



Banking Report 2022



Banking Report

2022

Banking Report

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Foreword

The Banking Report (REB) deals with a broad spectrum of issues related to the National Financial System (SFN) and the relations between institutions and their clients. This edition focus on the events in 2022.

REB comprises seven chapters. Chapter 1 analyzes credit evolution in the SFN from different angles and presents the results of the Quarterly Credit Condition Survey (PTC) and projections for the credit market. Chapter 2 examines the composition and evolution of the financial system funding. Chapter 3 presents the breakdown of the Average Cost of Outstanding Loans (ICC) and its spread in terms of its determining factors: funding cost, delinquency, administrative expenses, taxes, the Credit Guarantor Fund (FGC), and ICC's financial margin. Chapter 4 deals with foreign exchange products offered by the SFN. Chapter 5 analyses the profitability – and its main drivers – of the financial institutions. Chapter 6 examines the evolution of concentration and competition indicators in the SFN, innovations in the industry, and the performance of the Banco Central do Brasil (BCB). Chapter 7 discloses actions taken in the context of the Agenda BC#.

Additionally, REB brings a set of boxes focused on specific SFN themes. The boxes present studies and research, describing and analyzing the SFN, and addressing methodological issues.

Executive Summary

For the third consecutive year, the credit portfolio of the National Financial System (SFN) ended 2022 with strong growth. In the first half of the year, credit balance grew at a high pace, driven by higher-cost modalities in the household segment and working capital in the corporate segment. In the second half, however, credit expansion slowed down, due to the behavior of non-earmarked credit. Conversely, earmarked credit operations grew more sharply.

The increase in the Selic rate passed through to interest rates charged on credit operations contracted in 2022. The average interest rate on new loan contracts increased more significantly in the non-earmarked household credit segment. Delinquency increased in non-earmarked credit, especially in the household segment.

The expansion of household credit in 2022 occurred unevenly across geographic regions, with the highest growth in the Northern Region and the lowest in the Southeastern Region. Credit growth for women was slightly higher than for men in 2022, in contrast to the two previous years, when it was lower. In terms of age group, younger individuals experienced greater credit slowdown and higher delinquency increase in 2022.

The pace of expansion in the corporate credit segment in 2022 was also heterogeneous across Brazilian regions, with the lowest growth in the Southeast. In line with the trend of recent years, younger companies registered the highest growth rates in credit balances. Corporate credit grew in all economic sectors in 2022, especially in construction and mining.

In terms of size, the expansion of corporate credit in 2022 was driven by micro, small, and medium-sized enterprises (MSMEs), increasing their share in the total credit portfolio balance. The delinquency rate trend for small-sized companies (micro and small) continues upwards, as opposed to that for large companies, which have shown decreasing delinquency rates in the last two years.

According to the Quarterly Survey on Credit Conditions (PTC), financial institutions had more restrictive credit approval conditions throughout 2022, consistent with the scenario of rising interest rates. Among the factors that contributed to greater credit restriction are the general conditions of the domestic economy in the segment of large companies; delinquency levels for MSMEs; the service-to-income debt level in the consumer credit segment; and cost/availability of funding for housing credit. On the demand side, the need for working capital was pointed out as the main factor for the demand increase in the corporate credit segment. The change in the interest rate was perceived by financial institutions as an important factor inhibiting demand in both household and MSMEs credit segments.

The growth rate of the banking system funding resources was higher in 2022 (13.5%) than in 2021 (6.6%). The funding instruments with greatest growth in absolute terms were time deposits, whereas Agribusiness Credit Bills (LCAs), Real Estate Credit Bills (LCIs), and Guaranteed Real Estate Bills (LIGs) stand out in relative terms. Conversely, savings accounts and demand deposits registered a negative growth rate.

Regarding the funding rate of financial institutions, an important component is the Interbank Deposit (DI) rate, which, in turn, is associated with the Selic rate. Due to the monetary tightening cycle, the DI rate remained on an upward trend, stabilizing from August 2022 onwards.

After reaching the historical low of the time series at the end of 2020, the Cost of Outstanding Loans (ICC) indicator – the average cost of the entire financial system portfolio – registered a rate of 21.5% p.a. in December 2022. The ICC of non-earmarked operations reached 30.7%, of which 19.4% related to companies and 40.4% to households. The ICC of earmarked operations reached 9.0%, of which 9.4% related to companies and 8.8% to households. The ICC spread trajectory was also in an upward trend, going from 11.8 p.p. at the end of 2020 to 13.9 p.p. at the end of 2022.

Most components contributed to the increase in the adjusted average ICC of 2.57 p.p. in 2022. The main factor for this trend was the funding cost (+1.60 p.p.), followed by delinquency (+0.70 p.p.), financial margin (+0.34 p.p.), and taxes and FGC (+0.17 p.p.). Conversely, there was a decrease in the contribution of administrative expenses (-0.24 p.p.).

The stock of advances on export exchange contracts increased, as did the new grants of these advances, which totaled BRL 33.9 billion in 2022, corresponding to 12.7% of the value of export contracts and 10.1% of the value of physical exports. However, these percentages dropped slightly compared with the previous year. The interest rate used for funding external export lines – the main source of financing for these advances – increased, despite the reduction in the spread over the international reference rate.

The volume of both household and corporate foreign exchange operations increased. The volume for households is already higher than that of the pre-pandemic period, driven by remittances abroad related to the establishment of availabilities, direct investment, and investments in funds. The value of operations involving foreign currency in cash (usually associated with international travel by individuals) also increased significantly, although they are still below the average of pre-pandemic years.

The banking system profitability declined in 2022, registering a return on equity (ROE) of 14.7%, compared with 15.7% in 2021. The main reasons for the profitability decline were the increase in Loan Loss Provisions (LLP) expenses and the deterioration in the system's operational efficiency.

The increase in provisions is explained by the credit growth of higher-risk lines, increased household service-to-income debt, and reduced payment capacity of micro and small enterprises. Furthermore, in 2022Q4, provisions made for exposures to the *Americanas* group also contributed to the increase in provisions expenses. The deterioration in the system's operational efficiency is related to the lower growth of services revenues alongside the higher growth of administrative expenses.

The profitability of smaller banks continues lower than that of other groups. Regarding the focus of activity, banks predominantly engaged in treasury activities showed a profitability recovery due to the Selic rate hike cycle, while those more active in credit showed lower profitability.

The profitability of the Brazilian banking system remained in an intermediate position compared with the banking systems in other countries. Most countries, including Brazil, maintained profitability above that achieved in 2020, the year hit by the pandemic shock.

Regarding concentration in the SFN, the results of the Normalized Herfindahl-Hirschman Index (IHHn) suggest that the trend of reducing concentration continued during the 2020-2022 period. The reduction is observed in all of the accounting aggregates – total assets, total deposits, and credit operations.

Competition in the credit and financial services markets was assessed using the Lerner Index. It was found that competition in credit markets increased in 2022 for financial institutions in the banking, cooperative, and non-bank

segments. The index reduction points to a decrease in the market power of institutions, suggesting an increased level of competition. Regarding the financial services market in the banking segment, the Lerner Index followed an upward trend to reach high values, indicating high market power or low competition among banks in 2022.

Throughout 2022, among the main innovations promoted by the BCB, the following stood out:

- incorporation of improvements in the organization and operation of credit cooperatives; provision of payment services under the modalities of electronic money issuer and post-paid payment instrument issuer, exclusively to members; in addition to other services and improvements in corporate governance rules;
- improvement of rules on equity participations in Brazil and abroad, and on the opening of branches abroad by institutions authorized to operate by the BCB;
- approval of a set of regulations that updated and improved the prudential framework applicable to payment institutions;
- conclusion of the process of converging the accounting standards of the institutions regulated by the BCB (Cosif) to the ones established by the International Accounting Standards Board (IASB); and the
- continuation of Cycle 1 of the BCB's Regulatory Sandbox and the evolving process of Open Finance.

Through its strategic agenda, called Agenda BC#, the BCB seeks to promote improvements in the SFN aiming to financial democratization, better and increasingly inclusive financial services. The Agenda BC# has five dimensions: Inclusion, Competitiveness, Transparency, Education, and Sustainability.

In the Inclusion dimension, the highlights are the improvement of the regulations of the cooperative segment and the new Foreign Exchange and International Capital regulation. In the Competitiveness dimension, the most well-known measure is the evolving Pix agenda. Other notable actions are the implementation of Open Finance and the development of Real Digital.

In the Transparency dimension, the advances in 2022 were focused on services to citizens and the improvement of the legislation of the Guarantee Program of the Agriculture and Livestock Activity (Proagro). In the Education dimension, the national efforts to negotiate debts and provide financial guidance, and the “Aprender Valor” program, which brings financial education to elementary school students in public schools across the country, stood out. Finally, in the Sustainability dimension, the highlights were greater international integration, with the BCB joining the Steering Committee of the Network for Greening the Financial System (NGFS), and publicizing the second edition of the BCB's Report on Social, Environmental, and Climate-related Risks and Opportunities (RIS).

This Banking Report also highlights ongoing actions that are under debate in the National Congress or depend on the collaboration with other government agencies, such as Real Estate Collaterals, Bank Resolution Law, Rural Credit Insurance Instrument, Financial Market Infrastructure Bill (Limf), and the Authorizations Law Bill.

Boxes Summary

Box 1 – International Banking Statistics

Box 1 aims to present the International Banking Statistics (IBS), which are now published in the time series system by the BCB and are prepared according to the international methodological standard. These statistics refer to balances of financial assets and liabilities of the Brazilian banking system that were signed in any currency with non-residents, and in foreign currency with country residents. For national banks with branches and subsidiaries abroad, statistics include the positions in international assets of these units, on a consolidated basis. The series are broken down by type of instrument, counterparty country, currency, and counterparty sector. IBS provide a more detailed view of the internationalization of Brazilian banks, from the perspective of local and external activities, highlighting the operations of external units, which are an important channel for funding and operation of Brazilian companies abroad.

Box 2 – Economic benefits to credit union members

Credit unions differ from other financial institutions, especially banks, in that they are not-for-profit institutions created with the aim of offering economic benefits to their members (who are, at the same time, their partners and clients) in traditional financial activities. This benefit can be offered in a number of ways: better rates when granting credit and in the return on deposited funds; distribution of surpluses; lower tariffs for services provided or return on capital invested in the credit union itself. This box aims to measure the net benefit offered by credit unions to their members and to analyze whether they are fulfilling their social purpose.

Box 3 – Profile of credit card use in Brazil

This box evaluates the behavior of households regarding the number of credit cards they hold and the type of credit card issuing institutions in which they have outstanding balances. The increase in the number of institutions in which a person has credit cards is related to an increase in the average balance and credit limit and the individual's exposure to credit lines subject to interest charges. In addition, interest paying credit card debt is higher at small and medium-sized private banks and finance companies, and lower at cooperative banks and credit unions.

Box 4 – Personal credit, heterogeneous interest rates, and inequality

Using monthly data between January 2013 and December 2019 from the Credit Information System (SCR) and the Annual Report on Social Information (Rais), this box shows that interest rates on personal credit operations (payroll-deducted and non-payroll-deducted) vary systematically according to the characteristics of the individual. In particular, even after controlling for various observable individual attributes – such as income, occupation, and delinquency probabilities – low-income individuals pay higher interest rates than high-income ones. There are various reasons for these differences in interest rates for different income brackets and they go beyond the scope of this work. However, discussing the causes and effects of this heterogeneity in Brazilian interest rates is of paramount importance given the high level of inequality.

Box 5 – P2P lending fintechs: features and competitive aspects

This box examines whether fintech loans can alleviate the credit access problems faced by small businesses. This study is based on a database of unsecured working capital loans for micro-, small-, and medium-sized enterprises, both from banks and Peer-to-Peer (P2P) platforms. Initially, bank and P2P contracts are compared at the loan level. The profile of P2P clients include smaller, younger, and riskier companies, with younger employees with more formal education and economic activities related to professional services and technology. Companies borrowing from P2Ps used to pay 1.3 p.p. higher rates with traditional lenders before their first P2P loan. However, these companies manage to find a 1.4 p.p. lower rate on subsequent traditional bank loans after the first P2P loan. This indicates that banks are responding to the new competition and trying to win back their lost customers. Finally, P2P lenders offer 4 p.p. lower risk-adjusted rates than traditional lenders.

Box 6 – Evolution of concentration levels in the market of digital investment platforms

The box provides an exploratory analysis of the digital investment platform market in Brazil and the return rates on intermediated bank funding instruments (CDB, LCI, and LCA) between March 2014 and December 2022. The text describes the growth of this market, as well as the levels of "intra-platform" and "inter-platform" concentration. Results show a negative correlation between the level of intra-platform concentration and the average interest rate of the securities offered, which suggests that increased competition between issuers on a platform benefits the investor. In addition, higher levels of inter-platform concentration are associated with higher return rates on securities offered between March 2014 and December 2019, as a result of market consolidation.

Box 7 – Evolution of digital media for carrying out payment transactions in Brazil

This box aims to present an overview of the evolution of digital payment transactions in Brazil over the last decade. The study analyzes the increased use of electronic payment instruments in the country, based on statistics compiled from information sent by various market participants. It also highlights Pix's participation in this process since its introduction in November 2020, as well as the effects of the Covid-19 pandemic.

Box 8 – Profile and evolution of digital entities in the Brazilian National Financial System

Digital entities have contributed to the increase of competition in the SFN. They are different business models, but they share characteristics of predominantly remote service, with intensive use of digital platforms and technologies. These entities have seen a significant increase in the number of customers in recent years, although most of them are not exclusive relationships and a large part of their credit operations are still made with institutions in the traditional brick and mortar financial institutions. Even so, digital entities' pace of credit growth is significant, being more directed towards households and their portfolio more concentrated on credit cards and payroll-deducted personal credit. As for funding sources, most of the funding comes from time deposits, with low dependence on the one intermediated by brokerage platforms. Profitability is a challenge. Although operating costs per customer are lower compared with the traditional institutions, revenue is also lower, resulting in lower operating margins per customer.

Box 9 – Digital BRL: a platform for tokenized finance

The discussion about digital currencies is multifaceted and multidisciplinary, involving areas as diverse as information technology, law, and economics. This box details how the Digital BRL and tokenized versions of bank currencies can meet the demand for a digital representation of liquidity, which is necessary for the proper operation of a tokenized environment.

Box 10 – Has portability increased banking competition?

Credit portability has been touted as an important instrument for fostering competition in the banking sector. In 2014, the BCB implemented a new regulation that facilitates consumer credit portability. This box explores the spatial

concentration of local banks in Brazil to investigate how this institutional change has affected local credit markets. Robust evidence is found that credit portability has reduced interest rates and increased the volume of credit for the loan types which benefited the most through the regulatory change.

Box 11 – Pix as an instrument for companies, businesses and government entities to receive funds

Since its launch in November 2020, Pix has been widely adopted as a means of digital transfer, especially among individuals. Furthermore, its use as a means of payment by companies, government, and formal and informal entrepreneurs has been growing rapidly. In this scenario, this box aims to assess the evolution of the use of Pix throughout 2022 in payments received by companies or individuals who had a similar Pix use profile to companies. The adoption of Pix as a means of receiving payment was higher among small businesses, especially in the retail trade and food sector. The Northern region, followed by the Center-Western, had the highest share of recipients in relation to the population.

Box 12 – Skills, competencies, and financial well-being of primary education professionals enrolled in the *Aprender Valor* (Learn Value) program

As part of the “Education” dimension of the Agenda BC#, the *Aprender Valor* (Learning Value) program was created in 2019 to support education departments and schools in teaching financial education as a cross-cutting theme in public elementary schools across the country. To develop essential financial skills in students – planning the use of resources; actively saving; and managing the use of credit – *Aprender Valor* works on three main fronts: (i) training for managers and teachers; (ii) provision of educational resources for classroom use; and (iii) learning and impact assessments. The objective of this box is to present and analyze the results of an online questionnaire answered by school staff (managers and teachers) before starting their training. Understanding these professionals’ profile and knowledge gaps may help identify opportunities and challenges for the development of public policies for financial education in elementary education in Brazil.

Credit Market¹

Table 1.1 – Credit evolution

Segment	R\$ billions			% Variation		
	2020	2021	2022	2020	2021	2022
Total	4,021.3	4,679.4	5,335.3	15.7	16.4	14.0
Non-earmarked resources	2,319.2	2,791.3	3,183.9	15.4	20.4	14.1
Corporate	1,088.3	1,277.4	1,406.9	21.2	17.4	10.1
Household	1,230.9	1,513.9	1,777.0	10.7	23.0	17.4
Earmarked resources	1,702.1	1,888.1	2,151.5	16.1	10.9	14.0
Corporate	691.9	691.2	738.8	23.4	-0.1	6.9
Household	1,010.1	1,196.9	1,412.7	11.7	18.5	18.0
Corporate	1,780.3	1,968.5	2,145.7	22.0	10.6	9.0
Household	2,241.1	2,710.8	3,189.7	11.1	21.0	17.7
	% Ratio			p.p. variation		
Total/GDP	52.8	52.6	53.8	5.8	-0.2	1.2

/ Values as of December of each year.

1.1 Credit aggregates

The National Financial System (SFN) credit portfolio ended 2022 with strong growth for the third consecutive year. The total balance of SFN loans and financing grew 14.0% in the year to BRL 5.3 trillion (Table 1.1). The credit-to-GDP ratio rose 1.2 p.p. in the year, reaching 53.8% in December. The credit dynamics exhibited different characteristics in each half-year.

In the first half of 2022, credit growth in the household segment remained high, reaching a variation equivalent to 17.7% p.a. in June, even with the implementation of a more restrictive monetary policy since the beginning of 2021.² The higher-cost credit types contributed most to the growth in household loans, reflecting the changes in the composition of grants, with the expansion of emergency credit lines, such as revolving credit cards and overdraft facility. Regarding the non-earmarked corporate segment, a sharper increase was observed in working capital operations, offsetting the slowdown in the discount of receivables, especially that related to the advance of credit card sales.

In the second half of 2022, the pace of credit growth decelerated, with a slowdown in the non-earmarked segment. The expansion of non-earmarked household credit decreased, reflecting a deceleration in the growth of nonpayroll-deducted personal credit and credit card. In the non-earmarked corporate segment there was also deceleration, widespread across credit types. This slowdown reflected the drop in economic activity and the resumption of the National Program for Supporting

¹ The values presented in this Banking Report refer to data available on March 17, 2023, unless otherwise stated.

² As of March 2021, the Monetary Policy Committee (Copom) adopted a tighter monetary policy to combat rising inflation, continuously elevating the Selic rate target per annum, from 2% to 9.25% in December 2021. The monetary tightening continued until August 2022, when the target of 13.75% was set, a level that continued until the end of the year.

the Micro and Small Enterprises (Pronampe)³ and of the Emergency Credit Access Program (PEAC),⁴ earmarked credit programs that met part of the need for resources of the micro, small, and medium-sized enterprises (MSME).

In fact, the earmarked credit segment was stimulated in the second half of the year. The 36% increase in the 2022/2023 Harvest Program (*Plano Safra*) boosted rural credit for the second consecutive year, especially for households. The balance of the earmarked corporate credit resumed expansion in 2022, after remaining stable in the previous year, due to the increase in the Brazilian Development Bank (BNDES) portfolio and to the reactivation of Pronampe and of Peac FGI with great demand from the micro, small, and medium enterprises (MSME). It is also noteworthy the resilience of real estate financing, which maintained the level of balance growth despite the increase in interest rates.

At the end of 2022, the household credit balance rose 17.7% (21.0% in 2021), with expansions of 17.4% in non-earmarked credit (highlighting payroll-deducted operations) and 18.0% in earmarked credit (highlighting both rural credit and real estate financing). The corporate segment balance increased 9.0% (10.6% in 2021), up 10.1% in the non-earmarked segment, highlighting working capital, discount of trade bills and receivables, and vehicle financing. Earmarked credit rose 6.9%, with increases of 5.5% in the balance of operations with the BNDES, 12.0% in rural credit, and 5.0% in other earmarked credit types, which includes the Pronampe and PEAC programs.

Considering the broad credit to the non-financial sector⁵ (Table 1.2), the balance of debts totaled BRL 14.8 trillion (149.7% of GDP) in December 2022, up 9.0% in the year, against 13.9% in 2021. The balances of loans and financing increased by 14.1% and securities debts rose by 10.9%, while the amount converted into BRL of debts owed to non-residents decreased 3.8% (in USD, the balance of foreign debts grew by 2.9% in

Table 1.2 – Broad Credit Evolution

Segment	R\$ billions			% Variation		
	2020	2021	2022	2020	2021	2022
Total	11,954	13,612	14,843	16.8	13.9	9.0
Government	5,373	5,957	6,257	18.3	10.9	5.0
Loans and financing	163	163	168	15.6	0.0	3.1
Debt securities	4,356	4,815	5,198	18.2	10.5	8.0
External debt	854	979	891	19.3	14.6	-9.0
Corporations	4,130	4,725	5,154	18.8	14.4	9.1
Loans and financing	1,691	1,878	2,075	22.5	11.1	10.5
Debt securities	746	1,028	1,280	-0.7	37.8	24.5
External debt	1,693	1,819	1,799	26.0	7.4	-1.1
Households	2,451	2,930	3,432	10.8	19.5	17.1
Loans and financing	2,390	2,866	3,358	10.8	19.9	17.2
Securitization instruments	42	42	50	3.9	-0.5	20.7
External debt	19	23	24	29.6	16.2	4.8
	% Ratio			p.p. variation		
Total/GDP	157.1	153.0	149.7	18.6	-4.1	-3.3
Government credit/GDP	70.6	66.9	63.1	9.1	-3.7	-3.8
Corporate credit/GDP	54.3	53.1	52.0	7.3	-1.2	-1.1
Household credit/GDP	32.2	32.9	34.6	2.3	0.7	1.7

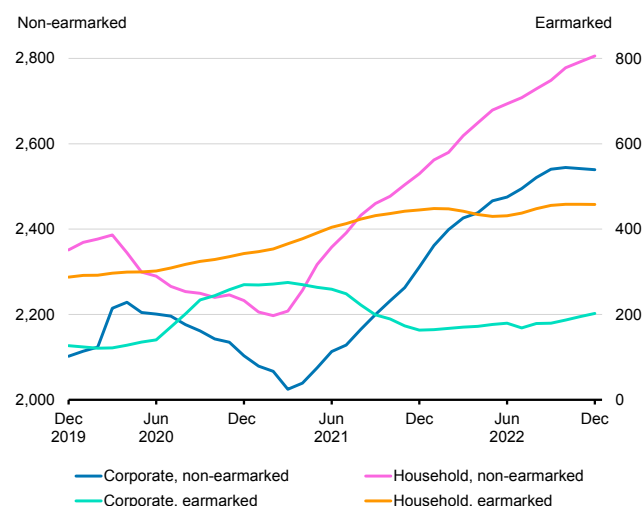
/ Values refer to December of each year.

3 Law 14,348, of May 25, 2022, established that the funds provided by the Federal Government to the Operations Guarantor Fund (FGO) must return as of 2025. Unused resources and amounts recovered from operations in progress can be used to cover new transactions.

4 Law 14,462, of October 26, 2022, resulting from the conversion of the Provisional Measure 1,114, of April 20, 2022, established that the funds provided by the Federal Government to the Investment Guarantor Fund (FGI) must return as of 2024. Unused resources and amounts recovered from operations in progress can be used to cover new transactions.

5 Statistics include, in addition to the balance of SFN credit operations, loans and financing granted by the other resident institutional sectors; the stocks of government and private securities and securitized instruments; and the loans and bond issuances whose creditors are non-residents.

Graph 1.1 – Credit Grants
12-month accumulated – R\$ billions of Dec 2022

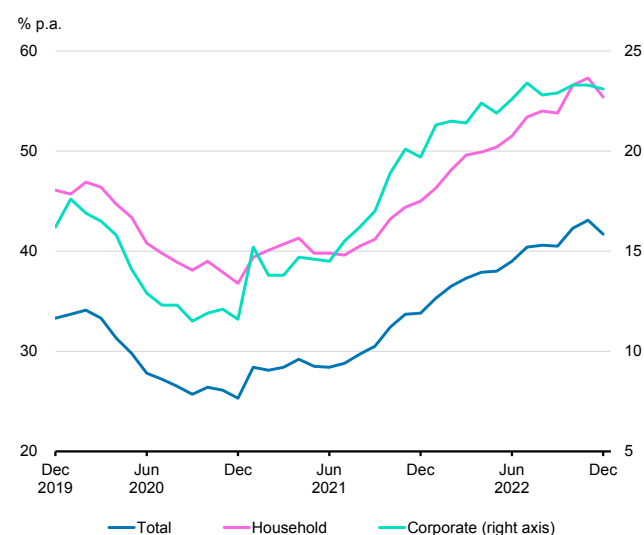


2022). The balance of broad credit granted to the general government corresponded to 42.2% of the total, up 5.0% in the year. The share of credit granted to non-financial companies accounted for 34.7% of the total, up 9.1%. Household debts corresponded to 23.1% of the total, up 17.1% in the period.

SFN credit granting, adjusted by IPCA (Graph 1.1), grew 10.2% in 2022, maintaining the high growth level registered in 2021 (10.1%). New household credit operations increased 9.7% (15.5% in 2021), highlighting the higher increase in non-earmarked credit (10.9%) compared with earmarked credit (2.9%). It is worth noting the rise in the granting of purchases on credit cards, revolving credit cards, and overdraft facilities, as well as the drop in payroll deducted loans and vehicle financing in the non-earmarked segment. In the earmarked segment, rural credit granting increased while real estate financing decreased.

In the corporate segment, new credit operations increased 10.8%, above the variation registered in 2021 (4.3%). Credit growth was mainly driven by the increase in BNDES operations after the drop registered in 2021, when the BNDES granted the lowest annual volume of credit in the series that began in 2012. It is also noteworthy the Pronampe and Peac programs, whose volume of new operations as of July totaled BRL 36.8 billion and BRL 16.6 billion, respectively.

Graph 1.2 – Non-earmarked interest rates

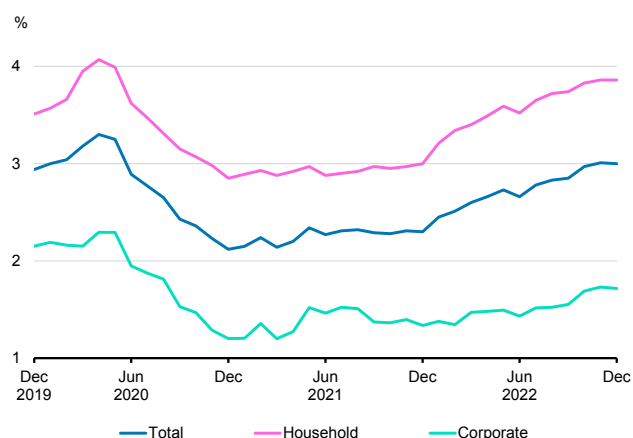


The increase in the Selic rate passed through to interest rates charged on credit operations contracted in 2022. The average interest rate on new credit operations increased 5.5 p.p. in 2022, reaching 30.1% p.a. in December. The average interest rate for non-earmarked credit closed the year at 41.7% p.a., a 7.9 p.p. increase in the period (Graph 1.2). The average rate of new non-earmarked operations with households reached 55.4% p.a. in December, increasing 10.4 p.p. in 12 months. It was particularly noticeable in this segment the above-average increase in the interest charged on revolving credit cards (60.3 p.p.), highlighting the weight of delinquency in the cost composition of this type of credit. The average rate in the non-earmarked corporate segment reached 23.1% p.a. in December, increasing 3.4 p.p. in the year. The interest rate on corporate overdraft facilities – which, unlike the overdraft line for individuals, is not subject to a maximum rate cap – recorded the largest increase of the year (22.4 p.p.).

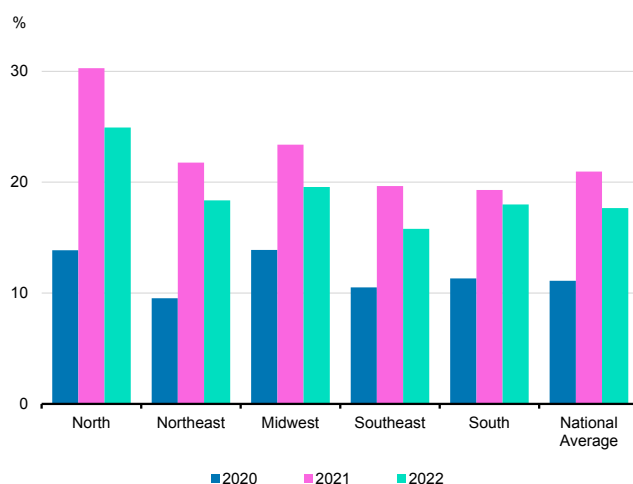
Table 1.3 – Credit Cost Index (ICC)

Segment	% p.a.			p.p. variation		
	2020	2021	2022	2020	2021	2022
Total	16.7	18.3	21.5	-3.5	1.6	3.2
Non-earmarked resources	23.3	25.7	30.6	-6.1	2.4	4.9
Corporations	12.7	15.5	19.4	-4.1	2.8	3.9
Households	33.5	34.9	40.2	-7.0	1.4	5.3
Earmarked resources	8.2	8.1	9.0	-0.4	-0.1	0.9
Corporations	8.4	8.6	9.4	-0.4	0.2	0.8
Households	8.1	7.9	8.8	-0.4	-0.2	0.9
Corporations	11.0	13.0	15.8	-2.7	2.0	2.8
Households	21.5	22.3	25.4	-3.7	0.8	3.1

/ Values refer to December of each year.

Graph 1.3 – Delinquency rate**Graph 1.4 – Credit balance variation**

Household, by region



The credit portfolio rollover, with operations agreed throughout 2022 with higher interest rates, raised the interest rate on the credit portfolio granted by the SFN by 3.2 p.p. The Average Cost of Outstanding Loans (ICC) reached 21.5% p.a. in December 2022. (Table 1.3). The ICC of non-earmarked operations reached 30.6% p.a., increasing 4.9 p.p. compared with the end of 2021. The ICC of non-earmarked corporate operations rose by 3.9 p.p. to 19.4% p.a. in December, whereas non-earmarked household operations reached 40.2% p.a., up 5.3 p.p. in the year.

In 2022, the delinquency rate on credit granted by the SFN increased, especially in the non-earmarked segment (Graph 1.3). The delinquency rate on non-earmarked household operations grew more sharply in the first half of 2022, mainly in revolving credit card and non-payroll-deducted personal credit. Regarding the non-earmarked corporate segment, operations overdue for more than 90 days increased in 2022Q4, especially in working capital. Thus, the banking credit delinquency rate increased 0.7 p.p. in 2022, reaching 3.0% in December. The delinquency rate in the corporate portfolio increased 0.4 p.p., to 1.7%, rising 0.6 p.p. in non-earmarked credit and remaining stable in the earmarked segment, while, in the household portfolio, it increased 0.9 p.p., reaching 3.9%, up 1.5 p.p. in the non-earmarked credit types and stable in the earmarked.

1.2 Characteristics of operations and borrowers

Household credit by state⁶

The 17.7% expansion of household credit in 2022, referred to in the previous section, developed with varying intensities among the geographic regions and states (Graph 1.4 and Table A in Appendix B). The states that presented the highest growth in household credit in 2022 were mainly located in the Northern Region, especially Tocantins (26.8%), Pará (25.9%), and Acre (25.5%).⁷

⁶ Data herewith presented may differ from other BCB publications due to methodological differences in the construction of the time series; however, it is noteworthy that the results of the analyses in this section are robust to such differences in those series.

⁷ Data relative to household credit by state, total and normalized by the population, are shown in tables A and B of Annex B.

Figure 1.1 – Household credit density by state (BRL thousand)



Graph 1.5 – Default rate Household, by region

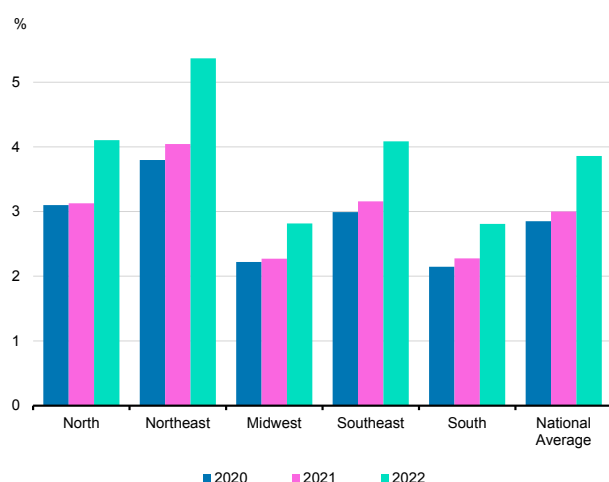
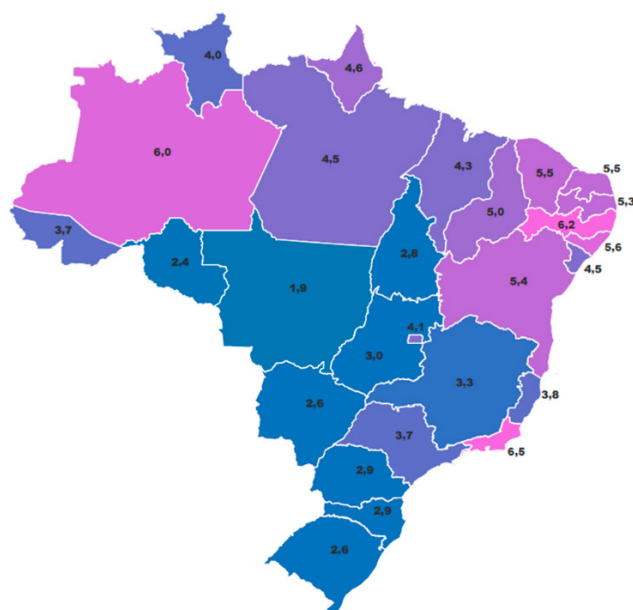


Figure 1.2 – Household delinquency rate by state (%)



The Central-western states are those with the highest densities of credit per inhabitant,⁸ followed by the Southern ones (Figure 1.1 and Table B in Annex B). Amazonas showed the lowest credit density.

In 2022, the household delinquency rate rose significantly in all regions and states, with biggest increases in the Northeastern, Northern, and Southeastern regions (Graph 1.5). The Northeastern region, which already had the highest level of household delinquency in the country, showed the biggest increase (1.3 p.p.). Rio de Janeiro, Pernambuco and Amazonas were the states with the highest delinquency rates in 2022 (Figure 1.2).

