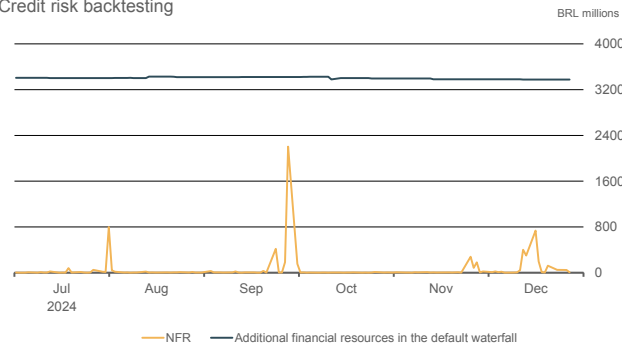
98 The primitive risk factor associated with a derivative contract is the designation given to the financial variables that are relevant to the contract’s price formation.

99 The backtestings indicate that the B3 Clearinghouse and the Foreign Exchange Clearinghouse are complying with SPB legislation and the objectives of the PFMI.

with each of the participants. Liquid resources held by the B3 FX Clearinghouse would be sufficient to cover the default of the participant with the largest obligation in Brazilian reais (Chart 1.4.7) and in U.S. dollars (Chart 1.4.8).¹⁰⁰

Chart 1.4.6 – B3 Clearinghouse

Credit risk backtesting



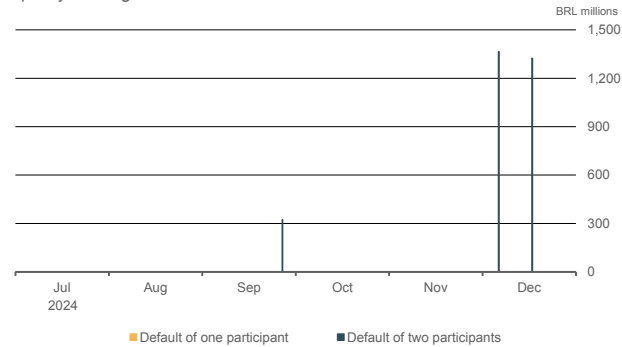
The Net Financial Result (NFR) is determined by comparing the financial result arising from the simulation of closing-out the participant's position against the value of its collateral, if it is declared in default. This result is calculated based on the close-out strategy projected by the individual margin calculation model and the actual changes in asset prices, observed in the subsequent days.

Sources: [B]³, BCB, and BCB staff calculations.

100 Principle 7 of the PFMI determines: a) maintenance of sufficient liquid resources to timely settle the obligations arising from the default of the two participants, including companies controlled by them, which would generate the largest aggregate payment obligation for the CCP, in the case of CCPs that are considered systemically important in more than one jurisdiction, or that have a complex risk profile; or b) maintenance of sufficient liquid resources to timely settle the obligations arising from the default of the participant and its affiliates, which would generate the largest aggregate payment obligation for the CCP, in the case of the other CCPs. Since the B3 FX Clearinghouse is systemically important only in Brazil, has a non-complex risk profile and only settles spot dollar purchase and sale contracts, the events represented in Charts 1.4.7 and 1.4.8 are consistent with international recommendations and domestic regulations.

Chart 1.4.7 – B3 FX Clearinghouse

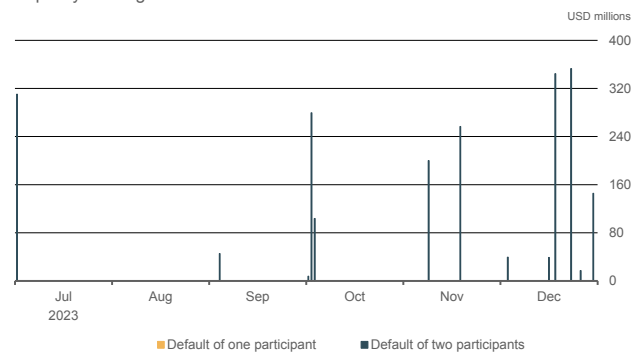
Liquidity shortage in BRL



Sources: [B]³ and BCB, and BCB staff calculations.

Chart 1.4.8 – B3 FX Clearinghouse

Liquidity shortage in USD



Sources: [B]³, BCB, and BCB staff calculations.

II

Selected Issues

Dolar	3,1464	3,1556
Euro	3,7064	3,7085
Ibovespa	67,671	67,659
CDI	9,14%	9,06%

2.1 Financial Stability Survey¹⁰¹ – Climate risks

In the FSS–Climate Risks 2025, financial institutions highlighted the strong climate events occurred in 2024. The number of financial institutions that reported the materialization of climate risks in their business more than doubled, reflecting the severity of extreme events registered in Brazil in 2024, such as those in Rio Grande do Sul. Among the 84 surveyed financial institutions, the assessment remains that the drought is the most relevant climate event in terms of the expected impact on the financial institution's assets in the long term. Financial institutions continue indicating as main channels for the transmission of physical risks to financial risks the impacts in the assets, productive processes and income, which would affect the credit market and delinquency. The number of respondents that manage transition risks, which

would be transmitted to the SFN mainly through the increased cost of complying with regulations and policies aimed at a low-carbon economy, remains relatively stable.

Climate physical risks¹⁰²

Financial institutions consider that, in the long term, the average expected impact of climate risks declined, remaining the drought as the event of largest concern. Respondents believe that the impact and the probability of acute climate events in the long term have decreased, except for the probability of wildfires. With these reductions, the average weighted expected impact¹⁰³ of acute events on the financial institutions' assets changed to low, except for droughts. According to the surveyed institutions, the expected average impact of droughts, which was estimated to be high in 2024,

changed to medium over the long-term horizon (Chart 2.1.1). Regarding chronic climate risks, the weighted average expected impact of scarcity of natural resources and desertification declined. With this reduction, the weighted average impact of all chronic events considered became low in the long-term (Chart 2.1.2). The reduced probability and impact of events could result from the improvement in the internal procedures of the respondents on the management of climate risks of the institution itself, such as the inclusion of new climate information and new procedures for the assessment of clients' risks.

101 The BCB conducts an annual survey to identify the perceptions of financial institutions about the effects of climate risks on the SFN's financial stability. Data collection period goes from January 13 to February 5, 2025. Of the 100 institutions invited (75 regulated by the BCB and 25 by the CVM, Previc, and Susep), 84 responded (corresponding to 96% of the total assets of the sample).

102 Questions: "A. Consider the physical climate events (acute/chronic) below. Assuming the occurrence of each event, indicate the respective impact in your institution in terms of losses of total assets of your financial institution over a horizon of up to five years (from 5 to 30 years)" and "B. Indicate the probability of occurrence of climate events listed in Question A over a horizon of up to 5 years (from 5 to 30 years)" For questions related to physical risks, short-term refers to a horizon up to five years and long-term, from 5 to 30 years. The parameters to answer these questions are: (i) physical acute events: drought, storm, waterlogging/floods, wildfire, and frost/hailstorm (ii) physical chronic events: change in the rainfall regime or in the temperature, desertification, soil degradation and compression and siltation of rivers, scarcity of natural resources, and rising sea level; iii) impact: very low (<0.1%); low (0.1%-1%); medium (1%-5%); high (5%-10%); very high (>10%); and (iv) probability: low (<1%); medium-low (1%-10%); medium-high (10%-30%); high (>30%)."

103 The expected individual impact of the financial institution is computed by multiplying the probability by the event's impact. This measure considers both the severity of the event (impact) and its possibility of occurrence (probability). The expected individual impact will be high only when both components have high values. The average expected impact is the average of the expected individual impacts weighted by the financial institutions' assets.

Chart 2.1.1 – FSS – Acute physical risks and their long term effects on financial institutions’ assets (5 to 30 years)



Chart 2.1.2 – FSS – Chronic physical risks and their long term effects on financial institutions’ assets (5 to 30 years)



Transition climate risks¹⁰⁴

The short-term is the most common horizon used in the management of transition climate risks. The percentage of financial institutions that informed that transition climate risks are part of their risk management is 40%, similar to the previous FSS. The short-term continues to be the mostly considered horizon. Only 17% of respondents manage long-term transition risk. The definition of horizons is directly related to the financial institutions’ business term profile. For example, financial institutions with portfolio concentrated on short-term operations tend to define shorter horizons. Financial institutions with a range of more complex operations and acting in sectors more vulnerable to transition climate risks consider more diversified horizons – short, medium, and long – and terms of longer horizons. The variability of horizons is also explained by the periodic reassessments made by financial institutions of their counterparties and scenarios. Improvements in the mitigation of climate risks on the part of the counterparties can reduce the horizons’ terms. New measures or information about the transition process for a low-carbon economy can positively or negatively impact the counterparties and

lead financial institutions to change their business profiles and the scenarios and horizons considered in their management of climate risks (Table 2.1.1). Regarding the effects of transition risks on financial institutions’ assets, in terms of percentage losses, most respondents consider the impact to be very low in the short- and medium-term horizon and medium in the long-term (Table 2.1.2).

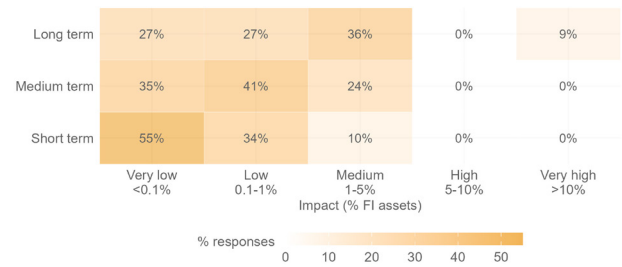
Table 2.1.1 – FSS – Transition climate risk management

Transition risks management?	FIs (%)	Term (Years)	
		Mean	Std dev
Yes	40	-	-
	Long Term	17	22
	Medium Term	25	10
	Short Term	35	4
No	60	-	-

Note: The percentage values in the column “Does the institution manage transition risk?” refer to the entire sample.

104 Questions: “Is transition climate risk incorporated into your institution’s risk management?”, “Which (is/are) the time horizon(s) considered in the transition climate risk analysis in your institution?”, “What is the impact of the transition risk on your institution in terms of asset losses in the time horizon(s) considered?” and “Describes the methodology used by the financial institution to evaluate transition risk (scenario, etc).”

Table 2.1.2 – FSS – Effects of transition risks on financial institutions’ assets



Note: The percentages in each cell show the share of respondents indicating “very low”, “low”, “medium”, “high”, or “very high” impact within a certain horizon (short-, medium-, or long-term). That means that the sum of shares for the same horizon is always one.

Financial institutions reported improvements in the assessment of transition climate risks, such as the use of new data, specific studies, and integrated stress testing. Financial institutions reaffirmed the use of tools and methodologies cited in previous survey to monitor and evaluate climate risks to which they are exposed. These include scenarios from the Network for Greening the Financial System

(NGFS), the Intergovernmental Panel on Climate Change (IPCC), and the European Central Bank (ECB), as well as recommendations from the Task Force on Climate-related Financial Disclosures (TCFD), the green taxonomy, and the sensitivity scale of the Brazilian Federation of Banks (Febraban). Financial institutions reported periodically reassessing their counterparties' ability to mitigate climate risks using ratings and questionnaires that cover Environmental, Social, and Governance (ESG) dimensions. They also re-evaluate the concentration of their portfolios and their exposure to more vulnerable sectors. Some financial institutions conduct integrated stress tests, considering that in a scenario of disorderly transition, physical climate events tend to increase. They also carry out specific studies, such as assessing the impact of the European Union's Anti-Deforestation Law. Other financial institutions have incorporated data from the Digital Atlas of Disasters in Brazil into their analysis of operations and clients to map climate events. They also use information from the Brazilian Institute of Environment (IBAMA) and the Ministry of Labor and Employment to verify restrictions on corporate taxpayer registration numbers (CNPJs).

Climate risks and transmission channels¹⁰⁵

Credit risk (delinquency) remains the most significant financial risk in the transmission of both physical and transition climate risks. The surveyed financial institutions assess that the transmission channels of physical climate risks to key financial risks include: (i) damage or repricing of households and companies’ assets; (ii) decline of corporate productivity due to business interruption or assets idleness; (iii) loss/reduction of households’ income; and (iv) reduction in agricultural sector productivity. The materialization of physical climate risks would primarily impact financial institutions through credit risk (delinquency) and, to a lesser extent, market risk and credit risk due to collateral depreciation (Chart 2.1.3). Regarding transition climate risk, delinquency also stands out as the most significant financial risk. However, the transmission channels of transition risk to traditional financial risks are more spread, with certain channels being particularly noteworthy (i) increased costs due to policies/regulation for a low-carbon economy and (ii) market barriers due to international regulatory and policy changes (Chart 2.1.4).¹⁰⁶

105 Question: “Considering the main physical risks (transition risks) listed by your financial institution, indicate the three main transmission channels of these risks to financial risks by relevance (the most relevant first) for your institution and indicate the respective risk to which your financial institution is exposed. Choose the transmission channel and the associated risk: Transmission channel (Financial risk)”.
106 The most relevant channels included in “Other transmission channels” are: “Increased cost/consumption of energy”, “Changes in the agricultural productive area”, “Climate litigation”.

Chart 2.1.3 – FSS – Transmission channels of physical climate risks to financial risks

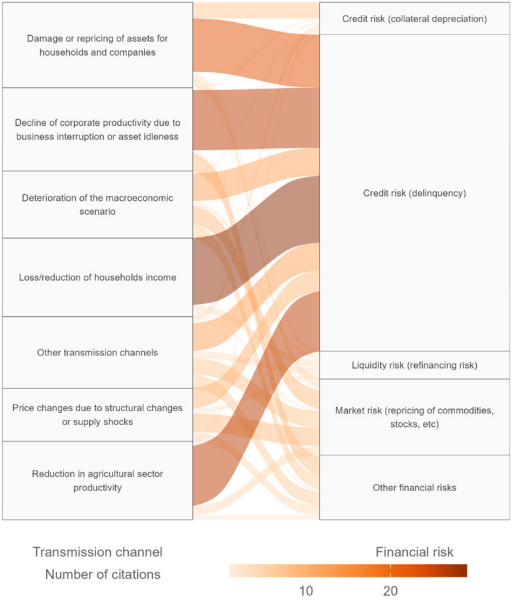
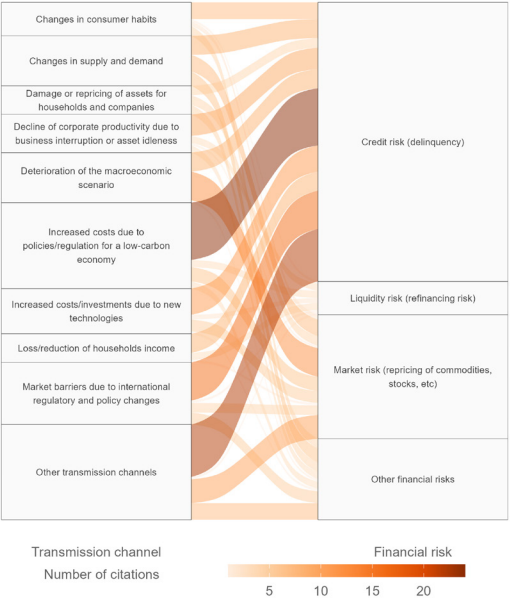


Chart 2.1.4 – FSS – Transmission channels of transition climate risks to financial risks



Note: “Other transmission channels” is relevant in terms of the amount of frequently mentioned responses. This channel represents several less frequently mentioned transmission channels. The most relevant are the increased cost and consumption of energy, changes in the agricultural productive area, and climate litigation.