Household credit by gender

Unlike 2020 and 2021, credit for women grew slightly more than for men in 2022 (Table 1.4). However, women's share of the total credit balance remained stable at 38% throughout the analyzed period. The small differential in women's versus men's delinquency rates in 2020 and 2021 increased slightly in 2022, although rates although rates of both genders remain very close to each other (Table 1.5).

Household credit by age group

The younger the age group, the greater the credit acceleration (time variation in the growth rate) experienced in 2021 and the greater its deceleration in 2022 (Table 1.6). Nevertheless this, the 24-and-under age group showed the greatest credit balance growth in 2022. All age groups, except those aged 60 and older, showed an increase in the delinquency rate in 2022 (Table 1.7). In addition, the lower the age group, the greater was the increase in the delinquency rate, with a significant rise in the 24-and-under age group.

Corporate credit by state

In 2022, the pace of credit expansion was heterogeneous among the geographic regions. As in the previous year, the Southeastern was the region with the lowest growth (Graph 1.6). The corporate delinquency rate rose in all regions (Graph 1.7), with higher values in the Northern and Northeastern regions, where the delinquency rate reached approximately 2.4%.

⁸ Largely reflecting the role of rural credit.

Table 1.4 – Household Credit Balance

By gender

Gender	2020	2021	2022	R\$ billions		
				% Variation		
				2020	2021	2022
Total	2,241	2,711	3,190	11.1	21.0	17.7
Male	1,387	1,682	1,977	11.7	21.2	17.5
Female	854	1,029	1,213	10.2	20.6	17.9

/ Values refer to December of each year and do not include unidentified cases.

Table 1.5 – Household Delinquency Rate

By gender

Gender	2020	2021	2022	%
Total	2.9	3.0	3.9	
Male	2.8	2.9	3.7	
Female	2.9	3.1	4.1	

/ Values refer to December of each year.

Table 1.6 – Household Credit Balance

By age group

Age group	2020	2021	2022	R\$ billions		
				% Variation		
				2020	2021	2022
Total	2,241	2,711	3,190	11.1	21.0	17.7
24 years or less	51	70	88	4.4	37.5	26.8
25 to 39 years	699	844	973	9.0	20.7	15.3
40 to 59 years	994	1,210	1,442	12.3	21.8	19.1
60 years or more	497	587	686	12.6	17.9	17.0

/ Values refer to December of each year.

Table 1.7 – Household Delinquency Rate

By age group

Age group	2020	2021	2022	%
Total	2.9	3.0	3.9	
24 years or less	5.9	6.9	9.9	
25 to 39 years	3.0	3.4	5.1	
40 to 59 years	2.6	2.5	3.2	
60 years or more	2.9	2.9	2.8	

/ Values refer to December of each year.

Corporate credit by company age

In 2022, there was a sharp decrease in the expansion of credit to younger companies, with three years or less of foundation time, seen in previous years (Table 1.8). The strong expansion in the four-to-five-year-old range suggests that, in 2022, those enterprises with a few years in the market expanded their credits more easily than entrants. The increase in the delinquency rate in 2022 (Table 1.9) was also due to its significant increase in companies with three or less years of foundation, due in part to the strong expansion of credit in this group in previous years.

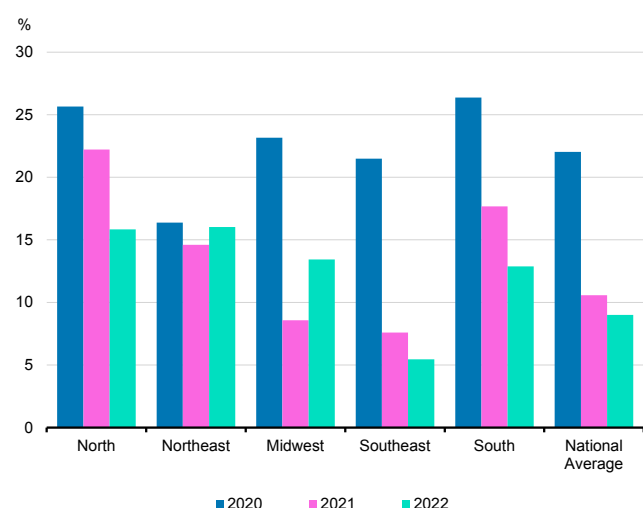
Corporate credit by activity sector

In 2022, the corporate credit balance increased in all economic activity sectors (Table 1.10). Noteworthy are the expansion in Construction (23.3%) and the recovery in Extractive Industries (30.8%), which had, respectively, low and negative growth in 2021. The Agriculture, Livestock, Forestry, Fishing and Aquaculture (16.7%), Transportation, Storage and Mail (12.9%), and Trade and Repair of Motor Vehicles and Motorcycles (12.6%) sectors also showed above-average growth (9.0%), although the latter sector slowed down compared to the previous year.

The 0.5 p.p. increase of the delinquency rate in 2022 (Table 1.11) mostly reflects its increase in Trade and Repair of Motor Vehicles and Motorcycles (0.8 p.p.), Other Services (0.6 p.p.), and Manufacturing (0.4 p.p.).

The decrease in the expansion of credit and the increase of the delinquency rate in the sectors of Trade and Repair of Motor Vehicles and Motorcycles and Other Services, in 2022, indicate that these sectors are adjusting after the strong expansion in 2020 and 2021, due to the pandemic. Also worth noting, the expansion of credit and the decrease of the delinquency rate in Construction reflect the favorable economic conditions for this activity in recent years.

Graph 1.6 – Credit balance variation
Corporate, by region



Graph 1.7 – Default rate
Corporate, by region

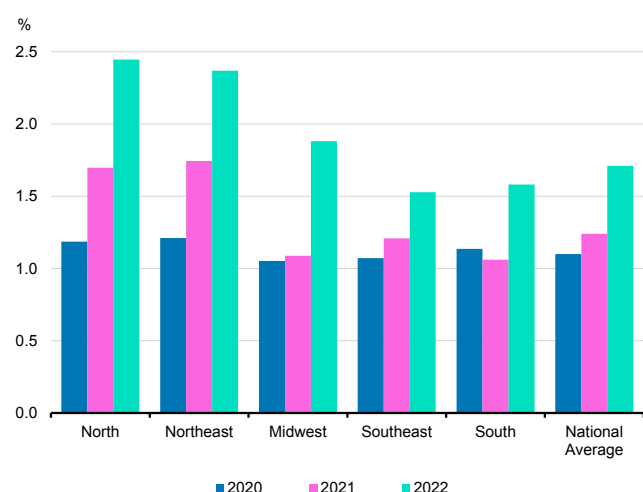


Table 1.8 – Corporate Credit Balance

By years founded

Years founded	R\$ billions					
	2020	2021	2022	% Variation		
				2020	2021	2022
Total	1,780	1,969	2,146	22.0	10.6	9.0
Up to one year	24	30	34	38.3	25.9	14.0
Two or three years	65	86	100	58.8	32.7	16.0
Four or five years	75	90	117	3.6	19.5	30.1
Six or seven years	96	99	107	19.2	3.9	8.0
Eight or nine years	93	110	116	-17.3	17.4	6.2
Ten or more years	1,427	1,553	1,670	25.7	8.8	7.6
Not identified	0	0	0			

/ Values refer to December of each year.

Corporate credit by enterprise size

This subsection analyzes the corporate credit balance and granting in 2022⁹ according to their size:¹⁰ (a) micro enterprise; (b) small enterprise; (c) medium enterprise; and (d) large enterprise.

The expansion of corporate credit in 2022 was driven by micro, small and medium-sized enterprises – MSME (Table 1.12). The credit portfolio of MSME grew 13.9%, while that of large enterprises increased 5.3%. The largest variation was in micro enterprises (16.4% growth).

In terms of the participation in the outstanding credit portfolio, large enterprises maintained the downward trend observed over the last years, reaching 55.2% of the market in 2022 (Graph 1.8). The participation of micro and small enterprises (MSE), for the first time since 2016, exceeded 20% of total portfolio.

Credit granting continued to expand nominally for all corporate size segments (Table 1.13). There was a significant increase in credit granting for all MSME segments. Considering the MSE segment, credit granting grew 21.5% in 2022, higher than in 2021 (3.7%). In turn, the growth in credit granting for large companies in 2022 (17.5%) was lower than in 2021 (24.3%).

The participation of non-earmarked credit in the corporate credit balance continued to expand only for micro enterprises (Graph 1.9). For large enterprises, traditionally more dependent on earmarked credit, the balance of non-earmarked operations reached 60.5% of total balance, presenting stability compared to 2021, which may be related to the expansion of the BNDES

9 Data herewith presented may differ from other BCB publications since they include operations transferred to institutions that are not part of the SFN and do not include credits reported abroad.

10 The size of the enterprises is reported to the BCB through the Credit Information System (SCR) by the financial institutions and must follow the criteria established by Complementary Law 123, of December 14, 2006 (when the same enterprise is classified in a different way by different financial institutions, mode is used, meaning the size indicated most often): micro enterprise is one whose annual gross revenue is equal to or less than BRL 360,000.00; small enterprise is one whose annual gross revenue is greater than BRL 360,000.00 and less than or equal to BRL 3,600,000.00; medium enterprise is one whose gross annual revenue is greater than BRL 3,600,000.00 and less than or equal to BRL 300,000,000.00, if its total assets do not exceed BRL 240,000,000.00. Large enterprise is one whose gross annual revenue is greater than BRL 300,000,000.00 or whose total assets are greater than BRL 240,000,000.00, as established in Article 3, sole paragraph, of Law 11,638, of December 28, 2007. In 2021, the methodology for measuring the enterprise size has changed and, as such, the data presented for each category in the current edition may differ from the data presented in past publications of this report.

Table 1.9 – Corporate Delinquency Rate

By years founded

Years founded	2020	2021	2022	p.p. variation			%
				2020	2021	2022	
Total	1.1	1.2	1.7	-1.0	0.1	0.5	
Up to one year	1.7	2.9	5.7	-1.5	1.2	2.8	
Two or three years	1.9	3.0	5.4	-1.3	1.1	2.4	
Four or five years	1.6	2.8	4.2	-0.8	1.2	1.4	
Six or seven years	1.8	2.0	3.6	-0.7	0.2	1.6	
Eight or nine years	1.9	1.6	2.7	-1.4	-0.3	1.1	
Ten or more years	0.9	0.9	1.0	-1.0	0.0	0.1	
Not identified	0.0	0.0	0.0				

/ Values refer to December of each year.

credit portfolio previously mentioned. Medium-sized companies had a lower share of non-earmarked credit in 2022 (82.5%) compared with 2021 (83.5%). Compared with 2020, however, all segments showed a higher share of non-earmarked credit in total balance portfolio.

In the MSE segment, working capital and anticipation of receivables accounted for 62.8% of the credit portfolio in 2022. For medium enterprises, these modalities were 55.1% of the portfolio and, for large companies, 30.5% of the credit balance. Large companies ended 2022 with 43.4% of credit portfolio allocated for infrastructure, projects, or investments and 17.2% for foreign trade operations (Graph 1.10).

Table 1.10 – Corporate Credit Balance

By sector of activity

Sector	2020	2021	2022	% Variation			R\$ billions
				2020	2021	2022	
Total	1,780	1,969	2,146	22.0	10.6	9.0	
Agriculture, livestock, forestry production, fishing and aquaculture	32	39	45	25.0	19.9	16.7	
Extractive industries	17	15	19	8.0	-10.1	30.8	
Manufacturing industries	434	454	475	21.5	4.7	4.6	
Electricity and gas, water, sewage and waste management	209	218	235	14.5	4.3	7.8	
Construction	77	85	104	15.9	9.7	23.3	
Trade, repair of motor vehicles and motorcycles	412	497	559	29.0	20.7	12.6	
Transportation, storage and mail	170	184	207	22.1	8.0	12.9	
Public administration, defense and social security	163	165	167	15.6	1.4	1.3	
Other services	266	306	325	32.1	15.1	6.3	
Corporations headquartered abroad or unclassified	2	7	8				

/ Values as of December of each year.

Table 1.11 – Corporate Default Rate

By sector of activity

Sector	2020	2021	2022	p.p. variation			%
				2020	2021	2022	
Total	1.1	1.2	1.7	-1.0	0.1	0.5	
Agriculture, livestock, forestry production, fishing and aquaculture	1.3	0.8	0.8	-2.6	-0.5	0.0	
Extractive industries	0.2	10.4	1.0	-0.5	10.2	-9.4	
Manufacturing industries	0.8	0.6	1.0	-1.6	-0.2	0.4	
Electricity and gas, water, sewage and waste management	0.5	0.1	0.1	0.4	-0.4	0.0	
Construction	3.7	2.9	2.8	-2.9	-0.8	-0.1	
Trade, repair of motor vehicles and motorcycles	1.6	1.8	2.6	-0.9	0.2	0.8	
Transportation, storage and mail	0.9	1.4	1.3	-0.6	0.5	-0.1	
Public administration, defense and social security	0.0	0.0	0.0	-0.3	0.0	0.0	
Other services	1.7	2.0	2.6	-0.8	0.3	0.6	
Corporations headquartered abroad or unclassified	1.0	1.6	2.2	-3.0	0.6	0.6	

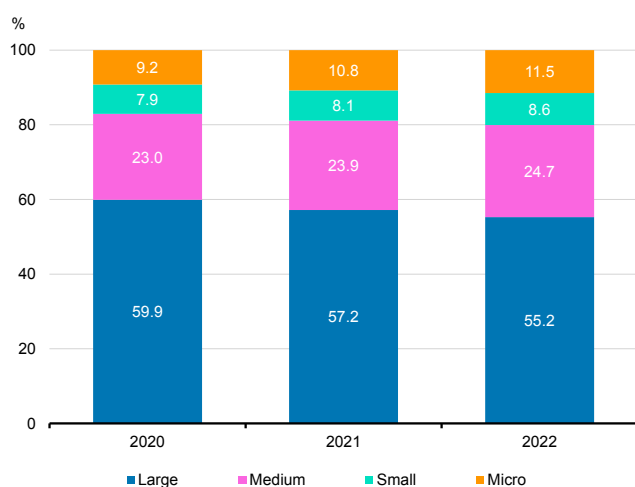
/ Values as of December of each year.

Table 1.12 – Corporate Credit Operations Balance

By enterprise size

Size	R\$ billions					
	2020	2021	2022	% Variation		
				2020	2021	2022
Total	1,780.3	1,968.5	2,145.7	21.9	10.6	9.0
Large	1,066.5	1,125.7	1,185.5	16.9	5.6	5.3
Medium	409.7	471.0	529.8	21.7	15.0	12.5
Small	139.9	159.9	183.8	43.3	14.2	15.0
Micro	164.1	211.9	246.7	44.2	29.2	16.4

/ Values refer to December of each year.

Graph 1.8 – Corporate credit
Share in balance by size**Table 1.13 – Corporate Credit Granting**

By enterprise size

Size	R\$ billions					
	2020	2021	2022	% Variation		
				2020	2021	2022
Total	1,973.2	2,233.9	2,699.9	9.5	13.2	20.9
Large	979.8	1,218.0	1,431.7	13.9	24.3	17.5
Medium	552.5	558.5	712.7	0.8	1.1	27.6
Small	195.0	194.8	240.5	10.5	-0.1	23.5
Micro	245.9	262.6	315.0	13.1	6.8	20.0

Regarding maturity, all segments showed stability in the proportion of long-term exposures (over 12 months) compared with 2021, maintaining the shortening of portfolio's maturity in compared with 2020. For MSE, short-term operations made up 12% of the total balance, while for large companies, such operations accounted for 27% of total balance (Table 1.14)

In 2022, the delinquency rate increased in all segments compared with 2021, except for large enterprises. The most significant increase occurred in the MSE segment: for small businesses, the delinquency rate rose from 3.2% to 4.1% and for micro-businesses, from 5.4% to 7.1% (Graph 1.11). It is worth noting that the delinquency rate had already risen in 2021 compared with 2020 in these segments. For medium enterprises, the delinquency rate rose from 1.2% to 1.6% and for large enterprises, it fell from 0.4% to 0.1%.

Thus, the new economic environment for MSE presents a relevant increase in the delinquency rate, at the same time as credit granting is rising compared with 2021, gradually gaining share in the corporate credit balance.

1.3 Credit portability

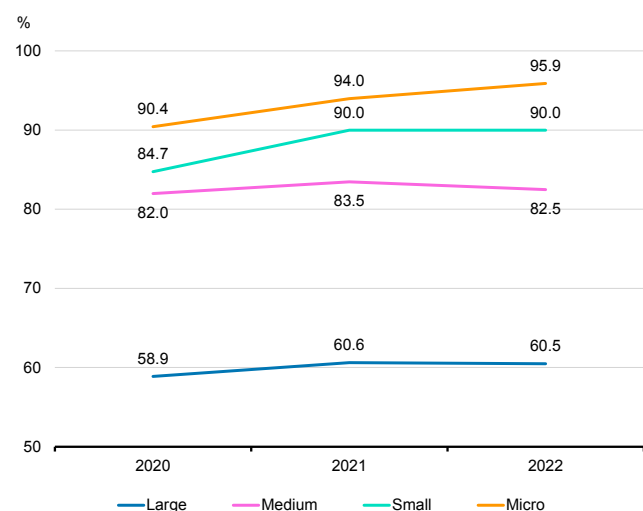
After a long sequence of rises, credit portability dropped sharply in 2022, returning to levels similar to those seen in 2017 (Graph 1.12).¹¹ In 2022, the number of credit portability requests fell by half (down 50.6% compared with 2021), to 5.1 million, with 1.9 million requests being carried out (down 57.5%), corresponding to BRL17.4 billion in ported balance (down 64.8%).

The worsening of credit conditions in 2022 led to a reduction in the rate of effected transactions and to an increase in the rate of cancellations, representing, respectively, 36.6% and 32.3% of total requests

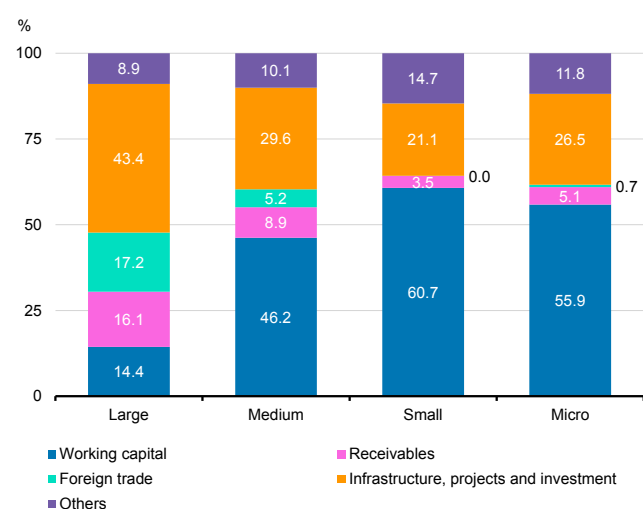
¹¹ The amounts and values presented are based on data from the Credit Transfer Center (CIP CTC), which uses a method that groups the contracts according to the date of the request.

Graph 1.9 – Non-earmarked credit

Share in balance by size

**Graph 1.10 – Credit Modalities**

Share in balance by size – 2022

**Table 1.14 – Credit Maturity for Large and Micro/Small Enterprises**

Share in credit balance

Maturity	2020	2021	2022	Δ
Large enterprise				
Short-term	24	27	27	
Long-term	76	73	73	
Micro and small enterprise				
Short-term	10	12	12	
Long-term	90	88	88	

/ Values as of December of each year.

(Graph 1.13).¹² The rise in the rate of cancellations was due to the tighter credit policy of the proposing institutions, indicating greater risk aversion at the time of credit portability. The combined rate of effected and renegotiated transactions with the original lender, which represent the cases in which the client obtains contractual advantages, fell slightly to 53.9% of total requests.

Payroll-deducted portable loans moved BRL 15.1 billion (down 63.1% – Table 1.15), representing 7.6% of the value of payroll-deducted loans in 2022,¹³ compared with 17.7% in 2021. Even with the reduction, the portability of payroll-deducted loans increased its market share, reaching 86.9% of the ported balance, mainly due to the poor performance of real estate financing credit portability in the year.

An unusual event in September 2022 was the portability of some working capital transactions. Despite being few, these transactions resulted in a ported balance of about BRL 780 million, an amount that considerably reduced the predominance of payroll-deducted credit that month, to nearly 60% (Graph 1.14).¹⁴

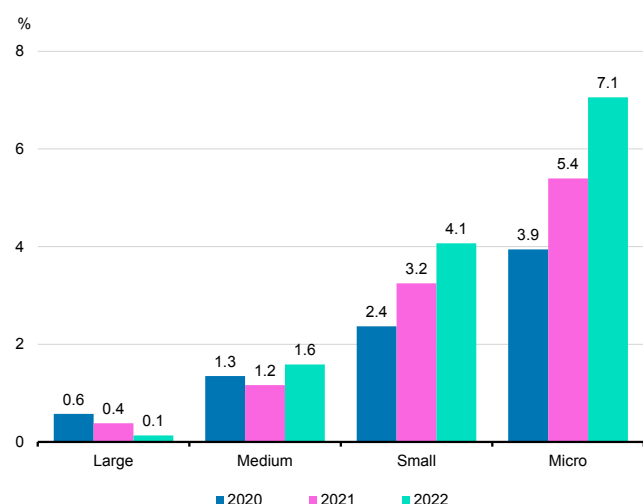
After a considerable period of decline, the average interest rates for new payroll-deducted credit operations rose again in 2022 (Graph 1.15). The increase in the interest rates for INSS payroll-deducted credit operations (Graph 1.16) followed the rise in the legal limit from 1.80% p.m. to 2.14% p.m. established by the Normative Directive INSS 125 of December 09, 2021. This increase reduced the financial attractiveness of INSS payroll-deducted credit operations portability in 2022, with 1.6 million requests being carried out (down 54.2% in relation to 2021).

12 The portability market involves, in addition to the customer, two actors: the original lender (the institution that granted the credit) and the proponent (the institution that will receive the ported contract). Frequently, a financial intermediary is also involved. Generally, portability requests can be classified into one of the following four situations: effected (the order is executed and the contract is transferred from the original lender to the proponent); canceled (at the request of the customer or, usually, at the proponent's discretion – depending, for example, on the credit policy); retained (when the process stops at the request of the original lender, due to data inconsistency or renegotiation of the terms of the contract); and pending (request awaiting action; if the request is not completed or retained by the lender or canceled by the proponent, it will be canceled by the registry institution). Since the retention due to renegotiation implies better contract conditions for the customer, the overall effectiveness of this instrument is the total of ported and renegotiated requests.

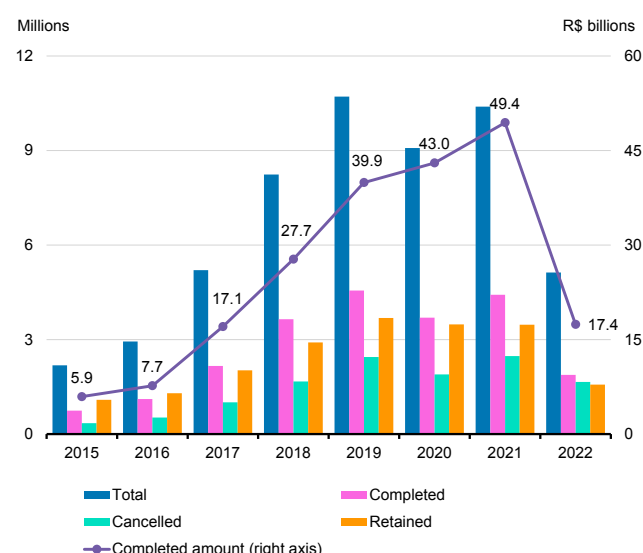
13 According to the Time Series 20671 – Credit granting with non-earmarked resources – Households – Total payroll-deductible personal credit, the value granted in 2022 in this credit type totaled BRL 199.2 billion).

14 The ported value of the working capital transactions is included in the “Other credit types” category in Table 1.15, which led to an increase of 1,182% compared to 2021.

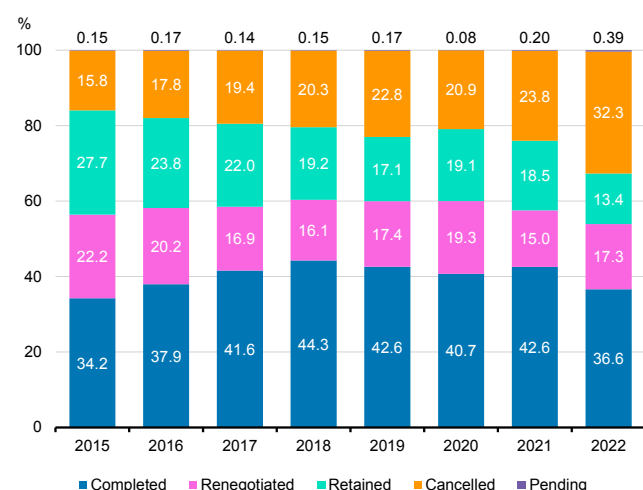
Graph 1.11 – Default Rate
Corporate, by size



Graph 1.12 – Portability Requests
Accumulated by year and status



Graph 1.13 – Portability Requests
Evolution of Status Participation



Similarly to previous years, real estate financing credit portability was strongly influenced by the Selic rate in 2022 (Graph 1.17). The rise in the rate resulted in an increase in funding costs and interest rates for new grants, which reduced the attractiveness of portability, bringing it back to levels like to those at the beginning of 2018. In 2022, total requests were 6,600 (down 91.7% from 2021). Effected contracts totaled 2,700 (down 89.5%), and the ported value reached BRL 934 million (down 86.6%).

1.4 Quarterly Survey on Credit Conditions

The Quarterly Survey on Credit Conditions (PTC) collects the financial institutions' assessments on the banking credit conditions in four segments. Corporate credit is broken down into two segments: credit to large companies and credit to MSME. Household credit is split into consumer credit and real estate financing.

For each segment, respondents assess the change patterns of supply and demand for credit lines observed in the last three months and the outlook for the following three months. The assessment is made by indicating, on a five-level scale, the direction and intensity of the observed or expected changes.¹⁵ Respondents also assess a set of factors that affect supply and demand conditions. They assign each factor a score for its importance and indicate, on a five-level scale, the positive or negative effect on supply and demand conditions, considering the last three months and the outlook for the following three months.¹⁶ The ratings are converted into values between -2 and 2, and the averages are calculated for each rated item. The graphs in this section show the evolution of these averages for the assessments referring to what was observed in the past three months, from 2020 to 2022.

¹⁵ The approval pattern, which represents the credit supply, can be assessed as “considerably more restrictive”, “moderately more restrictive”, “basically unchanged”, “moderately more flexible”, “considerably more flexible”. For the demand for credit lines, the alternatives are “substantially stronger”, “moderately stronger”, “same level”, “moderately weaker”, “substantially weaker”.

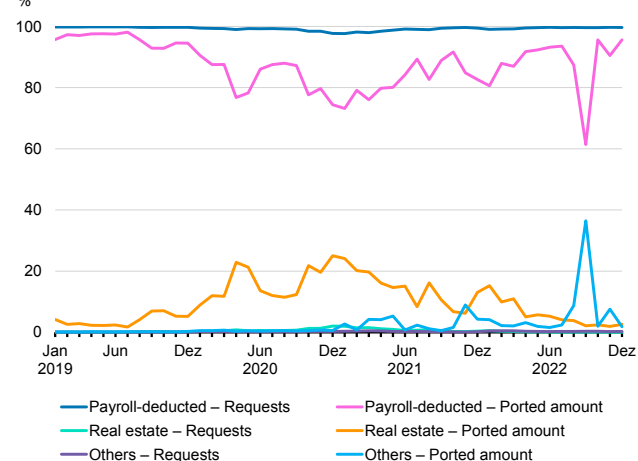
¹⁶ For the evaluation of supply factors, the alternatives are “significantly induced more restrictive conditions”, “moderately induced more restrictive conditions”, “did not affect the supply”, “moderately induced more flexible conditions” and “significantly induced more flexible conditions”. For the demand factors: “significantly induced a reduction in demand”, “moderately induced a reduction in demand”, “did not affect the demand”, “moderately induced an increase in demand” and “significantly induced an increased demand”.

Table 1.15 – Credit Portability by Type

Credit Type	2021	2022	R\$ millions	
			Share %	
			2021	2022
Total	49,417.02	17,406.34	100.0	100.0
Payroll-deducted	41,004.50	15,118.77	83.0	86.9
Real estate	7,021.23	965.67	14.2	5.5
Home equity	55.44	31.50	0.1	0.2
Business	0.85	1.34	0.0	0.0
SFI	1,662.73	272.95	3.4	1.6
SFH	5,302.21	659.88	10.7	3.8
Personal	1,140.55	416.17	2.3	2.4
Vehicles	183.82	47.68	0.4	0.3
Other types	66.92	858.05	0.1	4.9

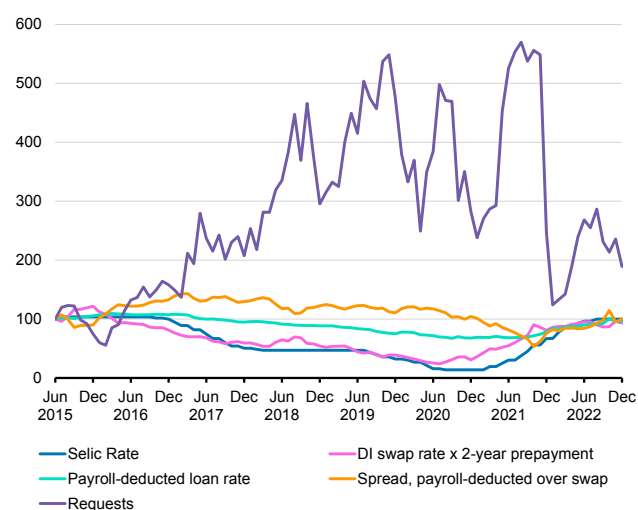
Graph 1.14 – Payroll-deducted and Real Estate Credit

Share in requests and ported amount



Graph 1.15 – Interest Rates and Portability

Index 100 in Jun 2015



Determinants of credit supply behavior

Graph 1.18 shows the assessments of quarterly changes in credit supply conditions in the four segments analyzed.

The positive values correspond to more flexible approval standards, and the negative values to more restrictive ones.

After a period of assessments close to neutral, credit supply was more dynamic throughout 2022.

Consistent with the scenario of rising interest rates, 2022Q4 assessments indicate more restrictive conditions in all segments. As for corporate credit, assessments were negative over the entire year, with greater intensity for MSME. As for households, consumer credit had a neutral assessment in the beginning of the year, but negative as of 2022Q3. In the segment of real estate financing, the perception of easing was growing until 2022Q3 when a sharp reversal was observed, and credit supply became restrictive in 2022Q4.

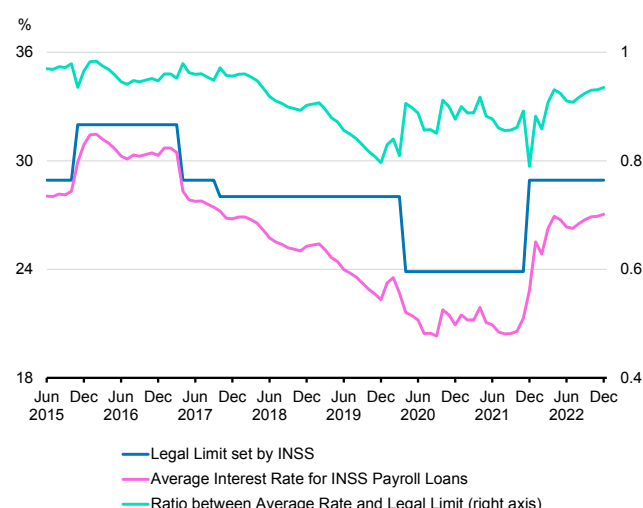
Graphs 1.19a to 1.19d show how the factors considered by the financial institutions as the most important for credit supply in each segment evolved.

Positive values correspond to more flexible conditions, and negative values to more restrictive conditions. In the segment of credit for large companies (Graph 1.19a), the most restrictive factors were the risk tolerance level and the general domestic economic circumstances. The client's risk perception, which was a positive factor in 2021, ended 2022 with a negative assessment. In the MSME segment (Graph 1.19b), the three main factors contributed negatively to the credit supply in all quarters and reached the end of 2022 with worse assessments than those at the end of 2021. According to the financial institutions, the factor that most contributed to the restriction of credit in this segment was the level of delinquency.

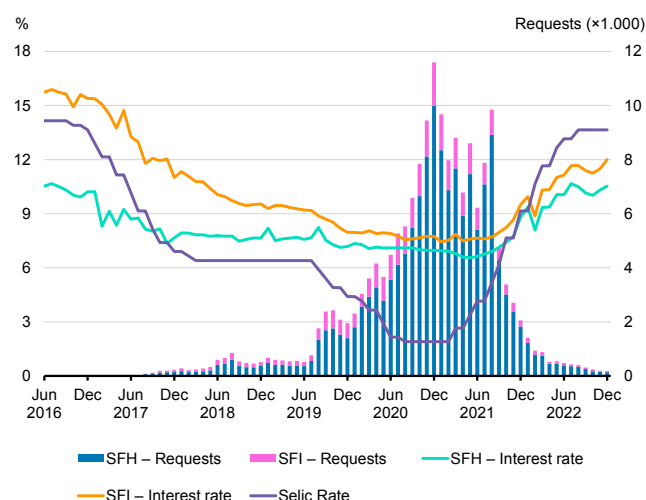
In the segment of household credit, all the highlighted factors were assessed as restrictive in 2022Q4.

In consumer credit, the factors were rated negatively in all quarters (Graph 1.19c), Comparing 2022Q4 with 2021Q4, of note is the level of risk tolerance worsening from neutral to restrictive. In real estate credit (Graph 1.19d), the assessments were predominantly negative, but varied greatly throughout the year. In 2022Q2, assessments improved in all factors, and the level of risk tolerance was considered a positive factor for supply. In 2022Q3, the factor "employment level and wage conditions" received a positive assessment, but in 2022Q4 all the factors became restrictive, with the highlight being the worsening of the cost/availability of funding item, which received a strongly restrictive assessment.