Climate risks and likely threats to financial stability¹⁰⁷

Most financial institutions believe that the effects of extreme climate events on financial stability would manifest primarily through the credit market and delinquency. Some financial institutions, despite recognizing the relevance of climate risks, consider that the materialization of physical climate risks would have a limited impact on the SFN. This assessment stems from the confidence in the sector's risk management practices and previous studies indicating a low concentration of SFN's credit portfolio exposed to physical climate risks and a limited impact in stress scenarios. As further evidence, respondents cite the extreme climate events that occurred in Rio Grande do Sul in 2024, whose effects did not threaten the SFN's stability due to the sector's resilience and the swift action taken by institutions and the BCB in implementing emergency measures. However, most respondents believe that acute climate events – such as droughts, storms, and floods – can negatively affect the economic performance of businesses and institutions, leading to negative consequences on the credit market and delinquency. These events may damage physical infrastructure, including roads, assets, and properties, raising repair costs and disrupting supply

107 Question: “How does your institution believe that climate risks could threaten the SFN's financial stability?”

Table 2.1.3 – FSS – Materialization of climate risks in the previous year

Responses (%)	2024 Survey	2025 Survey
Yes	17	44
No/ No answer	83	56

The maturity level¹⁰⁹ of institutions in adopting climate risk-related actions has slightly increased, mainly reflecting progress in the downstream dimension. The percentage of financial institutions that have implemented methodologies to manage climate risks has risen. However, the percentage

of financial institutions with already implemented methodologies that include impact measurement and defined targets for risk reduction remained unchanged, indicating stability in the Governance and Culture dimension. There was a decline in the percentage of financial institutions that reported being signatories to initiatives aimed at fostering a more sustainable economy (alignment dimension).¹¹⁰ Conversely, the percentage of financial institutions adopting risk management actions to enhance the selection of clients with greener production processes and lower climate risk exposure (downstream dimension) has increased. This rise offset the reduction in the alignment dimension and contributed to the slight increase in the maturity index of the 2025 survey compared with 2024 (Table 2.1.4).

109 The level of maturity was built based on the textual description of measures used by the financial institution to mitigate the effects of climate risks. Responses were classified into one or more of the following dimensions: (i) Governance and culture –encompasses the methodologies for analyzing climate risks. This dimension is subdivided into four items and reflects the stage the financial institution is at: 1 – Own activities – when the financial institution has sustainable actions limited to administrative activities (e.g., water reuse); 2 – Methodology under analysis – when it has defined the methodology and indicators associated with climate risks, but has not yet implemented them; 3 – Methodologies implemented – when the methodologies and indicators are already used to analyze climate risks; and 4 – Impact and target setting – when the financial institution not only has and calculates indicators related to climate risks, but also includes institutional targets associated with these risks; (ii) Alignment – indicates whether the financial institution is a signatory to global, national, or regional initiatives encouraging a sustainable economy; (iii) Downstream – indicates that the financial institution has actions or develops products aimed at clients that encourage a sustainable economy; (iv) Upstream – indicates that the financial institution has mitigation actions aimed at suppliers; and (v) Society – indicates that the financial institution develops actions that engage several actors, from employees to society in general. The financial institution’s level of maturity regarding the existence of actions to mitigate the effects of climate risks is given by a sum of the five dimensions: in governance and culture, the financial institution can score from 0 to 0.5 points, with 0.125 points added for each stage advance (0 for the own activities stage and 0.5 for the impact and goal-setting stage). In the other four dimensions, the institution can score 0 or 0.125 points, depending on whether there are mitigating actions in that dimension. In this methodology, the maturity level ranges from 0 to 1.

110 These initiatives include the Principles for Responsible Banking (PRB), the Net-Zero Banking Alliance (NZBA), and the Principles for Responsible Investment (PRI). These initiatives were established or jointly created by the United Nations Environment Programme Finance Initiative (UNEP-FI).

Table 2.1.4 – FSS – Actions to mitigate climate risks impacts

Action dimensions/focus	2024 % FIs	2025 % FIs
Governance and culture		
In-house activities	5	4
Methodologies under analysis	7	8
Implemented methodologies	27	30
Impact and target setting	30	30
Alignment		
The FI is a voluntary signatory	18	13
Downstream		
Clients	29	38
Upstream		
Suppliers	5	8
Society		
Stakeholders	5	5
Maturity index (Sum of dimensions - from 0 to 1)		
Simple average	0.34	0.37
Asset-weighted average	0.59	0.60
Memo:		
FIs with at least 1 action	80	82
FIs that did not report actions	20	18

Standardization and availability of data and methodologies for the case of Brazil remain among the main recommendations from financial institutions to regulators. There have been no significant changes in the recommendations made by the responding financial institutions to the regulator. They continue to emphasize the importance of providing databases and methodologies, as well as conducting studies on climate risks that accurately reflect the Brazilian reality. This is evident in the textual descriptions through terms such as “data”, “standardization”, “provision”, “studies”, and “practices” (Chart 2.1.6). Additionally, they recommend conducting stress tests, implementing regulations proportional to the complexity of each institution, creating a website with climate information accessible to financial institutions, and promoting forums for discussing climate risks.

Chart 2.1.6 – FSS – Recommendations to the regulator



2.2 Credit exposures at risk arising from physical climate risks

Introduction

The largest exposures of the Brazilian National Financial System (SFN) to physical climate risk are related to drought events, the Cerrado, Atlantic Forest, and Pampa biomes, and the consumer staples sector, which includes agriculture and livestock. These exposures were obtained from a mapping of the SFN’s exposure to physical climate risks, considering biomes, industry sectors, and the severity of climate events. Although the results of this mapping are exploratory in nature and have limitations, they offer multiple preliminary perspectives on the SFN’s exposure to physical climate risk, enabling the development of more detailed metrics.

Direct risks arising from climate change to infrastructure, supply chains, and other assets are referred to as physical climate risks. These risks materialize through extreme events such as droughts, floods, hurricanes; or gradual changes such as rising sea levels and temperature shifts. The increased

frequency and severity of these events have made such risks relevant to financial stability. Damage to properties and businesses can potentially increase default rates and impact the soundness of institutions.

Methodology

The methodology used by the *Banco Central do Brasil* (BCB) to assess physical climate risks in the credit exposures of the financial system considered biomes, the sensitivity of industry sectors, and the severity of climate events. For each sector of economic activity and for each biome in which a credit exposure is located, a physical climate risk exposure was calculated using two weighting factors. The first weighting factor is the sensitivity of the industry sector associated with the exposure to each type of physical risk, obtained from a study by S&P Global.¹¹¹ The second weighting factor, which uses data from the Digital Atlas of Disasters in Brazil,¹¹² is a measure – per biome – of financial losses per capita associated with various types of climate disasters. In a credit operation, the weighted exposure to a given type of physical climate risk, such as drought, is the product of the outstanding balance and its

111 S&P Global, Quantifying the financial costs of climate change physical risks for companies, November 20, 2023. Available at <https://www.spglobal.com/esg/insights/featured/special-editorial/quantifying-the-financial-costs-of-climate-change-physical-risks>.

112 Atlas Digital de Desastres no Brasil, Ministério de Desenvolvimento Regional (MCR). Available at <https://atlasdigital.mdr.gov.br/>.

two weighting factors. The types of physical climate risk and the sectors considered follow S&P Global’s terminology, GICS (Tables 2.2.1 and 2.2.2).

Table 2.2.1 – Types of climate physical risk

Risk Type	
S&P Global terminology¹	This study
Wildfire	Wildfire
Extreme Heat	Heat Wave
Drought / Water Stress	Drought / Water Stress
Coastal Flood	Coastal Flood
Fluvial Flood	Heavy Rainfall and Fluvial Flood
Tropical Cyclone	Tornadoes, Strong Winds and Cyclones

Sources: S&P Global and Digital Atlas of Disasters in Brazil.

Table 2.2.2 – Industry sectors

Sector	Description
Communication Services	Includes media and entertainment services, and telecommunication services.
Financials	Financial services in general, including insurance and mortgage real estate investments
Health Care	Manufacturing and marketing of medicines, healthcare services, and manufacturing and marketing of medical equipment and supplies
Consumer Staples	Agriculture, livestock, food production and marketing, clothing industry and marketing, beverages
Utilities	Provision of essential public services such as electricity, natural gas, water and wastewater services
Consumer Discretionary	Automobiles and auto parts, apparel and luxury goods, hotel, restaurants, leisure, and other non-essential goods or services
Industrials	Transportation, equipment, construction materials, supplies
Real Estate	REITs in general, real estate management & development
Information Technology	Software development, IT services, IT hardware equipment, semiconductor equipment, communication equipment
Materials	Chemicals, construction materials, metals & mining, paper & forest products
Energy	Oil, gas and consumable fuels; energy equipment & services

Source: S&P Global.

The methodology requires information on the location of credit exposures. The scope included credit operations for legal entities, along with rural credit operations. The location of exposures to legal entities was obtained from BCB’s Credit Information System (SCR) data. In cases where the borrowing company operated in more than one municipality, its credit exposure was distributed among those

locations proportionally to the number of employees in each, according to the Annual Social Information Report (RAIS). The location of rural credit exposures was obtained directly from the Rural Credit Operations and Proagro System (SICOR) of the BCB.

It is possible to calculate various indicators of physical climate risk exposure in the SFN based on

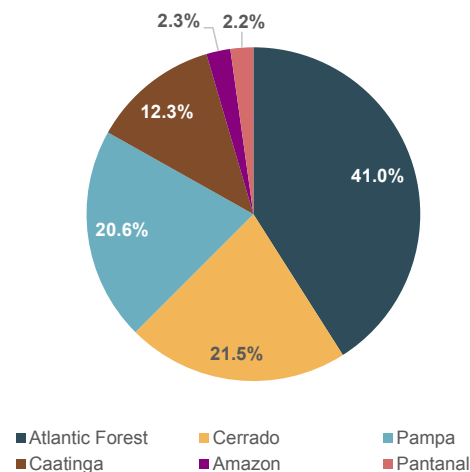
the grouping of exposures by financial institution, biome, and macroeconomic sector. Aggregating credit exposures to physical climate risk makes it possible to identify the financial institutions most exposed to this risk. Financial institutions can also be ranked according to the relevance of physical climate risk relative to their credit exposure. Another useful assessment for risk management and prudential supervision is to create a map of the most relevant physical climate risk exposures for a given financial institution, including regions, sectors, and types of physical climate risk.

Results and discussion

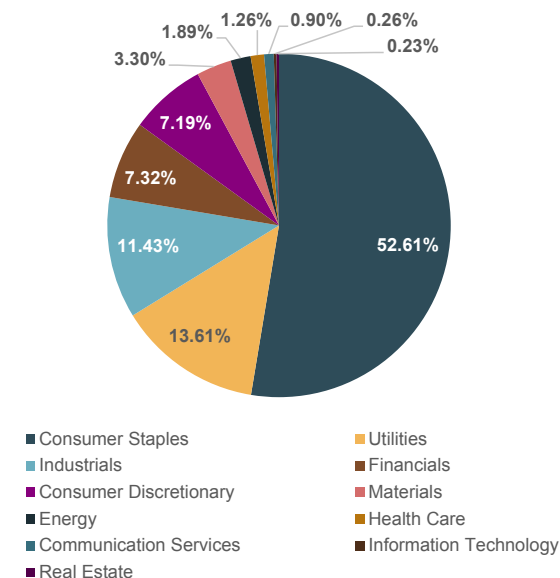
According to the methodology, the SFN has its greatest exposures to drought risk, particularly in the Cerrado, Atlantic Forest, and Pampa biomes, and in the basic consumer goods sector, which includes agriculture and livestock. Although the Cerrado and Pampa are the biomes with the highest incidence of disasters, the greatest physical climate risk to the SFN is found in the Atlantic Forest (41.0%), as it has the highest population density, followed by the Cerrado, Pampa, Caatinga, Amazon, and Pantanal (Chart 2.2.1). More than half of the exposures to risk are concentrated in the utilities sector (52.61% of the total) which includes agricultural and livestock activities (Chart 2.2.2). Next in relevance is the utilities sector, which includes electricity generation and

distribution, as well as water distribution. The most relevant type of physical risk is Drought and Water Stress (84.4% do total), followed by Heavy Rainfall and Fluvial Flood (Chart 2.2.3). Considering aggregated data from 1991 to 2023, the other types of risks are not significant.

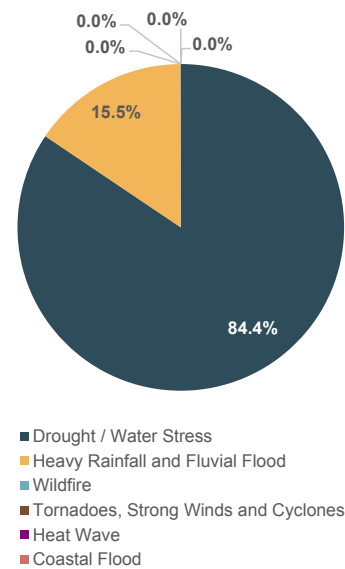
Graph 2.2.1 – Distribution of the SFN's exposure to physical climate risks by biome



Graph 2.2.2 – Distribution of the SFN's exposure to physical climate risks by sector



Graph 2.2.3 – Distribution of the SFN's exposure to physical climate risks by risk type



Considering the SFN as a whole, the greatest exposures to physical climate risk fall within the consumer staples sector, in the Cerrado, Atlantic Forest, and Pampa biomes, driven by the risk of drought and water scarcity (Charts 2.2.4a e 2.2.4b). Other relevant exposures include drought risks in the Caatinga biome within the same sector, and exposures in the utilities sector – which includes water distribution and electricity generation and distribution – in the Atlantic Forest biome. Based on the Disaster Atlas

database through 2023, the risk of heavy rainfall and flooding is of lesser relevance to the SFN. It should be noted that the approach used for these estimates does not take into account risk transmission mechanisms between biomes.