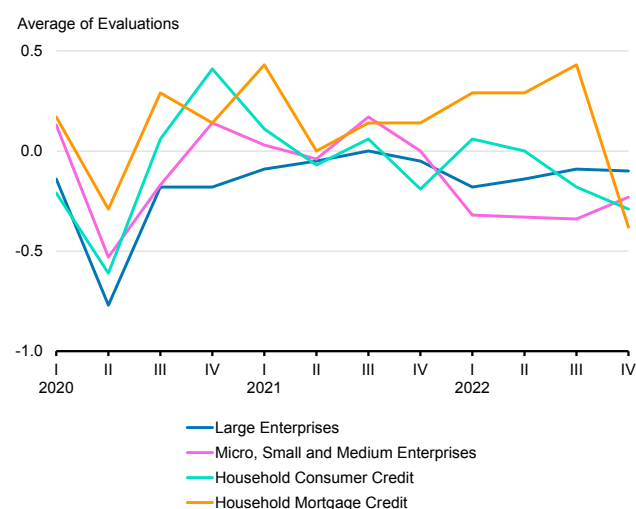
Graph 1.16 – INSS Payroll-Deducted Loans
Market Interest Rate vs. Legal Limit



Graph 1.17 – Real estate credit portability
Number of requests and interest rates



Graph 1.18 – Credit Lines Supply
Changes in Approval Conditions



Determinants of the credit demand behavior

Graph 1.20 displays assessments of demand changes in each quarter from 2020 to 2022. Positive values correspond to the perception of stronger demand, and negative values of weaker. In the segment of credit to large companies, the perception of stronger demand grew. In the segments of credit to MSME and credit to household consumption, assessments varied throughout the year, closing 2022 at levels similar to those at the end of 2021. The oscillation was sharper in the segment of real estate credit, which ended 2022 with a significant worsening compared with 2021.

Graphs 1.21a to 1.21d show financial institutions' views on the evolution of factors affecting the demand for credit. In the segments of corporate credit, the need for working capital remained the main factor favoring growth in demand, followed by the need for investing in fixed assets (Graphs 1.21a and 1.21b). For the segment of credit to MSME, interest rates change was perceived as a factor reducing credit demand.

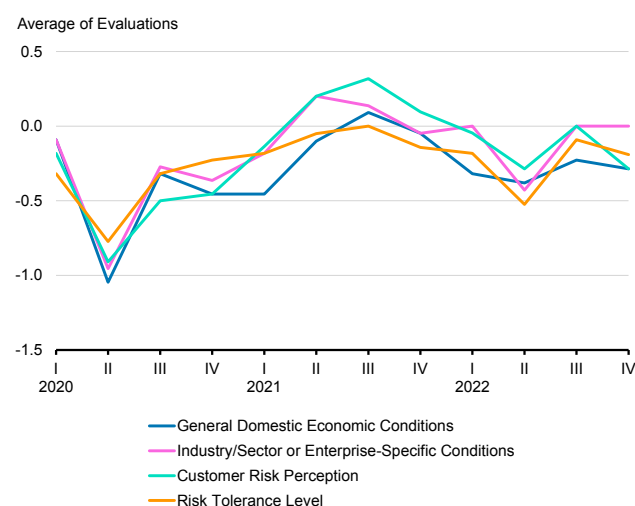
In the household segments, interest rates change was considered by financial institutions the main factor inhibiting demand (Graphs 1.21c and 1.21d). In consumer credit, factors associated with employment and income oscillated throughout the year around the neutral assessment for the demand behavior. In the real estate sector, in addition to interest rates change, the level of debt-service-to-income (DSTI) was also highlighted as an important factor for reducing demand. The other factors oscillated around neutral assessments, ending 2022 with slightly negative assessments.

1.5 Credit prospects

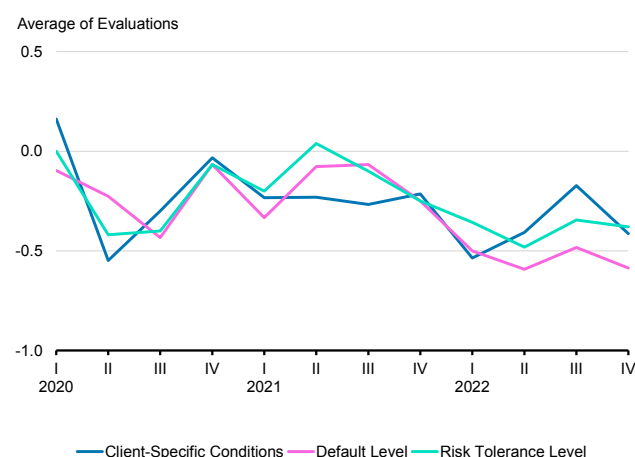
The Quarterly Survey on Credit Conditions (PTC) asks institutions to inform their expectations about the variation in credit balance and delinquency in the SFN for the end of each year. The graphs in this section show the collected expectations in the first survey of each year from 2021 to 2023. Expectations for 2023 were collected between January 16 and 27. The values observed in 2021 and 2022 are shown in the same graph for comparison.

In 2022, the growth in the credit balance for large companies, 4.0%, was lower than the median

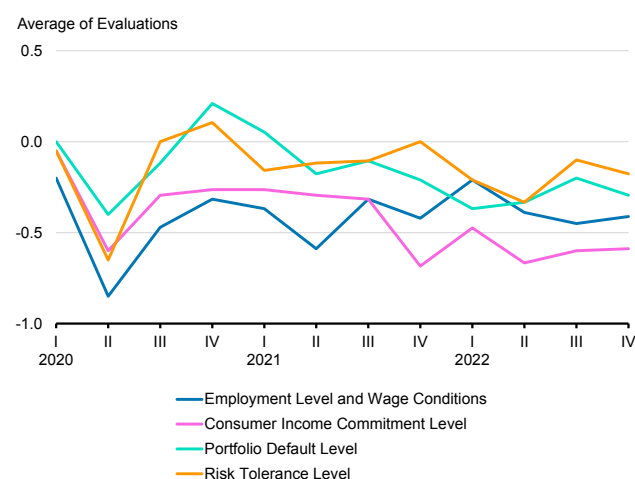
Graph 1.19a – Contribution of Factors
Credit Supply – Large Enterprises



Graph 1.19b – Contribution of Factors
Credit Supply – Micro, Small and Medium Enterprises



Graph 1.19c – Contribution of Factors
Credit Supply – Household Consumer Credit



expectations, 7.5% (Graph 1.22). In turn, in the other segments of the survey, credit growth was higher than the median. In the MSME segment (Graph 1.23), the observed increase in the balance was 11.7%, against median expectations of 9.5%.¹⁷ In the household credit segment (Graphs 1.24 and 1.25), the surprise was even greater. Consumer credit grew 17.4%, the highest among all segments, and the real estate credit 14.0%, against a growth expectation of 10.0% in both segments.¹⁸

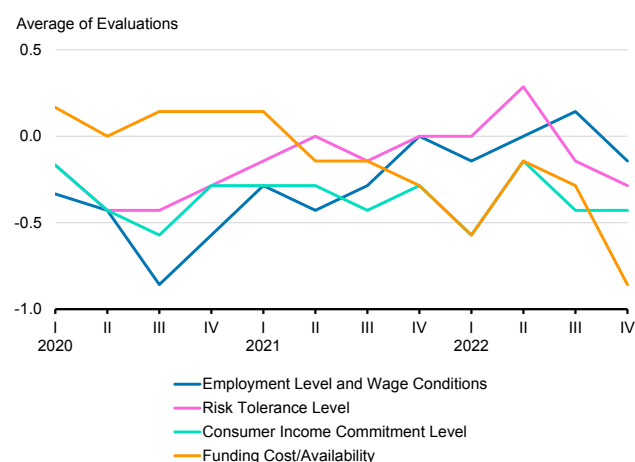
Corporate delinquency closed 2022 with lower-than-expected rates (Graphs 1.26 and 1.27). The rate for large companies ended 2022 at 0.3%, the lowest value in the time series and below the median of expectations, at 2.0%. For MSME, the delinquency rate rose to 2.3%, but also below expectations, whose median was 3.7%. The delinquency rate in household consumption credit, which was the highest of the segments analyzed, increased to 5.9% in 2022, in contrast with the expectation of reducing to 3.8% (Graph 1.28). In turn, the delinquency rate in real estate financing stood at 1.4%, below the median of 2.0% expected by the financial institutions (Graph 1.29).

Each graph also shows the distribution of expectations for 2023. For corporate credit, the expected balance growth for both segments is 10.0%. For households, the expected growth rate for consumption is 17.8% and for real estate financing, 12.8%. These rates are close to those observed in 2022. Regarding delinquency rates, the medians of the expectations of the financial institutions indicate an increase in the corporate segment, to 1.5% among large companies and 4.0% among MSME. In the household credit segment, the expectation is for relative stability, with delinquency rates of 5.5% for consumer credit and 1.5% for real estate financing.

17 To classify corporate credit by company size, financial institutions follow their own criteria, which are not necessarily comparable to those used in this report. The heterogeneity of these criteria contributes to greater dispersion in expectations.

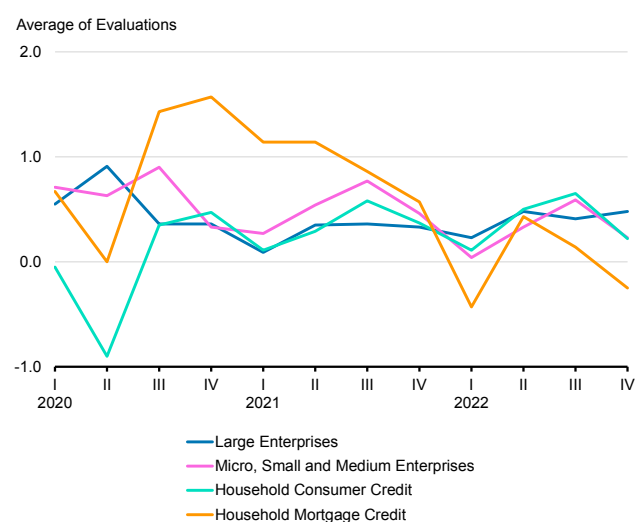
18 The segmentation for households presents more homogeneous criteria and the results can be better compared with the time series released by the BCB. For the consumer credit segment, the reference series codes in the time series system and their names are 20,570, "Non-earmarked credit operations outstanding – Households – Total balance (*Saldo da carteira de crédito com recursos livres – Pessoas físicas – Total*)", and 21,112, "Percent of 90 days past due loans of non-earmarked credit operations outstanding – Households – Total (*Inadimplência da carteira de crédito com recursos livres – Pessoas físicas – Total*)". For the real estate financing, they are 20,612, "Earmarked credit operations outstanding – Households – Real Estate Financing Total Balance" (*Saldo da carteira de crédito com recursos direcionados – Pessoas físicas – Financiamento imobiliário total*), and 21,151, "Percent of 90 days past due loans of earmarked credit operations outstanding – Households – Real Estate Financing Total Balance" (*Inadimplência da carteira de crédito com recursos direcionados – Pessoas físicas – Financiamento imobiliário total*).

Graph 1.19d – Contribution of Factors
Credit Supply – Household Mortgage Credit

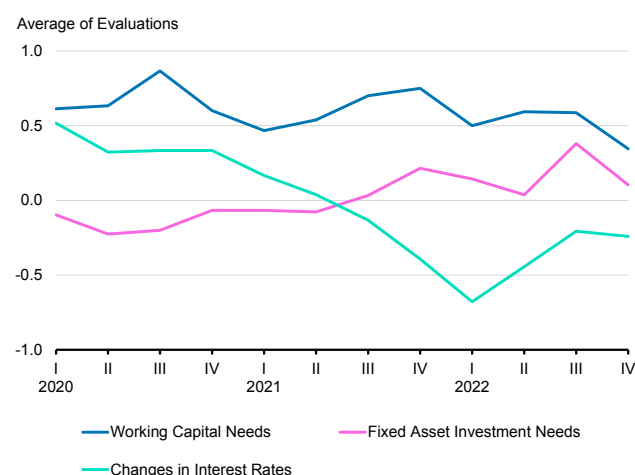


The BCB's bank credit projections¹⁹ for 2023 indicate growth of 7.6% in the total credit balance, with an increase of 7.1% in the balance of operations with non-earmarked resources and 8.3% with earmarked resources (Table 1.16).

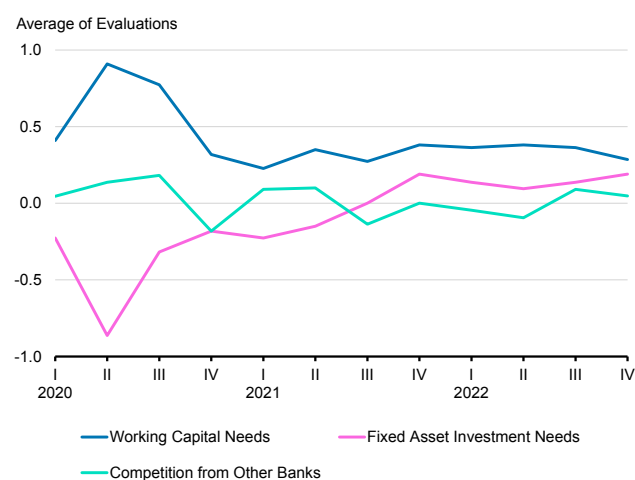
Graph 1.20 – Credit Lines Demand



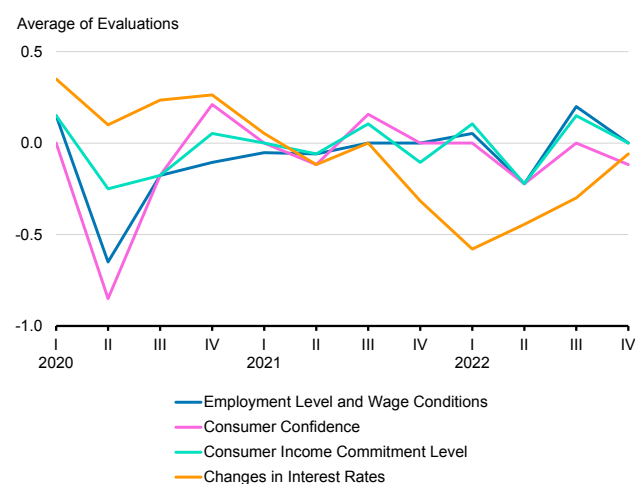
Graph 1.21b – Contribution of Factors
Credit Demand – Micro, Small and Medium Enterprises



Graph 1.21a – Contribution of Factors
Credit Demand – Large Enterprises

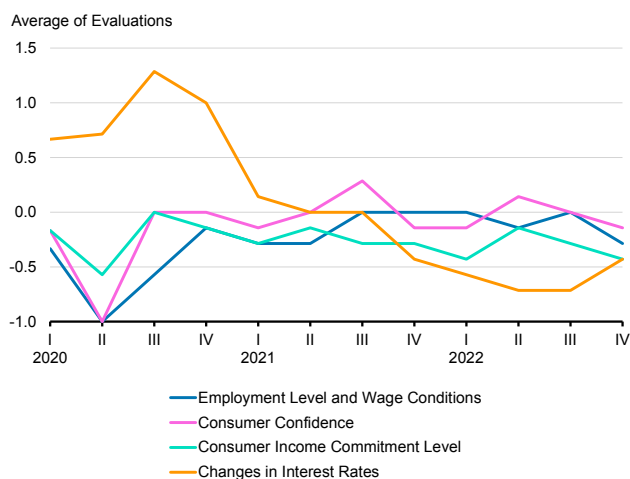


Graph 1.21c – Contribution of Factors
Credit Demand – Household Consumer Credit

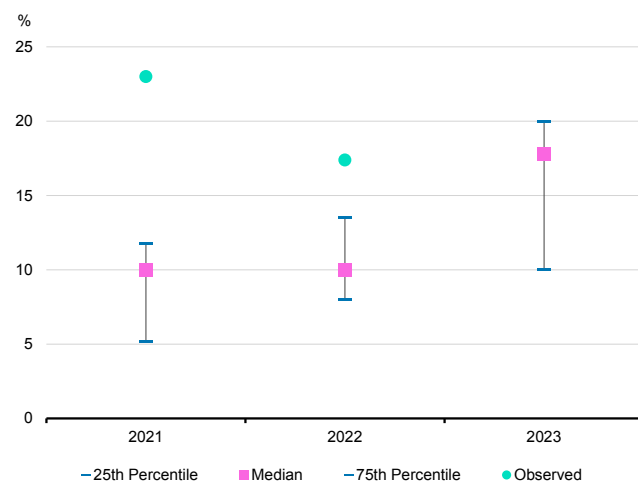


19 Estimates presented in the March 2023 Inflation Report.

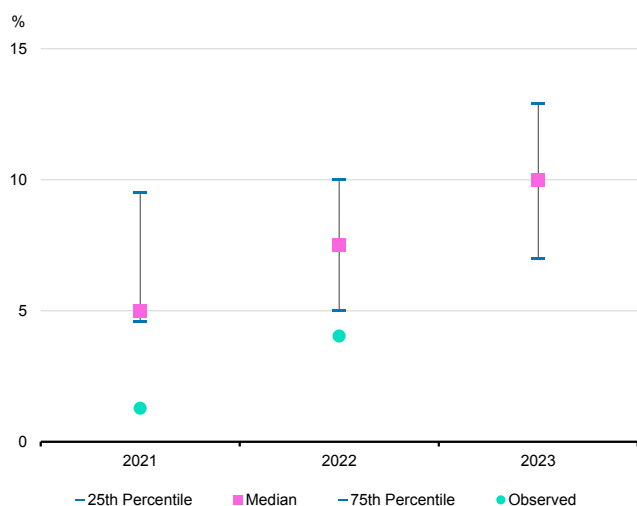
Graph 1.21d – Contribution of Factors
Credit Demand – Household Mortgage Credit



Graph 1.24 – Balance variation
Household Consumer Credit

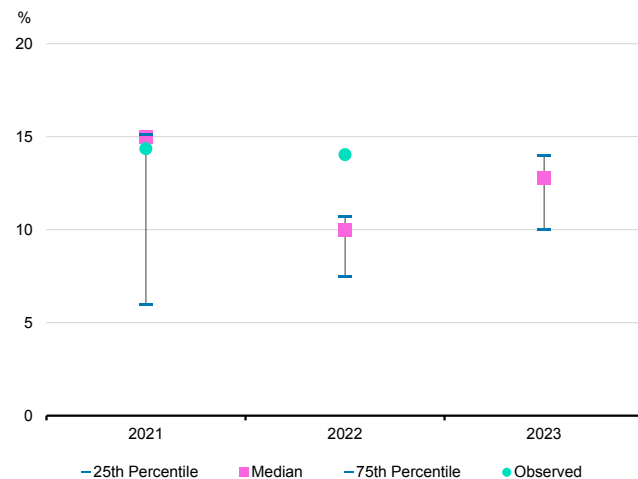


Graph 1.22 – Balance variation
Large Enterprises

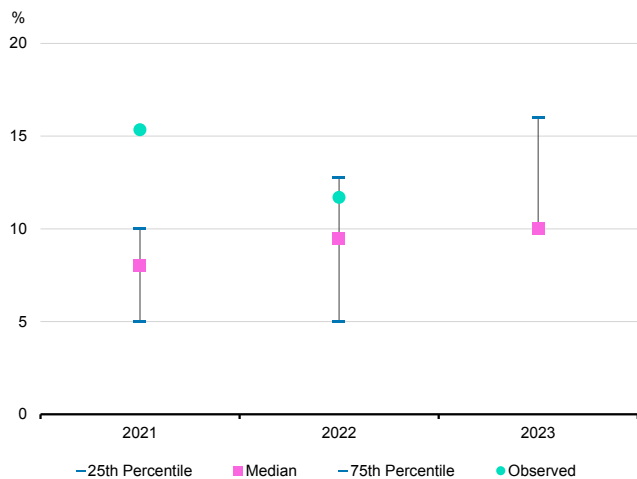


/ The observed change in 2021 was published with an error in the 2021 BBR and was corrected to 1.3%.

Graph 1.25 – Balance variation
Household mortgage credit

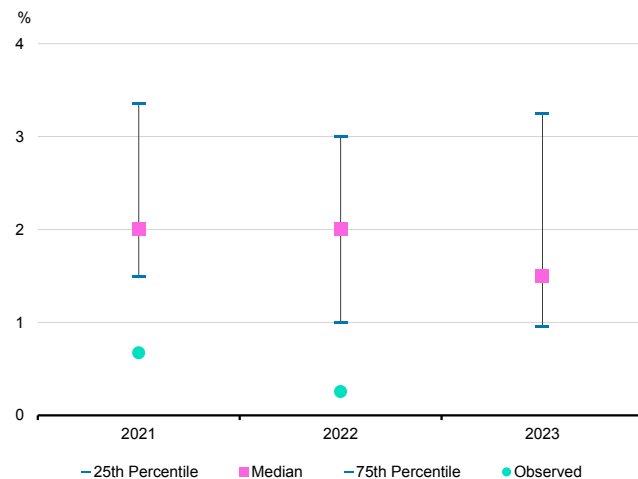


Graph 1.23 – Balance variation
Micro, small and medium enterprises



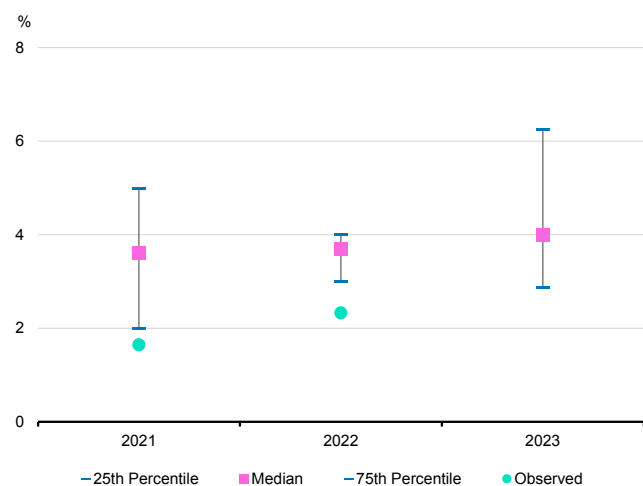
\ The variation observed in 2021 was published with an error in the 2021 BER and corrected to 15.3%.

Graph 1.26 – Default
Large enterprises



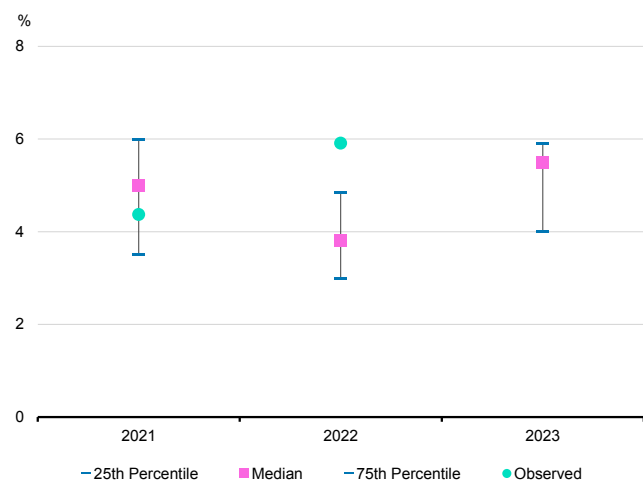
/ Expectations of 0% delinquency rate were disregarded and not considered in the calculation of medians and quartiles.

Graph 1.27 – Default
Micro, small and medium enterprises



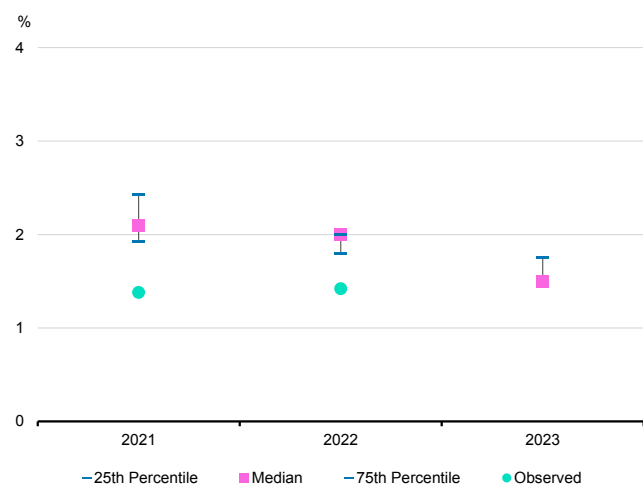
/ Expectations of 0% delinquency rate were disregarded and not considered in the calculation of medians and quartiles.

Graph 1.28 – Default
Household consumer credit



/ Expectations of 0% delinquency rate were disregarded and not considered in the calculation of medians and quartiles.

Graph 1.29 – Default
Household mortgage credit



/ Expectations of 0% delinquency rate were disregarded and not considered in the calculation of medians and quartiles.

Table 1.16 – Credit Growth for 2023

	Actual	Projection
	2022	2023
Total	14.0	7.6
Non-earmarked resources	14.1	7.1
Earmarked resources	14.0	8.3

/ Values refer to December of each year.

Box 1 – International Banking Statistics

Introduction

The Banco Central do Brasil (BCB) has added the International Banking Statistics (IBS) to the wide range of official macroeconomic statistics published through the Time Series Management System (SGS). The IBS are quarterly statistics on the balances of international assets and liabilities of banks operating in Brazil (domestic and foreign) and which have relevant international exposures. The methodology and release of these statistics are coordinated by the Bank for International Settlements (BIS). The BCB compiles the IBS and send them to the BIS, which releases the information from Brazil together with those from other reporting countries (currently 47 countries, including Brazil).

The purpose of this box is to present the characteristics and main results of the IBS and compare the Brazilian statistics with those of other countries.

International banking assets and liabilities, under the terms of the IBS, refer to transactions with non-residents, in any currency, and transactions with residents in foreign currency. Transactions with residents included in the IBS are those made directly in foreign currency or in national currency referenced in foreign currency.¹

The IBS are compiled from two perspectives: locational banking statistics (LBS), which record the international assets and liabilities of the local units of banks resident in the country; and consolidated banking statistics (CBS), relating to the consolidated assets of national banks, including foreign branches and subsidiaries.

The provision of information for the compilation of IBS is regulated by BCB Resolution 132, of August 24, 2021. The IBS are compiled according to the latest methodology approved by international forums, such as the BIS Committee on the Global Financial System (CGFS), with emphasis on the recommendations applied to the G-20 countries, consolidated in the Data Gaps Initiative (DGI).²

-
- 1 Transactions with residents in national currency referenced in foreign currency are transactions made and settled in national currency, but whose principal and/or interest values are affected by exchange rate variations. Examples include loans in the domestic market with a floating interest rate in foreign currency – such as export and import financing – and securities and derivatives at market values subject to exchange rate variations.
 - 2 The DGI (Data Gaps Initiative), coordinated by the Financial Stability Board (FSB) and the International Monetary Fund (IMF), aims to fill gaps in available statistics and increase the availability of economic and financial information that contributes to preventing risks to international financial stability.

Methodology

The EBI are compiled in accordance with the international methodological standard defined in the BIS/CGFS Reporting guidelines for the BIS International Banking Statistics.³ The standardized methodology allows for alignment with the best statistical compilation practices, favoring international comparability and integration with other official macroeconomic statistics.

In accordance with BC Resolution 132/2021, the IBS are produced from documents sent to the BCB by a sample of banks with international asset or liability balances equal to or greater than the equivalent of USD 300 million, on average over the four quarters of the calculation period. The sample includes commercial and multiple banks, savings banks, foreign exchange banks, investment banks and development banks.

Locational banking statistics (LBS)

The purpose of the LBS is to calculate the international assets and liabilities of banks operating in Brazil, whether domestic or foreign, without consolidating the positions in the country and abroad of the units of the same group. Therefore, it considers the concept of residence,⁴ including, among assets and liabilities, the gross balances of transactions between the local banking unit and the foreign branches and subsidiaries of the same group, and in the case of foreign banks, between the local unit and its parent company. The LBS do not cover the operations of external units that have been contracted abroad with counterparties other than the reporting banking unit in Brazil.

Statistics are broken down by financial instrument, residence of the counterparty country, currency of the transaction, and the counterparty institutional sector.

Instrument categories

LBS are classified into four instrument categories:

- **Loans and deposits:** the main operations recorded in this category refer, on the asset side, to cash and deposits in foreign currency abroad and to loans (notably contracted in the domestic market and referenced in foreign currency). On the liability side, mainly include obligations abroad linked to the financial institution's operations, such as those arising from contracts with importers and exporters, external borrowings and on-lending, and payment orders in foreign currencies.
- **Securities:** on the asset side, mainly include securities issued in the foreign market. On the liability side, notably debt securities issued to non-residents, in the domestic or international market.
- **Derivatives:** represent the differentials receivable (in assets) or payable (in liabilities), at the end of the quarter, for operations contracted in international or domestic markets, especially swaps involving foreign currency in one of the parties to the contract. The balance is concentrated in domestic market contracts referenced in foreign currency.

³ Available at: <https://www.bis.org/statistics/bankstatsguide.htm>.

⁴ The concept of residence follows an internationally adopted statistical definition and is independent of legal criteria and nationality. Thus, an institutional unit, whether it is an individual or a legal entity, is a resident of a country when its center of economic interest is located in that country's economic territory.

- Other: on the asset side, main operations are foreign currency rights arising from foreign exchange contracts, notably with residents who bring foreign currency into the country (such as exporters and companies that internalize funds raised abroad), and equity participation in agencies and subsidiaries abroad. On the liability side, includes foreign currency obligations due to foreign exchange contracts, mainly with importers and companies that need to pay debts for foreign services.

Classification by currency and counterparty country and sector⁵

The LBS are broken down by the main countries of the transaction's immediate counterparty. In this sense, even if there are guarantees granted by residents of other countries, only the country of the immediate counterparty is considered.

The transaction currency is that which determines the value of the instrument's flows and balance. It can be different from the settlement currency. For example, in the case of securities that have been issued and will be settled in BRL with payment determined by the USD variation, the currency of the operation is considered to be the USD. In the IBS, international asset and liability balances are classified in the following currencies: BRL (Brazilian currency), USD, EUR, JPY, GBP, CHF, RMB, and other currencies.

The classification by counterparty sector follows the institutional category of the immediate debtor or creditor of the operation, as follows:

- Banking sector:⁶ includes central banks and financial institutions that hold instruments included in the broad monetary aggregates.⁷ Balances with this sector are broken down into central banks; related offices (institutions that are part of the same conglomerate as the reporting bank); and unrelated banks.
- Non-banking sector, classified into the following sub-sectors: non-bank financial institutions;⁸ non-financial corporations; and others (which includes general government, households, and non-profit institutions serving households).
- Unallocated by sector: covers international organizations that are not considered central banks and cases in which the counterparty sector is unknown.

Consolidated banking statistics (CBS)

The purpose of the CBS is to determine the risk exposure of the international operations of domestic banks, on a consolidated basis, in the country and abroad. They consider the concept of nationality,⁹ including the operations of external units linked to banks with head offices in the country and disregarding intra-group positions between units of the same conglomerate (domestic and foreign).

The main focus of each country's CBS is the assets of domestic banks, except derivatives, registered with the immediate counterparty of the operation. The liabilities of domestic banks are obtained by the BIS from the

⁵ Regarding derivatives, balances are classified only by the transaction's counterparty country.

⁶ In the System of National Accounts (SNA), they correspond to the concept of depository corporations (central banks and other depository corporations).

⁷ In Brazil, it includes commercial and multiple banks; *Caixa Econômica Federal* (CEF); credit unions; investment and development banks; credit, financing, and investment companies; real estate credit companies; savings and loans associations, and mortgage companies.

⁸ In the SNA, it covers other financial corporations, investment funds, insurance companies, and pension funds.

⁹ The concept of nationality is adopted as a complement to that of residence in official macroeconomic statistics. They also consider the nationality of the entity that has economic control of the reporting economic units, which are considered to be of the same nationality, regardless of whether they are resident or non-resident units and whether they are located in the reporting country or abroad.

data provided by the other reporting countries. As for foreign banks, the CBS are provided to the BIS by the reporting countries where their head offices are located.

The CBS are broken down into assets of local units (local claims) and assets of foreign units (international claims). Similar to the LBS, these assets are also classified according to the country of residence of the debtor of the operation and their institutional sector.

Differences with external sector macroeconomic statistics

The IBS differs from the external sector statistics compiled for the banking sector in that the latter follow the methodological standard defined in the IMF's Balance of Payments and International Investment Position Manual, 6th edition (BPM6)¹⁰. External sector statistics refer to stocks and flows of transactions between residents of the national economy and the rest of the world (non-residents). In turn, the IBS are compiled according to the methodology defined by the BIS/CGFS and incorporate, in addition to transactions between residents and non-residents contracted by banks, those carried out with residents which may generate exchange rate risk for the financial system. They are therefore statistics with different coverage and objectives. The following table lists the main differences between the two statistics.

International Banking Statistics	External sector statistics – Banks
Include transactions with non-residents (any currency) and with residents (contracted or referenced in foreign currency).	Include only transactions with non-residents, in any currency.
Include banks with international assets or liabilities equal to or exceeding US\$300 million, on average over the four quarters of the calculation period.	Cover the entire banking system.
In the consolidated statistics of banks with national capital, they include operations of foreign branches and subsidiaries.	They do not include balances from foreign branches and subsidiaries, except from operations with the bank's unit resident in Brazil, without consolidation.
Include balances of foreign exchange contracts to be settled (in assets or liabilities) and exclude capital shares in liabilities (equities).	Exclude balances of foreign exchange contracts to be settled and include equities in the liabilities of the International Investment Position (IIP).

Main results

Locational banking statistics (LBS)

In December 2022, the international assets of the banks operating in Brazil totaled BRL 792.3 billion, which corresponds to 7% of the banking system's total assets. International liabilities amounted to BRL 1,070.4 billion, equivalent to 10% of the system's liabilities. These balances include operations by banks with domestic capital (61% of assets and 53% of liabilities) and foreign capital (39% and 47%, respectively, most of which correspond to subsidiaries of foreign banks in Brazil).

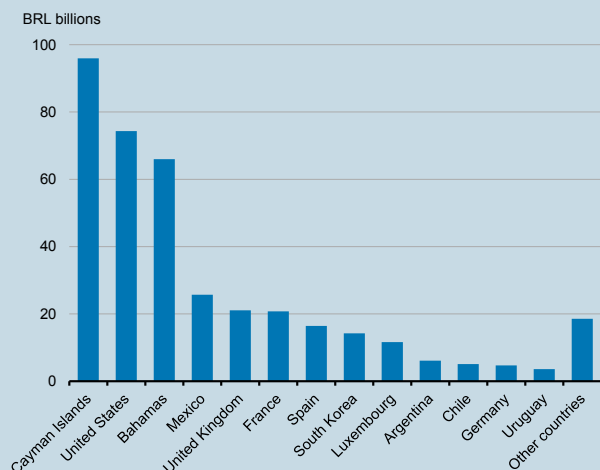
A significant part of the IBS – 52% of assets and 32% of liabilities – refers to operations in foreign currency with residents in Brazil (basically foreign exchange contracts) or operations referenced in foreign currency (such as loans and derivatives). In operations with residents in Brazil, international assets are more significant

¹⁰ Available at: <https://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm>.