Graph 2.2.4a – Relevance of exposures to the risk of Drought and Water Stress' for each biome-sector grouping of economic activity in Brazil's financial system (SFN)

Sector	Biome					
	Amazon	Caatinga	Cerrado	Atlantic Forest	Pampa	Pantanal
Communication Services						
Consumer Discretionary						
Consumer Staples						
Energy						
Financials						
Health Care						
Industrials						
Information Technology						
Materials						
Real Estate						
Utilities						

Color code

	Risk > 10.00%
	5.00% < Risk < 10.00%
	1.00% < Risk < 5.00%
	Risk < 1.00%

Graph 2.2.4b – Relevance of exposures to the risk of 'Fluvial Flood and Heavy Rainfall' for each biome-sector grouping of economic activity in Brazil's financial system (SFN)

Sector	Biome					
	Amazon	Caatinga	Cerrado	Atlantic Forest	Pampa	Pantanal
Communication Services						
Consumer Discretionary						
Consumer Staples						
Energy						
Financials						
Health Care						
Industrials						
Information Technology						
Materials						
Real Estate						
Utilities						

Color code

	Risk > 10.00%
	5.00% < Risk < 10.00%
	1.00% < Risk < 5.00%
	Risk < 1.00%

The results presented are exploratory in nature and have limitations. The first limitation is the aggregation of the location of exposures at the biome level, lacking the necessary granularity for a more accurate risk analysis. Furthermore, the impact of each type of physical climate risk on the sectors was not adjusted to the Brazilian context. In addition, the temporal evolution of climate events – which have been intensifying in recent years – was not considered. Finally, the transmission mechanisms of climate risk to credit and across regions were disregarded. Nevertheless, the results provide multiple preliminary perspectives on physical climate risk in the SFN, allowing for the development of more detailed metrics.

2.3 Credit cost and spread decomposition

In 2024, the average Cost of Outstanding Loans (ICC) and its spread reduced slightly, reflecting the lower delinquency. Despite this decline, delinquency persists as the main component of the ICC spread. The average ICC for earmarked credit continues much lower than that of non-earmarked credit, although this difference has reduced due to the divergent behavior of the funding cost.

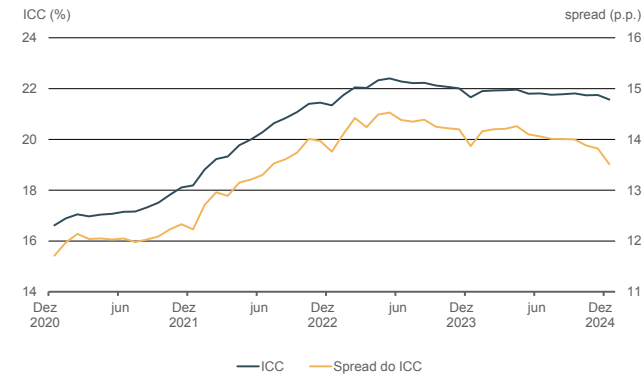
Lower delinquency more than offset the increased contribution of taxes and financial margin, leading to a 0.24 p.p. decline in the average ICC

in 2024. The adjusted average ICC decreased from 20.13% in 2023 to 19.89% in 2024 (Chart 2.3.1). The contribution of delinquency dropped from 4.52 p.p. to 4.15 p.p., reflecting the fall in the average delinquency rate, from 3.40% in 2023 to 3.19% in 2024, driven by the expansion in the credit portfolio and the dynamism of economic activity. The contribution of administrative expenses fell from 3.05 p.p. to 3.01 p.p., in line with the movement of reduction of physical network and digitalization of financial services. Conversely, the contribution of the group taxes and Credit Guarantee Fund (FGC) grew from 2.49 p.p. to 2.62 p.p., reflecting the increased contribution of the Tax on Financial Transactions (IOF), the Income Tax (IR), and the Social Contribution on Net Income (CSLL). The contribution of the financial margin rose from 2.52 p.p. to 2.57 p.p. Lastly, the funding cost remained stable, despite the decline in the average Selic rate, from 13.21% in 2023 to 10.83% in 2024. The funding cost of the non-earmarked credit reduced slightly but was offset by the increased funding cost of the earmarked credit (Chart 2.3.1).¹¹³

Table 2.3.1 – ICC adjusted average breakdown

Item	p.p.			
	2022	2023	2024	Average
1 - Funding cost	6.76	7.55	7.54	7.28
2 - Delinquency	3.68	4.52	4.15	4.12
3 - Administrative expenses	3.07	3.05	3.01	3.04
4 - Taxes and FGC	2.57	2.49	2.62	2.56
5 - ICC financial margin	2.61	2.52	2.57	2.57
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	18.69	20.13	19.89	19.57

Chart 2.3.1 – ICC and its spread



The order of importance of ICC components remained nearly stable, with funding cost at the top, followed by delinquency and administrative expenses. The participation of the funding cost increased from 37.51% in 2023 to 37.91% in 2024, reflecting the lower average ICC *vis-à-vis* the stable funding cost. Conversely, while the participation of delinquency fell sharply, from 22.45% in 2023 to 20.86% in 2024 (Table 2.3.2). The participation of the component taxes and FGC exceeded the participation of the ICC financial margin. Nonetheless, considering the 2022-2024 average as a more stable measure and less subject to the economic cycle trend, the participation of taxes and FGC remained practically identical to that of the ICC financial margin (Chart 2.3.2).

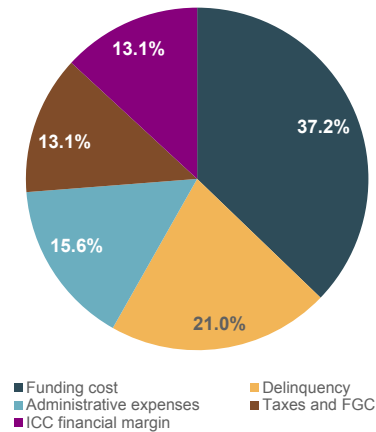
Table 2.3.2 – ICC adjusted average breakdown

As a proportion of adjusted average ICC

Item	%			
	2022	2023	2024	Average
1 - Funding cost	36.17	37.51	37.91	37.19
2 - Delinquency	19.69	22.45	20.86	21.00
3 - Administrative expenses	16.43	15.15	15.13	15.57
4 - Taxes and FGC	13.75	12.37	13.17	13.10
5 - ICC financial margin	13.96	12.52	12.92	13.13
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	100.00	100.00	100.00	100.00

¹¹³ For methodological details of this calculation, see the appendix of this section.

Chart 2.3.2 – ICC breakdown
Average 2022 to 2024



The ICC spread fell in 2024 due to the lower delinquency. The average ICC spread fell from 12.58 p.p. in 2023 to 12.35 p.p. in 2024, with the contribution of delinquency dropping from 4.52 p.p. to 4.15 p.p. The value of administrative expenses also declined slightly. However, taxes and FGC and the ICC financial margin increased in the period, mitigating the fall in the spread (Table 2.3.3).

Table 2.3.3 – ICC spread breakdown

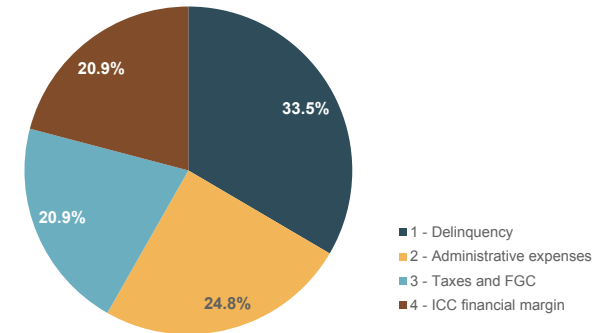
Item	p.p.			
	2022	2023	2024	Average
1 - Delinquency	3.68	4.52	4.15	4.12
2 - Administrative expenses	3.07	3.05	3.01	3.04
3 - Taxes and FGC	2.58	2.49	2.62	2.56
4 - ICC financial margin	2.61	2.52	2.57	2.57
ICC spread (1 + 2 + 3 + 4)	11.94	12.58	12.35	12.29

Despite this decline, delinquency persists as the main component of the ICC spread. The delinquency contribution fell from 35.93% to 33.6% in 2024 (Table 2.3.4), but is still far behind the other components, such as administrative expenses (24.37%), taxes and FGC (21.21%), and ICC financial margin (20.81%).

Table 2.3.4 – ICC spread decomposition
As a proportion of the spread

Item	%			
	2022	2023	2024	Average
1 - Delinquency	30.82	35.93	33.60	33.45
2 - Administrative expenses	25.71	24.24	24.37	24.78
3 - Taxes and FGC	21.61	19.79	21.21	20.87
4 - ICC financial margin	21.86	20.03	20.81	20.90
ICC spread (1 + 2 + 3 + 4)	100.00	100.00	100.00	100.00

Chart 2.3.3 – ICC spread breakdown
Average 2022 to 2024



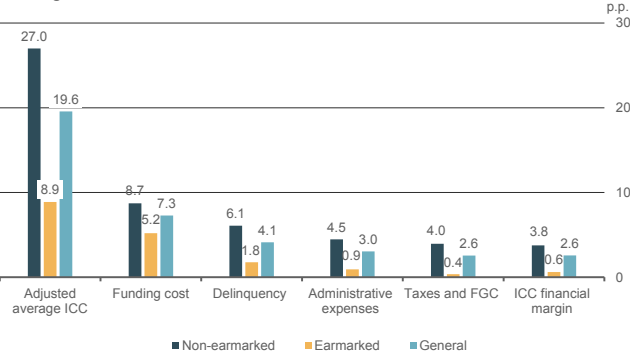
The average ICC for earmarked credit and each of its components continued much lower than those for non-earmarked credit. Similarly to previous years, the financial margin of the earmarked credit remained close to zero (Table 2.3.5 and Chart 2.3.4). The caps on interest rates for earmarked credit imposed by specific regulations explain this characteristic. Assuming the non-existence of an earmarked credit portfolio with near-zero profitability, it is reasonable to assume that the profitability of the non-earmarked credit portfolio could be lower,¹¹⁴ since financial institutions tend to compensate for profitability by increasing the ICC financial margin of non-earmarked credit to generate returns on the capital invested in both types of credit.

¹¹⁴ Simulations on Box 6 of the Banking Report 2017 "Methodology for Assessing the Impact of Reserve Requirements and Earmarked Credit" demonstrate that reductions in the rates of non-earmarked credit are proportional to reductions in the earmarked credit balance.

Table 2.3.5 – ICC Decomposition by credit type

	Non-earmarked			Earmarked			Overall		
	2022	2023	2024	2022	2023	2024	2022	2023	2024
1 - Funding cost	8.11	9.12	8.94	4.73	5.28	5.59	6.76	7.55	7.54
2 - Delinquency	5.32	6.69	6.26	1.59	1.91	1.82	3.68	4.52	4.15
3 - Administrative expenses	4.44	4.48	4.47	0.95	0.92	0.91	3.07	3.05	3.01
4 - Taxes and FGC	3.94	3.87	4.04	0.37	0.33	0.40	2.57	2.49	2.62
5 - ICC financial margin	3.82	3.70	3.78	0.63	0.58	0.62	2.61	2.52	2.57
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	25.63	27.86	27.49	8.27	9.02	9.34	18.69	20.13	19.89

Chart 2.3.4 - ICC components
Non-earmarked, earmarked and total credit
Average 2022 to 2024



The difference between the earmarked credit ICC and non-earmarked credit ICC fell in 2024, reflecting the increased funding cost of earmarked credit and the slight decline of funding cost of non-earmarked credit. The difference decreased from 18.84 p.p. in 2023 to 18.15 p.p. in 2024. The funding cost of earmarked credit increased from 5.28% in 2023 to 5.59% in 2024, following the increase of the TLP (*Taxa de Longo Prazo*). Part of the earmarked credit is indexed to the TLP, which is associated with the inflation measured by the IPCA and the real interest rate of the 5-year NTN-B government security. The

funding cost of earmarked credit operations dropped from 9.12% in 2023 to 8.94% in 2024, following the reduction of the average Selic rate in 2024.¹¹⁵

Methodological appendix

The ICC decomposition aims to identify and measure the main factors that determine the cost of credit for borrowers.¹¹⁶ Table 2.3.A1 shows the items used for the calculation of decomposition and its values, while Table 2.3.A2 decomposes the overall ICC into non-earmarked and earmarked credit. These items are grouped into five components, as follows (between brackets, the corresponding lines in the table):

- 1) “Funding Cost” (B): estimates the interest paid by financial institutions on their funding, as in the case of time deposits;
- 2) “Delinquency” (H + I + J): captures losses arising from non-payment of debts or interest, in addition to discounts granted;

115 Interest rates of non-earmarked credit operations respond more to changes in the Selic rate. See, for instance, box “Monetary policy power” in the March 2020 Inflation Report.

116 For methodological details on the ICC decomposition, see box 5 “Credit cost and spread decomposition methodology” of the Banking Report 2017, and boxes concerning methodological improvements in subsequent reports.

Table 2.3.A1 – ICC composition

Item	p.p.		
	2022	2023	2024
A.1 - Average ICC	20.38	22.09	21.81
A.2 - Adjustment for capitalization method	1.69	1.96	1.92
A - Adjusted average ICC (A.1 - A.2)	18.69	20.13	19.89
B.1 - Funding cost	6.97	7.81	7.80
B.2 - Adjustment for capitalization method	0.21	0.26	0.26
B - Adjusted funding cost (B.1 - B.2)	6.76	7.55	7.54
C - Spread (A - B)	11.94	12.58	12.35
D - FGC expense	0.05	0.05	0.05
E - IOF	0.21	0.23	0.30
F - PIS and Cofins contributions	0.50	0.52	0.52
G - Administrative expenses	3.07	3.05	3.01
H - Loss estimate	2.76	3.40	3.18
I - Interest not received from operations with delays of 60 days or more	0.64	0.79	0.69
J - Discounts granted	0.28	0.33	0.28
K.1 - Interest on equity received by shareholders	0.54	0.58	0.55
K.2 - Withholding income tax on interest on equity	0.09	0.10	0.10
K - Interest on equity expense (K.1 + K.2)	0.63	0.68	0.65
L - ICC margin before income tax, social contribution (C - D - E - F - G - H - I - J - K)	3.81	3.54	3.66
M - Income tax and social contribution	1.73	1.59	1.65
N - ICC financial margin (L - M + K.1)	2.61	2.52	2.57

Table 2.3.A2 – ICC composition by credit type

Average 2022 to 2024

Item	p.p.		
	Non-earmarked	Earmarked	Overall
A.1 - Average ICC	30.60	9.24	21.43
A.2 - Adjustment for capitalization method	3.61	0.37	1.86
A - Adjusted average ICC (A.1 - A.2)	26.99	8.87	19.57
B.1 - Funding cost	9.08	5.32	7.53
B.2 - Adjustment for capitalization method	0.36	0.12	0.24
B - Adjusted funding cost (B.1 - B.2)	8.72	5.20	7.28
C - Spread (A - B)	18.27	3.67	12.29
D - FGC expense	0.05	0.04	0.05
E - IOF	0.41	0.02	0.25
F - PIS and Cofins contributions	0.75	0.15	0.51
G - Administrative expenses	4.46	0.93	3.04
H - Loss estimate	4.29	1.41	3.11
I - Interest not received from operations with delays of 60 days or more	1.38	0.19	0.71
J - Discounts granted	0.42	0.17	0.30
K.1 - Interest on equity received by shareholders	0.56	0.56	0.56
K.2 - Withholding income tax on interest on equity	0.10	0.10	0.10
K - Interest on equity expense (K.1 + K.2)	0.65	0.65	0.65
L - ICC margin before income tax, social contribution (C - D - E - F - G - H - I - J - K)	5.86	0.11	3.67
M - Income tax and social contribution	2.64	0.05	1.66
N - ICC financial margin (L - M + K.1)	3.77	0.61	2.57

3) “Administrative Expenses” (G): captures diverse administrative expenses such as personnel and marketing, incurred by financial institutions when performing their credit operations;

4) “Taxes and FGC” (D + E + F + K.2 + M): reflects taxes on credit paid by borrowers and financial institutions. Clients pay the Tax on Financial Operations (IOF). Financial institutions pay contributions to the Social Integration Program (PIS), Contribution for Social Security Financing (Cofins), Income Tax (IR), Social Contribution on Net Income (CSLL) and also Withhold Income Tax (IRRF) on interest paid to equity owners. All these taxes, directly or indirectly, affect the ICC. In addition, all institutions associated to the Credit Guarantee Fund (FGC) shall monthly contribute to the fund with a certain percentage of the balances of guaranteed accounts;¹¹⁷ and

5) “ICC Financial Margin” (N): includes the portion of the ICC that remunerates the shareholders’ capital of financial institutions for credit activity and other factors not mapped by the methodology, such as errors and omissions in the estimates.

¹¹⁷ Further details on the institutions associated to the Credit Guarantee Fund (FGC) and guarantees offered are available at <https://www.fgc.org.br/>.

2.4 Concentration indicators¹¹⁸

The concentration in the SFN (National Financial System) decreased in 2024, following the trend of recent years. The Normalized Herfindahl-Hirschman Index (HHIn) decreased for all accounting aggregates considered: total assets, total deposits, and credit operations (Table 2.4.1). Considering the references from the Merger Review Guidelines (Guide), published through Communiqué 22,366, of April 26, 2012, the classification of the concentration level for all aggregates remained at the lowest level (unconcentrated market). Similarly, the Four-Firm Concentration Ratio (CR4) also showed a reduction or stability in all accounting aggregates, maintaining the composition of leading institutions.

The SFN concentration reduction was due to a market share increase for the credit unions segment (b3) and non-banking institutions (n1 + n2). Consequently, institutions in the banking segment (b1 + b2) lost market share. This movement was observed in all accounting aggregates considered during the period (Table 2.4.1) and can be associated with the performance of non-banking institutions in the credit card and non-payroll credit markets, while credit unions, in 2024, stood out for their performance in the overdraft and working capital markets.

Table 2.4.1 – Summary of SFN concentration indicators

	Total assets			Total deposits			Credit operations		
	2022	2023	2024	2022	2023	2024	2022	2023	2024
Market share by segment (%)									
b1 + b2	87.8	87.6	86.6	91.2	90.7	89.0	86.2	85.8	85.0
b3	5.1	5.5	5.9	6.4	6.6	7.5	6.3	6.8	7.2
b4	4.9	4.5	4.7	0.1	0.1	0.3	5.7	5.3	5.2
n1+n2	2.0	2.2	2.4	2.2	2.5	3.0	1.7	2.0	2.6
n4	0.2	0.2	0.3	0.1	0.1	0.2	0.0	0.0	0.0
Market share by type of ownership (%)									
State-Owned	37.2	37.4	37.4	31.7	32.6	33.3	43.5	44.1	44.0
Private	62.8	62.6	62.6	68.3	67.4	66.7	56.5	55.9	56.0
Concentration indicators									
HHIn	0.0896	0.0881	0.0870	0.0966	0.0944	0.0919	0.1003	0.0990	0.0986
EN	11.2	11.3	11.5	10.3	10.6	10.9	10.0	10.1	10.1
CR4 (%)	56.0	55.3	54.7	58.4	57.9	57.1	58.6	57.8	57.9
CR4 market share (%)	BB (14.9)	CEF (15)	CEF (15.1)	BB (15.7)	BB (15.5)	BB (15.4)	CEF (19.1)	CEF (19.6)	CEF (19.7)
	CEF (14.4)	BB (14.9)	BB (14.9)	ITAU (15.3)	ITAU (15.1)	CEF (14.6)	BB (16.1)	BB (16.4)	BB (16.5)
	ITAU (13.6)	ITAU (13.8)	ITAU (13.6)	BRADESCO (14.6)	CEF (13.9)	ITAU (14.5)	ITAU (11.9)	ITAU (11.5)	ITAU (11.2)
	BRADESCO (13.1)	BRADESCO (11.6)	BRADESCO (11.1)	CEF (12.7)	BRADESCO (13.4)	BRADESCO (12.6)	BRADESCO (11.6)	BRADESCO (10.3)	BRADESCO (10.4)

¹¹⁸ The concepts of the concentration indicators used in this section can be found in the Concepts and Methodologies annex.

It was observed reduction or stability of concentration levels in most relevant credit markets.

When considering the main credit segments, a decrease or maintenance of concentration levels was observed in most segments in 2024, using either the IHHn Equivalent Number (EN) metric or the CR4 (Table 2.4.2). When considering the EN indicator, the most significant concentration levels reductions were observed in the markets for operations with acquired receivables (companies), working capital (companies), and credit cards (individuals and companies). It is also noteworthy that, in 2024, there was an increase in the number of financial institutions offering working capital (companies), non-payroll personal credit (individuals), and overdraft (individuals and companies). According to the Guide, in 2024, the concentration level remains high in rural and agro-financing (individuals and companies), housing financing (individuals and companies), and infrastructure and development financing (companies), whose resources are predominantly earmarked. A moderate concentration level is observed in payroll-deducted personal credit (individuals), vehicle financing (individuals), credit cards (individuals and companies), and overdraft (individuals and companies). The segments of credit granted through operations with acquired receivables (companies), working capital (companies), and non-payroll personal credit (individuals) are considered unconcentrated.

Table 2.4.2 – Concentration indicators of SFN credit operations balance, by relevant market

Relevant Markets	Concentration indicators								
	EN			CR4 (%)			Effective institutions ^{2/}		
	2022	2023	2024	2022	2023	2024	2022	2023	2024
Rural and agro-financing (individuals and companies) ^{1/}	3.7	4.0	4.0	65.6	64.0	64.2	67	60	59
Housing financing (individuals and companies) ^{1/}	2.1	2.1	2.1	92.6	92.6	92.6	12	12	12
Infrastructure and development financing (companies) ^{1/}	2.3	2.3	2.4	93.2	93.7	92.2	16	16	19
Operations with acquired receivables (companies)	8.1	9.8	10.4	63.0	55.9	54.6	31	31	31
Working capital (companies)	11.0	11.4	13.5	57.4	57.0	51.7	67	78	94
Payroll-deducted personal credit (individuals)	8.3	8.3	8.5	64.6	63.6	62.7	33	31	29
Non-Payroll Personal Credit (individuals)	13.1	14.1	14.3	47.5	46.6	49.2	54	62	72
Vehicles financing (individuals)	8.6	9.2	9.2	61.5	58.3	56.5	22	24	25
Credit card (individuals and companies)	8.0	8.8	9.4	62.4	59.5	57.4	33	35	34
Overdraft (individuals and companies)	6.7	7.2	6.9	71.1	68.0	68.0	38	50	56

1/ Unlike other relevant markets, both free and targeted resources were considered.

2/ It was considered only financial institutions with a market share higher than 0.1% in the total active credit portfolio.

The concentration by ownership type differs depending on the funding for credit operations.

Among the markets with high concentration, where earmarked credit prevails, the state-owned banks share is higher than that of private banks. Among the markets with moderate concentration, characterized by non-earmarked resources, the private banks market share prevails.

In 2024, the concentration level in the brokerage markets (stocks, commodities and futures) and the investment products distribution increased compared to the amounts observed in previous years (2022 and 2023). This movement is observed in both the EN analysis and the CR4 indicator (Table 2.4.3). Despite this increase, considering the references from the Guide, in 2024, the level observed in the brokerage markets remains unconcentrated, and in the investment products distribution market, it remains moderately concentrated.

Table 2.4.3 – Concentration indicators of transactions of stocks, commodities and futures, and investment products distribution

Relevant markets	Concentration indicators								
	EN			CR4 (%)			Effective institutions		
	2022	2023	2024	2022	2023	2024	2022	2023	2024
Brokerage – commodities and futures	12.0	12.8	11.9	47.1	45.9	48.1	48	48	47
Brokerage – stocks	14.3	14.5	11.7	41.9	41.6	50.4	57	55	54
Investment products distribution	8.7	8.9	8.5	61.0	58.9	60.0	91	89	89

Source: B3 and Anbima.

In 2024, the *Banco Central do Brasil* (BCB) cleared eight merger reviews. Three of these mergers directly involved at least one bank and some form of credit among the impacted relevant markets, and three involved securities and brokerage firms and some of the brokerage and/or investment products distribution markets. Notable among these are the investment agreement between the Bradesco Conglomerate and Banco John Deere S.A., the acquisition by Banco Safra S.A. of a stake in Guide Investimentos S.A. Corretora de Valores, and the acquisition of Órama Distribuidora de Títulos e Valores Mobiliários by Banco BTG Pactual S.A.

2.5 Open Finance: driving competition, innovation, and efficiency in the Brazilian financial system

Motivators and current stage

Open Banking and Open Finance initiatives have become essential in meeting new consumer expectations, as more people value personalized financial services integrated into their daily lives. Such initiatives are being adopted in an increasing number of countries, creating opportunities for the development of innovative and inclusive solutions by building agile and robust infrastructures that ensure the necessary privacy and security for this process.

In Brazil, the implementation of Open Finance introduced a new element by adding the promotion of financial citizenship as one of its fundamental goals. Generally, the regulation of these initiatives aims to foster competition, including in the payments sector, and protect clients’ rights to use their data to their own advantage. The Brazilian project emphasizes financial citizenship alongside goals to promote competition, innovation, and efficiency in the financial system. This new element arises from the need to enhance the various dimensions encompassed by this concept¹¹⁹ within the country and the regulator’s commitment to achieve it.

The broadened scope of data led to the renaming of the initiative from Open Banking to Open Finance. A key feature of Brazil’s model is its extensive data scope, which includes financial products such as investments and foreign exchange operations, in addition to traditional banking products like account data, cards, and credit transactions.

119 The concept of financial citizenship encompasses the following dimensions: financial inclusion, financial education, consumer protection in financial services, and participation in the dialogue about the financial system. To learn more, visit: https://www.bcb.gov.br/content/cidadaniafinanceira/documentos_cidadania/Informacoes_gerais/conceito_cidadania_financeira.pdf.

Beyond data sharing, the implementation of the service of payment initiation¹²⁰ enables more convenient and secure ways for resource management. Available functionalities include one-time or recurring payments with fixed amounts and customizable periods, as well as automated transactions between accounts of the same holder, triggered by client-set conditions. All these solutions are based on the Pix arrangement.

A new payment initiation method will enable easier payments in e-commerce and physical stores. Customers will be able to link their accounts to a specific digital wallet to make contactless Pix payments in physical stores. This same journey will allow Pix payments in e-commerce through a pre-linked account, eliminating the need for QR Code scans or the Copy and Paste process.

Adoption and impact

The significant growth of Open Finance in Brazil demonstrates its potential to transform the financial system and benefit consumers. By the end of 2024 – about four years after the implementation began in 2021 – the ecosystem recorded approximately 62 million accounts authorized for data sharing by their

holders, representing around 41 million unique clients. This marks growth of 47% and 49%, respectively, compared to January 2024. Considering the total number of financial system clients is approximately 221 million, there is still substantial growth potential.

The increasing use of Open Finance is strongly linked to the rising offer of tangible benefits to clients through shared data or services. Examples include cheaper credit, more profitable investments, better payment solutions, and financial management tools, among other possibilities. Equally important is the encouragement of modernization among participating institutions by updating their infrastructures and incorporating intensive data use into their processes.

Numerous use cases based on data sharing and the implementation of new payment functionalities have emerged, bringing more customized, efficient, and innovative products to the Brazilian population. A survey conducted by the *Banco Central do Brasil* (BCB) regarding products and services generated from Open Finance and offered by participating institutions during the second half of 2024 reported a total of 139 use cases – 90 related to data sharing and 49 to payment transaction initiation services. While use cases

related to transactional data sharing are more varied and dominate in number, the implementation of new payment functionalities offering greater convenience in using Pix may shift this scenario in future surveys.

Financial Aggregators and Managers

Financial managers are the most widespread use case, enabling clients to better organize their finances. According to mapping reports, around thirty million clients have already adopted data aggregators for different accounts, providing a centralized view of their finances. This tool fosters the development of a variety of use cases, supported by more comprehensive information about clients' profiles and needs.

Notifications regarding balances and debits assist clients in avoiding unnecessary costs and managing resources effectively. This functionality was adopted by thirteen million clients in the second half of 2024 alone. One survey respondent reported notifying 1.3 million clients about imminent overdraft use in shared accounts, saving them BRL2 million during the period and BRL12.5 million since the introduction of the functionality.

¹²⁰ Payment initiation allows clients to perform financial transactions through the app or platform of an institution other than the one where their account to be debited is held. This service can only be offered by institutions authorized to operate by the *Banco Central do Brasil* (BCB), such as banks and payment institutions, including Payment Transaction Initiators (ITPs).

Credit operations

With Open Finance, data usage for credit provision facilitates more accurate assessments of clients' payment capacity and risk profiles, whether individuals or companies. Since its implementation, BRL18 billion in credit operations has been reported, originating from analyses of shared Open Finance data. Mapping indicates that fintechs benefited 4.3 million clients by offering credit through shared data analysis, generating BRL3.2 billion in new credits during the period.

Credit portability has become faster and more efficient for institutions. Shared Open Finance data reduces errors due to incorrect information in the process, making it easier for clients to initiate requests. In 2024, one institution reported BRL2 billion in credit portability transactions using shared Open Finance data. Although the process has not yet leveraged the infrastructure of the open system directly, a project is being developed to enhance it, yielding even greater benefits for clients.

The project also holds untapped potential for benefits to businesses, especially micro, small, and medium-sized enterprises (MSMEs). Although most shared data belongs to individuals, there is room for use cases supporting MSMEs, like demonstrating their payment capacity for credit operations. In this context, one institution reported reductions in capital loan rates, totaling BRL306 million granted.

Financial management use cases and accounting automation for businesses have already moved billions of reais. Offered by all types of participants, these use cases resemble those for individuals: streamlined account opening, personalized offers, credit portability, competitive loan quotations for working capital, and financial control platforms with intelligent cash flow insights. However, more advanced uses, such as automating accounting closure processes and bank reconciliations, are also emerging. Though still reaching a relatively small number of clients, business-oriented use cases moved nearly BRL7 billion in 2024.

Investments

Shared investment data has facilitated the offer of more profitable and suitable products for clients. Beyond providing investment consolidators that help clients view portfolios comprehensively, institutions have used this data to present portfolio rebalancing and diversification options with assets better aligned to client profiles or propose similar assets with better profitability. Other mapped use cases include personalized product offers and generating new investments prompted by alerts about unused resources in other accounts or reinvestment suggestions for assets nearing maturity. These use cases moved approximately BRL8 billion in the second half of 2024.