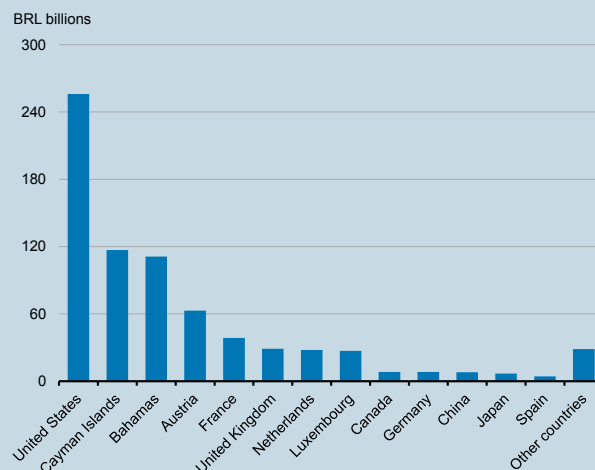
than international liabilities, since a portion of the funds raised from non-residents are invested in the domestic market as operations in BRL referenced in foreign currency.

The main countries that appear as counterparties to Brazilian banks' investments and funding, excluding Brazil, are the United States and offshore centers such as the Cayman Islands and the Bahamas (Graphs 1 and 2).

Graph 1 – Assets with non-residents
Main counterparty countries – December 2022

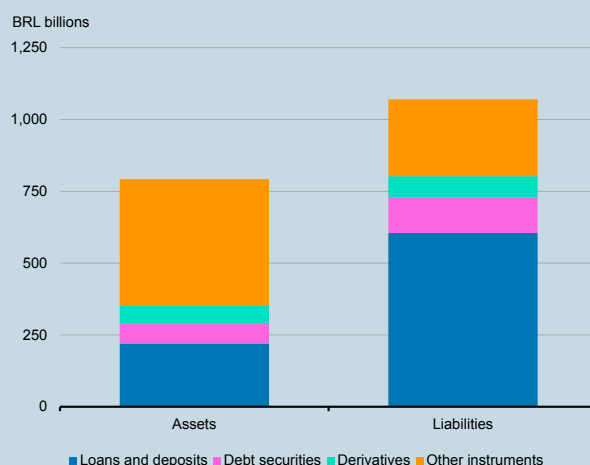


Graph 2 – Liabilities with non-residents
Main counterparty countries – December 2022



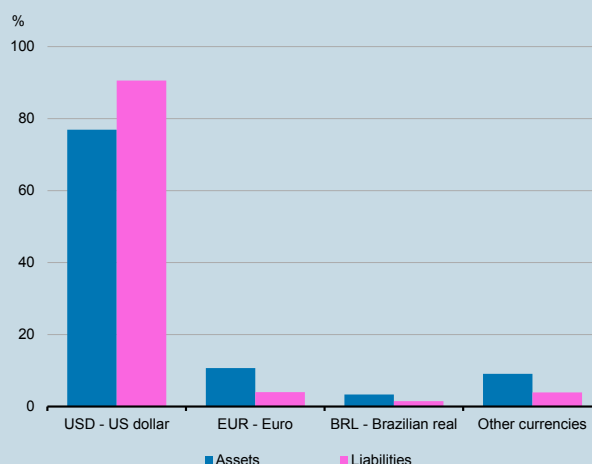
With regard to the classification of international balances by instrument, including operations with residents in Brazil, the “Other” category stands out among the assets, which includes contracted exchange rate balances (foreign currency receivable, mainly from residents) and equity participation in Brazilian banks' branches and subsidiaries abroad (Graph 3). In terms of liabilities, loans and deposits stand out, particularly loans obtained abroad by banks (to finance foreign trade, for example) and foreign funding for onlending in the country.

Graph 3 – International assets and liabilities
By instruments – December 2022



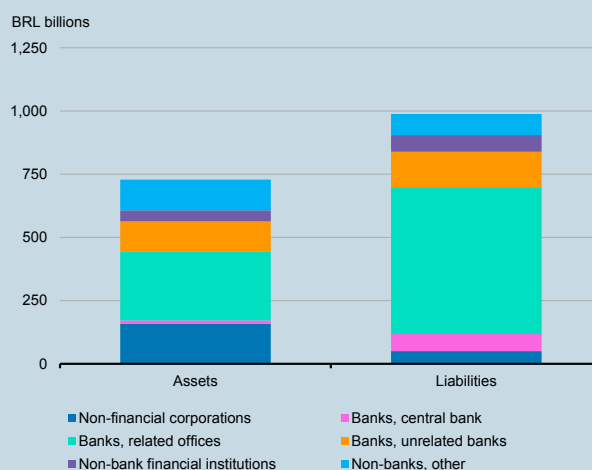
In the segmentation by currency of international assets and liabilities (excluding derivatives), contracts (and referenced operations) in USD predominate (77% of assets and 91% of liabilities) – Graph 4.

Graph 4 – International assets and liabilities
By currency – December 2022



The classification by institutional sector of the counterparty of the assets and liabilities, excluding derivatives (Graph 5), shows the concentration of assets in banks, related offices (for example, operations with foreign branches and subsidiaries or with the head offices of foreign banks operating in Brazil) and non-financial corporations (examples: loans in the domestic market referenced in foreign currency and foreign exchange to be settled with exporters). In liabilities, balances with banks, related offices predominate, such as the internalization of funds raised by branches and subsidiaries of Brazilian banks abroad and the funding of foreign capital banks.

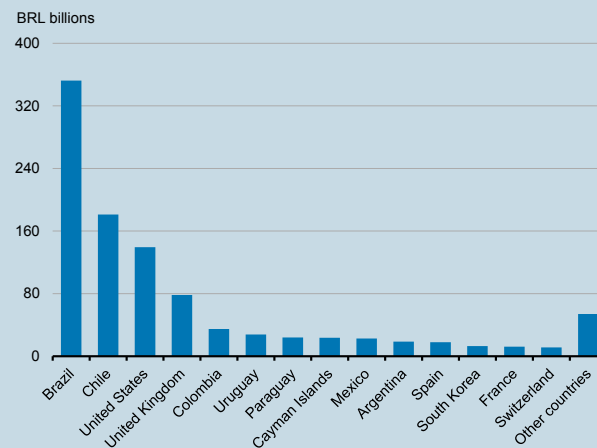
Graph 5 – International assets and liabilities
By counterparty sector – December 2022



Consolidated banking statistics (CBS)

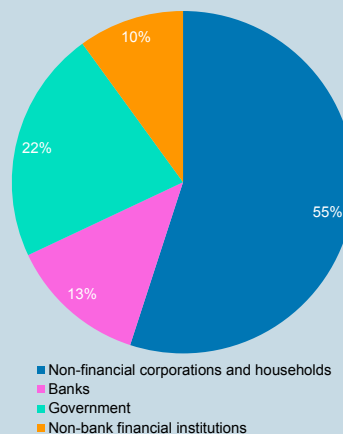
In December 2022, the consolidated international assets of banks with domestic capital, excluding derivatives, reached BRL 1,010.4 billion. Of this total, 71% was from branches and subsidiaries abroad and 29% represented transactions by resident units in Brazil. Excluding transactions with Brazil, the places of residence of the debtors with the most significant balances are Chile, the United States, and the United Kingdom (Graph 6).

Graph 6 – Consolidated international assets of national banks
Main counterparty countries – December 2022



With regard to the classification of consolidated assets by counterparty sector, the main debtors are non-financial corporations and households, followed by the government and the financial sector – banks and non-banks (Graph 7). In contrast to the local IBS, in which operations with financial institutions from the same conglomerate predominate, the consolidated statistics show banking exposure to the real sector of the economy, in the country and abroad.

Graph 7 – Consolidated international assets of national banks
By counterparty sector – December 2022



International comparison

Table 1 shows the comparison of IBS data in a sample of countries. Brazil is 34th in the ranking of assets of all the reporting countries (out of a total of 47 countries).¹¹ Transactions referred to by the BIS as cross-border were considered, i.e. balances with non-residents, in any currency, of banks resident in each country.

¹¹ Data source: [Locational banking statistics \(bis.org\)](https://bis.org/locational-banking-statistics), Table A2.1 (Cross-border positions, by location of reporting bank and sector of counterparty – Amounts outstanding). The calculation was based on data updated by the BIS on April 26, 2023.

Table 1 – Locational banking statistics – Cross border assets and liabilities
December 2022

	Assets US\$ billion	Liabilities US\$ billion	Rank ^{1/}	% in country's financial assets ^{2/}	% in country's financial liabilities ^{2/}
United Kingdom	5,334	5,385	1°	40	42
Japan	4,286	1,487	2°	18	6
France	4,167	4,770	3°	34	40
Germany	3,529	3,356	4°	32	33
United States	3,327	4,472	5°	-	-
Brazil	74	140	34°	4	8
Turkey	53	94	37°	17	34
India	51	224	38°	2	8
South Africa	51	40	39°	12	9

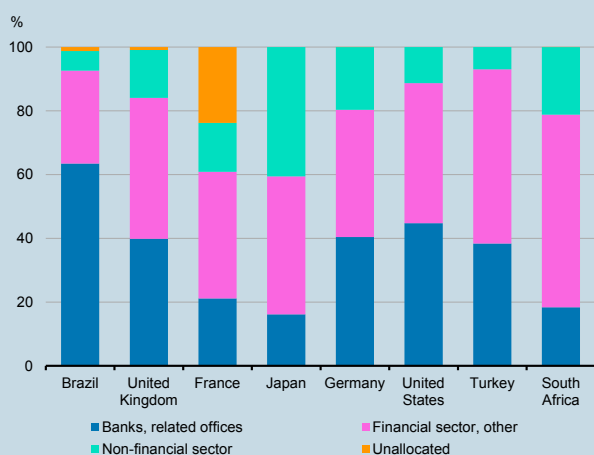
1/ Ranked by cross-border assets among 47 reporting countries.

2/ Share of cross-border assets/liabilities among the total financial assets/liabilities of reporting banks. Data not available for the United States.

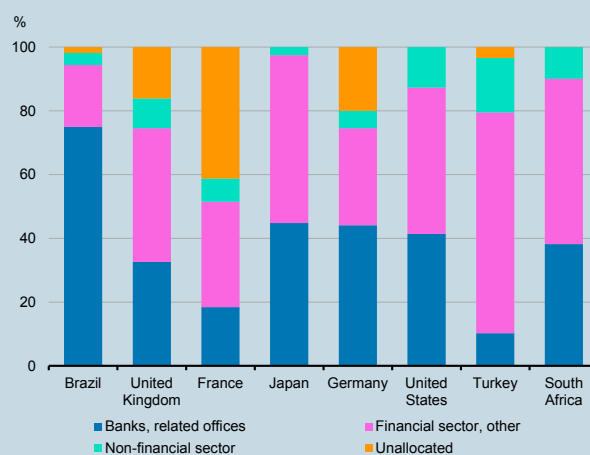
Banks resident in Brazil have a low degree of internationalization, with operations with non-residents corresponding to only 4% of the total assets and 8% of the total liabilities of banks with significant international operations (Table 1).¹²

Graphs 8 and 9 show the segmentation, according to the counterparty institutional sector, of the balances of assets and liabilities with non-residents reported by resident banks in each country. In the case of Brazil, there is a high concentration of transactions with banking entities from the same group (blue segment of the column) and a low share of transactions with the non-financial sector (green segment). This result reflects the predominance, in the LBS reported by Brazil, of operations with foreign branches and subsidiaries of national banks and those carried out between foreign banks operating in Brazil and their parent companies.

Graph 8 – Distribution of cross-border assets of resident banks in each country
By debtor sector – December 2022



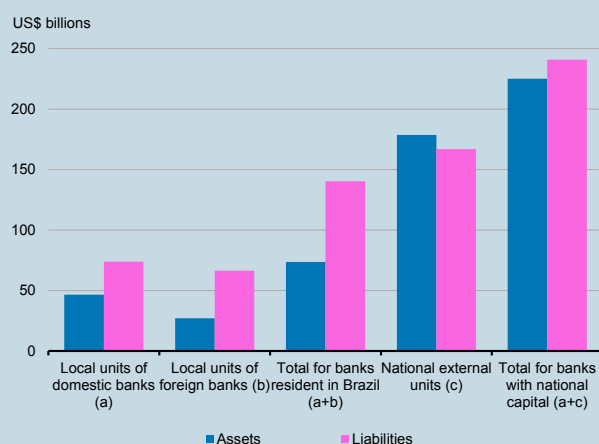
Graph 9 – Distribution of cross-border assets of resident banks in each country
By creditor sector – December 2022



12 The percentages for banks resident in Brazil published in this table are lower than those published in the “Main Results – Local International Banking Statistics” section (7% of assets and 10% of liabilities), because the cross-border balance refers to operations with non-residents only, not including balances with residents in foreign currencies.

Graph 10 shows the composition of the cross-border assets and liabilities of Brazilian banks with domestic capital in the IBS published by the BIS, including data from local units (reported by the BCB) and foreign units (reported by other countries). In terms of total assets with non-residents, Brazilian banks (columns a + c in the graph) rank 21st out of 39 nationalities grouped by the BIS.¹³

Graph 10 – Banks with national capital in the IBS
Cross-border assets and liabilities
December 2022



The operations with non-residents of the external units of Brazilian banks are much more significant than those of their head offices, located in Brazil. Although these assets and liabilities include intra-group transactions, the data published by the BIS shows that most of the balances of the external units of Brazilian banks are transactions with counterparties located in countries other than Brazil and with non-financial entities. Examples are the operations of external units with Brazilian companies that carry out activities abroad and with foreign companies that operate in Brazil, with headquarters located in other countries.

Conclusion

The IBS represent a set of statistics on banking operations in line with the most up-to-date international standards, as well as Brazil's commitments under the G-20. They are compiled from specific documents sent to the BCB by a sample of banks and cover financial assets and liabilities contracted abroad or in the domestic market, with non-resident or resident counterparties (if contracted or referenced in foreign currency).

Together with information from the other countries reporting to the BIS, the IBS make it possible to assess the global activity of the banking system, with its international exposures and interrelationships with other financial and non-financial entities located in various countries.

The IBS provide a comprehensive view of the internationalization of Brazilian banks, from the point of view of local and external activities. The results indicate that the international operations of banks resident in Brazil are insignificant when compared to those contracted in the local market and in domestic currency. However, from the point of view of nationality, the international activity of Brazilian banks acquires greater relevance, with emphasis on the operations of external units, which are an important channel for attracting and operating Brazilian companies abroad.

¹³ Data source: [Locational banking statistics \(bis.org\)](https://bis.org), Table A4.1 (*Cross-border positions, by nationality of reporting bank and sector of counterparty – Amounts outstanding*). The calculation was based on data updated by the BIS on April 26, 2023.

Box 2 – Economic benefits for credit union members

Introduction

Cooperatives are non-profit institutions formed by people who reciprocally undertake to contribute goods or services for the exercise of an economic activity of common benefit.¹ In the case of credit unions, the economic activity is the intermediation of financial resources, basically by taking deposits and granting credit, just as commercial banks do.² Since the latter are profit-making, the generation of value for their members is mainly due to the remuneration and appreciation of the shareholder's capital. Credit unions, in turn, are non-profit and their main clients are their members (also known as union members) – in other words, in addition to receiving services from the credit union, they also own its capital.

The fact that they are non-profit also means that the goal of the managers of a credit union is to maximize the economic benefit obtained by its members. Since the member is both a client and a partner, the economic benefit, which is the result of the efficiency obtained in the credit union's operations and represents a return to the union member, can reach him in five different ways: through the distribution of surpluses (positive net income from the credit union's operations); by paying interest on own capital (remuneration of the share, which is the member's capital in the credit union); by charging lower rates than the market average for credit operations and offering higher rates for term deposits; and by charging lower rates for services provision. Therefore, the calculation of the value generation for the member has singularities that will be the subject of this study. The objective of the credit union is not to maximize the value of the surpluses or the social quota, but the economic benefit obtained by its members.

This text consists of this introduction and the following sections. Section 1: differences in capital structure and governance between banks and credit unions. Section 2: quantification of the net economic benefit of the member. First, the calculation of economic benefits for credit union borrowers is explained, by comparing the average rates of credit operations between credit unions with the rates used by the rest of the national financial system (SFN) in the same modalities.³ Subsequently, the correlated analysis is extended to depositors, the main form of funding for credit unions. Finally, surpluses allocation is analyzed. This surpluses bring additional economic benefits to members and allow the estimation of the total economic benefit to depositors and borrowers. Section 3: Conclusions.

1 Law 5.764, of December 16th, 1971, art. 3.

2 Notwithstanding the fact that these are their core operations, credit unions offer their members practically all the financial services and products offered by other financial institutions.

3 This section presents some assumptions of our methodology. However, readers already familiar with the organization of the SFN and the peculiarities of the National System of Cooperative Credit (SNCC, which comprises the set of singular, central, and confederate credit unions and cooperative banks) – explained in other BCB publications (2021b, 2021c) – may proceed directly to section 2, without prejudice to understanding.

Relevant distinctions regarding capital structure and governance in credit unions

Each member of a cooperative has only one vote at the General Meeting, regardless of the size of their shareholding. In the terminology of A. Hirschman (1970),⁴ in his relationship with the cooperative the client-member not only has the power to “leave” (i.e. to stop contracting, as happens with any other financial institution), but also the right to “voice” – to influence decision-making in the society. This implies (assuming a properly functioning governance structure) sharing power between capital providers and borrowers.

In banks – and other public limited companies – the shareholders, client-depositors, and client-borrowers tend to be different people, with the power of control and the shareholder's return being a function of their capital share. Usually, the greater the number of shares held by a shareholder, the greater the number of votes at the General Meeting, the greater their share in dividends (*i.e.* the distribution of profit to the shareholder) and the greater the gain from the increase in the nominal value of the shares. Consequently, the main objective of these entities is to maximize the generation of shareholder value.

Cooperatives are non-profit companies formed by people who reciprocally undertake to contribute goods or services for the exercise of an economic activity of common benefit. In the case of a credit union, the activity is the intermediation of financial resources. Its main objective, therefore, is to offer financial services to its members in a more advantageous way than if the same services were contracted from another type of institution.

Credit union managers should seek to maximize the generation of value for their members, who, in addition to being shareholders, are also counterparties in the provision of services (since the entity's clients are also its members). In this sense, they must seek to charge the lowest possible rates on credit operations, offer the best rates to remunerate deposits and, at the same time, guarantee the viability and sustainability of operations by balancing their income and expenses.

In credit unions, the result for the year is called surplus (when positive) or loss (when negative). The use of surpluses is defined by the credit union's General Assembly. There are two mandatory allocations by law, the Reserve Fund – used to absorb possible future losses – and the Technical, Educational, and Social Assistance Fund (Tesaf) – intended to provide assistance to members and their families, and (when provided for in the bylaws) to the credit union's employees and the community where it is physically present.⁵ After retaining part of the profits for these funds, the rest is distributed to the members in proportion to their use of the credit union's services and products, and not the share capital.⁶ In the distribution share defined by the General Meeting, both demand and term deposits can be considered in this equation – so, in practice, demand deposits in credit unions can be indirectly remunerated.

4 Intermediating the choice of one of these strategies is what Hirschman (1970) calls *loyalty / fidelity* – i.e. the non-economic relationship between the member and the institution. From a historical and sociological point of view, credit unions favor the voice strategy, while in other institutions the main strategy for influencing the organization is the leave strategy, “cutting the relationship” with the institution (which corresponds, for example, to losing clients or fleeing investors).

5 The law defines minimum percentages of surpluses that must be earmarked for these funds, which may be increased by the bylaws:

- Tesaf: the normative basis for this fund is found in article 17-C of Complementary Law 130, of April 17, 2009, according to which at least 5% of the net surpluses for the year must be allocated to the Tesaf. Its balance is recorded as a liability of the cooperative in Cosif Account 4.9.3.20.00-2.
- Reserve Fund (RF): the normative basis for this fund is presented in art. 28, item I, of Law 5.764 of 1972, according to which at least 10% of the positive result must be allocated to the RF. Its balance is recorded as part of the credit union's net worth in Cosif Account 6.1.5.20.00-0.
- Bylaws can create other funds (Capital Reserves, etc.) to absorb losses or finance the entity's expansion. Those funds are usually recorded as part of the credit union's net equity in account 6.1.5.30.00-7.

6 In Brazil, art. 24, § 3, of Law 5.764, of 1971, and art. 7 of CL 130, of 2009, prohibit the distribution of surpluses based on the amount of capital held by each member.

This is also why the credit union's objective is not to maximize surpluses since their distribution returns to the counterparties of its operations. This is financially equivalent to a discount (deferred over time) for the borrower.⁷ Therefore, when generating value for members, the three dimensions of the credit union's operations must be considered: depositors (return on deposits), borrowers of credit and products, and shareholders.

In the event of a negative result, the losses are apportioned among the members, also in proportion to their use of the credit union's services and products (arts. 80, 81 and 89 of Law 5.764 of 1971). Payment of the apportionment of losses can be made in three ways. The first is by deducting it from the Reserve Fund (the reason for which it was created). The second, by offsetting the losses against surpluses from future financial years. And, if the previous two are not sufficient to cover the total losses, payment is made through deposits from members for this purpose. However, unlike banks, where "the shareholder's capital is easily priced and tradable on the secondary stock market" (GARCIA; LHACER, 2012, p. 62), members cannot sell their shareholding, but they do have the right to resign and receive the book value of their share (as long as this does not imply a breach of the credit union's operating limits, according to art. 10 of CL 130).

Table 1 shows a comparison of the governance capital structure between credit unions and banks.

Table 1 – SNCC and Banks

Differences in capital structure and governance between cooperatives and banks

Capital characteristics	Banking institutions Public companies	Cooperative
Unit	Action	Share
Right to leave	Not redeemable, but transferable (liquidity).	Redeemable, but not transferable.
Membership	Free entry – except for legal exceptions.	Statutory restrictions (e.g. area of activity; common ties, etc.).
Return on capital	Interest on equity (in some cases).	Interest on equity (limited by LC 130).
Benefit of exercise	Dividends (proportional to shareholding), no apportionment of losses.	Distribution of surpluses or apportionment of losses (proportional to the use of products and services).
Indirect return	Valuation of shares.	There is no change in the value of the share.
Liability – losses	Limited to the subscribed capital (share).	It can be limited or not, according to the bylaws.

Source: Law 6.404/1976 and Law 5.764/1971

The next section further details the concept of economic benefit, a metric that combines the returns on capital, the profit for the year, and the indirect return (presented in Table 1).

Given these peculiarities, it can be said that "some of the most important rules of corporate finance theories do not apply to credit unions" (GARCIA; LHACER, 2012, p. 62).

⁷ In practice, however, the credit union's profitability is an important indicator of its long-term sustainability. Since the member might lack the incentive to finance the capital (which, as can be seen, has limiting characteristics), there is a risk of insufficient capital in the long term (as argued by Furubotn and Pejovich, 1970) that the surpluses would allow to be mitigated by allocating them to reserve funds or distributing them through the payment of a share in the capital. In fact, as noted in Section 4, the (SNCC tends to allocate a significant part of the result to reserves (thus reducing the economic benefit to the member). In addition, it is common for shareholders' meetings to distribute a significant portion of the surpluses as payment for share capital. This can be seen in Combined Financial Statements of Sicoob (2021, p. 21) and Sicredi (2021 – explanatory note 20).

Cooperative credit – calculating the economic benefit

To simplify the analysis, as proposed by Garcia and Lhacer (2012), the interest rates charged by banks are considered as exogenous variable⁸. Thus, the net economic benefit to members corresponds to the sum of:

- economic benefit from credit (EBC) – given by multiplying the balance of the relevant modalities in the SNCC by the difference in the average rates (weighted by the balance) charged by credit unions and banks for the operations practiced in the years 2016 to 2021;
- economic benefit from deposits (EBD) – given by multiplying the balance of time deposit (and savings) accounts in the SNCC by the difference in the average rates paid by credit unions and banks for operations carried out between 2016 and 2021;
- economic benefit in the period (EBP) – made up of:
 - net surpluses (NS) – the amount of surpluses, calculated at the close of the financial years from 2016 to 2021, to be distributed according to the credit union's General Meeting of the following year. Losses were considered a negative benefit in the calculation;
 - earmarked for Tesaf (F) – the part of the result earmarked for Tesaf, a mandatory fund for cooperatives (as explained in Section 4), for the financial years 2016 to 2021.
 - payment of interest on own capital – the part of the result earmarked for the payment of interest on members' capital, which may or may not be paid by the credit union, depending on its bylaws, and must be limited to the Selic rate.⁹

Therefore, the EBP to the member in a financial year corresponds to the sum of $EBP = EBC + EBD + EBP$. In addition, the net benefit per capita is calculated by dividing this EBP sum by the number of members of the singular cooperatives.

It is important to note that credit unions also distribute economic benefits to their members in another way, by charging lower rates than the rest of the SFN. Since the available data does not allow to calculate an adequate proxy for this purpose, this difference will not be estimated.

Economic benefit from credit (EBC)

In December 2021, the outstanding credit portfolio of credit unions totaled BRL 315 billion, accounting for 68.6% of SNCC assets (BRL 459 billion) and 6.07% of SFN credit, of which:

- Households: BRL 188 billion (59.7%), concentrated in rural credit (BRL 82.2 billion - 26.1% of the total), non-payroll deducted personal loans (BRL 35.2 billion - 11.2%), and payroll deducted credit (BRL 18.3 billion - 5.8%);
- Companies: BRL 127 billion (40.3%) went to companies, especially small and medium-sized companies (BRL 116.5 billion), concentrated in working capital (BRL 66.7 billion - 21.2%) and investments (BRL 20.3 billion - 6.4%).

⁸ The literature discusses the existence of observable effects in the competition between SNCCs and banks. There is evidence that interest rates are influenced by local competition with credit unions (SANTOS; BRAGA; BRESSAN, 2021); but the pressure exerted by the SNCC would not be enough to lead to a general reduction in the rates charged by banks, especially in lines such as non-payroll deducted credit (ANNIBAL; KOYAMA, 2011). In countries with a greater share of cooperatives in the credit market, however, the effects of competition would be observable (EMMONS; SCHMID, 2000).

⁹ The limitation is given by art. 7 of CL 130/2009.

The EBC per credit modality was calculated by multiplying the difference between the average rate charged by the SFN and the average SNCC rate by the value corresponding to the sum of the balances of outstanding operations of the respective modality in the SNCC. The calculation of the average rate (weighted by the balance) of the operations of individual credit unions (referred to below as SNCC) and the rest of the SFN (*i.e.* all SFN institutions, except credit unions) was made possible based on data reported to the Credit Information System (SCR) referring to outstanding credit operations on the December base date for the years 2016 to 2021. The sum of the EBC per modality results in the total EBC, which, divided by the total number of SNCC members, provides the average EBC per member (Table 2).¹⁰

Table 2 – Economic Benefit – Credit (BEC)

Variable	Dec 2016	Dec 2017	Dec 2018	Dec 2019	Dec 2020	Dec 2021
Total BEC (R\$ million)	15,377.7	12,616.8	13,665.0	14,924.7	12,594.8	17,962.9
Annual % change	-	-18.0	8.3	9.2	-15.6	42.6
Number of members	8,392,285	9,093,968	9,928,850	10,898,597	11,953,671	13,609,603
Average per member (R\$)	1,832	1,387	1,376	1,369	1,054	1,320
Annual % change	-	-24.3	-0.8	-0.5	-23.1	25.3

It's important to note that some specific modalities account for most of this value, where there is a high variance in the rates practiced by banks, such as non-payroll deducted loans and overdraft facilities, both of which have fixed rates. Conversely, following the same methodology, there are products where the average SNCC rate is higher than the rest of the SFN (resulting in a “negative benefit” to the member), such as long-term working capital with fixed rates and indexed to the CDI, which can be explained by special credit lines of public banks and large private institutions.

The EBC calculation does not control for the risk profile of members. The difference in this profile between credit union members and bank clients is a variable to be considered in future periods on the subject.

Economic benefit from deposit (EBD)

In December 2021, SNCC funding reached BRL 361.5 billion, corresponding to 4.82% of the SFN, 83.4% concentrated on deposits (48.7% term, 19.2% demand, and 10.0% savings). Table 3 shows the evolution of deposits in the SNCC until December 2021.

Table 3 – Cooperative deposits

Funding and deposits	Dec 2016	Dec 2017	Dec 2018	Dec 2019	Dec 2020	Dec 2021	R\$ million
							Share % Dec 2021
Time deposits	73,484.2	83,918.2	96,909.4	109,292.4	147,892.7	167,237.4	46.3
Sight deposits	16,264.8	20,537.8	26,719.7	33,055.8	61,910.3	66,115.5	18.3
Savings deposits	10,043.3	13,477.8	18,537.5	21,918.9	32,258.8	38,040.4	10.5
Other deposits (except member deposits)	29,408.6	33,855.1	31,716.1	39,428.3	48,017.7	18,851.5	5.2
Total funding	129,201.0	151,788.9	173,882.6	203,695.3	290,079.5	361,514.6	100.0

¹⁰ The average EBC is an order of magnitude calculation (integrating the difference in rates between SNCC and SFN, in proportion to the balance of the respective modality in SNCC) and does not represent how much each member actually received from this benefit. This is because by nature the EBC is proportional to the size of the credit operation and depends on the type of modality and contractual conditions of each operation carried out by the member. The same applies to the other average benefits calculated in this article.

To calculate the economic benefit from deposits (EBD), the following procedure was used:

- i. Calculation of funding expenses: adding up the (annualized) balances of the accounts (Cosif) corresponding to expenses on savings deposits (8.1.1.10.00-5), expenses on time deposits (8.1.1.30.00-9), expenses on agribusiness bills of credit (8.1.1.65.00-5), and expenses on real estate bills of credit (8.1.1.75.00-2), referring to SNCC member institutions and the rest of the SFN, in the years 2016 to 2021.
- ii. Calculation of funding balances: using the averages of the last thirteen months (to mitigate one-off variations), referring to the months of December 2016 to 2021, and the averages of the balances of savings deposit accounts (4.1.2.00.00-3), term deposits (4.1.5.00.00-2), funds from real estate, mortgage, credit, and similar bills (4.3.2.00.00-1), referring to SNCC member institutions and the rest of the SFN;
- iii. Calculation of the average funding expense: dividing the funding expenses (i) by the funding balances, which gives the average funding expense for each system (which are then used as a proxy for the average interest rate).¹¹
- iv. Calculation of the EBD: multiplying the difference between the average funding costs in the SNCC and the banks by the funding balances (ii) of SNCC members, thus obtaining the total and average EBD per member (Table 4).

Table 4 – Economic benefit from deposits (BED)

	Dec 2016	Dec 2017	Dec 2018	Dec 2019	Dec 2020	Dec 2021
BED (R\$)	4,999,720,145	4,155,671,657	2,795,084,543	2,803,876,790	792,111,003	1,860,753,692
Annual % change		-16.9	-32.7	0.3	-71.7	276.4
BED per member	595.8	457.0	281.5	257.3	66.3	136.7
Number of members	8,392,285	9,093,968	9,928,850	10,898,597	11,953,671	13,609,603

As expected, the EBD tends to be lower than the EBC, which is a necessary condition for the sustainability of the business. A significant drop over the five years has been observed. The main explanation is that the remuneration of deposits is correlated with the CDI and Selic rates, both of which fell in the period considered. In addition, there is little variation in the rates paid by the different institutions, especially regarding savings deposits, whose remuneration is defined by law.¹² Furthermore, this result is consistent with what the literature shows: in Brazil, credit unions tend to favor borrowers proportionally more than depositors (BREZZAN *et al.*, 2013; MERCER, PÓVOA and PICCOLI, 2020).

Economic benefit in the period (EBP)

The EBP is the result of adding up net surpluses (NT) with Tesaf (T) allocations (Table 5) and the payment of Interest on [Shareholders'] Equity (ISE). To calculate net surpluses, it is necessary to exclude allocations to Interest on Equity, Reserves, and Tesaf from the result for the year.

¹¹ Unlike the EBC calculation, which used information from the SCR relating to individual operations, the accounting data was used to allow better comparability between the systems and to avoid possible unnecessary complications for the calculation, since the variation in deposit remuneration rates tends to be smaller than that corresponding to credit interest rates.

¹² More specifically, art. 12 of Law 8.177 of 1991, as amended by Law 12.703 of 2012, and art. 7 of Law 8.660 of 1993

- i. Annual net result: sum of SNCC's result for the six-month periods ending in June and December 2016 to 2021.
- ii. ISE discount: sum of the interest on equity balances for the same period¹³ (this amount will later be added to the EBP, as shown in the table below).
- iii. Reserves discount: sum of the allocations to the reserve fund, calculated from the difference of the balances of account 6.1.5.00.00-6 recorded in Doc 4016 and Doc 4010 of December of the respective year.
- iv. Tesaf discount (T): sum of the allocations to Tesaf, calculated from the difference between the balances in account 4.9.3.20.00-2 recorded in the balance sheet (Doc 4016) and the trial balance (Doc 4010) of December of the respective year.
- v. Net Surplus (NS): the annual net profit, minus Interest on Equity, Reserves and Tesaf.

Table 5 – Calculation of the Economic Benefit for the Year (BEE)

	R\$ million					
	Dec 2016	Dec 2017	Dec 2018	Dec 2019	Dec 2020	Dec 2021
Result (i)	5,178.18	6,078.27	6,724.63	7,320.05	8,165.80	11,429.86
JCP (ii)	1,612.79	1,469.10	1,224.46	1,273.42	765.37	1,142.89
Reserves (iii)	1,557.32	2,025.92	2,591.09	2,968.36	3,699.91	5,350.41
FATES (iv)	281.19	330.54	388.84	421.35	483.47	590.93
Net surplus (v = i - ii - iii - iv)	1,726.89	2,252.71	2,520.24	2,656.92	3,217.06	4,345.62
BEE (ii + iv + v)	3,620.86	4,052.35	4,133.54	4,351.69	4,465.89	6,079.45
Average BEE (in R\$)	239.28	284.06	292.99	282.45	309.57	446.70
Number of members	8,392,285	9,093,968	9,928,850	10,898,597	11,953,671	11,430

Total economic benefit (TEB)

TEB can be obtained as the sum of the economic benefits from credit, deposits, and the period (Table 6).¹⁴

Table 6 – BET calculation

	R\$ million					
Variable	Dec 2016	Dec 2017	Dec 2018	Dec 2019	Dec 2020	Dec 2021
BEC	15,377.74	12,616.78	13,664.98	14,924.69	12,594.82	17,962.91
BED	4,999.72	4,155.67	2,795.08	2,803.88	792.11	1,860.75
BEE	3,620.86	4,052.35	4,133.54	4,351.69	4,465.89	6,079.45
BET	23,998.32	20,824.80	20,593.61	22,080.26	17,852.82	25,903.12
BET per member (in R\$)	2,513.13	1,995.39	1,822.45	1,758.43	1,269.55	1,903.30
Number of members	8,392,285	9,093,968	9,928,850	10,898,597	11,953,671	13,609,603

¹³ A peculiarity of the SNCC is that cooperatives usually pay the ISE through the payment of shares to the member (thus reinforcing the entity's share capital). As can be seen from the Statements of Changes in Shareholders' Equity in the Combined Financial Statements of the two largest credit cooperative systems, Sicoob (2021, note 15.5) and Sicredi (2021, p. 11), interest on equity was almost entirely paid through the payment of shares in the share capital in 2020.