Payment transaction initiation

Immediate Pix functionality simplifies resource transfers between participating institutions, improving financial process efficiency. Mapping shows immediate Pix, which streamlines transfers between institutions, as the most offered functionality to date. The most frequent use case among respondent institutions is cash-in transactions to bring money from other accounts.

The volume of Pix transactions grew significantly, largely due to the contextualized service offering combined with account and investment aggregators. Most respondent institutions provide this functionality in the context of their account aggregator or financial manager, while others associate it with product and service journeys such as applications and investments, bill payments, loan repayment, salary portability, and even cross-border payments.

Pix's notable growth within Open Finance reflects its convenience for consumers. Throughout 2024, the volume of Pix transactions initiated through Open Finance payment systems increased significantly, accelerating in the second half with a 131% rise compared to the first six months. By the end of 2024, these transactions totaled BRL3.2 billion, more than five times the BRL624 million recorded the previous year.

Initiation modalities like intelligent transfers and payments via a pre-linked account are still in early stages of implementation but show significant growth potential. One fintech reported that 940 thousand clients used the Intelligent Transfer functionality, enabling automatic account-to-account transfers, transacting BRL520 million in the second half of 2024. Additionally, a payment functionality via pre-linked accounts, implemented voluntarily by an ITP in partnership with three account-holding institutions, recorded payments for 80,000 clients.

Conclusion

The growing diversity of use cases and increasing client adoption demonstrate that Open Finance is driving modernization and enhancing service efficiency among institutions. The project's impressive figures and extensive scope position Brazilian financial and payment institutions to compete more effectively. Greater understanding of client needs through shared data, coupled with new payment functionalities, paves the way for new financial services and products tailored to clients' daily requirements.

Given Open Finance's scale and disruptive potential in Brazil's financial system, the BCB has made continuous efforts since its conception

to monitor implementation by participating institutions. This includes participation in various Open Finance governance structures and making ongoing regulatory improvements to deliver tangible benefits to society while ensuring model security and consumer interests protection.

The BCB's ongoing regulatory refinement and the enhanced professionalism brought by the newly established Open Finance Association strengthen the foundations for the initiative's consolidation and future scope evolution. Recently, participating institutions formed the Open Finance Association, a private non-profit organization providing shared infrastructure and technical support to enable and operate Open Finance as its governance structure.

Despite the project's advanced implementation stage, evidenced by its achievements, there remains a challenging evolutionary agenda ahead. Today's broad scope of shared data and services ensures Open Finance's irreversible integration into the business processes of the financial system. Maintaining and evolving this technological and business apparatus will require ongoing effort, commitment, and collaboration between the regulator and participating institutions.

2.6 Effects of interest rate increases on the indicators of non-financial companies

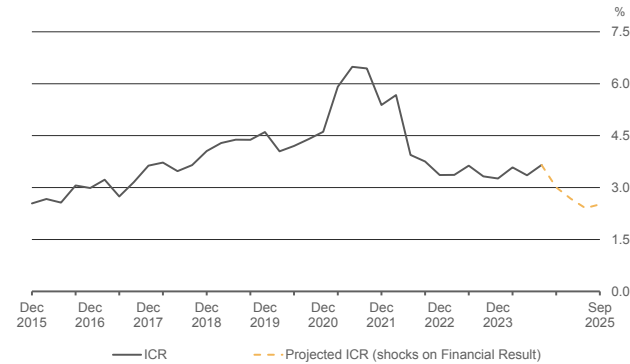
Interest rate hike cycles tend to negatively impact companies' financial statements. In this regard, it was estimated how the Interest Coverage Ratio (ICR, calculated here as the ratio between EBITDA and Financial Result) and Return on Equity (ROE) would evolve for companies with available balance sheet information,¹²¹ over a one-year horizon, based on the data available in September 2024.

The estimated impacts are significant but more moderate than during the last recession. In the case of the ICR, the reduction in companies' overall payment capacity would be substantial, with the median value estimated to be comparable to some points in the series from 2015 and 2016 (Chart 2.6.1). However, in terms of debt, the volume related to companies with an ICR less than 1 would be lower than those observed in 2015, 2016, and during the pandemic, indicating a smaller impact of the estimated shock compared to those periods (Chart 2.6.2). Additionally, the impact on the calculated ICR should be viewed with caution, as the interest rate shock could be positive for companies with financial investments, which would

¹²¹ Source: Economática. Here, there are typically large, publicly traded companies.

therefore see an increase in their financial income,¹²² helping to prevent a significant reduction in the ICR. In terms of profitability, the median value would fall to a level lower than that observed during the pandemic but higher than those seen in 2015 and 2016 (Chart 2.6.3); in terms of debt, the impact would be lower than in those years and during the pandemic when evaluating companies with negative profitability (Chart 2.6.4).

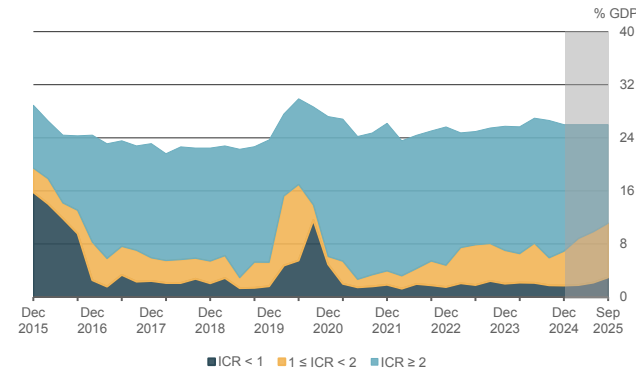
Chart 2.6.1 - Interest Coverage Ratio (ICR) (median)
Publicly traded companies



Sources: Economatica, Anbima, and BCB staff calculations.

¹²² As showed in the Financial Stability Report of April 2017, Selected Issue 2.1 Non-financial private sector overview, many companies also have financial assets, which led us to consider the indicator EBITDA/Financial Result (or Net Financial Expense) for the ICR.

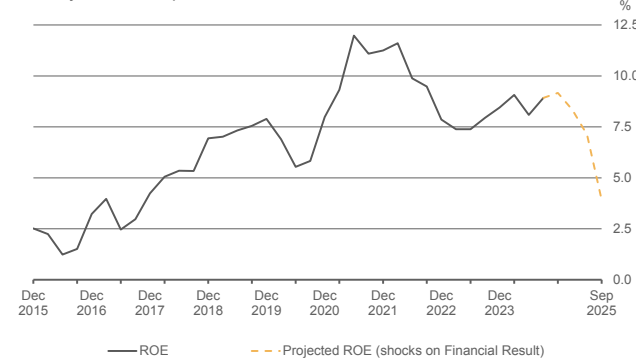
Chart 2.6.2 - Interest Coverage Ratio (ICR)^{1/}
Total gross debt (shaded area: projection)



^{1/} The values after Sep/24 were estimated using individual shocks to the Sep/24 financial result for each of the companies analyzed (shocks depending on each debt profile).

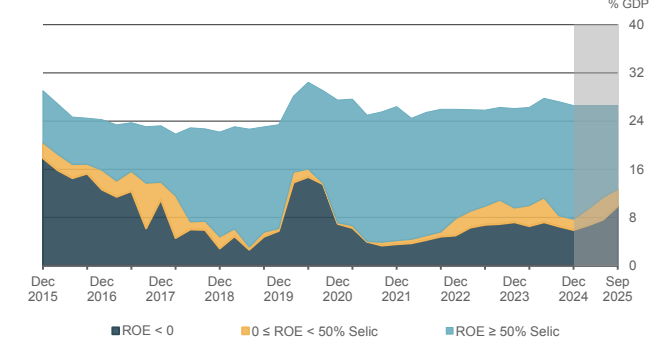
Sources: Economatica, Anbima, and BCB staff calculations.

Chart 2.6.3 - Profitability (median)
Publicly traded companies



Sources: Economatica, Anbima, and BCB staff calculations.

Chart 2.6.4 - Profitability^{1/}
Total gross debt (shaded area: projection)



^{1/} The values after Sep/24 were estimated using individual shocks to the Sep/24 financial result for each of the companies analyzed (shocks depending on each debt profile).

Sources: Economatica, Anbima, and BCB staff calculations.

Methodology

It is important to highlight some approximations in the simulation. For the exercise carried out here, the total bank debt, debentures, and commercial/promissory notes were mapped, considering all companies in the economic group.¹²³ Thus, there is a partial mapping of the companies' debts, as the data on foreign currency debts and other domestic currency debts not mentioned above were not individualized.

¹²³ The economic group assembled followed internal criteria with manual adjustments. Thus, what is being considered as the economic group in the exercise may differ from the group considered for the published consolidated financial statements.

Therefore, these debts underwent the average shock observed for the mapped debts. Additionally, the simulations carried out only consider the impact of the increase in financial expenses given by the new market interest rates. The other balance sheet variables were kept constant.

The applied shocks had different assumptions based on the expected evolution of the debt indexers. Fixed-rate debts maturing after September 2025 did not have their interest expenses altered; those maturing by that date were renewed considering the future interest rate curves available at the end of December 30, 2024, and the maintenance of the original contracting spread. For floating-rate debts, the interest expense was adjusted considering the realized and projected scenarios of future interest rate curves and the maintenance of the original contracting spread. Debts indexed to the IPCA had their interest expense adjusted considering the realized scenarios and those projected with the expectations of the Focus bulletins of December 2024, with the maintenance of the original contracting spread.

The increase in financial expense resulting from the above shocks was applied to the ICR and ROE, generating an impact company by company. For the mapped debts, the ratios between the simulated financial expenses with the new interest rates and the financial expenses accumulated over twelve

months until September 2024 were calculated for each company. These factors were applied to the financial expenses of the balance sheets published for September 2024. From this new financial expense, the financial income from the balance sheet was deducted, thus obtaining a new financial result, which was compared to the EBITDA of the balance sheet to project an ICR until September 2025. To project the new ROE,¹²⁴ the Net Profit verified in September 2024 was deducted from the estimated financial result with the above shock.

2.7 Evaluation of the conservation buffer release during Covid-19

Introduction

The temporary release of the conservation buffer during the COVID-19 pandemic was successful in overcoming the stigma associated with using capital buffers, sustaining credit, and simultaneously preserving regulatory capital.¹²⁵ The release of the conservation buffer allowed banks with less capital headroom to avoid restricting

credit during the pandemic. The analysis is based on a Difference-in-Differences (DiD) approach, with an identification strategy based on regulatory capital headroom. The full study can be found in the Regulatory Result Assessment (RRA) published by the *Banco Central do Brasil* (BCB) in 2024¹²⁶.

Since the 2008 global financial crisis, macroprudential policies have been used to mitigate the joint failure of interconnected institutions and procyclicality, which amplifies economic shocks throughout the financial cycle. One example of a macroprudential policy is the Basel capital buffers, designed to limit systemic risk by increasing resilience and smoothing economic shocks.

In 2020, during the COVID-19 pandemic, two ad hoc measures were adopted: a decrease in the Capital Conservation Buffer (CCoB) from 2.5% to 1.25%, combined with a temporary restriction on dividend distribution to prevent imprudent outlays of capital. These measures were necessary to support the supply of bank credit amid the uncertain environment and to preserve the resilience of the financial system.

¹²⁴ The Average Equity, the denominator of ROE, was also maintained at the value determined in September 2024.

¹²⁵ This latter effect can also be partially attributed to the imposition of restrictions of capital distribution, ensuring a balance between solvency and support for the economy.

¹²⁶ Available at https://www.bcb.gov.br/estabilidadefinanceira/avaliacao_resultado_regulatorio.

Moreover, the space for macroprudential policy was limited, as it was not possible to release the Countercyclical Capital Buffer for Brazil (ACCP_{Brasil}), which had been set at its neutral level of zero.

The design of the intervention took into account that the buffers, as outlined in the Basel framework, face a strong stigma associated with their use. One of the potential obstacles refers to the microprudential capital conservation mechanism that imposes automatic restrictions – on an individual basis – on banks' dividend payouts and other forms of earnings distribution when capital levels fall below the buffers. Additional concerns regarding regulatory reactions or negative assessments by rating agencies, investors, and other market participants also contribute to banks' reluctance to use capital buffers.

Data

The credit and capital requirement data are structured as a balanced panel at the conglomerate¹²⁷-firm-month level, with zero values assigned to months in which a given conglomerate-firm pair has

no loans. The baseline regression is estimated using approximately 135 million conglomerate-firm-month observations across 91 banking¹²⁸ conglomerates for 4.3 million firms, before and after the implementation of the measures.¹²⁹ The data span from April 2019, one year prior to the measures taking effect, through April 2021, one year after their implementation.

Methodology

The econometric approach uses a DiD methodology, with the identification strategy based on the regulatory capital headroom of conglomerates prior to the policy. It is assumed that financial institutions with capital constraints would have been forced to severely restrict lending due to the economic recession that followed the pandemic, had the conservation buffer not been reduced. Therefore, the hypothesis is that, following the measure, capital-constrained institutions would lend more than unconstrained institutions.

The conglomerates were distributed into tertiles according to their excess capital over the regulatory

minimum (regulatory margin) in December 2019, the last quarter before the Covid-19 pandemic.

The treated group is composed of conglomerates in the first tertile, that is, those with the lowest excess capital over the minimum requirement. They had a greater potential to be affected by the release of the CCoB, as they were operating closer to the minimum capital limits. The median regulatory margin in this first tertile was approximately 2 percentage points (p.p.). The control group is composed of conglomerates in the second and third tertiles, that is, those with the largest capital buffer. The median regulatory margin in the second tertile was 7 p.p., while in the last tertile it was 30 p.p., showing that these banks were not capital constrained.¹³⁰

The econometric specification is conducted at the firm-cluster-month level:

$$\ln(V_{bft}) = \alpha \text{post}_t + \beta [\text{treat_cap}_b \times \text{post}_t] + \theta_{bf} + \varepsilon_{bft}$$

Where:

$\ln(V_{bft})$ is the natural logarithm of the volume of new credit V from conglomerate b to company f in month t .

¹²⁷ The terms conglomerate and banks are used interchangeably in this section.

¹²⁸ Only segment b1 is considered, which includes conglomerates with commercial banks and multiple-service banks with a commercial portfolio.

¹²⁹ The release of the conservation buffer and the restriction of capital distribution were implemented by Resolution CMN 4,783, of March 16, 2020, and by Resolution CMN 4,820, of May 29, 2020.

¹³⁰ Table 1 of the [Regulatory Result Assessment \(RRA\)](#) shows descriptive statistics for the treatment and control samples. The treatment and control groups have similar numbers of observations, firms, and average loan amounts.

$treat_cap_b$ is a dummy variable equal to one if conglomerate b is treated, that is, if it is in the first tertile of excess bank capital before the pandemic.

$post_t$ is a dummy variable equal to one if time t is after the start of the capital release measure.

θ_{bf} are conglomerate-firm fixed effects.

ε_{fbt} is the random error term.

The estimated effect of reducing the capital buffer is the coefficient β , which can be interpreted as the percentage change in credit of the treated group in relation to the control group, comparing the period before the measure with the period after. The empirical analysis assumes that, in the absence of regulatory intervention, the average volume of credit of the treated group would have followed a downward trend, since this group had little room for regulatory capital to sustain credit levels.

Results

The regulatory intervention managed to keep credit stable in banks affected by the measure (Table 2.7.1). One possible interpretation is that the release of the conservation buffer did not affect banks with comfortable regulatory capital, in a scenario of high-risk aversion, and thus the expected

behavior of this group would be to reduce credit. However, banks with tight regulatory capital ex-ante were able to maintain credit because of the release of regulatory capital, as in Couaillier *et al.* (2022).¹³¹ In this interpretation, we assume that these capital-constrained banks would also have reduced lending with the pandemic, but the regulatory change helped them sustain lending levels.

Table 2.7.1 – Regression

	(1)	(2)	(3)
	Ln(Credit)	Ln(Credit)	Ln(Credit)
Post	-0.1904 (0.137)	-0.4438*** (0.156)	
Treated × Post		0.4851*** (0.169)	0.4661*** (0.168)
# Observations	135,114,213	135,114,213	55,958,463
R ²	0.4175	0.4189	0.6670
Fixed Effects	Cong. × Firm	Cong. × Firm	Cong. × Firm Firm × Time
# Conglomerates	91	91	91
# Firms	4,272,239	4,272,239	974,131

Note: Standard error in parentheses clustered by conglomerate.

*** denotes coefficients statistically greater than zero at 1%.

After the intervention, there is no evidence of a relevant change in credit to firms considering all banks, regardless of whether they were affected by the measure or not. This is evidenced in the first specification, where the coefficient α for the dummy “After” is negative, but not statistically significant (column 1 of Table 2.7.1).

Banks in the control group decreased credit after the regulatory change, as shown in the second specification, where the coefficient for the “After” dummy is negative and statistically significant (column 2 of Table 2.7.1). However, banks affected by the regulatory capital release had an increase in the credit volume compared to the control group, after the measure, since the coefficient β “Treated × After” is positive and statistically significant. Furthermore, treated banks managed to maintain credit after the pandemic and the intervention, since the sum of the coefficients α and β is not statistically significant.

The results are robust to a more rigorous specification. In the third specification, the β coefficient is again positive and statistically significant, although with a smaller magnitude (column 3 of Table 2.7.1). In this regression, the firm × time fixed effects exclude firms

131 Couaillier, C., Reghezza, A., Rodriguez D’Acri, C. e Scopelliti, A (2022) “How to release capital requirements during a pandemic? Evidence for euro area banks”, Working Paper Series 2720, European Central Bank.

with relationships only with affected banks or only with unaffected banks. This reduces the sample drastically, from over 4 million firms to less than one million. Thus, it is likely that the sample in this regression is not representative of the overall sample, but rather biased toward large firms. However, firm × time fixed effects improve identification power, as the same firm can be compared with affected and unaffected banks.

Additional considerations

The full RRA study¹³² also includes an assessment of the effects of dividend restrictions. This measure was important in signaling to the system that the capital released should not be used for profit distribution. Together, the measures induced banks to preserve and gradually rebuild their capital levels.

The partial release of the CCoB during the pandemic also highlighted the challenges of calibrating the countercyclical buffer throughout the credit cycle. Activating the countercyclical buffer is particularly challenging, as it tends to remain at 0% most of the time. The original design of the countercyclical buffer

calls for a base, or neutral, level calibrated at zero in periods without accumulating vulnerabilities.

To facilitate the gradual activation of the countercyclical buffer, a growing number of jurisdictions are already operating at a positive neutral level or are in the process of doing so. Many policymakers believe that activating their countercyclical buffers before the pandemic was or would have been important to expand the scope for macroprudential policy action (BCBS, 2022a).¹³³ The BCBS reinforced the benefits for countries that adopt positive cycle-neutral (PCN), even though it is not mandatory according to international standards (BCBS, 2022b).¹³⁴ Based on the Brazilian experience during the coronavirus pandemic, a positive neutral rate for the CCyB in Brazil could become an important mechanism to generate releasable capital when most needed and to increase the effectiveness of macroprudential policy in the country.

2.8 The impact of the end of the “overhedge” on the exchange rate volatility

Introduction

The end of the “overhedge” by financial institutions contributed to a reduction in the exchange rate volatility. The “overhedge” (henceforth, “OH”) consisted in the excess short exchange rate position relative to the long position, object of hedging. The long position consisted in investments in subsidiaries and branches abroad (henceforth “IE”). The OH was needed due to the asymmetric taxation of the revaluations of the long and short positions reflecting changes in the exchange rate. Law 14,031, of July 28, 2020, eliminated the need for the OH.

With the end of the OH, the volatility of the exchange rate reduced by more than what is justified by the explanatory variables included in the model. This result survives statistical robustness tests. We interpret this result through the prism of the additive feedback loop of volatility caused by the OH. During the period when OH was needed, the volatility of the exchange rate tended to feed itself back additively.

¹³² Available at https://www.bcb.gov.br/estabilidadefinanceira/avaliacao_resultado_regulatorio.

¹³³ Basel Committee on Banking Supervision (2022a): *Buffer usability and cyclical in the Basel framework*, Bank for International Settlements.

¹³⁴ Basel Committee on Banking Supervision (2022b): *Newsletter on positive cycle-neutral countercyclical capital buffer rates*, Bank for International Settlements.

The overhedge

Financial institutions adopted OH strategies to neutralize the effect of fluctuations of the exchange rate on their accounting equity.

This was due to Law 12,973, of May 13, 2014 (article 77), which set an asymmetric taxation of the effect of revaluations of the long and short positions. The accounting and tax bookkeeping presented in the stylized example in the following Box illustrates why the OH was needed to neutralize the effect of a currency depreciation.

The value of OH to constitute a perfect hedge is substantial. Indeed, with the tax rate at 48%, the perfect OH is 92.3% of IE.¹³⁵

At the beginning of the Covid-19 pandemic, immediately before the publication of Provisory Measure 930, of March 30, 2020, the value of the aggregate OH of all institutions in the SFN exceeded USD50 billion (Chart 2.8.2).

¹³⁵ The perfect OH in proportion to IE is given by function $\frac{OH}{IE} = \frac{a}{1-a}$ in which a is the sum of tax rates on revenues and profits. This function is based on the formula in the Financial Stability Report of the *Banco Central do Brasil* (BCB), October 2020, page 79.

Box – Accounting and tax bookkeeping of IE and OH after a currency depreciation

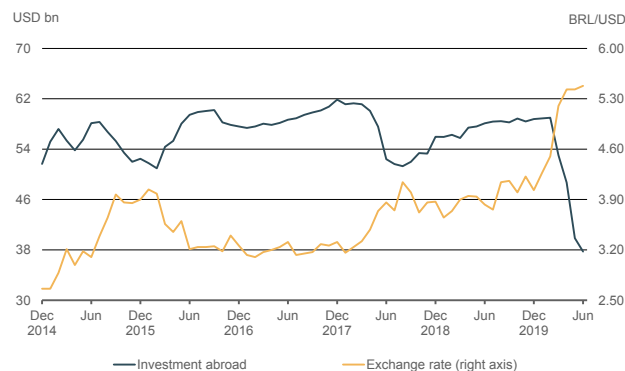
Consider a financial institution who owns shares in a subsidiary located abroad valued at USD200. Assuming the exchange rate is BRL5/USD, the value of the shares recorded in the asset side of its balance sheet is BRL1,000. To protect this foreign exchange long position by means of an economic hedge with a currency swap, the institution needed a short position of USD384.62 – the equivalent of BRL1,923.08 of which BRL1,000 was the hedge and BRL923.08 was the OH – assuming the tax rate on revenues and profits of 48% (PIS, Cofins, Income Tax and Social Contribution). If the Real depreciates 5%, with the exchange rate becoming BRL5.25/USD, it becomes necessary to revalue the long position (IE) and the short position (the hedge plus the OH). Revaluing the long position in the asset side (+BRL50) raises the accounting equity by this amount without affecting the taxable income. Nevertheless, revaluing the short position (+BRL96.15 in the liability side) creates an expenditure that reduces the taxable income by BRL46.15 (tax rate of 48%). If the taxable income is negative, the tax savings creates a Deferred Tax Asset (Tax Credit of Negative Taxable Income), yielding a net (after tax) loss of BRL50. This net loss offsets exactly the amount by which the equity was raised (owing to IE) while neutralizing the impact of the exchange rate depreciation in the comprehensive net income.

The OH may cause difficulties to the liquidity management of financial institutions. For example, the OH may reduce the available liquid assets of financial institutions, specially during episodes of high volatility and currency depreciation. After all, during such episodes, there are significant daily settlements, and margin calls in futures markets in which the OH is typically held (by means of future sales of USD or foreign exchange coupons). By settling the daily adjustments and honoring the margin calls in significant volumes, the liquid assets of institutions are reduced.

In response to volatility increases, institutions tend to act defensively, creating conditions for further rises in volatility. This additive feedback loop happened to the extent that institutions reduced their long positions (with IE withdrawals) to minimize the need for OH. To reduce the OH, institutions purchased foreign currency to unwind their OH positions (short positions). This buying pressured the exchange rate even further, reinforcing the volatility feedback. This behavior seems more evident in moments of larger currency depreciations, such as in 2015, 2018 and 2020 (Chart 2.8.1).

Indeed, moments of substantial depreciation of the Real are associated with reductions of IE (Chart. 2.8.1). The correlation between changes in the exchange rate and in the IE from January 2015 (when Law 12,973, of May 13, 2014, entered into effect) to June 2020 (date of Law 14,031, of July 28, 2020) is negative -0.35.

Chart 2.8.1 – Investment abroad and exchange rate

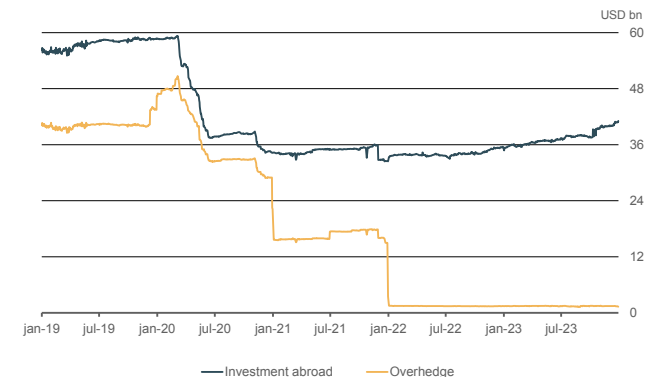


In particular, this scenario took place in March 2020 at the beginning of the Covid-19 pandemic when financial institutions started to unwind IE positions (Chart 2.8.1 and 2.8.2). Between March and June 2020, more than USD20 billion in IE were liquidated. This allowed financial institutions to exit hedge and OH positions. The unwinding of OH represented substantial buying pressure in the foreign currency market.

In this context, to eliminate the need for the OH, Provisory Measure 930 was published on March 30, 2020, later signed into Law 14,031 on July 28, 2020. These norms eliminated the asymmetric taxation of IE and OH, rendering the OH unnecessary and allowing the unwinding of excess short positions. The implementation was staggered in two steps: in

2021, the tax asymmetry was reduced by 50%, and starting in 2022, the tax asymmetry was completely eliminated (Chart 2.8.2). The unwinding of the OH followed this implementation schedule. The only remaining tax asymmetry related to the PIS and Cofins, with smaller tax rates.

Chart 2.8.2 – Investment abroad and overhedge



Econometric tests

We tested statistically the hypothesis that OH added volatility to the exchange rate. The corollary of this hypothesis is that the end of the OH reduced the volatility partially in 2021 – when the OH was halved – and with more intensity from 2022. The estimation results are consistent with this hypothesis.

The estimation is an extension of the study by the *Banco Central do Brasil* (BCB) published in the Inflation Report, March 2021: Box “Volatility of exchange rate in Brazil”. The data series used in this study were extended through January 2025. The dependent variable is the implicit volatility of the exchange rate extracted directly from the premium of currency options with remaining maturity of 1 month. The independent variables were chosen in an *ad-hoc* fashion according to their statistical significance, in a purely empirical form (“kitchen sink” procedure), as explained by the Inflation Report.

The independent variables are: the volatility index VIX,¹³⁶ the volatility of the commodity index CRB, the first principal component of implicit volatilities of a bundle of emerging market currencies,¹³⁷ the forward interest rate from 3 to 5 years of Brazil's National Treasury securities, and the quantity of trades with mini-USD futures contracts at B3.

We added two independent dummy variables indicating the end of OH. Variable OH_010 takes on the value 1 during 2021 and zero before and after this

year. Its coefficient measures the “2021 effect”, when the OH was halved. Variable OH_001 takes on the value zero before 2022 and 1 from 2022. Its coefficient measures the “2022+ effect”, when the end of OH was completed. The sample period (1/1/2018 through 1/30/2025) was chosen so that the periods with and without OH had approximately the same length.

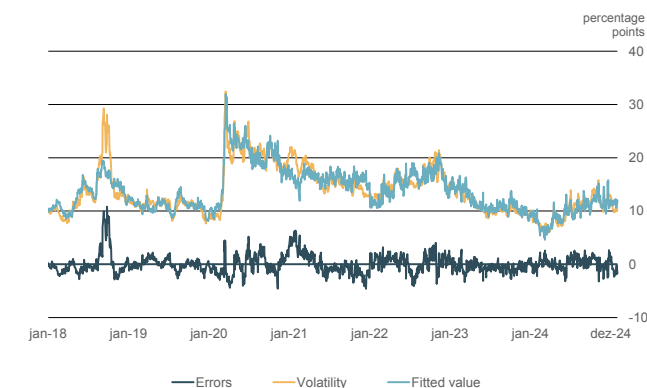
Result

The estimation suggests that the end of OH is indeed associated with the reduction of exchange rate volatility. First, the dummy variables matter for the estimation. With the inclusion of the dummy variables, the goodness-of-fit (measured by the adjusted R^2 and with the Bayes information criterion – BIC) improves substantially.¹³⁸

The coefficients of the dummy variables are negative and statistically significant, indicating that after the end of OH, the exchange rate volatility declined. The magnitude of the reduction in volatility with the end of OH is also relevant: in 2021 the decline of volatility was partial, around 3

percentage points. From 2022, the volatility declines almost 8 percentage points: it is the equivalent of more than half of the mean volatility after the OH (which was 12.2 percentage points).

Chart 2.8.3 – Exchange rate volatility (model 5)



Robustness test suggests that the dummy variables are indeed capturing the effect of some factor which is specific to Brazil (such as the end of OH) and not some global confounding factor. The coefficients of the dummy variables could be capturing the end of the OH as well as the effect of some other omitted variables. Indeed, the end of OH coincided with the pandemic Covid-19, when other extraordinary policy measures could have influenced global exchange rate volatility. In particular, the extraordinarily loose monetary policy and ample liquidity – domestically and abroad – tend to compress the exchange rate volatility.