¹⁴ For more details, see Appendix 1 of this box.

The results show that credit unions manage to generate value for their members. It is important to note that although the TEB value is high, it has been falling over the last few years, both in gross value and in average value per member. There are two possible explanations for this drop. The first explanation is that the economic benefit offered is heavily dependent on the spread. With the fall in the Selic rate until 2021, a scenario of diminishing benefits has been seen, which may have resulted in their performance coming closer to that of the other SFN institutions, in terms of the rates offered for credit and deposits, since the spread of all the institutions has decreased. The second explanation is that the accelerated growth of credit unions in recent years would have required more capital and therefore less distribution of benefits to members. It would then be a trade-off between offering more benefits to current members or offering benefits to more members (who will come as the cooperative grows). In any case, it is important for credit unions to be vigilant to continue offering benefits and generating value for their members, which is the ultimate goal for which they were founded.

In 2021, for example, credit unions generated BRL 25.9 billion in benefits, equivalent to BRL 1,269.55 per member. This benefit estimate means that a member of a credit union representative of the average SNCC's credit unions who made deposits and took credits at the average of all members would have increased their wealth by BRL 1,269.55 in 2020, compared to the situation in which they had made these same deposits and credits at a bank representative of the average SFN bank. However, the distribution of these benefits is not uniform, depending not only on each credit union, but also in proportion to each member's operations with the credit union. More than 70% of the value of the TEB comes from credit operations, which suggests that the decision to take credit from a cooperative rather than a bank brings greater potential advantages than the decision to keep deposits in a credit union, in line with international experiences.

Conclusion

Credit unions operate in a similar way to commercial banks in terms of products and services, but they are non-profit and their depositors and creditors are also members that contributed capital. This box calculates the economic benefits offered by SNCC to its members in the period 2016-2021. The total economic benefit (TEB) is made up of the economic benefits from credit (EBC), deposits (EBD), and the distribution of surpluses and the payment of interest on equity (EBP). Due to methodological difficulties in comparing data from banks and credit unions, the TEB calculated in this box does not include another possible benefit provided by credit unions, which is the difference in fees charged. The result was that credit unions generate economic benefits for their members, especially in the form of more advantageous credit operations.

The continuous generation of benefits for members of a credit union depends on its growth over time. In recent years, Brazilian credit unions have grown faster than other financial institutions. Agenda BC# contributes to this evolution. The possibility of issuing Financial Bills (FB) and Guaranteed Real Estate Bills (LIG) and the access to rural savings and real estate savings by singular credit unions are examples of this. In Agenda BC#, the credit union sector made a commitment to increase its participation in credit for the population with an income of up to ten minimum wages and to expand its presence in the North and Northeast regions, as well as to expand its market share in relevant credit modalities from 9% to 20%.

The rapid growth of the sector poses challenges to maintaining the economic benefits offered to members, as it leads to a greater need for capital and investments to sustain this growth. It is important to note that although the value of TEB is high, it has been falling over the last few years – both in gross value and in average value per member. One possible explanation is that the economic benefit offered is strongly dependent on the spread. With the fall in the Selic rate until 2021, a scenario of decreasing benefits has been seen, which may have resulted in their performance coming closer to that of the other SFN institutions, in terms of the rates offered for credit

and deposits. It is important for credit unions to be vigilant to continue offering benefits and generating value for their members, which is the goal for which they were founded.

Appendix – Notes on the methodology used to calculate the economic benefit to members

The information on total assets and funding of the SNCC and the SFN was calculated by aggregating the data from the balance sheets of the respective financial institutions, following the Accounting Standards of the Institutions Regulated by the BCB (Cosif).¹⁵ Data from the Credit Risk System (SCR)¹⁶ were also used in the credit analysis, from the Information System on Institutions of Interest of the BCB (Unicad), and from the Information on Cooperative Relationships (Document 5300 – Cooperative Member Census). Other publications available on the BCB's website were also used as sources, such as the Banking Report – REB (BCB, 2021b), the Financial Stability Report – FSR (BCB, 2021a), and the Panorama of the National Cooperative Credit System (BCB, 2021c).

In addition, the information in the combined statements (in which transactions carried out between institutions in the same cooperative system are eliminated) makes it possible to see the real situation of the segment, by considering only transactions carried out with third parties, avoiding duplication. Result accounts were grouped by year (*i.e.*, adding data from the first and the second halves). The respective financial institution is responsible for this data, which may differ from other publications for reasons such as late delivery or substitution of documents, aggregation of individual data, gaps or errors in filling in the information, etc. For example, there is a divergence between the data on the number of members presented by FGCoop (2020), which aggregates information from singular credit unions and does not exclude members registered in more than one credit union (duplicate Individual Taxpayer Registrations – CPF), and the data published by the BCB (2021a).

As for the EBC, it is important to explain that the choice to use SCR data rather than accounting data, is because SCR data provides more detailed information, and accounting data does not make it possible to identify revenue by credit modality. Still on the variable “balances”, it is worth noting that this is data on the gross balances of provisions for loan losses. For the calculation, information on the credit balance in the active portfolio in December was used (*i.e.* the total balance reported in Doc. 3040), and not the average annual flow (as when calculating the EBD), as this is a more appropriate variable for credit values.

When calculating the average rate, the interest rate (per year) reported by the institution as the contracted rate was used, weighted by the balance of the value of the respective operation aggregated by modality and index (e.g. CDI, TR, IPCA, fixed rate, etc.). This means that the total cost of the operation (TCO) was not considered, nor what was actually paid by clients or members. Not using the TCO is likely to generate greater distortion for operations with terms much shorter than one year.

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¹⁵ Available to the general public at the BCB's website – IF.Data system: www3.bcb.gov.br/ifdata/.

¹⁶ Doc. 3040.

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Box 3 – Profile of credit card use in Brazil

Introduction

This box aims to investigate the behavior of household credit card customers according to the number and type of credit card issuers¹ with which they have a relationship. The idea is to assess whether customers using a greater number of credit cards from different issuers or using credit cards from a certain group of issuers access more often to expensive credit lines.

Context

The entry of new players into the postpaid card segment and the consequent increase in competition have led to a substantial rise in the number of users of this payment instrument in recent years. As a result, a significant share of Brazilians was provided with one or more credit cards.

In June 2022, the number of credit cards (190.8 million) represented almost the double of the economically active population in Brazil (107.4 million), according to 2021 data from the Brazilian Institute of Geography and Statistics (IBGE) and to the Brazilian Payment System (SPB) statistics.

Greater access to credit cards, although positive from a financial inclusion perspective, also deserves attention due to its potential to increase household indebtedness. When a customer fails to pay the full amount of the credit card bill, the unpaid value becomes a type of loan, the so-called revolving credit card. This is one of the market operations with the highest costs and delinquency rates.

Hence, this box tries to understand whether the growth in the number of credit cards per capita, the increase in the value of credit limits used, and the use in transactions with credit characteristics – notably the revolving credit card – may indicate indebtedness rise for users of this instrument.

Methodology

Data were collected from the BCB's Credit Information System (SCR), where credit card transactions are segmented as follows: *i.* purchase or purchase in installments financed by the store; *ii.* purchase in installments financed by financial institutions; *iii.* revolving credit card (30 days); *iv.* non-migrated revolving credit card; *v.* migrated revolving credit card and; *vi.* limit granted and not used. The transaction "purchase or purchase in installments financed by the store" is characterized by the use of credit cards as means of payment. Other

¹ Issuers are financial and payment institutions with which credit card customers have a commercial relationship.

transactions are characterized as credit granted to customers because interest rates are charged on the outstanding balance.²

The analysis segregates customers by the number of credit card issuers with which they have an outstanding balance. If, for example, a customer has an outstanding balance on its credit card with only one institution, this is considered one link; if the outstanding balance is with two institutions, this is considered two links, and so on.

To understand some of the characteristics of the credit card market regarding different profiles of participants in the National Financial System (SFN) and in the SPB, prudential conglomerates and individual institutions are classified into four groups (Table 1).

Table 1 – Segmentation of prudential conglomerates and individual institutions comprising the SFN and the SPB

Groups	Description
G1	State-owned banks and the top three private banks.
G2	Other banks – except those with fully digital operating model – and credit, financing, and investment companies (“finance companies”), including those linked to retail companies that issue credit cards linked to their chain of stores.
G3	Financial institutions that operate predominantly with a digital model – either through a banking license or through a conglomerate that includes non-banking institutions and emulates banking services – credit societies and payment institutions.
G4	Credit union banks and individual credit unions.

Results

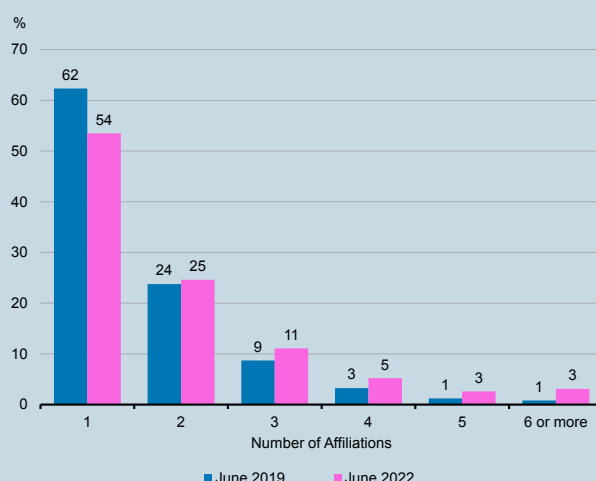
Distribution of customers, outstanding balance, and average limits

Based on the SCR data, 84.7 million customers had an outstanding balance greater than zero as of June 2022.³ This means an increase of 30.9% compared with June 2019 (64.7 million). This credit card market expansion led to an increased percentage of customers with more than one link in this period (Graph 1). However, the share of customers with an outstanding balance with only one (54%) or two (25%) issuers continues to be the most representative. Customers with three or more links account for nearly 20% of the total.

² Outstanding balance refers to the amount of a purchase – paid in installments or not – which has not yet been paid by the customer and on which interest rates may or may not be charged.

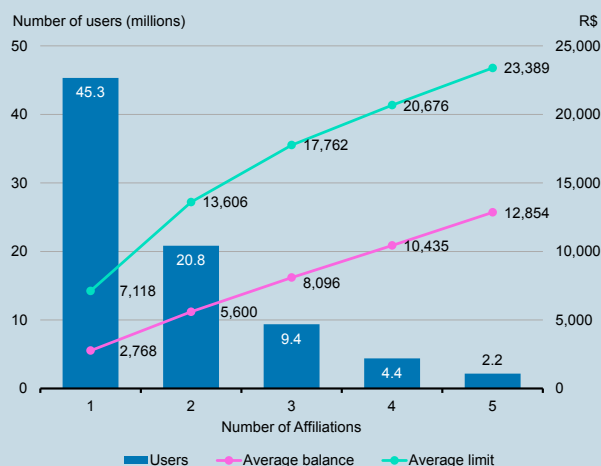
³ Information in the SCR refer to the last day of each month.

Graph 1 – Distribution of Users by Number of Affiliations



As customers increase the number of links, the average limit and the balance rise,⁴ especially for those customers with up to three links. It indicates that customers using credit cards from more than one issuer are expanding their spending capacity by increasing additional limits, thus raising, on average, their consolidated outstanding balance (Graph 2).

Graph 2 – Average Debit Balance and Credit Limit by Number of Affiliations



Analysis by usage type and used limit

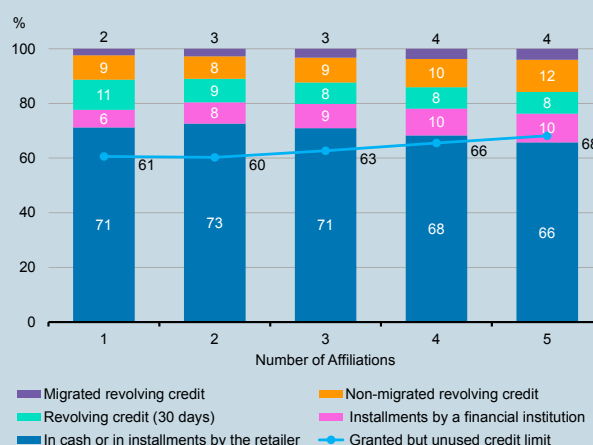
To analyze how the use of credit cards is related to credit card transactions, customers' outstanding balances were segregated into transactions with payment characteristics, such as purchases or purchases in installments financed by the store, and into transactions with credit characteristics (subject to interest charges), such as revolving credit card, purchases in installments financed by a financial institution and migrated revolving credit card and non-migrated revolving credit card.

⁴ For calculating the average balances and limits, firstly the total balance and limit for each customer is extracted individually in a consolidated way for all their links. Then the average balances and limits are calculated, segregating by the number of links.

From two links onwards, one observes, on average, that the share of transactions with credit characteristics in the outstanding balance and the percentage of used limit increased (Graph 3).⁵ This suggests a trend towards the use of more expensive credit card transactions as additional links are added.

It is also noteworthy the percentage of 17% to 20% of revolving credit card and non-migrated revolving credit card, regardless of the number of customers' links, as well as the less than 5% share of migrated revolving credit card.⁶

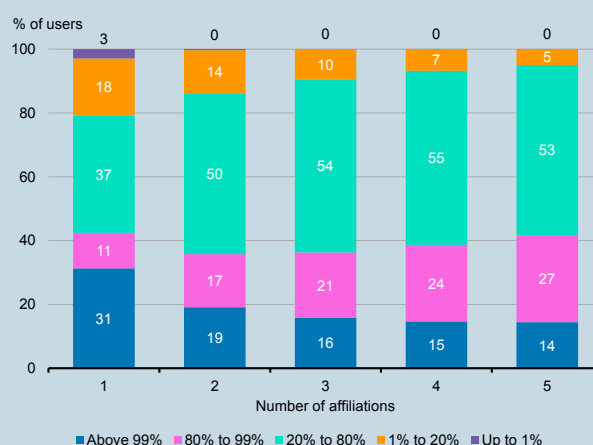
Graph 3 – Average used credit limit and debt balance distribution for each usage type by number of affiliations



Next, customers are categorized according to the percentage of used limit:⁷ 99% to 100%; 80% to 99%; 20% to 80%; 1% to 20%; 0% to 1%.⁸

The greater the number of links, the lower the percentage of customers compromising almost the entire credit limit – over 99% (Graph 4), which suggests increased spending capacity due to the limits offered by additional cards.

Graph 4 – Distribution of users according to percentage of credit limit used by number of affiliations



⁵ The share of each type of transaction in the outstanding balance and the percentage of the limit used are calculated for each customer individually in a consolidated way for all their links. Subsequently, the average of these values is calculated, segregating by the number of links.

⁶ According to CMN Resolution 4,549 of January 26, 2017, credit card debt not paid in full on the due date can remain in the revolving credit system for a maximum of 30 days (due date of the next bill). After this period, the remaining balance must be financed through a credit line offered by the financial institution, with lower interest rates.

⁷ Ranges are open on the left and closed on the right. For example, the range from 1% to 20% does not include 1% and does include 20%.

⁸ It considers the total consolidated limit of all user links.

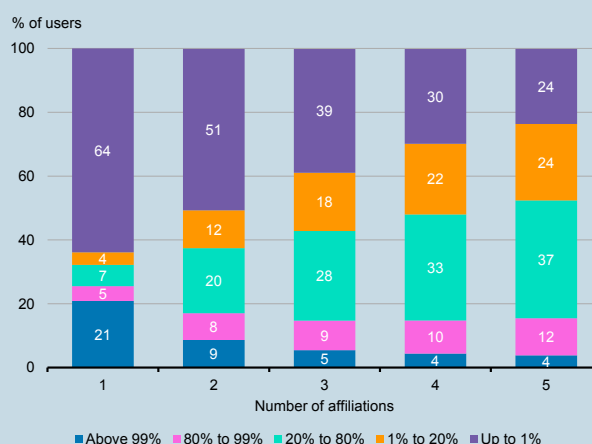
In addition, the average percentage of used credit card limit increases as customers add new links, which indicates a higher consumption propensity as customers use more cards.

Then, customers are categorized regarding debt subject to interest charges: 99% to 100%; 80% to 99%; 20% to 80%; 1% to 20%; 0% to 1%.

Graph 5 shows that, as the number of links increases, the percentage of customers using more than 1% of their balance on more expensive credit card transactions also increases. This indicates that a greater number of cards is related to a greater use of credit subject to interest charges through this payment instrument.

It is noteworthy that 21% of customers with only one link have almost all (over 99%) their outstanding balance in transactions subject to interest charges. Furthermore, almost 25% of customers with only one link have more than 80% of their outstanding balance in transactions subject to interest charges.

Graph 5 – Distribution of users according to percentage of debt balance in credit modalities by number of affiliations

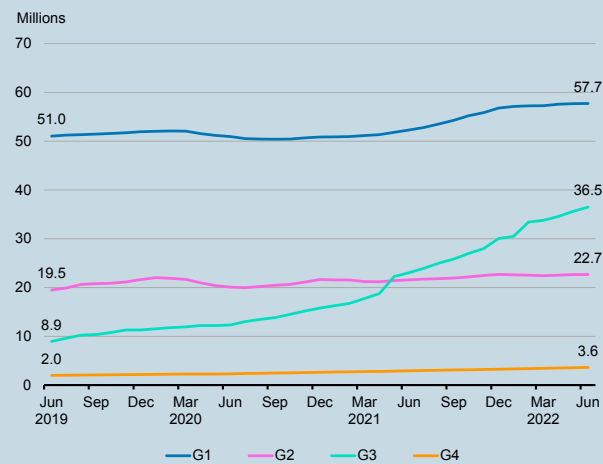


Analysis by issuing groups

By analyzing the evolution of the number of credit card customers (Graph 6)⁹ according to the four different groups of issuers (Table 1), one observes that the growth of the credit card market was mainly driven by the performance of G3 institutions, which increased their number of customers by 27.6 million individuals in the period.

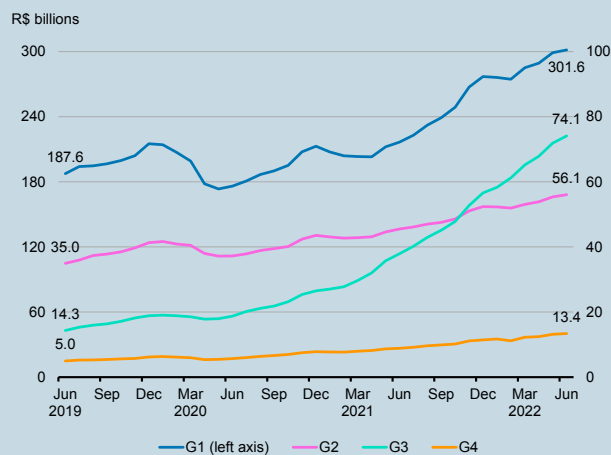
⁹ Each customer may be accounted for in more than one group according to the number of groups in which they have an outstanding balance.

Graph 6 – Evolution of number of users by issuer group



G3 was also the group with the greatest growth in their customers' outstanding balances (292.3%),¹⁰ while the entire market grew by 79.1% in the period. Conversely, G1 was the segment with the lowest growth in the period (55.4%), although it continues to be the group with the largest share of outstanding balance (Graph 7).

Graph 7 – Evolution of total debt balance by issuer group

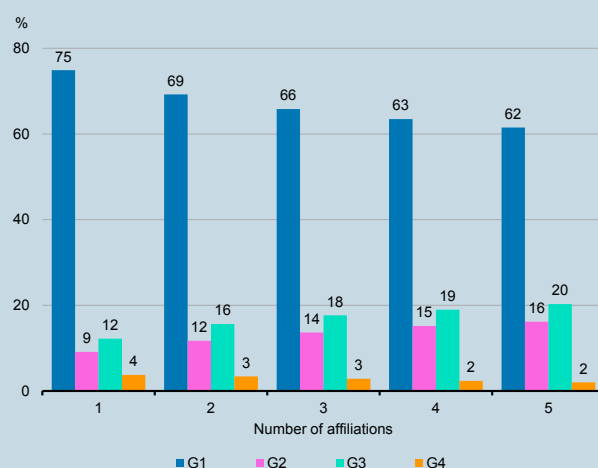


Graph 8 shows that the outstanding balance is highly concentrated in G1, regardless of the number of links.¹¹ This share slightly decreases as the number of links rises, while the G2 and G3 shares increase.

¹⁰ The increase in the reported outstanding balance is mainly due to the growth in the customer base of G3 financial and payments institutions.

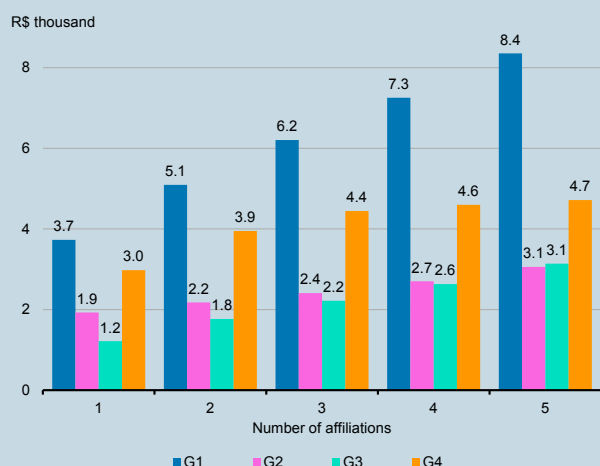
¹¹ It should be mentioned that, in this case, the number of links, defined by the number of institutions in which the customer has a balance, may be different from the number of groups, since different institutions may belong to the same group.

Graph 8 – Distribution of debt balance by number of affiliations and issuer group

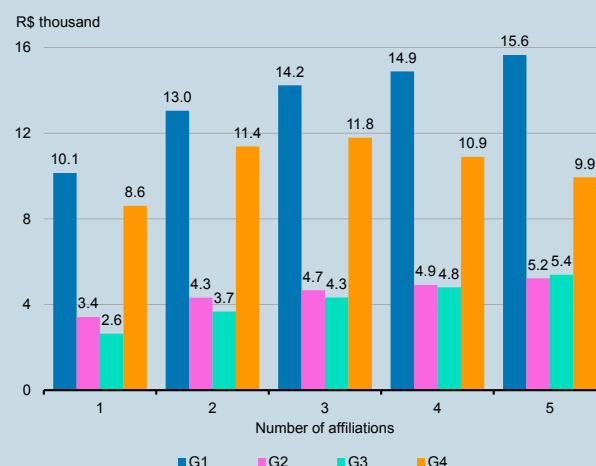


When assessing customers' outstanding balances and average limits by the number of links and issuing groups (Graphs 9 and 10),¹² the highest outstanding balances and average limits are found in G1 and G4 groups. The lowest outstanding balances are found in G2 and G3.

Graph 9 – Average debt balance by number of affiliations and issuer group



Graph 10 – Average credit limit by number of affiliations and issuer group

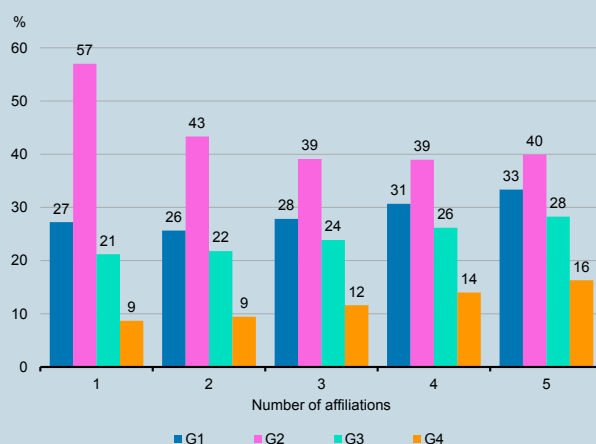


As for expensive credit card debt, represented by the percentage of the outstanding balance in transactions subject to interest charges, this indicator is significantly higher in G2, regardless of the number of links. This result is in line with the profile of this group, in which a common practice is to carry out personal loans with installments charged on the credit card bill (Graph 11).

On the opposite side, G4 institutions have substantially lower percentages of transactions subject to interest charges than other segments, suggesting that for G4 users the credit card is mainly used as a means of payment for purchases and/or purchases in installments financed by the store. In turn, G1 and G3 have similar percentages, with slightly lower percentages in G3 than in G1.

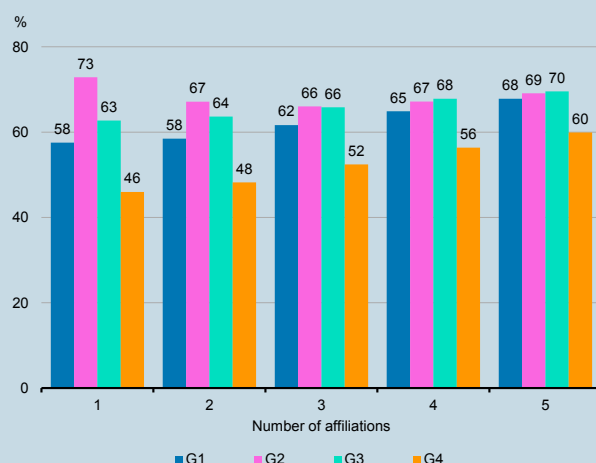
¹² For calculating the average balances and limits, firstly the total balance and limit for each user is extracted individually in a consolidated way for all their groups. Then the average balances and limits are calculated, segregating by the number of links.

Graph 11 – Percentage of debt balance in credit modalities by number of affiliations and issuer group



The limit compromising is, on average, higher in G2 for customers with up to two links (Graph 12).¹³ From three links on, the percentages of the limit commitment in G1, G2, and G3 are similar.

Graph 12 – Percentage of used credit limit by number of affiliations and issuer group



Conclusion

The expansion of the credit card market over the last years, driven by payment institutions and by digital banks (G3), provided Brazilians with greater access to this payment instrument. Despite the increase in competition and in the number of credit cards, the market is still dominated by large banking conglomerates (G1).

The expansion in the average outstanding balance and in the used limit as the number of links increases indicates that customers with a greater number of links search for additional spending limits. Furthermore, it seems that a greater number of credit cards with different issuers tends to increase the average balance in transactions subject to interest charges, especially revolving credit, which has high interest rates.

¹³ The percentage of limit used is calculated for each user individually, in each of the groups. Subsequently, an average of these values is calculated, segregating by the number of links.

Considering the groups of issuers, regardless of the number of links, expensive credit card debt is significantly higher in the G2 segment, of small and medium-sized private banks and finance companies. The segment of credit union banks and individual credit unions (G4) is on the opposite side, with a much lower percentage of credit card use subject to interest charges.

Box 4 – Personal credit, heterogeneous interest rates, and inequality

Financial intermediates, such as banks, play a fundamental role in the economy, connecting those who save part of their income with those who need credit. In particular, personal credit allows households to smooth consumption over time, especially when facing income risks that cannot be mitigated by means of insurance. Credit markets are characterized by high interest rates in developing countries, such as Brazil (Banerjee, 2003; Banerjee and Duflo, 2010a; Cavalcanti *et al.*, 2021), making it difficult for households to smooth consumption over time.

This box aims to document and investigate the relationship between interest rates of personal credit operations (payroll and non-payroll deducted) and borrowers' characteristics, such as income and occupation.¹ To this end, monthly data between January 2013 and December 2019 from the Credit Information System (SCR) – which provides information on loans, including borrowers' characteristics, covering almost all credit operations in Brazil – is used. In addition, data from the Annual Report on Social Information (Rais), which provides information on labor market and on formal workers' characteristics, such as salary, hiring, lay-offs, occupation and schooling, are also used.²

The study focuses on two types of loans that account for around 50% of non-earmarked credit operations with households: non-payroll-deducted personal credit (for the sake of simplicity, hereinafter “personal credit”) and payroll-deducted personal credit (hereinafter “payroll-deducted credit”). Personal credit is available to everyone, while payroll-deducted credit is available only for individuals who have payments due deducted directly from their paycheck or social security benefit. Almost all payroll-deducted credit borrowers are INSS retirees or public servants.

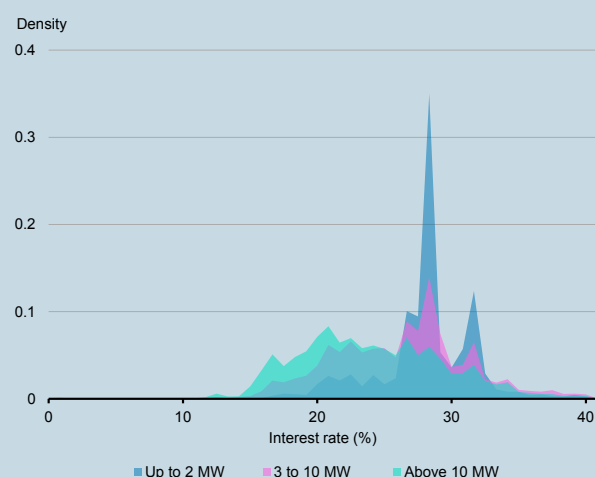
During the analyzed period, the average interest rates charged for personal credit operations are five times higher than those charged for payroll-deducted credit. Interest rates variability, measured by the standard deviation, is 17 times higher in personal credit than in payroll-deducted credit operations. Delinquency – defined in this study as a binary variable with a value of 1 if the individual has a loan overdue for more than 90 days, and a value of 0 otherwise – is three times higher in personal credit (6%) than in payroll-deducted credit (2%). As payroll-deducted credit is deducted directly from workers' paychecks or retiree's social security benefits, it represents a better guarantee to banks. This is reflected in the lower delinquency and interest rates for this type of credit.

Looking only at the interest rate on loans by income, the interest rate paid on both types of credit is higher and more dispersed for those with lower incomes (Graphs 1 and 2).

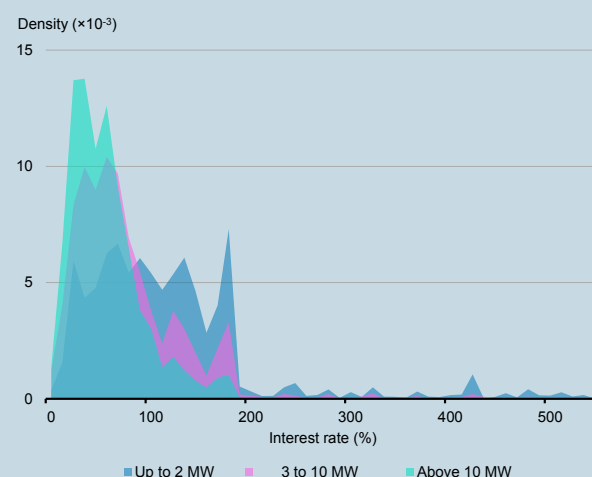
1 The results presented in this box are based on ongoing research entitled Consumer Loans, Heterogeneous Interest Rates, and Inequality developed by Marco Bonomo (Insper), Tiago Cavalcanti (University of Cambridge, FGV-EESP and CEPR), Fernando Chertman (Banco Central do Brasil), Amanda Fantinatti (FGV-EESP), Andrew Hannon (University of Cambridge) and Cezar Santos (Inter-American Development Bank and CEPR).

2 The research uses a representative sample of around 1.36 million individuals registered in the Credit Information System (SCR) between 2013 and 2019.

Graph 1 – Interest rate of payroll-deductible loans by income



Graph 2 – Interest rate of personal loans by income



Additionally, the study highlights, using regressions (Table 1), that the interest rates for both types of credit are related not only to individual characteristics. Even after introducing control variables for loans (such as maturity and value), various attributes of clients (such as age, gender, race, occupation, financial education³), and credit score or probability of delinquency, it is shown that low-income individuals pay higher interest rates than high-income individuals. Furthermore, a significant part of interest rate spread is not explained by individual characteristics and/or by credit operation risk.

Table 1 shows the main results regarding payroll-deducted credit and personal credit. A relationship between interest rates paid in both credit types and income is observed, with all other individuals paying a higher interest rate than those with incomes above 20 minimum wages (the basis of comparison in these regressions). It should be noted that INSS retirees or public servants pay lower interest rates than those with formal jobs. It is also worth mentioning that more “financially educated” individuals pay lower interest rates.

One may argue that this inverse relationship between interest rates on credit operations and individuals’ income is derived from the higher levels of risk associated with lower-income individuals. To clarify this question, Table 2 shows the same regressions presented in Table 1 for some types of risk.⁴ Table 2 shows that the relationship between the interest rates on both credit operations and income remains the same, lower-income individuals pay a higher interest rate, regardless of their risk rating.

3 The financial education index is calculated only for formal jobs employees taken from the Annual Report on Social Information (Rais), by multiplying years of schooling by a dummy variable that assumes value 1 for those working in areas related to finance, economics, statistics, accounting, mathematics, engineering and banking. The methodology is similar to that used in (GARBER *et al.*, 2021), (BUSTOS *et al.*, 2019) and (LAGARAS, 2017).

4 According to BCB's Resolution 2,682, financial institutions and other institutions authorized to operate by the BCB must classify credit operations, in ascending order of risk, from level AA to H. For clients with operations overdue between 15 and 30 days, the operations must be classified as at least B. Operations overdue between 91 and 120 days must be classified as at least E.

Table 1 – Estimated annual effective interest rate for personal and payroll loans (sample 2013.01 – 2019.12)

Variables	Type of loan		Personal (1)	Personal (2)
	Payroll loan (1)	Payroll loan (2)		
No income	2.638*** (0.0228)	3.109*** (0.0949)	74.79*** (0.629)	62.34*** -1,029
Income up to 1MW	2.548*** (0.0228)	3.161*** (0.0835)	54.53*** (0.366)	43.10*** (0.349)
Income between 1 and 2 MW	2.458*** (0.0228)	2.872*** (0.0788)	39.44*** (0.292)	26.86*** (0.257)
Income between 2 and 3 MW	2.216*** (0.0225)	2.639*** (0.0760)	28.82*** (0.257)	20.61*** (0.252)
Income between 3 and 5 MW	1.908*** (0.0222)	2.333*** (0.0775)	19.32*** (0.214)	12.68*** (0.241)
Income between 5 and 10 MW	1.434*** (0.0216)	1.779*** (0.0736)	9.501*** (0.163)	5.792*** (0.227)
Income between 10 and 20 MW	0.463*** (0.0179)	1.177*** (0.0677)	1.474*** (0.108)	0.300 (0.215)
Retired (INSS)	-0.959*** (0.0149)	0.0829*** (0.0188)	-0.545*** (0.104)	-4.930*** (0.313)
Public servants	-2.524*** (0.0197)	-2.082*** (0.0206)	-11.40*** (0.131)	-9.206*** (0.122)
Informal workers	-	-	2.069*** (0.0582)	
Prob. of default	1.497*** (0.0279)		41.50*** (0.568)	
Financial education		-0.0865*** (0.00250)		-1.285*** (0.0124)
Constant	29.83*** (0.0629)	31.17*** (0.178)	109.1*** (0.422)	171.4*** (0.924)
Number of observations	20,518,626	1,863,378	24,093,347	3,750,840
R ²	0.208	0.179	0.278	0.292
Risk control	No	Yes	No	Yes
Fixed time effect	Yes	Yes	Yes	Yes
Municipal fixed effect.	Yes	Yes	Yes	Yes

/ Robust standard deviation in brackets; ***p<0.001, **p<0.05, *p<0.1

All regressions are controlled for term, loan, age and gender

Table 2 – Estimated annual effective interest rate for personal and payroll loans (Sample 2013.01 – 2019.12)

	Personal loans			Payroll loans		
	risk A	risk B	risk E	risk A	risk B	risk E
No income	97.52*** (0.762)	68.58*** -1,085 (0.508)	23.37*** (0.508)	1.891*** (0.0318)	4.957*** (0.0324)	0.676*** (0.112)
Income up to 1 MW	59.82*** (0.388)	46.20*** (0.410)	42.77*** (0.604)	1.924*** (0.0306)	3.404*** (0.0264)	1.425*** (0.0728)
Income between 1 and 2 MW	48.05*** (0.334)	41.32*** (0.271)	28.26*** (0.402)	1.556*** (0.0307)	3.515*** (0.0249)	1.950*** (0.0699)
Income between 2 and 3 MW	38.21*** (0.309)	22.83*** (0.243)	24.12*** (0.383)	1.377*** (0.0310)	3.048*** (0.0252)	1.833*** (0.0698)
Income between 3 and 5 MW	26.97*** (0.280)	12.56*** (0.199)	19.58*** (0.374)	1.032*** (0.0315)	2.709*** (0.0249)	1.594*** (0.0687)
Income between 5 and 10 MW	15.12*** (0.233)	4.523*** (0.159)	14.42*** (0.345)	0.738*** (0.0312)	2.005*** (0.0245)	1.055*** (0.0679)
Income between 10 and 20 MW	4.146*** (0.190)	-1.024*** (0.133)	5.607*** (0.330)	-0.0670** (0.0269)	0.924*** (0.0231)	0.184** (0.0723)
Retired (INSS)	0.431*** (0.145)	2.059*** (0.201)	-3.975*** (0.352)	-0.659*** (0.0159)	-1.048*** (0.0205)	-2.083*** (0.0465)
Public servants	-7.577*** (0.152)	-8.779*** (0.161)	-10.33*** (0.195)	-2.505*** (0.0198)	-2.541*** (0.0253)	-2.525*** (0.0384)
Informal work	3.864*** (0.0768)	1.856*** (0.141)	-0.356** (0.144)	-	-	-
Constant	113.2*** (0.548)	98.04*** (0.583)	92.79*** (0.708)	29.52*** (0.0667)	27.41*** (0.0881)	34.89*** (0.134)
Observations	11,926,979	2,775,011	1,222,624	9,648,688	4,468,121	371.518
R2	0.330	0.251	0.256	0.248	0.236	0.268
Control Risk	No	No	No	No	No	No
Fixed effect Time	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effect municipality	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard deviation in brackets; ***p<0.001, **p<0.05, *p<0.1

All regressions are controlled for term, loan, age and gender

risk B: late payment between 15 and 30 days

risk E: late payment between 91 and 120 days (default)

To calculate a proxy for a risk-free interest rate for credit operations in Brazil, the expected probability of delinquency was deducted from the interest rate observed on the market.^{5,6} Next, the risk-free interest rate was subtracted from the contracted interest rate of each credit operation. This rate is called interest rate wedge. Thus, considering personal credit for individuals earning between 1 and 2 minimum wages, the interest rate wedge is almost double (106 p.p.) the wedge for individuals earning more than 20 minimum wages (44 p.p.). For payroll-deducted credit, the wedge is around 17 p.p. for individuals earning between 1 and 2 minimum wages, and 13 p.p. for those earning more than 20 minimum wages.

5 The term structure of interest rates, estimated by Anbima, was used to calculate market interest rates that have a maturity close to that of the loan under analysis.

6 The expected probability of delinquency is calculated using a *logit* model. The independent variables in this model are: maturity, maturity squared, loan amount in *log*, income, occupation, age, age squared, dummy for woman and individual risk.

Finally, Table 3 shows some descriptive statistics that confirm the results presented in the regressions above. For payroll-deducted credit, interest rates fell from 28.49% p.a., on average, for people earning up to 1 minimum wage, to 23.21% p.a. when considering only people earning over 20 minimum wages. The same effect is observed for personal credit with interest rates falling from 112.83% p.a. to 47.41% p.a., respectively, for people earning up to 1 minimum wage and for people earning over 20 minimum wages.

Table 3 – Descriptive statistics by income (Sample 2013.01 – 2019.12)

Panel A	Payroll loans													
	up to 1 MW		1 and 2 SM		2 and 3 MW		3 and 5 MW		5 and 10 MW		10 and 20 MW		above 20 MW	
	average	sd	average	sd	average	sd	average	sd	average	sd	average	sd	average	sd
Interest rate (% p.a.)	28.93	14.66	28.70	9.42	27.99	9.98	26.95	9.06	25.76	9.92	24.37	8.53	23.85	8.03
Term (months)	63.24	14.58	61.64	19.05	61.21	23.53	62.53	24.77	62.32	27.01	62.84	29.03	65.40	27.87
Default	0.02	0.15	0.02	0.15	0.02	0.13	0.02	0.12	0.01	0.11	0.01	0.09	0.01	0.10

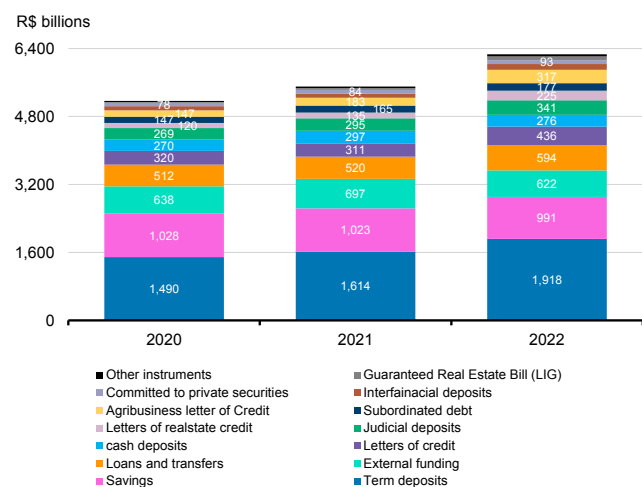
*sd = standard deviation

Panel B	Personal loans													
	up to 1 MW		1 and 2 SM		2 and 3 MW		3 and 5 MW		5 and 10 MW		10 and 20 MW		above 20 MW	
	average	sd	average	sd	average	sd	average	sd	average	sd	average	sd	average	sd
Interest rate (% p.a.)	199.66	241.61	168.74	216.46	136.17	183.26	120.30	176.24	92.36	138.74	71.01	102.99	59.53	76.70
Term (months)	26.79	19.65	24.93	18.90	25.76	20.03	27.44	22.38	29.75	24.07	31.54	24.01	31.22	22.13
Default	0.07	0.26	0.08	0.27	0.06	0.24	0.04	0.20	0.03	0.18	0.03	0.17	0.03	0.16

*sd = standard deviation

We understand that the reasons for the differences in interest rates for different income ranges are diverse and go beyond the scope of this study. However, the discussion of the causes and effects of this heterogeneity in Brazilian interest rates is extremely important, given the high levels of inequality in Brazil. This study shows relevant welfare effects, especially for the poorest families, contributing to initiatives that effectively reduce the cost of personal credit in the country. Improving the legal protection of creditors is fundamental, allowing for a higher recovery rate for delinquent loans and lower financial intermediation costs. In addition, improving the portability system for various banking services is essential, making it possible for new players to operate in the market, increasing competition in the sector and allowing for the independence of clients who could look for banking entities that best meet their needs and preferences.

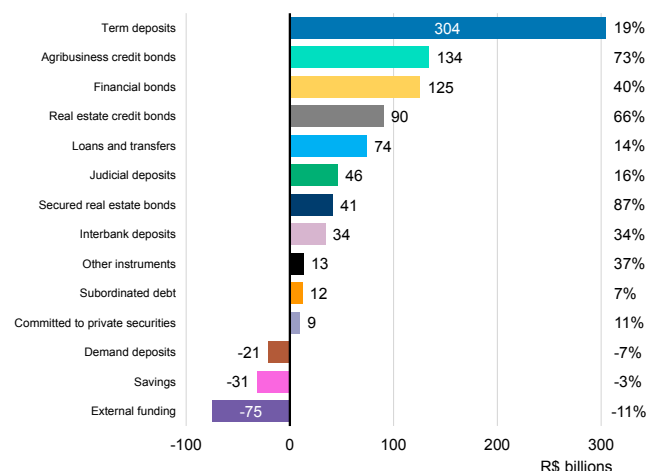
Graph 2.1 – Funding profile by instrument
Banking system



Sources: BCB, B3

/ Term deposits: bank deposit certificates, bank deposit receipts, term deposits with special guarantee from the Credit Guarantee Fund (FGC). Subordinated debt: bank deposit certificates with subordination clause, financial bills with subordination clause and instruments eligible for capital composition. Other instruments: COE, bills of exchange, mortgage bills, box operations. Repurchase agreements: only repurchase agreements with private securities.

Graph 2.2 – Fundraising instruments – Changes in stocks
December 2021 to December 2022



Sources: BCB, B3

/ Term deposits: bank deposit certificates, bank deposit receipts, term deposits with special guarantee from the Credit Guarantee Fund (FGC). Subordinated debt: bank deposit certificates with subordination clause, financial bills with subordination clause and instruments eligible for capital composition. Other instruments: COE, bills of exchange, mortgage bills, box operations. Repurchase agreements: only repurchase agreements with private securities.

2.1 Funding profile by instrument types

The pace of expansion of funding stock in 2022 (13.5%) was higher than in 2021 (6.6%) (Graph 2.1).

This expansion was impacted by positive net funding, signaling greater propensity to the accumulation of banking funding instruments by economic agents, in face of the Selic rate level (effective values between 9.15% p.a. and 13.65% p.a.). It is noteworthy that the stock growth exclusively due to accrued interest tends to be proportionally lower than the increase in the Selic rate due to the speed of stock turnover.

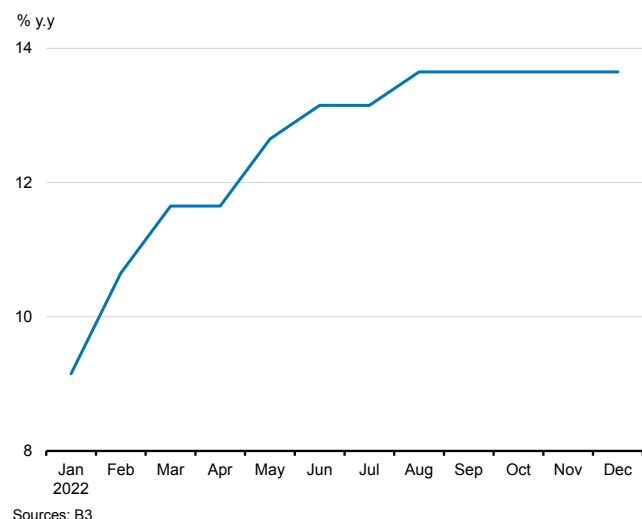
Term deposits stand out among the instruments with positive growth in absolute terms, with BRL 304 billion (Graph 2.2). In relative terms, similarly to 2021, Agribusiness Credit Bills (LCAs), Real Estate Bills (LCIs), and Guaranteed Financial Bills (LIGs) stand out. These instruments are attractive to customers due to their profitability and exemption from the household income tax (IR), and represent lower financial costs to banks.

In 2022, savings accounts and demand deposits registered a negative performance. As for savings accounts, the decline in net funding observed in 2021 was further intensified in 2022, with net outflows reaching BRL 102 billion 2022, although the balance variation was largely counterbalanced by credited earnings (Graph 2.3). The performance of savings accounts is sensitive to the macroeconomic scenario in which the Selic rate is at higher levels than earnings. Concerning external funding, it should be mentioned the effect of the exchange rate variation accumulated in 2022. Nearly BRL 45 billion out of the BRL 78 billion decline in external funding are associated with the USD change (corresponding to 6.5% of a total relative reduction of 11.3%).

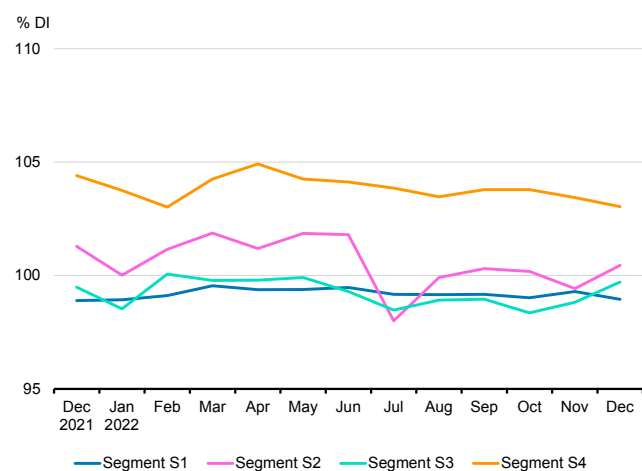
Graph 2.3 – Savings accounts
Breakdown of stock variation



Graph 2.4 – Evolution of the average fixed rate (overnight) of the DI



Graph 2.5 – Average monthly fundraising rates as a percentage of DI by segment



/ Weighted average rate of the following instruments: bank deposit certificates, bank deposit receipts, term deposits with special guarantee from the Credit Guarantee Fund (FGC), interbank deposits, agribusiness letters of credit, real estate letters of credit, financial letters (including those with a subordination clause), guaranteed real estate letters.

2.2 Funding rates

A relevant component of the funding cost is the **Interbank Deposit (DI) rate**, which, in turn, is associated with the **Selic rate**. Due to the monetary tightening cycle, the DI rate continued on an upward trend in 2022 (Graph 2.4).

The average funding rate of the S1 segment kept around 100% of the DI rate. In the other segments, the average funding cost as a DI percentage also remained stable. In the YoY comparison, changes were below 1.4%. Therefore, the rate differential across several segments kept almost stable over the year, although with slightly lower percentages in the second half of the year (Graph 2.5).

Concerning **Bank Deposit Certificates (CDBs)**, the average funding rates, as a DI percentage, remained stable throughout 2022, with relative changes lower than 2% (Graph 2.6).

Average funding rates of financial bills with no subordination clause (long-term funding securities), as a DI percentage, ended the year with average rates lower than in 2021 for all segments, registering some volatility in the S4 segment (Graph 2.7).

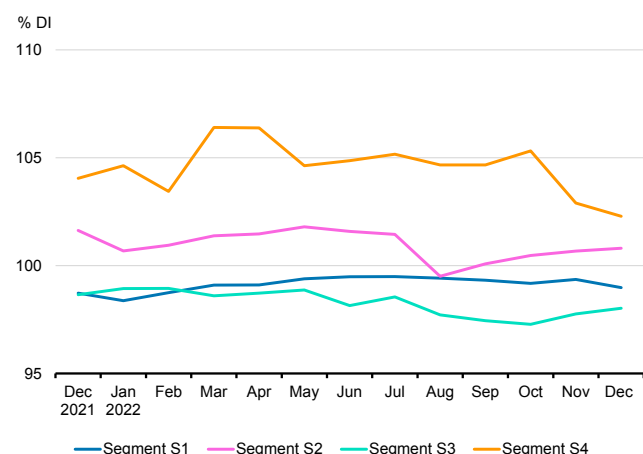
Regarding LCAs and LCIs (Graph 2.8), one observes, over 2022, a downward trend of funding rates as a DI percentage in all segments but in S1, which reverted this downward trend in the second half of the year.

2.3 Investor type

In December 2022, households and companies not classifiable as institutional investors or non-resident continued to be the main banking system's funding sources, accounting for 69% of the total stock (Graph 2.9). Non-residents, public sector, and institutional investors complete the relevant banking system's funding sources, with respective shares of nearly 10%, 10%, and 8%. It is noteworthy in the year the 38% increase in the share of institutional investors.

Graph 2.6 – Average collection rates as a percentage of DI by segment

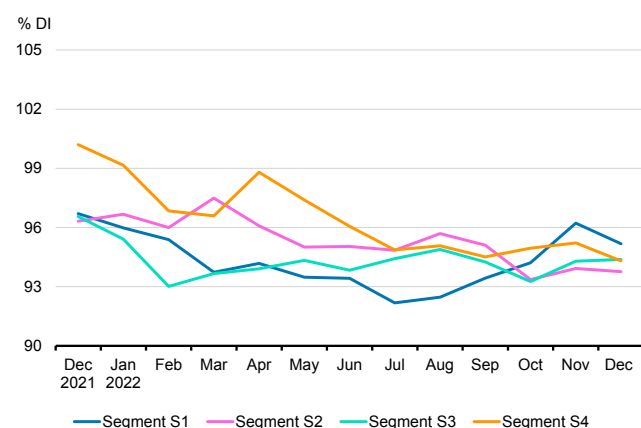
Bank deposit certificates – CDBs



Sources: BCB, B3

Graph 2.8 – Average funding rates as a percentage of DI by segment

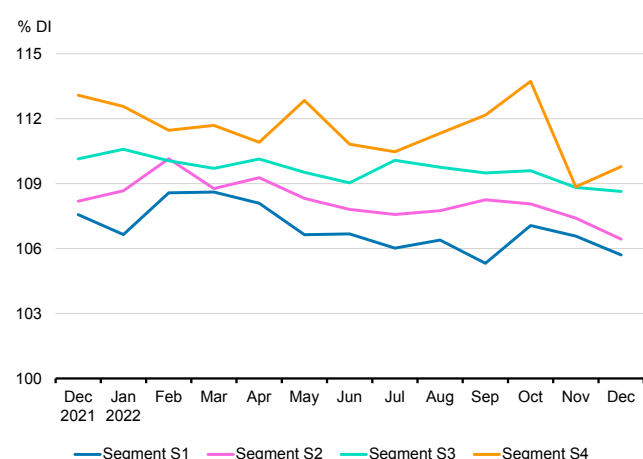
Agribusiness credit letters (LCAs) and real estate credit letters (LCIs)



Sources: BCB, B3

Graph 2.7 – Average funding rates as a percentage of DI by segment (excluding LFG)

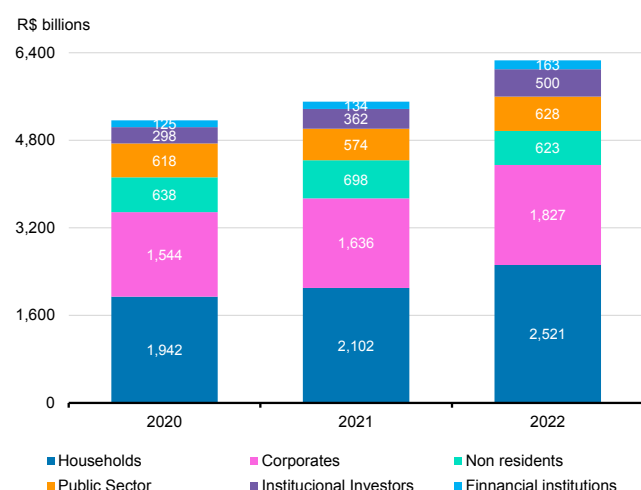
Financial letters without subordination clause



Sources: BCB, B3

Graph 2.9 – Fundraising profile

By investor nature – Banking system



Sources: BCB, B3

Credit Cost and Spread Decomposition

Graph 3.1 – ICC and its spread

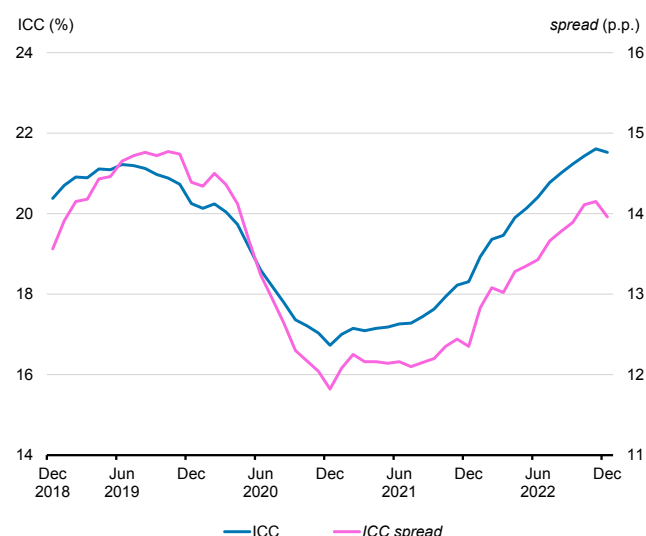


Table 3.1 – ICC Composition

Item	2020	2021	p.p. 2022
A.1 – Average ICC	18.46	17.49	20.52
A.2 – Adjustment for capitalization method	1.40	1.26	1.72
A – Adjusted average ICC (A.1 - A.2)	17.06	16.23	18.80
B.1 – Funding cost	5.33	5.28	6.96
B.2 – Adjustment for capitalization method	0.13	0.13	0.21
B – Adjusted funding cost (B.1 - B.2)	5.20	5.15	6.75
C – Spread (A - B)	11.85	11.07	12.06
D – FGC expense	0.05	0.05	0.05
E – IOF	0.23	0.27	0.33
F – PIS and Cofins contributions	0.50	0.47	0.50
G – Administrative expenses	3.43	3.32	3.08
H – Loss estimate	2.75	2.26	2.76
I – Interest not received from operations with delays of 60 days or more	0.55	0.45	0.63
J – Discounts granted	0.31	0.25	0.27
K.1 – Interest on equity received by shareholders	0.39	0.42	0.54
K.2 – Withholding income tax on interest on equity	0.07	0.07	0.09
K – Interest on equity expense (K.1 + K.2)	0.46	0.49	0.63
L – ICC margin before income tax, social contribution (C - D - E - F - G - H - I - J - K)	3.57	3.52	3.80
M – Income tax and social contribution	1.58	1.67	1.73
N – ICC financial margin (L - M + K.1)	2.38	2.26	2.61

This chapter presents the decomposition of credit cost in Brazil by the Average Cost of Outstanding Loans (ICC), published by the BCB since April 2017. The ICC estimates the average cost of credit for outstanding operations from the borrower's perspective at a given moment, regardless of the contract date.²⁰ Therefore, the ICC includes information from recent contracts and previous contracts still in force.

With the beginning of the normalization process of monetary policy after the Covid-19 pandemic, an upward trajectory of the ICC is observed, going from 16.7% in December 2020 to 21.5% at the end of 2022 (Graph 3.1).

The ICC spread is obtained by excluding from the ICC the share corresponding to the funding cost. The spread trajectory was also upward, from 11.8 p.p. at the end of 2020 to 13.9 p.p. at the end of 2022.

3.1 ICC decomposition

The ICC decomposition aims to identify and measure the main determinant factors of borrowers' credit cost.²¹ Table 1 presents the items used for the decomposition calculation. 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.

²⁰ For methodological details on the ICC estimation, please see BCB's Technical Note 45, "Indicador de Custo de Crédito", of June 2018.

²¹ For methodological details on the ICC decomposition, see box "Credit Cost and Spread Decomposition Methodology" in the Banking Report 2017, and boxes concerning methodological improvements in subsequent reports.

Table 3.2 – Adjusted average ICC breakdown

Item	p.p.			
	2020	2021	2022	Average
1 – Funding cost	5.20	5.15	6.75	5.70
2 – Default	3.62	2.97	3.67	3.42
3 – Administrative expenses	3.43	3.32	3.08	3.28
4 – Taxes and FGC	2.43	2.52	2.69	2.55
5 – ICC financial margin	2.38	2.26	2.61	2.42
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	17.06	16.23	18.80	17.36

2) “Delinquency” (H + I + J): captures losses arising from non-payment of debts or interest, in addition to discounts granted.

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 + K2 + M): reflects taxes on credit paid by borrowers and financial institutions. Customers 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)²² and also withhold the 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 Guarantor Fund (FGC), shall monthly contribute to the fund with a certain percentage of the guaranteed accounts balance.²³

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.

In 2022, with the exception of the administrative expenses component, all components contributed to the 2.57 p.p. in the ICC increase over 2021 (Table 3.2). The main factor underlying this movement was the funding cost (+1.60 p.p.), followed by delinquency (+0.70 p.p.), financial margin (+0.34 p.p.), and taxes and FGC (+0.17 p.p.). As opposed to the increase in these factors, the contribution of the administrative expenses decreased by 0.24 p.p.

The increase of the funding cost took place due to the rise in the basic interest rate in response to inflationary pressures. The Selic target rate, which was at the lowest historical low in December 2020, at 2% p.a., began to increase as of March 2021, reaching 13.75% p.a. in August 2022. Delinquency, in turn, after reaching the historical lows in late 2020 and early 2021, increased

22 The CSLL rate was 15% in January and February 2020. On March 1st, 2020, the CSLL rate returned to 20%, and starting from July 1st, 2021, it became 25% until December 31st, 2021. Starting from January 1st, 2022, the rate became 20% until the end of July 2022, when it was changed to 21% until the end of that year.

23 Further details on the institutions associated to the Credit Guarantor Fund (FGC), collaterals offered, value, available at <https://www.fgc.org.br/>.

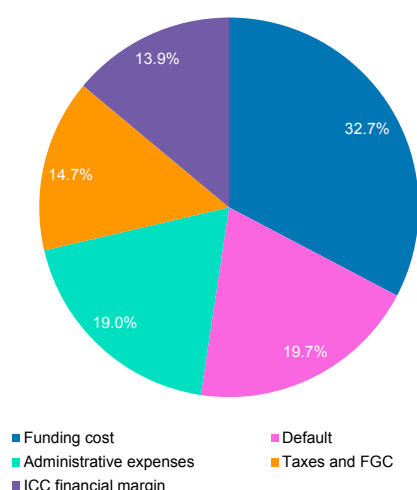
Table 3.3 – Adjusted average ICC breakdown

As a proportion of adjusted average ICC

Item	2020	2021	2022	Average
1 – Funding cost	30.48	31.73	35.90	32.71
2 – Default	21.22	18.30	19.52	19.68
3 – Administrative expenses	20.11	20.46	16.38	18.98
4 – Taxes and FGC	14.24	15.59	14.31	14.71
5 – ICC financial margin	13.95	13.99	13.88	13.94
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	100.0	100.0	100.0	100.0

Graph 3.2 – ICC breakdown

Average 2020 to 2022

**Table 3.4 – ICC Composition by Type**

Average from 2019 to 2021

Item	Non-earmarked	Earmarked	Overall
A.1 – Average ICC	26.66	8.39	18.82
A.2 – Adjustment for capitalization method	2.81	0.31	1.46
A – Adjusted average ICC (A.1 - A.2)	23.85	8.08	17.36
B.1 – Funding cost	6.65	4.71	5.86
B.2 – Adjustment for capitalization method	0.20	0.10	0.16
B – Adjusted funding cost (B.1 - B.2)	6.45	4.61	5.70
C – Spread (A - B)	17.40	3.47	11.66
D – FGC expense	0.05	0.03	0.05
E – IOF	0.46	0.02	0.28
F – PIS and Cofins contributions	0.72	0.15	0.49
G – Administrative expenses	4.83	0.98	3.28
H – Loss estimate	3.42	1.40	2.59
I – Interest not received from operations with delays of 60 days or more	1.10	0.17	0.54
J – Discounts granted	0.42	0.18	0.28
K.1 – Interest on equity received by shareholders	0.45	0.45	0.45
K.2 – Withholding income tax on interest on equity	0.08	0.08	0.08
K – Interest on equity expense (K.1 + K.2)	0.53	0.53	0.53
L – ICC margin before income tax, social contribution (C - D - E - F - G - H - I - J - K)	5.89	0.02	3.63
M – Income tax and social contribution	2.69	0.02	1.66
N – ICC financial margin (L - M + K.1)	3.65	0.45	2.42

gradually throughout 2022, reaching, in the end of 2022, a level similar to that observed in early 2020, before the effects of the Covid-19 pandemic. On the other hand, there was a decrease in the contribution of administrative expenses, possibly due to the digitalization process underway in the banking sector, which accelerated with the outbreak of the Covid-19 pandemic.

When the percentage share of several ICC components is evaluated, the largest variations were observed in the items funding cost and administrative expenses.

If, on the one hand, the participation of the funding cost rose from 31.7% in 2021 to 35.9% in 2022, on the other hand, administrative expenses followed an opposite trend of the same magnitude, reducing from 20.5% in 2021 to 16.4% in 2022 (Table 3.3).

Considering the average for the period 2020-2022 (Graph 3.2) as a more stable measure less subject to cyclical components, the order of components is the same of 2022, although with different magnitudes. The funding cost is the first component (average of 32.7%), followed by delinquency (average of 19.7%), and administrative expenses (average of 19.0%). Then follow Taxes and FGC (average of 14.7%), and finally, ICC Financial Margin (average of 13.9%).

The ICC decomposition for the non-earmarked and earmarked portfolios²⁴ reveals that the average ICC as well as all its components continue significantly lower for the earmarked credit, reflecting the ceiling imposed on rates due to specific regulations (Table 3.4 and Graph 3.3). Similarly to previous years, the financial margin of the earmarked credit remains around zero.

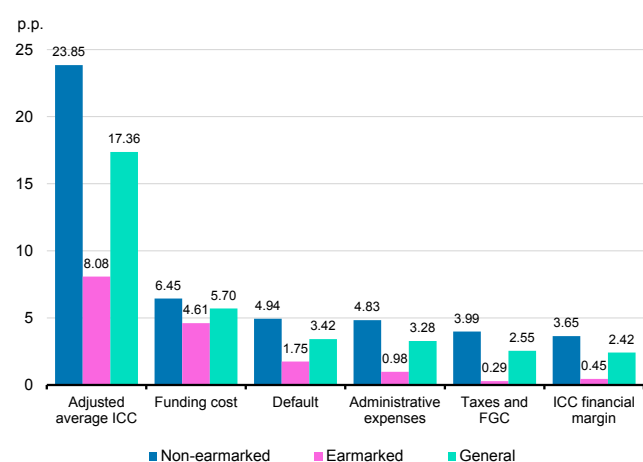
This indicates that the ICC financial margin around zero for the earmarked credit leads institutions to compensate by increasing the ICC financial margin for the non-earmarked credit, in order to remunerate the invested capital in both credit segments. Therefore, it is reasonable to suppose that, assuming the absence of earmarked credit portfolio with profitability around zero, the profitability of the non-earmarked credit portfolio might be lower.²⁵

²⁴ It should be noticed, however, that the larger the decomposition of the credit portfolio for calculating the participation of components that influence on the ICC formation, the more inaccurate is the allocation of administrative expenses.

²⁵ 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.

Graph 3.3 – ICC components

Non-earmarked, earmarked and total credit
Average 2020 to 2022



In the YoY comparison (Table 3.5), one notices that the variations of ICC components in the earmarked credit are relatively small, causing variations in the overall result to be mostly determined by the non-earmarked segment. In this decomposition, it becomes quite clear how the monetary policy has little influence on the earmarked segments as compared with the non-earmarked segment. Whereas the funding cost of non-earmarked operations rose 5.7% in 2021 to 8.1% in 2022 (+2.4 p.p.), the increase in the funding cost of earmarked operations was only 0.3 p.p. (from 4.4% to 4.7%).

Table 3.5 – ICC Decomposition by Type

	p.p.								
	Non-earmarked			Earmarked			Overall		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Funding cost	5.55	5.70	8.09	4.72	4.39	4.73	5.20	5.15	6.75
Default	5.18	4.29	5.34	2.10	1.55	1.59	3.62	2.97	3.67
Administrative expenses	5.12	4.92	4.46	1.00	0.99	0.95	3.43	3.32	3.08
Taxes and FGC	3.92	3.91	4.13	0.12	0.37	0.37	2.43	2.52	2.69
ICC financial margin	3.76	3.36	3.82	0.21	0.53	0.62	2.38	2.26	2.61
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	23.53	22.18	25.84	8.15	7.83	8.26	17.06	16.23	18.80

Table 3.6 – ICC Spread Decomposition

Item	p.p.			
	2020	2021	2022	Average
1 – Default	3.62	2.97	3.67	3.42
2 – Administrative expenses	3.43	3.32	3.08	3.28
3 – Taxes and FGC	2.43	2.52	2.69	2.55
4 – ICC financial margin	2.38	2.26	2.61	2.42
ICC spread (1 + 2 + 3 + 4)	11.85	11.07	12.06	11.66

3.2 ICC spread decomposition

The decomposition of the ICC spread – given by the difference between the ICC and the funding costs – allows identifying the factors determining the borrowers' credit cost, leaving out market conditions effects related to the cost of funding resources, such as the level of the Selic rate.

When comparing 2022 with 2021, it is observed that, with the exception of Administrative Expenses, all other components contributed to the ICC spread increase, especially Delinquency (Table 3.6).²⁶ It is noteworthy that the methodology employed for estimating the effect of delinquency on the ICC spread decomposition uses measures that estimate losses by observing how much can be written-off in the balances of financial institutions. After the significant build-up

²⁶ The contributions in percentage points are the same as those reported for the ICC decomposition, but the percentage shares of all components (Table 3.6) increase due to the exclusion of the funding cost.