¹³⁶ Volatility index based in options, traded at the Chicago exchange (CBOE), on stocks in the S&P500.

¹³⁷ India, Mexico, Russia, Chile, Singapore, South Africa, Colombia, Malasia, Israel, the Philippines and Thailand. The principal component is standardized with mean zero and standard-deviation 1.

¹³⁸ Estimation results are in Table 2.8.1 in the Statistical Annex.

To assess the hypothesis that there was some other global extraordinary factor during that period, we estimated a model specification interacting the dummy variables and the volatility of the exchange rates of other emerging markets.

The coefficients of the interaction terms capture the extraordinary global factor that period, leaving the dummy coefficients “clean” with only the Brazil-specific factors. Indeed, the interaction coefficients are negative, suggesting that the volatility of the exchange rate was also smaller in other emerging markets (although in modest magnitude, under 1 percentage point). Now the estimates of the dummy coefficients remain statistically significant, negative and with the same approximate magnitude. This result reinforces the confidence that it was indeed something domestic such as the end of the OH the explanatory factor of the volatility reduction since 2021 and notably since 2022.

Appendix

Banco Central do Brasil Management

Abbreviations

Dolar	3,464	3,1556
Euro	3,7064	3,7085
Ibovespa	67,671	67,659
CDI	9,14%	9,06%

Banco Central do Brasil Management

Board of Governors

Gabriel Muricca Galípolo

Governor

Renato Dias de Brito Gomes

Deputy Governor

Ailton de Aquino Santos

Deputy Governor

Rodrigo Alves Teixeira

Deputy Governor

Diogo Abry Guillen

Deputy Governor

Gilneu Francisco Astolfi Vivan

Deputy Governor

Izabela Moreira Correa

Deputy Governor

Nilton José Schneider David

Deputy Governor

Paulo Picchetti

Deputy Governor

Abbreviations

ACCP_{Brasil}

Countercyclical Capital Buffer for Brazil

ACP

Capital Buffer

AE

Advanced economy

ALM

Asset liability management

BCB

Banco Central do Brasil

BCBS

Basel Committee on Banking Supervision

BIS

Bank for International Settlements

CCP

Central counterparty

CCyB

Countercyclical Capital Buffer

CET1

Common Equity Tier 1

Comef

Financial Stability Committee

CRA

Agribusiness Receivables Certificate

CRE

Commercial real estate

CRI

Real Estate Receivables Certificate

CVM

(Brazilian) Securities and Exchange Commission (*Comissão de Valores Mobiliários*, in Portuguese)

DI

Interbank Deposit

DSTI

Debt service-to-income ratio

EBITDA

Earnings Before Interest, Taxes, Depreciation, and Amortization

EME

Emerging economy

Fed

Federal Reserve

FGC

Credit Guarantee Fund

FGTS

Length-of-Service Guarantee Fund (*Fundo de Garantia do Tempo de Serviço*, in Portuguese)

FI

Financial institution

FIDC

Credit Rights Investment Fund

FMI

Financial market infrastructure

FSR

Financial Stability Report

FSS

Financial Stability Survey

GDP

Gross Domestic Product

G-SIB

Global Systemically Important Bank

HQLA

High-Quality Liquid Asset

ICR

Interest Coverage Ratio

IEO

Operational Efficiency Index

IL

Short-Term Liquidity Ratio

ILE

Structural Liquidity Ratio

IMF

International Monetary Fund

IPCA

National Consumer Price Index

IT

Information technology

IVG-R

Residential Real Estate Collateral Value Index

LCA

Agribusiness Credit Bill

LCI

Real Estate Credit Bill

LCR

Liquidity Coverage Ratio

LFL

Financing Lines

LGD

Loss given default

LGFV

Local Government Financing Vehicle

LIG

Real Estate Secured Bill

LLI

Immediate Liquidity Facility

LLP

Loan loss provision

LLT

Term Liquidity Facility

LTV

Loan-to-value

MSME

Micro, small, and medium-sized enterprise

NII

Net interest income

NIM

Net interest margin

NSFR

Net Stable Funding Ratio

OEI

Operational Efficiency Index

PA

Problem asset

PD

Probability of default

PFMI

Principles for Financial Market Infrastructures

PI Payment institution	SCR Credit Information System
Previc <i>Superintendência Nacional de Previdência Complementar</i>	SFN National Financial System
PRF Primitive risk factor	SGS Time Series Management System
PTC Quarterly Credit Conditions Survey (<i>Pesquisa Trimestral de Condições de Crédito</i> , in Portuguese)	SPB Brazilian Payment System
RC Regulatory capital	SPI Instant Payment System
ROE Return On Equity	SRisk Systemic risk indicator
RSF Required Stable Funding	STR Reserves Transfer System
RWA Risk-weighted asset	Susep <i>Superintendência de Seguros Privados</i>
SAC Constant amortization schedule	TLP <i>Taxa de Longo Prazo</i>
SCE Foreign Capital Information Provision System	TPF Federal Public Securities

Annex

Concepts and Methodologies

Working Papers about financial stability

Dolar	3,7464	3,7456
Euro	3,7064	3,7085
Ibovespa	67,671	67,659
CDI	9,14%	9,06%

Concepts and Methodologies

Broad credit – For the purpose of calculating the broad credit-to-GDP gap, the following sources of broad credit are considered:

- **Total loans:** Households: includes SFN bank credit, consortiums operations, pension funds loans (EFPC), constitutional funds (Fundo Constitucional de Financiamento do Nordeste – FNE, Fundo Constitucional de Financiamento do Norte – FNO, Fundo Constitucional de Financiamento do Centro-Oeste – FCO, and Fundo de Financiamento Estudantil – FIES). For constitutional funds, these are operations not considered in the SFN bank credit.
- **Total loans:** Companies: includes SFN bank credit, credit operations from Agência Especial de Financiamento Industrial S.A. (Finame) and BNDES Participações S.A. (BNDESPAR) – institutions from the Banco Nacional de Desenvolvimento Econômico e Social (BNDES) group –, consortiums operations, and constitutional funds.
- **Capital market:** includes debentures (except from leasing companies), commercial papers, CRI, CRA, FIDC (credit rights), CPR and CCB without co-obligation.

- **External market:** consists of the balance of funds raised abroad by loans (including intercompany) or bond issuance, i.e., the credit operations from non-residents to residents.

Broad credit-to-GDP gap – The broad credit-to-GDP gap is defined as the difference between the ratio of private nonfinancial sector broad credit to GDP and its long-term trend, obtained with the use of a Hodrick-Prescott (HP) filter, with a λ parameter of 400,000. This calculation excludes the foreign exchange variation due to its impacts on the broad credit, as discussed in the April 2016 issue of FSR (box “Countercyclical Capital Buffer”, section 4, “Credit-to-GDP gap in Brazil”).¹³⁹

Capital Buffer – Additional CET1 requirement corresponding to the sum of the following installments: conservation, countercyclical and systemic. The value of the conservation buffer

corresponds to 2.5 per cent of RWA. The value of the countercyclical buffer is currently zero for exposures in Brazil and is limited to a maximum of 2.5% of RWA. The systemic buffer depends on the ratio between total exposure and GDP and is currently equal to 1% of RWA for S1 institutions, under the terms of Resolution CMN 4,553, of January 30, 2017. Failure to comply with the capital buffer results in the restrictions described in article 9 of Resolution CMN 4,958, of October 21, 2021. Resolution BCB 200, of March 11, 2022, established a similar conservation buffer requirement for conglomerates led by IPs and made up of a financial institution authorized to operate by the BCB, with two distinctions: the percentage to be applied to RWA to calculate the conservation buffer is zero between July and December 2023 and 1.25% of RWA during 2024; and there is no requirement for the systemic portion. As the excess of CET1 used to meet the other minimum requirements cannot be used to fulfil the capital buffer, this requirement is added to all three minimum requirements described in the previous items.

Capital stress tests – Comprised by a macroeconomic stress test and sensitivity analyses to risk factors deemed relevant, these stress tests are simulations to estimate losses arising from extreme events, though

¹³⁹ References: (i) Drehmann, M., Borio, C., & Tsatsaronis, K. (2011). *Anchoring countercyclical capital buffers: the role of credit aggregates*, BIS Working Papers 355. (ii) Drehmann, M., and Juselius, M. (2013). *Evaluating early warning indicators of banking crises: Satisfying policy requirements*, BIS Working Papers 421. (iii) BCBS (2010). *Guidance for national authorities operating the countercyclical capital buffer*.

plausible, and assess the resilience of an institution or the financial system. Hence, it is possible to determine the impact on the capital of institutions taking into consideration unexpected, and thus, not provisioned losses caused by acute changes in macroeconomic variables. For each stress scenario, new capital ratios (Total Capital Ratio, Tier 1, and CET1) are calculated. An FI is considered as non-compliant whether any of its capital ratios is below the minimum required and classified as insolvent in the case of total depletion of the CET1. The relevance of non-compliant and/or technically insolvent institutions is assessed, as well as the additional capital needed so that no bank might become non-compliant is calculated. The relevance of an institution is based on of its Total Assets (ATA) as a proportion to the banking system.

The positive effects of the eventual activation of Tier 2 and Additional Tier 1 capital triggers, in which values are converted into CET1 capital, are classified as income.

Furthermore, when computing capital shortfall, all applicable capital buffer requirements (ACP) are taken into account, as determined by Resolution CMN 4,958, of October 21, 2021.

Finally, the framework also considers the potential changes of registration and uses of deferred taxes and its implications on regulatory capital calculus,

according to Resolution CMN 4,955, of October 21, 2021, and later modifications.

i) Macroeconomic stress test – The macroeconomic stress test framework is an exercise that consists of the application of adverse macroeconomic scenarios and simulation of balance sheet responses on an individual basis. Based on these results, capital shortfall for the entire financial system is estimated.

ii) Scenario design – Three macroeconomic scenarios are built, for a time horizon of twelve quarters, based on market information and the following macroeconomic variables: 1) economic activity (GDP); 2) exchange rate (quarter average of the Brazilian real vs US dollar parity); 3) Brazilian Benchmark Interest Rate (quarter average of the Selic rate); 4) inflation (consumer prices given by the Extended National Consumer Price Index – IPCA – cumulative twelve months) and 5) unemployment rate (calculated by IBGE – Instituto Brasileiro de Geografia e Estatística).

The baseline scenario is built upon the median of market expectations (Focus report). Scenarios stress 1 and stress 2 used for simulations are described in Box – Scenarios used in the macroeconomic stress test.

iii) Stress simulation – The stress simulation is conducted by projecting seven basic income statement accounts, representing operational performance, presented in

the last income statement (non-operational income is not considered in the test): 1. Net interest income comprises net credit income, accrued income from bonds and securities and funding costs; 2. Noninterest incomes: mark-to-market effects, hedges and exchange rates fluctuations; 3. Fees & commissions; 4. Gains from non-consolidated companies; 5. Administrative expenses and; 6. Provision expenses; and 7. Other results.

In the ‘net interest income’ account, credit, and bonds/securities incomes as well as funding costs are modeled based on the Selic rate behavior. Funding volumes are adjusted according to loan portfolio volumes, in a 1:1 proportion. Provision expenses are estimated based on problem assets (PA) evolution given by each of the scenarios.

Non-interest incomes are modeled by the application of market risk shock on positions observed in the date the test starts. The stressed market risk factors are obtained out of the macroeconomic scenario, and positions are then recalculated. The result is the difference between stressed and initial values. This amount is applied on the first quarter of projection and incorporated to earnings.

“Fees & Commissions”, “Non-consolidated companies” and “Administrative Expenses” accounts are modeled by use of dynamic panel data models, obtained with the same macroeconomic variables provided by the scenarios.

“Other results” account is modeled by the average of all other income statement items not included in the six previous accounts, e.g. non-operational results, other operational incomes and treasury results.

Besides the performance simulation, verified through income statement items, the BCB has incorporated the interfinancial contagion into the macroeconomic stress test framework. For each quarter in the test time horizon, it is verified whether any institution falls below the Core Tier 1 capital ratio minimum threshold of 4%. If this is the case, inter-financial contagion is estimated. Uncollateralized interbank exposures issued by the affected institution are assumed as losses into the creditors’ balance sheet, and its new capital position is recalculated. If any institution also falls below the abovementioned threshold, the process is repeated iteratively until there is no new institutions falling below the threshold. The stress test continues with the new affected capital levels and the process is repeated in all quarters of the projection, until the end of the time horizon.

iv) Sensitivity analyses are aimed at complementing the macroeconomic stress test. Sensitivity analyses assess the individual effects of credit or market risk factors that might affect institutions’ regulatory capital, causing eventual capital shortfalls. Those analyses are conducted by applying incremental variations to individual risk factors, while keeping other factors fixed.

- a. Sensitivity analysis – changes in market risk factors – exposures subject to interest rate changes (e.g., fixed rates, currency coupons, price indexes and interest rates) listed in the trading book are stressed. The positions at all vertices (from 21 to 2,520 days) are recalculated after the application of shocks as well as the financial impact on banks’ capital positions. Stressed exposures also affect risk weighted assets components (RWA_{JUR1} , RWA_{JUR2} , RWA_{JUR3} , RWA_{JUR4}). In the case of fixed rates, new regulatory parameters of capital requirements are recalculated based on each yield curve generated by a shock.

Exposures to gold, foreign currency, and other instruments subject to changes are also stressed. Impacts due to exchange rate fluctuations on regulatory capital and capital requirements (RWA_{CAM}) are then recalculated. It is assumed that all exposures subject to exchange rate fluctuations are revalued following the percentage points projected for the stressed USD/exchange rate.

Shocks alter, individually, interest rates and the exchange rate, in 10 percentage points steps, downward until it reaches 10% of the original value, and upward until an increase of 100% of the original value is reached. After assessing impacts, new capital ratios are calculated, and

then regulatory capital adequacy and the solvency of banks are verified.

- b. Sensitivity analysis – increases in problem assets – This analysis aims at measuring the effect of problem assets increases on the regulatory capital of institutions. Problem assets are raised to 150% of its current level in several steps. For each step, additional provisions required are estimated, and regulatory capital and RWACPAD suffer the impacts from additional provisioning. After impacts are applied, new capital ratios are computed, and solvency and capital adequacy status of banks are evaluated.
- c. Sensitivity analysis – fall in housing prices – The objective of this analysis is to estimate the impacts of falling residential real estate prices on the regulatory capital of institutions with mortgages to households in their loan portfolio. Prior to the simulations, real estate prices are updated using the IVG-R index, by the incorporation of the variations measured by the index since each loan’s inception up to the date of the simulation.

Adverse shocks are applied to prices, in sequential steps of 5 percentage points. In each step, loans whose collaterals do not amount to 90% of the loan’s outstanding balance are considered as delinquencies.

The loss of each delinquent loan is estimated as the difference between the outstanding balance and the present value of the amount recovered from the foreclosure process. To compute the recovered amount, residential real estate prices after applied shocks are considered, and deducting an estimate for taxes, maintenance, and auction costs. Furthermore, the auction sale is considered to occur at a discounted price proportionate to the price fall due to the applied shock. This amount's present value is obtained by discounting the sale proceeds by the 1-year future rate. New regulatory capital ratios of each institution are calculated considering the estimated losses associated to each step of housing prices decline.

Common Equity Tier 1 Ratio (CET1 Ratio) – It consists of the ratio between CET1 and RWA. The minimum CET1 requirement established by Resolution CMN 4,958, of October 21, 2021, and Resolution BCB 200, of March 11, 2022, is 4.5 per cent of RWA.

Companies' size – Defined by an intern algorithm, which considers three sources of information: i) size of micro and small enterprises set by Federal Revenue of Brazil; ii) size mode informed by FIs in the Credit Information System (in case of tie, it is considered information of the FI in which the company has the greatest volume of debt); (iii) corporate indebtedness amount (bank credit, capital market, internalized

external debt) to enclose size's boundaries. The criteria (i) and (ii) take into consideration annual gross revenue standards of Complementary Law 123, of December 14, 2006, and Law 11,638, of December 28, 2007. The criteria (iii) are residual and classifies companies' sizes not set by criteria (i) or (iii).

Concentration indicators – To systematically monitor the concentration levels of different segments of the SFN, the BCB uses the Normalized Herfindahl-Hirschman Index (HHIn), the “HHIn equivalent number” (EN), and the Four-Firm Concentration Ratio (CR4) in the accounting aggregates related to total assets, credit operations, and total deposits in Brazil.

The HHI is used by domestic and international antitrust authorities as an auxiliary tool for assessing levels of economic concentration. In its normalized version, the HHIn is obtained by the sum of the square of each financial institution market share, in the decimal form, resulting in a number between 0 and 1. According to Communiqué 22,322, of April 27, 2012 (BCB's Merger Review Guidelines, 2012), the BCB considers markets that register values corresponding to the HHIn to be situated:

- a) between 0 and 0.10 are of low concentration;
- b) above 0.10 to 0.18 are of moderate concentration; and

- c) above 0.18 to 1 are of high concentration.

The “HHIn equivalent number” (EN) indicates which would be the number of financial institutions (FI) with equal share in the market that would generate the same observed HHIn ($HHIn = 1/EN$).

The CR4 measures the concentration degree by adding up the market shares of the top four financial institutions in each market.

These indicators are analyzed for three accounting aggregates¹⁴⁰ and consider the following adjustments:

- a. for total assets, it is used the Adjusted Total Assets (ATA), which excludes investments in interfinancial deposits, interfinancial transfers, and investments in institutions authorized by the BCB;

¹⁴⁰ The monetary values of the accounting aggregates considered the IF.data prudential conglomerate concept, available at <https://www3.bcb.gov.br/ifdata/>. Prudential conglomerates include, in addition to the institutions belonging to the financial conglomerate: i) consortium management; ii) payment institutions; iii) companies that perform the acquisition of credit operations, including real estate or credit rights; iv) other companies headquartered in the country whose exclusive corporate purpose is to hold equity stakes in the aforementioned institutions; v) investment funds in which the institutions that make up the prudential conglomerate substantially assume or retain risks and benefits.

- b. for total deposits, it is used total deposit (-) interfinancial deposits (+) Agribusiness Credit Bills (LCA) (+) Real Estate Bills (LCI) (+) Financial Bills, and, in the case of the non-banking segment (b3 + b4 + n1 + n2 + n4), Exchange Bills are included; and
- c. for credit operations, the balances of the outstanding portfolio of all the institutions' credit operations are considered.

Regarding the concentration level in credit operations, in addition to the general analysis, an assessment is also carried out for each relevant market, i.e. for each set of close substitute products.¹⁴¹ This type of analysis contributes to greater transparency of the environment in which competition takes place in the SFN and to the improvement of the BCB's role in defending competition. The set of relevant markets is made up of:¹⁴² rural and agribusiness financing (household + corporate),¹⁴³ housing financing

(household + corporate),¹⁴⁴ infrastructure and development financing (corporate),¹⁴⁵ operations with acquired receivables (corporate),¹⁴⁶ working capital (corporate),¹⁴⁷ payroll-deducted personal credit (household),¹⁴⁸ non-payroll-deducted personal credit (household + corporate),¹⁴⁹ vehicle financing (household),¹⁵⁰ credit card (household + corporate),¹⁵¹ and overdraft facility (household + corporate).¹⁵² Together, the relevant markets analyzed account for 75.01% of the total outstanding SFN credit operations on December 31, 2024. Indicators refer to credit operations granted with both non-earmarked and earmarked resources¹⁵³

in the banking and non-banking segments (b1+b2+b3+b4+n1+n2+n4).¹⁵⁴

In addition, the concentration of the relevant markets of brokerage and distribution of retail investment products is analyzed.¹⁵⁵ The source of brokerage market data is the B3 and refers to the annual financial volume, while the distribution market data is the Brazilian Financial and Capital Markets Association (Anbima) and refer to the consolidated annual financial volume of distribution of traditional retail and high-income products, except savings.

141 For details on the definition of a relevant market, see the BCB's Merger Review Guidelines.

142 Data from Document 3040 – Credit Risk Data, whose information is incorporated into the Credit Information System (SCR) database – were used for the modalities analyzed.

143 It covers sub-modalities 801 (costing and pre-costing), 802 (investment and working capital for agribusiness financing), 803 (sale and pre-sale), and 890 (project financing).

144 It covers sub-modalities 901 (housing finance from the Housing Finance System – SFH) and 902 (housing finance - mortgage portfolio).

145 It covers sub-modalities 1101 (infrastructure and development financing), 1190 (project financing), and 490 (project financing – BNDES). Sub-modality 490 includes other types of BNDES operations, in addition to those directly related to infrastructure and development.

146 It covers sub-modalities 250 (loan-acquired receivables), 450 (financing-acquired receivables), and 1350 (other receivables-acquired receivables).

147 It covers sub-modalities 215 (working capital with a maturity of less than 30 days) and 216 (working capital with a maturity of 30 days or more).

148 It covers sub-modality 202 (payroll-deducted personal credit).

149 It covers sub-modality 203 (non-payroll-deducted personal credit).

150 It covers sub-modality 401 (acquisition of goods - motor vehicles).

151 It covers the following sub-modalities: 204 (revolving credit linked to a credit card); 210 (purchase, invoice in installments or withdrawal financed by the card-issuing institution); 406 (purchase or invoice in installments by the card-issuing financial institution), 1304 (cash purchase and in installments from a shopkeeper), and 218 (not migrated).

152 It covers sub-modality 213 (overdraft facility).

153 Credit operations granted with non-earmarked resources, except housing, rural, and agribusiness, and infrastructure and development financing, whose resources are both earmarked and non-earmarked.

154 Tables A to J in Annex C present the participation of the top four institutions in each relevant credit market considered and show the evolution of the relevant markets by type of control and by source of funds.

155 The following products are considered: investment funds 555 (fixed income, multimarket, mutual privatization fund (FMP), foreign exchange and shares, except those arising from Decree-Law 157, of February 10, 1967), structured funds (credit rights investment funds, real estate investment funds, equity investment funds, and fixed and variable income Exchange Traded Fund (ETF)), and securities (shares, government securities, private securities, and structured operations certificates).

The brokerage segment encompasses relevant markets of stocks and of commodities and futures due to the low level of substitutability between the products traded on the stock market and those traded on the commodities and futures market. This reflects the differences concerning traded assets, business environments, operating platforms, and customers profiles.

Household debt service-to-income ratio (DSTI) – Defined as the ratio between monthly debt service and monthly income. A methodological review of the measure presented in the FSR issues of September 2014, March 2015 and October 2015, this measure uses data from BCB's Credit Information System (SCR) to calculate the ratio for each debtor in the SFN and, from individual data, calculates measures of central tendency for the SFN and other aggregation levels.

Leverage ratio (LR) – Basel Committee on Banking Supervision international concept, consisting of Tier 1 Capital to Total Exposure ratio. In Brazil, the Circular BCB 3,748, of February 27, 2015, established the LR methodology. This index intends to complement the current prudential requirements, through a simple, transparent and non-sensitive risk metric. The leverage ratio minimum requirement of 3.0% was established by the Resolution CMN 4,615, of November 30, 2017, which is effective from January 2018 on, applicable for institutions classified as S1 or S2, according to the Resolution CMN 4,553, of January 1, 2017.

Loan-to-Deposit ratio (LTD) – It measures the ratio between the loans granted by the Financial Institution and the volume of deposits of its customers, constituting a complementary metric for liquidity assessment. A high LTD ratio means that the volume of loans granted corresponds to a relevant portion of the Financial Institution's deposit base, which may lead to an increase in its liquidity risk. Conversely, a low LTD ratio may be an indication that the Institution is not adequately monetizing its assets, as a significant proportion of its deposits may be allocated to less profitable assets than credit ones. The scope for calculating the LTD ratio is that of the prudential conglomerate and repo operations are excluded from the funding base for calculating the indicator.

Monthly debt service – Credit outstanding due in 30 days, except for: a) real estate financing, whose 30-day due amount is estimated by a constant amortization system; b) overdraft, whose debt service is defined as its monthly interest; and c) other revolving facilities, whose 30-day due amount is estimated by a Price amortization system. It considers all household loan modalities, except for rural and business modalities, even when loaned by an individual. Even though it is calculated, 30-day due amount in credit card purchases are not considered in the DSTI base measure, being included only in alternate measures of the indicator.

Monthly income – As a customer's income may vary when informed by different FIs, the following procedure applies: i) in case of more than one income bracket, the mode is used to select a single income bracket for the customer – if there is a tie among income brackets, the one with the largest amount of credit outstanding is chosen; ii) among the FIs which informed the selected income bracket, the largest informed income is chosen, capped by the lower and upper bounds of the income bracket; and iii) an estimate of income tax and social security contribution is deducted from the selected income.

Short-Term Liquidity Ratio (IL) – Conceptually like the Liquidity Coverage Ratio (LCR), it is the ratio between the stock of liquid assets held by the institution and the net stressed cash flows (estimated disbursements in the next 21 business days under a stress scenario). Therefore, institutions with IL above one (100%) have enough liquid assets to withstand this stress scenario.

i) Liquid assets – liquid resources available for each conglomerate/institution to meet its stressed cash flows for the next 21 business days. The methodology does not consider different accounting classification methods. In other words, it marks securities to market or by the price disclosed for collateral under repurchase agreement operations with the BCB. It is the sum of highly liquid assets, release of required reserves (due to deposits run-off) and supplemental resources.

- a. Highly liquid assets – these include: i) unencumbered Brazilian sovereign bonds held by the institution or received as a collateral in reverse repurchase agreement operations (reverse repos); ii) stocks listed in Ibovespa index; iii) liquid quotas of investment funds; iv) cash; v) free central bank reserves and vi) voluntary deposits at the BCB.
- b. Release of required reserves – amount of the required reserves that would be released to the institution due to the deposit run-off estimated in the stressed cash flows calculation.
- c. Supplemental resources – other options for monetization in the scenario's time-horizon, such as: Bank Deposit Certificate (CDB), Bank Deposit Receipt (RDB), Interbank Deposit (DI), long positions in box strategies (options), reverse repurchase agreements (reverse repos) backed by private securities.

ii) Stressed cash flows – an estimate of the amount of cash that the institution needs within the scenario's timeframe (21 business days) under a stress scenario. The analyses take into account retail deposits run-off, wholesale funding run-off, market stress and net contractual cash flows.

- a. Retail deposits run-off – estimate of the necessary amount to cover the retail-customers withdrawals in demand deposits, term deposits, savings accounts, box

strategies, securities issued by the bank, and repurchase agreements (repos) backed by private securities.

- b. Wholesale funding run-off – estimate of the necessary amount to cover the possibility of early redemption of the liability positions from the three largest market counterparties.
- c. Market stress – estimate of the necessary amount to cover losses arising from market movements affecting the liquid assets or others positions that may cause a cash outflow of the institutions in the stress scenario. The losses comprise: i) margin calls; ii) pre-settlements of derivatives contracts; iii) losses on the marked-to-market values of the liquid assets.
- d. Net contractual cash flow – payments due in derivatives positions and in contractual cash flows (assets and liabilities positions) with market agents, maturing within the horizon of the scenario.

Structural Liquidity Ratio (ILE) – It is the ratio between the available stable funding (part of the equity and liabilities on which the institution can rely for a one-year horizon) and the required stable funding (part of the assets, including off-balance-sheet assets, which must be financed by stable funding because they have long maturities and/or low liquidity). Institutions with ILE equal or above one (100%) are

less susceptible to future liquidity problems. The calculation methodology is based on the final version of the Net Stable Funding Ratio (NSFR), which was introduced as a minimum mandatory compliance in October 2018.

i) Available stable funding – the funding that shall remain in the institution for at least a year. The main sources of banks' stable funding are the capital; non-redeemable liabilities with residual maturities above one year regardless of counterparty; and funding with no

maturity or with a maturity of less than a year coming from retail customers.

ii) Required stable funding – the amount of stable funding needed to finance the long-term activities of financial institutions (FIs). Therefore, it takes into account the liquidity and the maturity of the assets of the institution. The long-term assets are mainly the credit portfolio maturing in over a year; nonperforming assets; less liquid or encumbered securities (i.e., margin requirement in clearings); fixed assets; and the items deducted from the regulatory capital.

Tier 1 Capital Ratio (T1 Ratio) – It consists of the quotient between Tier 1 Capital and RWA. The minimum T1 Ratio requirement established by Resolution CMN 4,958, of October 21, 2021,

and Resolution BCB 200, of March 11, 2022, is 6%. However, the latter standard defined a transition rule for conglomerates whose leading institution is a PI and integrated by a financial institution authorized to operate by the BCB on the date of publication of the standard, whereby the factor is reduced to 5.5% between July and December 2023.

Total Capital Ratio (TCR) – Basel Committee on Banking Supervision international concept, consisting of the system regulatory capital (RC) divided by the system RWA. The minimum RC requirement in relation to RWA is defined by Resolutions CMN 4,958, of October 21, 2021, 4,606, of October 19, 2017, and Resolutions BCB 198 and 200, both of March 11, 2022. For S1 to S4 institutions, the default value of the factor is 8.0%. For conglomerates led by PIs and with no member institution authorized to operate by the BCB, the factor is 8% from July to December 2023, 10% during 2024 and 12% from 2025 onwards. For conglomerates led by PIs and made up of a financial institution authorized to operate by the BCB on the date of publication of Resolution BCB 200, of March 11, 2022, the factor applied is 6.75% from July to December 2023, 7.5% during 2024 and 8% from 2025 onwards. Single credit unions not affiliated to central cooperatives and not opting for the simplified methodology defined in Resolution CMN 4,606, of October 19, 2017, have their minimum capital requirements increased by 4%. For institutions

adopting the simplified methodology, the value of the factor is 12% for single credit unions affiliated to central credit unions and 17% for other institutions.

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