Table 3.7 – ICC Spread Decomposition

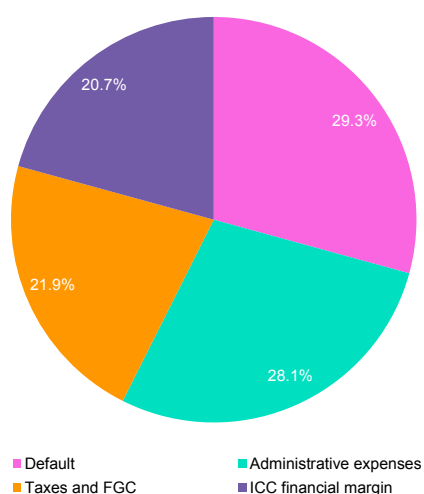
As a proportion of the spread

Item	2020	2021	2022	Average
1 – Default	30.52	26.81	30.46	29.26
2 – Administrative expenses	28.92	29.96	25.56	28.15
3 – Taxes and FGC	20.49	22.74	22.32	21.85
4 – ICC financial margin	20.07	20.49	21.66	20.74
ICC spread (1 + 2 + 3 + 4)	100.0	100.0	100.0	100.0

of credit loss provisions in the financial statements of financial institutions in 2020, throughout 2021 and 2022, the establishment of new provisions began to return to pre-pandemic levels. However, since these provisions are estimates only, they may underestimate or overestimate the effective losses with credit assets, regardless of their accounting records. Therefore, the delinquency rate in 2020, mainly, and in 2021, should be interpreted with caution, since unobserved losses in the year, due to the public and private sector mitigating the pandemic effects, may occur in 2022 and also in 2023, depending on the evolution of the economic outlook.

Graph 3.4 – ICC spread breakdown

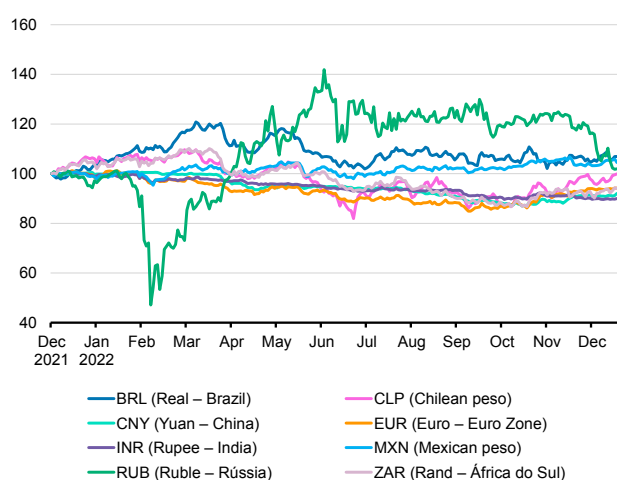
Average 2020 to 2022



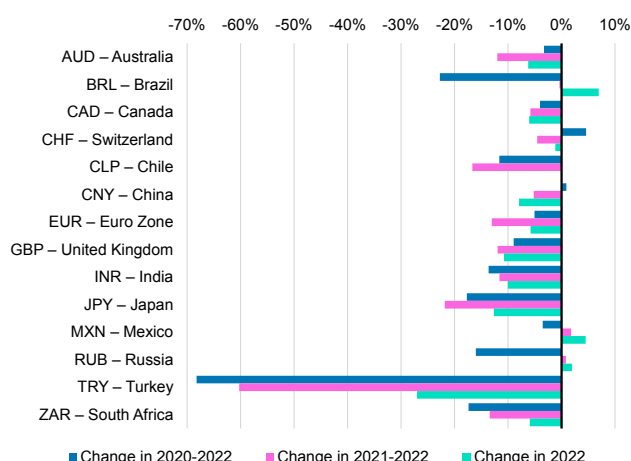
Considering average values for the period 2020–2022, *Delinquency* accounts for 29.3% of the ICC spread, followed by *Administrative Expenses* (28.2%), *Taxes and FGC* (21.9%) and, lastly, *ICC Financial Margin* (20.7%) – Table 3.7 and Graph 3.4.

Foreign Exchange Products

Graph 4.1 – Foreign exchange market
Evolution of the value expressed in US\$ in 2022
Index 100 at 31/12/2021



Graph 4.2 – Variation in quotations rates expressed in US\$



4.1 Introduction²⁷

In 2022, the BRL appreciated by 7.0% against the USD,²⁸ reaching a peak in April and remaining relatively stable throughout the last five months of the year (Graphs 4.1 and 4.2). When compared to a basket of emerging market currencies, the BRL variation was close to that of the MXN and the RUB, which also appreciated against the USD.

Spot buying and selling operations,²⁹ with settlement terms of up to two business days, accounted for 91.0% of the total value of the primary market (compared with 91.3% in 2021), and 99.0% of the number of operations in 2022. The predominance of this type of settlement term stems from the characteristics of the underlying their transactions related to the exchange operations and their respective cash flow.

Future settlement operations³⁰ accounted for 9.0% of the total value of the primary market in 2022, increasing slightly for the second consecutive year, after two years of decline. The granting of advances on export exchange contracts (Advances on Foreign

²⁷ The analyses are based on the exchange operations recorded in the Foreign Exchange System ("Sistema Câmbio") of the BCB. Authorized exchange institutions make these records on the day they occur, as a general rule, but exchange contracts can be retroactively changed at any time. The values reported in this chapter were calculated in January 2023, including operations with symbolic (*i.e.*, not effective) delivery of currencies. They may differ from the contracted exchange series disclosed by the BCB weekly in the Consolidated Economic Indicators and in the Time Series Management System (SGS), which, until 2022, did not include retroactive records.

²⁸ Comparison of the BRL value, expressed in USD units, on 12/31/2021 and 12/30/2022.

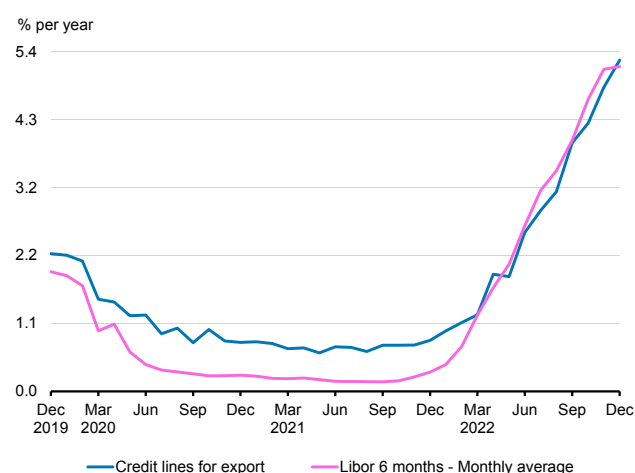
²⁹ In these cases, institutions authorized to operate in the foreign exchange market negotiate with their clients the final price of the foreign currency, with no adjustments made at the time above of settlement.

³⁰ Operations contracted for settlement above two business days are considered as future settlement operations. The exchange rate used is the spot rate at trade date, and an adjustment in relation to the future rate of the foreign currency is negotiated between the parties.

Graph 4.3 – ACC and ACE
Average cost



Graph 4.4 – External credit lines for exports
Cost



Exchange Contracts – ACC and Advances on Delivered Export Shipment Documents – ACE),³¹ in the amount of USD 33.9 billion in 2022, corresponded to 12.7% of the total of USD 267.6 billion of export exchange contracts (-0.3 p.p. over 2021) and 10.1% of the physical exports of USD 334.5 billion (-0.3 p.p. over the previous year) registered by the Ministry of Development, Industry, Trade and Services – Secretariat of Foreign Trade (MDIC-SECEX).

The stock of ACCs and ACEs (volume of operations contracted and not yet settled) rose by 13.1%, from USD 15.7 billion in December 2021 to USD 17.8 billion in December 2022. The value of new advances also increased during the year (16.4%), mainly due to the 20% increase in the total volume of export exchange operations. The average term of ACCs and ACEs was 150 business days. The interest rates for these advances rose significantly compared with the previous year, from 2.7% p.a. in December 2021 to 6.1% p.a. in December 2022 (Graph 4.3). The upward trend began in March, the same month of the start of the Fed interest rate hike, and five months after the start of the upward trend in the 6-month USD Libor reference rate. The main funding source used by financial institutions when celebrating export related ACC/ACE contracts with their customers were specific credit lines obtained from banks abroad. Considering all external lines raised for Brazilian exports, the average nominal cost in December 2022 was 5.3% p.a. (Graph 4.4),³² well above that of December 2021 (0.8%). However, the spread of the average cost in relation to the 6-month USD Libor reference rate in the period fell from 0.5 p.p., in December 2021, to 0.1 p.p. in December 2022.

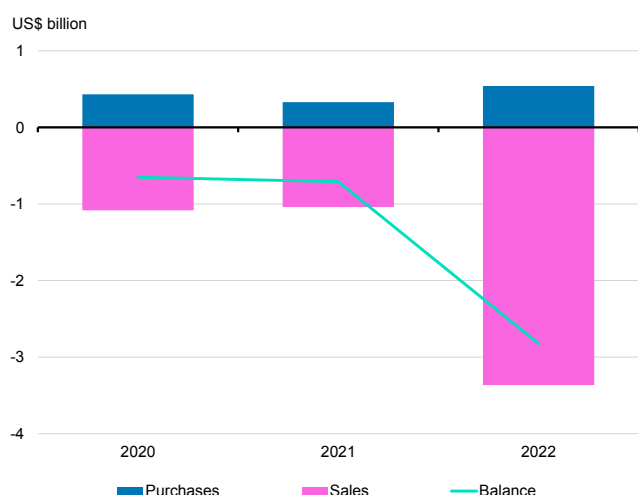
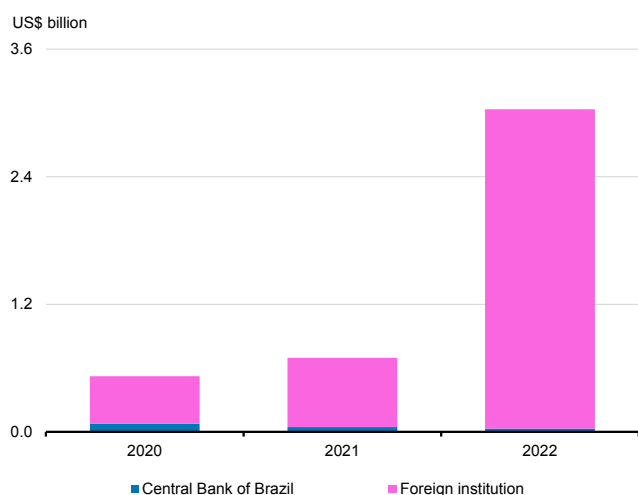
Future settlement FX operations without advance payment of domestic currency reached USD 32.6 billion in export-related contracts (-16.6% over 2021) and another USD 88.9 billion in other classifications (+32.9% over 2021). The increase in other classifications is mainly associated with the rise in the contracted amounts related to long-term direct loan operations with non-resident creditors and import transactions.

31 Export exchange operations may be contracted either previously or after the shipment of goods, with the advance payment of the domestic currency to the Brazilian exporter by the bank authorized to operate in foreign exchange, against future receipt of the foreign currency. The advance payments of the domestic currency are intended to provide exporters with the capital they need to finance their industrial or commercial cycle. ACC occurs when the exporter receives the domestic currency before the shipment of goods. ACE occurs when the exporter receives the domestic currency after the shipment of goods.

32 Graph 4.4 considers all external funding raised for Brazilian exports, not just the advance payment modalities.

Table 4.1 – Advances exports and imports

Advances	2020		2021		2022	
	US\$ billion	%	US\$ billion	%	US\$ billion	%
Exports	191.8	100.0	223.6	100.0	267.6	100.0
Receipt in advance	70.7	36.8	55.0	24.6	60.8	22.7
Short term	29.4	15.3	30.2	13.5	40.2	15.0
Long term	41.3	21.5	24.8	11.1	20.7	7.7
Other modalities	121.2	63.2	168.6	75.4	206.8	77.3
Imports	164.8	100.0	207.4	100.0	231.4	100.0
Payment in advance	16.5	10.0	26.7	12.9	29.1	12.6
Other modalities	148.3	90.0	180.6	87.1	202.4	87.4

Graph 4.5 – Foreign currency in kind
Purchases (+) and sales (-) to customers**Graph 4.6 – Foreign currency in kind**
Origin in terms of supplier

Operations regarding anticipated receipt of exports totaled USD 60.8 billion in 2022 (Table 4.1), the lowest percentage share of total exports over the last ten years. Long-term operations explain this low share, while short-term operations remained type of financing close to the average of recent years. This financing modality is mostly used by multinational exporting companies (fuel and agribusiness sectors), which receive funds from their affiliated companies abroad backed by a future shipment of goods.

Prepayment of imports accounted for 12.6% of the total of these operations (Table 4.1). This type of operation is highly concentrated: 0.05% of the total customers accounted for 25% of the contracted value. The largest customers are companies in the fuel, energy, and fertilizer sectors. In 2022, operations by the Ministry of Health related to the importation of equipment, vaccines, and supplies related to the Covid-19 pandemic also stood out.

Cash and traveler's checks operations with customers recorded sales of USD 3.4 billion and purchases of USD 541.9 million (Graph 4.5). Despite the 185% increase over 2021, the amount is 44% lower than the average of the three pre-pandemic years, as such operations are typical of the international tourism segment.

In the country, the amount of foreign currency purchased in cash by Brazilian travelers is usually far higher than the amount sold by foreign tourists. The difference is covered by imports of foreign currency in cash by banks³³ and, complementarily, by the BCB, which also imports foreign currencies in cash to supply the market (Graph 4.6).

4.2 Characteristics of customers and exchange operations

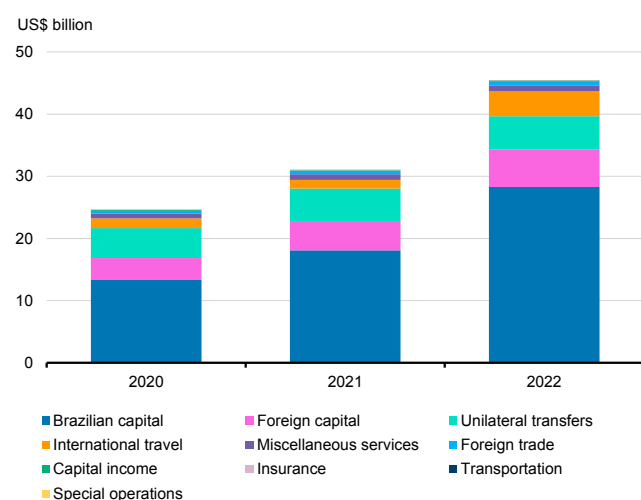
Transactions carried out by individuals are characterized by their low average value and are concentrated in the Southeast region, in a combination of population and *per capita* income above the average

³³ The supply of foreign currency in cash and its distribution throughout the national territory involves a complex logistics, which begins with international transport, usually by cargo plane, customs clearance at Brazilian airports, transport by a company specialized in valuables transport to the place of custody and, subsequently, distribution to the points of sale (bank branches, foreign exchange posts, correspondents). These logistics implies costs that impact the spread charged by authorized institutions via the fees or exchange rates used in operations.

Table 4.2 – Primary market

Value and number of contracts by region and type of client

Region	2020		2021		2022	
	US\$ billion	Qty. (thousands)	US\$ billion	Qty. (thousands)	US\$ billion	Qty. (thousands)
North	18.1	1,059	23.6	1,277	26.2	1,527
Household	0.6	969	0.7	1,179	1.0	1,423
Corporate	17.4	90	22.9	99	25.2	104
Northeast	35.8	1,709	42.4	2,183	59.5	3,281
Household	1.8	1,525	2.3	1,976	3.7	3,051
Corporate	34.0	184	40.1	207	55.9	230
Midwest	50.1	1,156	66.6	1,772	79.4	2,390
Household	1.7	1,040	2.0	1,457	3.0	2,077
Corporate	48.4	116	64.6	315	76.3	313
Southeast	1,189.2	9,326	1,298.0	11,368	1,413.3	16,723
Household	16.2	6,644	20.6	8,423	29.6	13,364
Corporate	1,173.0	2,681	1,277.4	2,945	1,383.6	3,359
South	86.5	2,859	109.3	3,455	145.9	4,999
Household	3.0	2,097	3.8	2,560	6.2	3,997
Corporate	83.6	762	105.6	895	139.8	1,002
Exterior	5.9	1,091	6.3	936	8.5	1,291
Household	1.4	1,088	1.6	930	1.9	1,284
Corporate	4.5	3	4.7	5	6.6	7
Total	1,385.5	17,199	1,546.3	20,989	1,732.9	30,211
Household	24.6	13,363	31.0	16,524	45.4	25,196
Corporate	1,360.9	3,836	1,515.3	4,465	1,687.5	5,015

Graph 4.7 – Transactions by households
Total per account**Table 4.3 – Primary market**

Accumulated values by range

Accumulated range	2020		2021		2022	
	US\$ billion	Qty. (thousands)	US\$ billion	Qty. (thousands)	US\$ billion	Qty. (thousands)
Up to US\$ 3 thousand	7.5	13,974	9.0	17,188	13.0	25,732
Up to US\$ 100 thousand	64.8	16,620	76.6	20,286	88.7	29,397
Up to US\$ 1 million	203.5	17,072	245.2	20,843	285.5	30,043
Up to US\$ 10 million	526.5	17,177	618.3	20,965	721.1	30,184
Up to US\$ 100 million	1,075.7	17,198	1,245.1	20,988	1,391.3	30,209
Up to US\$ 1 billion	1,333.0	17,199	1,486.4	20,989	1,673.7	30,211
Total	1,385.5	17,199	1,546.3	20,989	1,732.9	30,211

of the other regions³⁴ (Table 4.2). Individuals continued to account for the largest number of exchange operations (83% of the total). Although transactions related to international travel are still lower than in the pre-pandemic period, the quantity and total value of transactions by individuals in 2022 have already exceeded pre-pandemic levels (Graph 4.7). This growth was due to the increase in the quantity and value of inflows and remittances related to cash and cash equivalents from Brazilians abroad, to the value of remittances related to Brazilian direct investments, and to the value of remittances related to investment in funds abroad.

The average value of companies' operations is higher than that of individuals. Foreign exchange operations carried out by companies accounted for 97.4% of the primary market value (Table 4.2), despite accounting for only 16.6% of the number of operations. The total volume traded in the primary market increased by 46.5% for individuals and 11.2% for companies compared with 2021.

In this market, the few high-value transactions account for most of the total traded value. In 2022, nearly 0.6% of the total number of transactions exceeded USD 1.0 million, but the total value of these transactions corresponded to 84% of the volume traded in the year (Table 4.3).

Exchange operations related to foreign trade corresponded to 28.8% of the total value traded in the primary market (Table 4.4). Operations linked to portfolio investments of non-residents³⁵ corresponded to 32.6% of that market.

4.3 Institutions authorized to operate in the foreign exchange market

As of the end of 2022, there were 182 institutions authorized to operate in the exchange market, of

34 The distribution by region is based on the address, registered at the Special Secretariat of the Brazilian Federal Revenue (RFB), of the customer of the foreign exchange transaction recorded in the BCB's database. For companies, the production and shipment site may be different from the location of the office that contracts the exchange operation (headquarter and branches).

35 These operations are regulated by Resolution 4,373, of September 29, 2014, with investments in shares, federal government securities, funds, and depositary receipts predominating. Prior to carrying out operations, the non-resident investor must appoint a representative and a custodian in the country and register with the Securities and Exchange Commission (CVM).

Table 4.4 – Primary market

Values by type of contract

Type of contract	2020		2021		2022	
	US\$ billion	%	US\$ billion	%	US\$ billion	%
Export	191.8	13.8	223.6	14.5	267.6	15.4
Import	164.8	11.9	207.4	13.4	231.4	13.4
Financial						
Portfolio investment - Non-residents	527.9	38.1	536.2	34.7	565.0	32.6
Portfolio investment - Residents	61.2	4.4	74.3	4.8	78.3	4.5
Other	439.8	31.7	504.9	32.7	590.5	34.1
Total	1,385.5	100.0	1,546.3	100.0	1,732.9	100.0

Table 4.5 – Foreign exchange market

Number of institutions that registered transactions, by segment

Segment and classification of institutions	2020	2021	2022
Banking segment	93	93	93
Universal banks	64	64	64
Commercial banks	14	14	14
Foreign exchange banks	5	5	5
Investment banks	4	4	4
Credit Unions	2	2	2
Cooperative banks	2	2	2
Central Bank of Brazil	1	1	1
Caixa Econômica	1	1	1
Non-banking segment	71	71	70
Foreign exchange brokers	48	48	50
Securities distributors	12	13	12
Securities brokers	11	10	8
Total	164	164	163

Table 4.6 – Primary and interbank foreign exchange market

Volume operated by segment

Segment and classification of institutions	2020	2021	US\$ billion
			2022
Banking segment	2,063.3	2,216.0	2,635.7
Universal banks	1,961.3	2,075.4	2,467.6
Commercial banks	36.0	54.5	77.8
Foreign exchange banks	27.2	38.1	53.7
Investment banks	29.0	25.0	28.0
Caixa econômica	3.7	2.9	4.2
Cooperative banks	1.3	2.4	2.9
Development banks	4.8	2.6	1.5
Central Bank of Brazil	0.2	15.1	0.0
Non-banking segment	15.4	18.8	29.4
Foreign exchange brokers	12.9	16.6	25.7
Securities distributors	1.5	1.4	2.3
Securities brokers	1.0	0.9	1.4
Total	2,078.7	2,234.8	2,665.2

Table 4.7 – Annual evolution of foreign exchange correspondents

	2020	2021	2022
Number of correspondents	1,145	911	943
Number of operations (millions)	3.0	2.5	3.6
Unilateral transfers (US\$ million)	606.2	438.8	438.9
Purchases	132.3	159.3	162.9
Sales	473.9	279.5	276.0
International travel (US\$ million)	455.9	292.8	900.9
Purchases	148.3	100.8	180.3
Sales	307.6	192.0	720.6

which 103 were banks³⁶ and 79 were non-banks.³⁷

Of this total, only 163 actually carried out exchange transactions in 2022, of which 93 were banks and 70 were non-banks (Table 4.5). Banking segment institutions predominated in the volume of transactions, accounting for 98.9% of the total (Table 4.6).

As of the end of 2022, there were 5,003 companies registered at Unicad³⁸ as foreign exchange correspondents.³⁹ During the year, 943 of these correspondents carried out exchange transactions, a slight increase compared with 2021 (Table 4.7), due to the beginning of a recovery in their main focus, the international tourism sector.

Of the total traded in the primary market, nearly 13.5% was intermediated by institutions of the non-banking segment (down 1.3 p.p. over the previous year). The number of intermediaries fell for the third year in a row (Table 4.8).

In terms of traded volume, the top ten institutions are from the banking segment.⁴⁰ In the primary market, the top ten operators concentrated 77.7% of the value (against 79.0% in 2021). In the interbank market,⁴¹ this percentage totaled 66.8% (Graph 4.8).

Almost the entire volume negotiated on the primary market (99.0%) is concentrated in the banking segment (Table 4.9). The share of the non-banking segment, although still small, has raised over the last two

36 Banking segment institutions can carry out all exchange operations provided for in the exchange regulations, in any amount.

37 Non-banking segment institutions, while transacting with customers (primary market), are limited to the prompt settlement (up to two business days), and to a maximum amount per transaction. As of July 1, 2023, the limit for payment institutions is USD 100,000 (or its equivalent in other currencies), while for other institutions in the segment (foreign exchange brokers and securities brokers and dealers), it is USD 300,000 (or its equivalent in other currencies). Payment institutions are prohibited from carrying out transactions involving national or foreign currency in cash.

38 Information System on Institutions of Interest of the BCB.

39 Institutions authorized to operate in the exchange market – except for payment institutions – may engage correspondents when performing the following operations, up to the limit of USD 3,000.00 for each operation, or its equivalent in other currencies: i) purchase and sale of foreign currency in cash, check, and traveler's check, as well as foreign currency recharge of prepaid cards; and ii) unilateral overseas transfers. It should be noted that correspondents may also receive and forward proposals for exchange transactions, which are later carried out by the contracting institution.

40 Six are foreign-controlled banks, three are privately-owned domestic banks, and one is a state-owned bank.

41 Although carried out in the interbank market, arbitrage operations and the exchange between bank money and fiat currency were not included in this Banking Report. In these operations, two foreign currencies or even one single foreign currency are traded with no counterpart in BRL. In the latter case, with different delivery forms (cash x bank transfer).

Table 4.8 – Evolution of intermediaries
Number of institutions and amount operated

	2020	2021	2022
Number of intermediaries	43	41	37
Number of operations (thousand)	558.1	599.5	575.2
Purchase	134.0	138.8	136.7
Sale	424.1	460.7	438.5
Value of transactions (US\$ billion)	193.4	228.8	233.4
Purchase	85.2	100.4	106.8
Sale	108.2	128.4	126.6

Graph 4.8 – Foreign exchange market
Market share in 2022

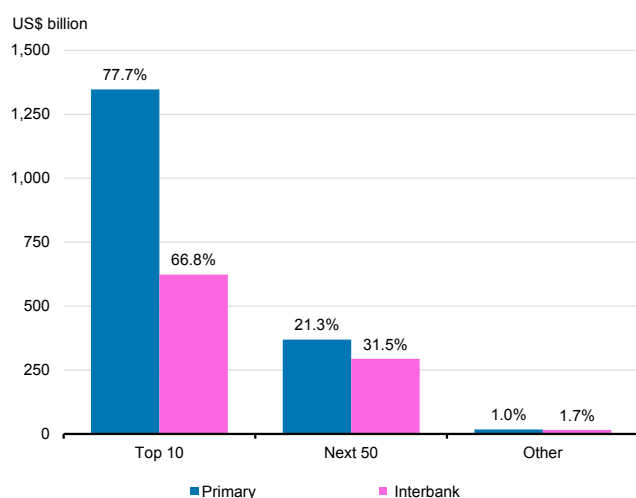


Table 4.9 – Primary market
Share of total volume contracted^{1/}

Position	2020	2021	2022	%
Banking segment	99.4	99.3	Banking segment	99.0
1 Banco Citibank S.A.	15.8	16.2	1 Banco Citibank S.A.	15.4
2 Banco Santander (Brasil) S.A.	14.3	14.1	2 Itaú Unibanco S.A.	13.2
3 Banco Bradesco S.A.	11.4	12.1	3 Banco Santander (Brasil) S.A.	11.4
4 Itaú Unibanco S.A.	10.8	8.9	4 Banco do Brasil S.A.	9.1
5 Banco J.P. Morgan S.A.	9.8	8.4	5 Banco J.P. Morgan S.A.	9.0
6 Banco do Brasil S.A.	6.9	6.9	6 Banco Bradesco S.A.	7.0
7 Bank of America Merrill Lynch Banco Múltiplo S.A.	4.0	4.6	7 Bank of America Merrill Lynch Banco Múltiplo S.A.	4.6
8 Banco ABN Amro S.A.	3.7	4.0	8 Banco ABN Amro S.A.	3.1
9 Banco Société Générale Brasil S.A.	2.5	2.6	9 Banco BNP Paribas Brasil S.A.	2.9
10 Banco BNP Paribas Brasil S.A.	2.4	2.6	10 Banco BTG Pactual S.A.	2.8
Other	18.3	19.6	Other	21.5
Non-banking segment	0.6	0.7	Non-banking segment	1.0
1 Advanced Corretora de Câmbio Ltda.	11.9	12.7	1 Wise Brasil Corretora de Câmbio Ltda.	25.0
2 B&T Corretora de Câmbio Ltda.	11.9	12.0	2 Advanced Corretora de Câmbio Ltda.	10.6
3 Western Union Corretora de Câmbio S.A.	10.4	9.0	3 B&T Corretora de Câmbio Ltda.	8.0
4 Fair Corretora de Câmbio S.A.	6.9	7.6	4 Western Union Corretora de Câmbio S.A.	6.7
5 Guitta Corretora de Câmbio Ltda.	6.1	6.6	5 Fair Corretora de Câmbio S.A.	4.7
6 AGK Corretora de Câmbio S.A.	6.1	6.0	6 Guitta Corretora de Câmbio Ltda.	3.9
7 Cotação Distribuidora de Títulos e Valores Mobiliários S.A.	4.5	5.8	7 Treviso Corretora de Câmbio S.A.	3.9
8 Dourada Corretora de Câmbio Ltda.	3.7	4.7	8 Cotação Distribuidora de Títulos e Valores Mobiliários S.A.	3.9
9 Treviso Corretora de Câmbio S.A.	3.6	4.1	9 Confidenc Corretora de Câmbio S.A.	3.7
10 Broker Brasil Corretora de Câmbio S.A.	3.6	3.7	10 AGK Corretora de Câmbio S.A.	3.5
Other	31.2	27.9	Other	26.0

^{1/} Percentages by segment refer to the total primary market; percentages by institution refer to the total segment.

years, with a significant increase in 2022 (from 0.7% to 1.0%), approaching the record of 1.2% achieved in 2014. An intra-segment analysis shows that the top ten banking institutions accounted for 78.5% of the volume negotiated by the banking segment in the primary market in 2022, a share that showed consecutive drops in the last four years, totaling -5.0 p.p. in this period.

The non-banking segment is a little less concentrated, as the top ten institutions accounted for 74.0% of the transacted volume by this segment in the primary market in 2022. However, this share has risen steadily over the last five years, totaling 18.8 p.p.

In the interbank market, the banking segment accounted for 98.7% of the volume transacted in 2022, close to the previous two years' shares. The intra-segment analysis shows a slight decline in the relative concentration of the top ten institutions in 2022 in the banking segment (-1.3 p.p.), concurrently to a more significant reduction in the non-banking segment (-6.7 p.p.), reaching 67.7% and 60.9%, respectively (Table 4.10).

Table 4.10 – Interbank marketShare of total contracts^{1/}

Position	2020	2021	2022	%
Banking segment	99.0	98.8	98.7	
1 Banco Santander (Brasil) S.A.	20.7	14.4	13.2	
2 Banco BTG Pactual S.A.	11.1	13.5	13.0	
3 Banco J.P. Morgan S.A.	9.7	10.7	11.6	
4 Itaú Unibanco S.A.	6.9	6.9	7.4	
5 Banco Bradesco S.A.	5.5	5.5	6.2	
6 Banco Citibank S.A.	4.6	4.5	4.8	
7 Banco do Brasil S.A.	3.6	4.2	4.3	
8 Bank of America Merrill Lynch Banco Múltiplo S.A.	3.4	4.0	2.6	
9 Banco Morgan Stanley S.A.	2.8	2.7	2.5	
10 Banco Votorantim S.A.	2.5	2.6	2.1	
Other	29.1	31.0	32.3	
Non-banking segment	1.0	1.2	1.3	
1 B&T Corretora de Câmbio Ltda.	16.7	13.2	10.0	
2 Advanced Corretora de Câmbio Ltda.	13.8	11.4	9.1	
3 Fair Corretora de Câmbio S.A.	5.9	8.8	7.9	
4 Guitta Corretora de Câmbio Ltda.	4.9	6.9	7.1	
5 AGK Corretora de Câmbio S.A.	4.5	5.8	5.5	
6 OM Distribuidora de Títulos e Valores Mobiliários Ltda.	4.5	5.6	5.2	
7 Broker Brasil Corretora de Câmbio S.A.	3.6	5.6	4.5	
8 Levycam - Corretora de Câmbio e Valores Ltda.	3.1	4.1	4.3	
9 Treviso Corretora de Câmbio S.A.	3.1	3.5	4.2	
10 Dourada Corretora de Câmbio Ltda.	2.7	2.7	3.1	
Other	37.1	32.4	39.1	

1/ i) arbitrage and conversion between manual exchange and drawee were not taken into account; ii) the percentages by segment refer to the total interbank market; the percentages by institution refer to the total segment.

Table 4.11 – Primary exchange market

Form of foreign currency delivery - 2022

Form of delivery	Segment		Total
	Banking	Non-banking	
Volume (US\$ million)	1,715,336	17,559	1,732,895
Wire transfer	1,283,208	14,300	1,297,508
Deposit account	242,445	454	242,898
Symbolic	152,696	446	153,141
Exporter's deposit account held at a bank abroad	31,802	45	31,846
Cash and/or traveler's checks	1,766	2,145	3,912
Letter of credit - forward	1,999	0	1,999
Letter of credit - cash	1,190	0	1,190
Prepaid card	83	160	243
Exporter's deposit or payment account with an institution abroad	66	0	66
Checks	37	9	46
Other	45	1	46
Number of transactions	15,838,936	14,371,866	30,210,802
Teletransmission	12,409,526	10,934,058	23,343,584
Cash and/or traveler's checks	1,896,459	3,105,708	5,002,167
Deposit account	1,314,328	67,675	1,382,003
Prepaid card	147,142	248,776	395,918
Symbolic	43,464	11,749	55,213
Exporter's deposit account held at a bank abroad	12,784	218	13,002
Check	5,099	3,646	8,745
Letter of credit - forward	7,887	0	7,887
Letter of credit - cash	1,662	6	1,668
Securities	569	30	599
Other	16	0	16

4.4 Forms of foreign currency delivery

The most common form of foreign currency delivery is wire transfer, in which payment orders are sent via electronic funds transfer systems. In terms of the number of operations, cash transactions hold the second place, but, as they are mostly carried out by individuals, they hold only the fifth place in terms of volume (Table 4.11). In the symbolic form of delivery, which is relevant

in terms of value, a pair of purchase and sale exchange operations is recorded, both with the same amount in foreign currency, representing a change in the status of resources in the country (of non-residents) or abroad (of residents) that occurred without an effective exchange of currency. The purpose of these records is to allow for the statistical collection of these changes, as well as to allow their registration in electronic foreign capital declaration systems. Examples include extensions of loans from abroad or their conversion into direct investment liability.

When analyzing the participation of the banking and non-banking segments in the primary market, the relevance of the non-banking sector in the total market value is low (1.0% in 2022). However, when analyzing only operations in which the foreign currency is delivered in the forms of cash/traveler's checks and prepaid currency cards, this segment becomes relevant in terms of the number of transactions, accounting for 62% and 63% of the market, respectively. These delivery methods occur in predominantly small-value operations, contracted with individuals and classified as "International Travel".

In 2022, there was a slight increase (0.8 p.p.) in the share of wire transfers in total contracted volume in the primary market, mainly due to the growth in the volume operated by international payment and transfer service providers (eFX), which used this form of foreign currency delivery in approximately 91% of their traded volume.

The increase in the share of this modality was offset by the reduction in the share of the Deposit Account modality. The "cash and/or traveler's checks" and "prepaid cards" showed a significant increase in the value transacted (178%) in the year, but are still below (-39%) the 2019 figures, the year before the outbreak of the Covid-19 pandemic, which caused a sharp drop in the amounts transacted with these forms of foreign currency delivery (Table 4.12).

Table 4.12 – Primary foreign exchange market

Form of foreign currency delivery	US\$ billion		
	2020	2021	2022
Wire transfer	1,035.1	1,146.0	1,297.5
Deposit account	208.2	235.8	242.9
Symbolic	119.3	133.2	153.1
Exporter's deposit account held at a bank abroad	19.3	27.2	31.8
Cash and/or traveler's checks	1.5	1.4	3.9
Letter of credit - forward	1.1	1.4	2.0
Letter of credit - cash	0.7	1.1	1.2
Prepaid card	0.1	0.1	0.2
Exporter's deposit or payment account with an institution abroad	0.0	0.0	0.1
Checks	0.0	0.1	0.0
Other	0.1	0.0	0.0
Total	1,385.5	1,546.3	1,732.9

4.5 Traded currencies

Each exchange operation deals with at least one foreign currency. The exchange position of each authorized institution records the balances, by currency, resulting from all exchange transactions carried out in the interbank and primary markets.

Table 4.13 – Primary foreign exchange market

Trading currency	2020		2021		2022	
	US\$ billion	%	US\$ billion	%	US\$ billion	%
Contracted value	1,385.55	100.00	1,546.34	100.00	1,732.90	100.00
USD – US Dollar	1,265.03	91.30	1,391.50	89.99	1,552.18	89.57
EUR – Euro	99.08	7.15	120.90	7.82	157.22	9.07
JPY – Yen	5.29	0.38	5.22	0.34	6.49	0.37
GBP – British Pound	4.24	0.31	4.20	0.27	5.92	0.34
MXN – Mexican Peso	0.72	0.05	1.29	0.08	2.23	0.13
CAD – Canadian Dollar	0.91	0.07	1.30	0.08	2.18	0.13
HKD – Hong Kong Dollar	0.00	0.00	1.45	0.09	1.95	0.11
CHF – Swiss Franc	7.44	0.54	3.06	0.20	1.45	0.08
CNY – Renminbi	0.58	0.04	0.85	0.06	1.36	0.08
AUD – Australian dollar	1.33	0.10	0.61	0.04	0.96	0.06
Other	0.91	0.07	15.94	1.03	0.95	0.05
	Amount	%	Amount	%	Amount	%
Number of contracts	17,199,181	100.00	20,989,342	100.00	30,210,802	100.00
USD – US Dollar	14,410,950	83.79	16,995,426	80.97	19,580,510	64.81
EUR – Euro	2,089,038	12.15	3,129,737	14.91	8,052,842	26.66
GBP – British Pound	156,540	0.91	198,632	0.95	869,315	2.88
CAD – Canadian Dollar	124,522	0.72	192,879	0.92	478,405	1.58
ARS – Argentinian Peso	102,492	0.60	40,808	0.19	214,189	0.71
AUD – Australian Dollar	40,234	0.23	46,234	0.22	177,732	0.59
CHF – Swiss Franc	58,317	0.34	70,011	0.33	124,102	0.41
CLP – Chilean Peso	24,709	0.14	14,438	0.07	105,347	0.35
PYG – Guarani	56,595	0.33	85,251	0.41	90,264	0.30
JPY – Yen	40,082	0.23	44,220	0.21	82,101	0.27
Others	95,702	0.56	171,706	0.82	435,995	1.44

Table 4.14 – Interbank foreign exchange market

Trading currency	2020		2021		2022	
	US\$ billion	%	US\$ billion	%	US\$ billion	%
Contract value	693.13	100.00	688.48	100.00	932.27	100.00
USD – US Dollar	686.12	98.99	678.44	98.54	913.44	97.98
EUR – Euro	6.01	0.87	9.16	1.33	17.55	1.88
GBP – British Pound	0.41	0.06	0.27	0.04	0.52	0.06
CAD – Canadian Dollar	0.12	0.02	0.14	0.02	0.27	0.03
CHF – Swiss Franc	0.09	0.01	0.15	0.02	0.16	0.02
AUD – Australian Dollar	0.04	0.01	0.03	0.00	0.13	0.01
JPY – Yen	0.12	0.02	0.14	0.02	0.07	0.01
ARS – Argentine Peso	0.15	0.02	0.07	0.01	0.04	0.00
CNY – Renminbi	0.01	0.00	0.02	0.00	0.02	0.00
NZD – New Zealand Dollar	0.01	0.00	0.01	0.00	0.01	0.00
Other	0.04	0.01	0.05	0.01	0.06	0.01
	Amount	%	Amount	%	Amount	%
Number of contracts	490,077	100.00	540,139	100.00	865,865	100.00
USD – US Dollar	296,451	60.49	329,115	60.93	438,493	50.64
EUR – Euro	99,948	20.39	122,650	22.71	228,526	26.39
GBP – British Pound	22,908	4.67	18,918	3.50	57,316	6.62
CAD – Canadian Dollar	21,470	4.38	22,822	4.23	43,918	5.07
AUD – Australian dollar	9,106	1.86	4,912	0.91	15,896	1.84
CHF – Swiss Franc	6,040	1.23	8,846	1.64	12,188	1.41
CLP – Chilean Peso	3,180	0.65	2,248	0.42	11,108	1.28
MXN – Mexican Peso	5,338	1.09	9,300	1.72	9,932	1.15
JPY – Yen	5,408	1.10	4,822	0.89	9,678	1.12
UYU – Uruguayan peso	2,694	0.55	2,112	0.39	5,772	0.67
Other	17,534	3.58	14,394	2.66	33,038	3.82

In the primary market, as in 2021, there was a drop in the share of the USD and the CHF in the traded volume, accompanied by an increase in the share of the EUR, CAD, MXN, RMB, and HKD. (Table 4.13). The USD, however, is still the predominant currency, accounting for 89.6% of the total value, followed by the EUR, which, in its third consecutive year of increased participation, reached a record share of 9.1% of the total amount traded on the primary market. The main operations underlying the increase in the share of the EUR in 2022 are direct loans, direct investment liabilities, the purchase of goods and services via international payment and transfer service providers, and foreign investment in shares.

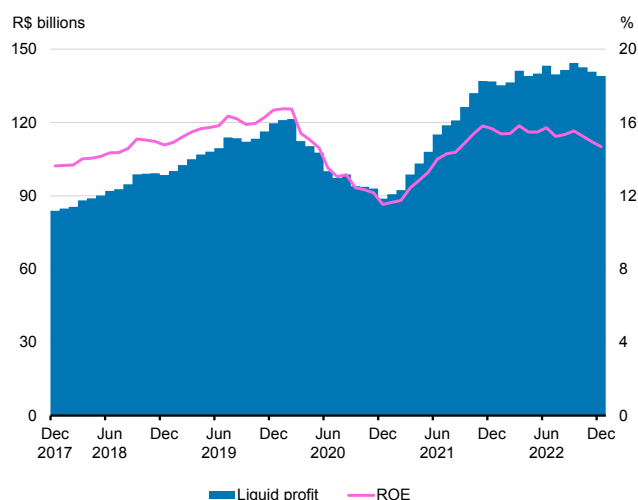
The concentration in USD is lower from the perspective of the number of transactions on the primary market. This is mainly due to the greater number of low-value transactions in currencies other than in USD, related to international travel and unilateral transfers.

In the interbank market, the share of the USD was even higher (98.0%),⁴² while the EUR accounted for 1.9% (Table 4.14), reaching its all-time maximum share in this market. Regarding the number of operations, the concentration is lower than in the primary market. USD operations accounted for around 51% of the total, while the EUR was the currency of around 26% of the operations.

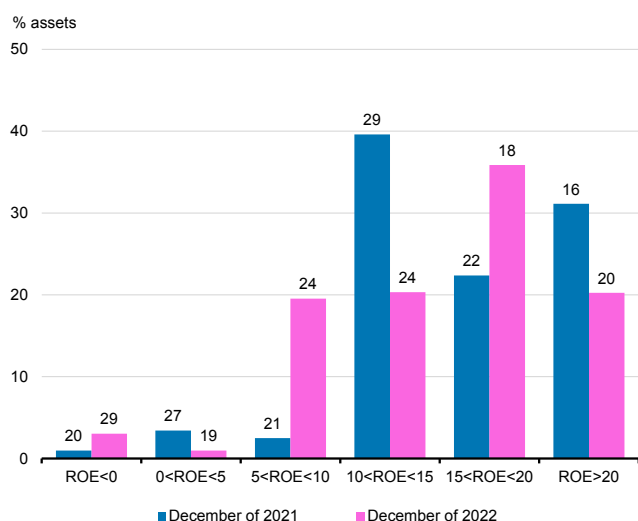
42 Arbitrage operations and exchange operations involving the conversion of foreign currency between bank form and cash form were not considered in this Banking Report.

Profitability

Graph 5.1 – Net profit and ROE
Accumulated in 12 months



Graph 5.2 – ROE distribution



/ The values above the bars refer to the number of FIIs in the corresponding ROE range.

5.1 System profitability

The profitability of the banking system declined in 2022 compared with 2021. The return on equity (ROE) was 14.7%, compared with 15.7% in 2021 (Graph 5.1). The main reasons for this profitability decline were higher Loan Loss Provisions (LLP) expenses and the system's worsened operational efficiency.⁴³ Net profit reached BRL 139 billion in 2022, up 2% against 2021. In the period, loss-making institutions accounted for only 3% of the system's total assets (Graph 5.2).

LLP expenses have increased consistently since late 2021, both in nominal terms and as a share of the credit portfolio, approaching the levels seen during the first year of the pandemic (Graph 5.3). The increase in problem assets and, consequently, in provisions throughout the year⁴⁴ is explained by the following factors: credit growth in higher risk lines, increase in household service-to-income debt, and reduction in the payment capacity of micro and small enterprises. In 2022Q4, provisions made for exposures to the *Americanas*⁴⁵ group contributed to an increase of nearly 25% in LLP expenses compared with 2022Q3.

The credit margin⁴⁶ fell as a result of the rise in the Selic rate throughout 2022, which led to a faster

⁴³ Operational efficiency is measured by the ratio of administrative expenses to operational income. Operational income is made up of interest income (NII – Net Interest Income) and services revenues.

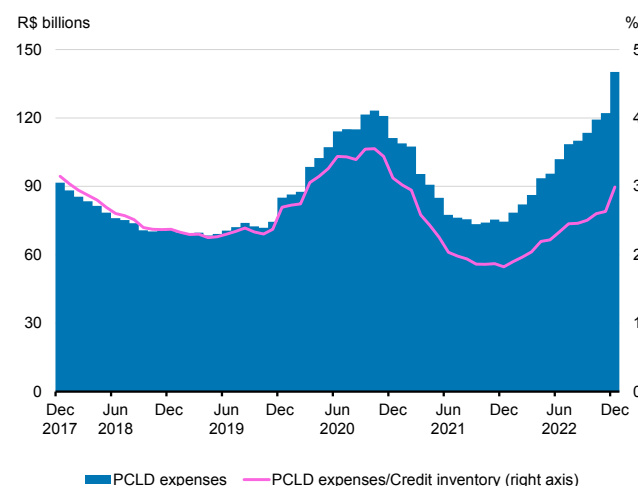
⁴⁴ Provisions remain adequate, above expected losses.

⁴⁵ At the beginning of 2023, the *Americanas* group identified accounting irregularities in its balance sheets, which led it to acknowledge billionaire losses and file for judicial reorganization.

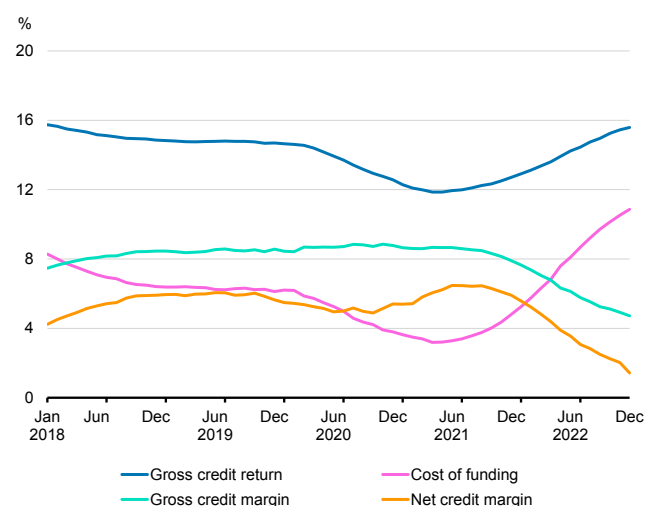
⁴⁶ This refers to the net credit margin, calculated as the difference between the return on credit (accumulated credit income over twelve months divided by the portfolio's average stock in the period) and the funding cost (accumulated funding expenses over twelve months divided by the average stock of funding in the period). To obtain the risk-adjusted net credit margin, LLP expenses are subtracted from the credit income used to calculate the net credit margin. The credit margin concept differs from the concept of ICC spread presented in Chapter 3. For further details, see Chapter 3.

Graph 5.3 – Provision expenses (PCLD)

Accumulated in 12 months

**Graph 5.4 – Credit margins**

Accumulated in 12 months

**Table 5.1 – Breakdown of service revenues**

Accumulated in each year

Service groups	R\$ billions				
	2020	2021	Var. (%)	2022	Var. (%)
Total fees	161.8	176.2	8.9	182.1	3.4
Total tariffs	48.6	46.3	-4.7	45.9	-0.8
Household tariffs	36.4	34.1	-6.3	32.9	-3.5
Corporate tariffs	12.2	12.2	0.1	13.0	6.8
Investment fund management	15.8	16.3	3.1	14.7	-9.7
Management of constit. and lot. funds	8.0	8.2	2.2	9.4	15.3
Collection service	6.9	7.0	0.7	6.8	-2.3
Guarantees provided	1.9	3.4	76.6	0.6	-83.4
Capital markets	14.4	17.3	20.0	14.4	-16.4
Result of payment transactions	17.7	22.8	28.2	31.7	39.2
Other service income	48.5	55.1	13.6	58.6	6.4

adjustment of the funding cost in relation to the return

on credit. As a result of the greater concentration in floating rate instruments and the shorter average funding period, the funding cost tends to respond more quickly to changes in the Selic rate than the return on credit. The risk-adjusted net interest margin (NIM) from provisions declined more sharply as a result of the increase in LLP expenses mentioned in the previous paragraph (Graph 5.4). Return on credit, however, benefited from the gradual renewal of the credit portfolio at higher rates and improved the credit margin in 2023.

The pace of growth in services revenues slowed in 2022.

After rising by 8.9% in 2021, services revenues grew by 3.4% in 2022 (Table 5.1). Despite the significant growth in payment transactions (especially cards), the other lines were pressured by the more restrictive economic scenario. Administrative expenses grew by 8.5% in 2022, while inflation measured by the Extended National Consumer Price Index (IPCA) was 5.8% in the period (Table 5.2). The largest contribution to the increase in administrative expenses was provided by labor expenses. As a result of the increase in administrative expenses and the reduction in the growth rate of operational revenues, the Operational Efficiency Index⁴⁷ (IEO) worsened, increasing by 1.4 p.p. in 2022 (Graph 5.5).

5.2 Profitability by type of control, size, and segment of based on activity

In 2022, the profitability of private and foreign banks declined while the profitability of state-owned banks increased.

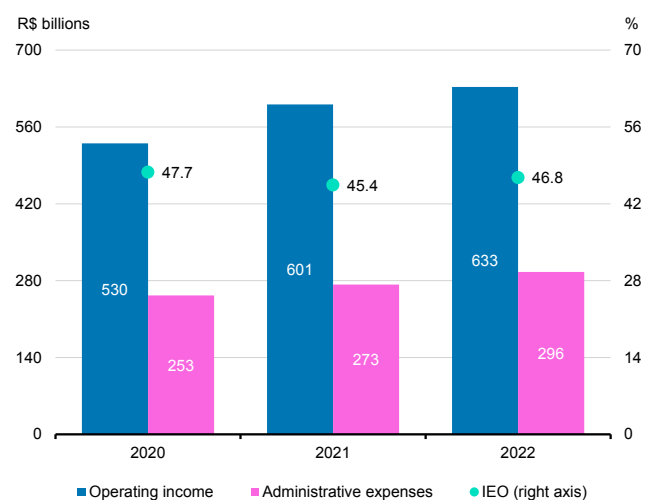
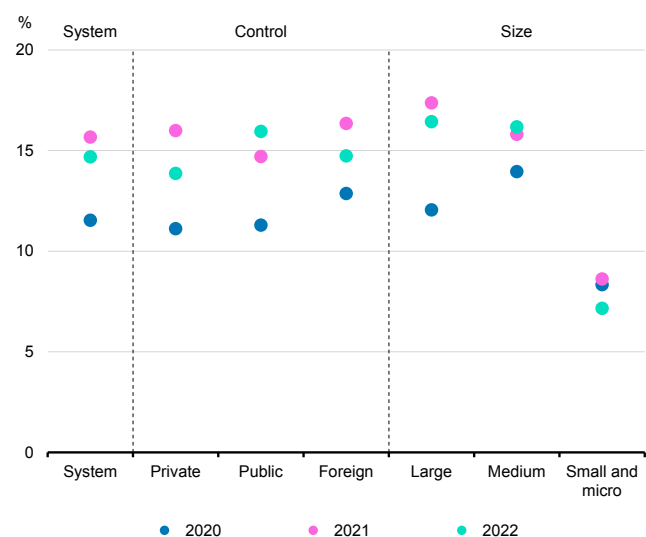
Thus, the latter became the most profitable sector in the period (Graph 5.6). The main difference between state-owned banks, on the one hand, and private and foreign banks, on the other, was the LLP expenses. They rose by 33.2% for state-owned banks, while, for private and foreign institutions, they grew by 94.6% and 59.2%, respectively. This is related to the credit event resulting from the *Americanas* situation, which affected more strongly the private banks and might also be related to the lower level of problem assets in state-owned banks, reflecting a portfolio with lower share of higher-risk loans. The operational efficiency of foreign banks worsened, due to a greater reduction in operational income, despite better control of administrative expenses.

47 The IEO measures the ratio of administrative expenses to operational income.

Table 5.2 – Composition of administrative expenses

Accumulated in each year

Breakdown	R\$ billions				
	2020	2021	Var. (%)	2022	Var. (%)
Total	252.6	273.1	8.1	296.3	8.5
Personnel	133.8	143.5	7.3	156.7	9.2
Data processing/telecom	21.8	24.6	12.5	27.7	12.9
Facilities	15.8	15.4	-2.0	16.2	4.9
Third-party services	29.0	33.0	14.0	36.4	10.1
Advertising and promotion	6.3	7.8	23.5	9.0	15.3
Depreciation, amortization and impairment ^{1/}	19.8	21.4	8.3	21.8	1.9
Other	26.2	27.4	4.5	28.5	4.3

^{1/} Does not include amortization of goodwill on acquisitions.**Graph 5.5 – Operational efficiency index (OEE)****Graph 5.6 – ROE by type of control and size**

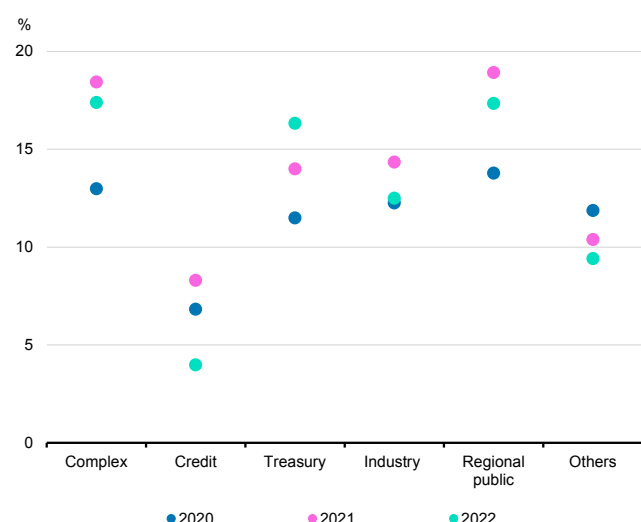
In both state-owned and private banks, operational efficiency remained practically stable over the period.

In terms of size, there is still a distinction in profitability levels between large and medium-sized banks on the one hand, and small and micro banks on the other hand (Graph 5.6). The difference may be related to gains in scale, a more diversified provision of products and services, as well as greater insertion in the retail segment, allowing large and medium-sized banks to operate with proportionally lower costs and obtain greater returns on their operations. Small and micro banks were the only ones to register lower profitability than in 2020, a year in which institutions' results were pressured by the context of the pandemic. This worsened performance reflects the more significant decline in net income (-8%) by these institutions. It is also worth noting the reduction in the difference in profitability between large and medium-sized banks, which may be related to the greater provisioning by large banks, especially because of the *Americanas* situation.

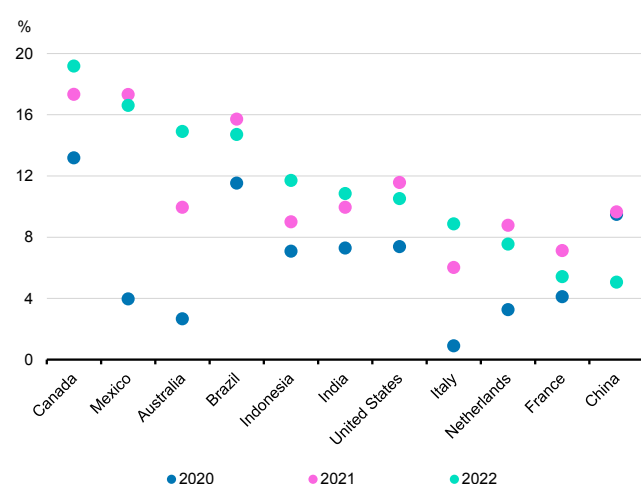
Regarding the type of financial institution activity,⁴⁸ most segments showed declining profitability (Graph 5.7). The treasury segment was the only one to improve, influenced by the Selic rate hike cycle. The "Complex" and "Regional state-owned" banking segments remained the most profitable, while the "Credit" segment registered the lowest ROE. The worsened profitability of the "Credit" segment, both in relation to the other segments and compared with 2020 (the first year of the pandemic), concerns the narrowing of the credit margin and higher LLP expenses, reflecting the greater materialization of credit risk in this segment.

⁴⁸ The segmentation based on activity consists in grouping banking conglomerates according to the profile of their operations, defined by the selection of qualitative or quantitative attributes that reflect similar characteristics among banking entities, as follows: a) complex banks – with multiple operations and products, such as credit portfolio, demand and time deposits, capital market, fund management, among others, besides an extensive branch network and diversified customer profile; b) regional state-owned banks – under federal or state control that operate regionally and have a branch network and a relevant number of customers where they operate, with diversified funding; c) industrial banks – linked to industrial or commercial groups, focused on promoting the group's productive chain d) credit banks – mostly operating with credit operations and credit risk exposures, such as guarantees and endorsements, with operating income more dependent on credit intermediation; and e) treasury and business banks – predominantly treasury and business operations (securities, repo operations, and investments), with greater dependence on these operations to generate their income.

Graph 5.7 – ROE by type of activity

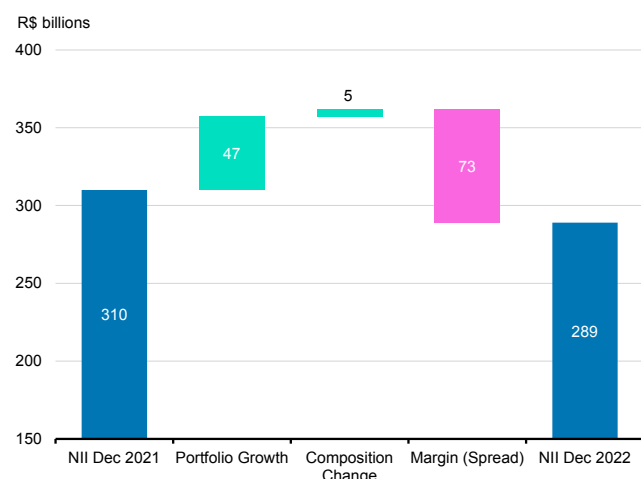


Graph 5.8 – Annual ROE
International comparison^{1/}



Sources: ROE (IMF - Financial Soundness Indicators)
1/ Latest data available

Graph 5.9 – Credit interest income (NII)
Contributions to change
Dec 2021 vs. Dec 2022 - Accumulated in 12 months



In 2022, most banking systems of significant countries from different continents⁴⁹ maintained profitability above that obtained in 2020 and close to that achieved in 2021 (Graph 5.8). The ROE of the Brazilian banking system was in the upper half of the group of countries in 2022, lower than that recorded in countries such as Canada, Mexico, and Australia, but higher than that reported by Indonesia, India, and the US.

5.3 Credit interest income

Credit interest income⁵⁰ (credit NII) declined in 2022.

The factor that most contributed to this reduction was the increase in funding costs due to the Selic rate hike cycle, which led to a reduction in the margin (Graph 5.9). The main positive contribution in the period was the growth in the credit portfolio, but this was not enough to offset the reduction in the margin. The change in the credit portfolio's composition had little effect on the NIM change in the period.

The representativeness of both household and corporate customers in the system's credit NII remained practically stable throughout 2022, with some increase in the corporate participation (Graph 5.10). The household portfolio continued to be the most significant in the system (65% of total outstanding credit) and household customers continued to account for most of the credit NII (73%).⁵¹ Given the representativeness of the household portfolio for the generation of credit NII, additional analyses on the generation of credit NII resulting from products aimed at household customers are presented below.

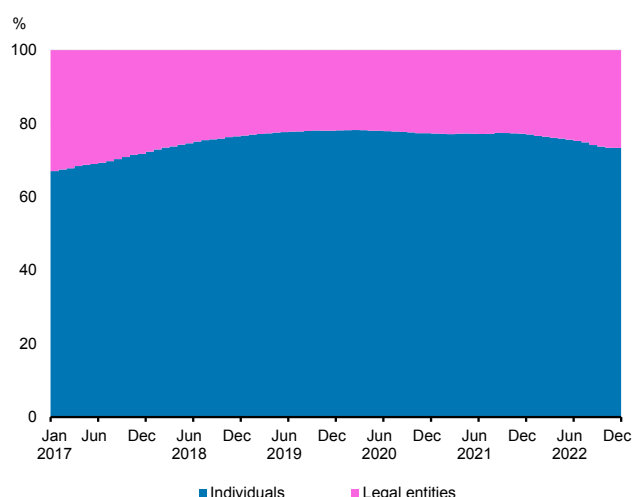
In 2022, the share of operations with higher risk and the expected return (+17 p.p) in the household credit NII (overdraft facility, credit cards, and non-payroll deducted credit) (Graph 5.11) continued to increase. This increase is due to the strategy adopted by some institutions to improve the profitability of their

⁴⁹ Data sent by the countries and available on the Financial Soundness Indicators (FSI) of the International Monetary Fund (IMF).

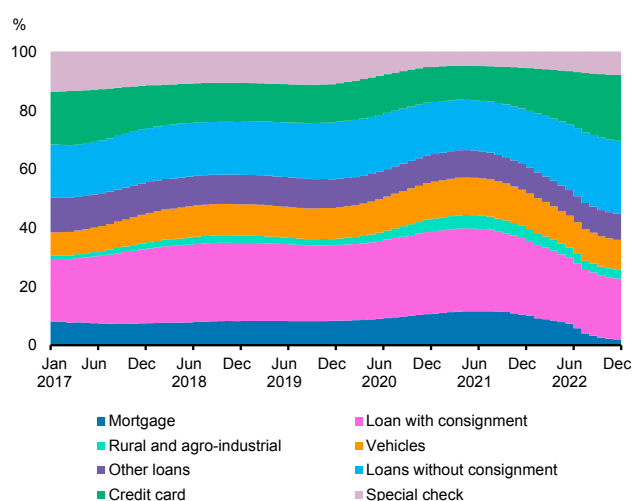
⁵⁰ It refers to the difference between credit interest income and interest expenses on funding credit.

⁵¹ The contribution of each credit modality to the credit NII cannot be considered as participation of a certain product in the final net profit, since the methodology does not consider the assessment of indirect expenses, such as administrative, processing and control, commercial, and taxes. Depending on the commercial, technological and administrative structure required for each type of credit, participation in possible assessments can be very different. Additional details of the methodology and its limitations can be found in the box "Methodology for calculating the credit margin by subgroups of the portfolio", of the 2018 REB.

Graph 5.10 – Credit NII formation
Individuals versus legal entities



Graph 5.11 – NII of credit by product
Individuals



credit portfolios after the significant growth of more conservative modalities in 2020.

Despite being less significant to the total outstanding loans, these modalities contribute significantly to the system earnings. This stems from the higher interest rates charged in these modalities. In 2022, 55% of the household credit NII was generated by these overdraft facility, credit card, and non-payroll deducted credit operations, even though they represent only 8% of the outstanding credit.⁵²

Credit modalities with non-earmarked resources maintained a significant share in the system's intermediation result (Graph 5.11). In household credit, nearly 76% of the generated NII came from non-earmarked resources in 2022. This category includes “payroll-deducted and non-payroll deducted personal credit”, “overdraft facility”, and “credit cards”.

⁵² The “credit card” and “installment credit card” modalities are not included in this calculation, as they are considered payment services for the purposes of this analysis and not credit granting (these modalities do not earn interest for the financial institution). In turn, revolving credit card and installment payments made by the financial institution itself are included in calculations. Even though they do not bear interest, the “credit card” and “installment credit card” operations bear the risk of delinquency. For this reason, financial institutions need to set up a provision for credit losses related to these receivable balances.

6.1 Concentration indicators⁵³

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” (E.N.) and the Concentration Ratio of the Top Four Financial Institutions (CR4) in the accounting aggregates related to total assets, credit operations, and total deposits in Brazil.⁵⁴

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 the *Guia para Análise de Atos de Concentração envolvendo Instituições Financeiras* (Financial Institutions Merger Review Guidelines, 2012),⁵⁵ the BCB considers that markets that record HHIn values:⁵⁶

- a) from 0 to 0.10 are of low concentration;
- b) from 0.10 to 0.18 are of moderate concentration; and
- c) from 0.18 to 1 are of high concentration.

The “HHIn equivalent number” (E.N.) shows the number of financial institutions with identical market

⁵³ Information regarding the evolution of the SFN is available at: <https://www.bcb.gov.br/en/statistics/financialsystemevolutionstatistics>.

⁵⁴ For the comparison with Banking Reports prior to 2021, the Table with CR5 is available in Appendix C (Table A).

⁵⁵ Annex I to Communiqué 22,366, of April 27, 2012.

⁵⁶ The 2010 Horizontal Merger Guidelines of the US Department of Justice (USDOJ), the Federal Trade Commission (FTC), and the U.S. antitrust agencies, considers HHIn from 0 to 0.15 (low concentration), from 0.15 to 0.25 (moderate concentration), and from 0.25 to 1 (high concentration).

share that would generate the same observed HHI_n (HHI_n=1/E.N.).

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

Since the 2021 Banking Report, the concentration analysis of credit operations has been performed for each relevant market, *i.e.*, for each set of similar substitute products.⁵⁷ This approach 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 the defense of competition. In this Banking Report, in addition to the markets analyzed in the 2021 edition, three new relevant markets are considered: non-payroll deducted personal credit (household), vehicle financing (household), and overdraft facility (household+corporate).⁵⁸ As a result, the set of relevant markets in this edition is made up of:⁵⁹ rural and agribusiness financing (household+corporate),⁶⁰ housing financing (household+corporate),⁶¹ infrastructure and development financing (corporate),⁶² operations with acquired receivables (corporate),⁶³ working capital (corporate),⁶⁴ payroll-deducted personal credit (household),⁶⁵ non-payroll-deducted personal credit (household),⁶⁶ vehicle financing (household),⁶⁷ credit card (household+corporate),⁶⁸ and overdraft facility

57 Further details about the definition of a relevant market, see Annex I to Communiqué 22,366, of April 27, 2012 (*Guia para Análise de Atos de Concentração envolvendo Instituições Financeiras e demais instituições autorizadas a funcionar pelo Banco Central do Brasil – Financial Institutions Merger Review Guidelines*).

58 The terms PF and PJ refer to household and corporate, respectively.

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

60 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).

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

62 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.

63 It covers sub-modalities 250 (loan-acquired receivables), 450 (financing-acquired receivables), and 1,350 (other receivables-acquired receivables).

64 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).

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

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

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

68 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).

(household+corporate).⁶⁹ Together, the relevant markets analyzed account for 74.5% of the total outstanding SFN credit operations on December 31, 2022.

Another new feature of this edition is the the concentration analysis of the relevant markets of brokerage and distribution of retail investment products.⁷⁰ The source of brokerage market data is the B3 and refers to the accumulated financial volume from January to December 2022, while the distribution market data is the Brazilian Financial and Capital Markets Association (Anbima) and refer to the consolidated financial volume of distribution of traditional retail and high-income products, except savings, as of December 2022.

The brokerage market is segmented between stocks and 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 between traded assets, business environments, operating platforms, and customers profiles.

Table 6.1 shows the participation of each segment (b1+b2, b3, b4, n1+n2, and n4),⁷¹ the participation of state-owned⁷² and private institutions,⁷³ as well as the HHIn, E.N., and CR4 for the balance of domestic operations on the base dates of December 31, 2020, 2021, and 2022, for each of the accounting

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

70 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 Funds (ETF), and securities (shares, government securities, private securities, and structured operations certificates).

71 Segment (b1) includes commercial, universal, and savings banks; segment (b2) includes universal banks without commercial portfolios, investment banks, and FX banks; segment (b3) includes individual credit unions (b3s) and credit unions centrals and confederations (b3c); segment (b4) refers to development banks (b4); segment (n1) comprises non-banking institutions active in the credit market; (n2) refers to non-banking institutions active in the capital market; and (n4) refers to payment institutions.

72 Federal or regional state-owned.

73 Foreign-controlled private, national private, and private with foreign participation.

aggregates.⁷⁴ The composition of the three accounting aggregates considers the following adjustments:

Table 6.1 – Summary of SFN concentration indicators

	Total assets			Total deposits			Credit operations		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Participation by segment (%)									
b1+b2	88.1	87.0	86.8	93.5	92.2	91.1	86.4	86.2	86.1
b3	3.8	5.3	5.1	5.3	6.0	6.4	5.1	6.1	6.4
b4	7.0	6.3	4.9	0.2	0.2	0.1	7.4	6.3	5.7
n1+n2	1.1	1.4	2.2	1.0	1.5	2.2	1.2	1.4	1.7
n4	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Participation by type of control (%)									
Public	40.6	38.0	37.0	34.9	32.6	32.0	45.6	43.5	43.7
Private	59.4	62.0	63.0	65.1	67.4	68.0	54.4	56.5	56.3
Concentration indicators									
IHHn	0.0981	0.0928	0.0888	0.1103	0.1032	0.0982	0.1068	0.1034	0.1015
E.N.	10.2	10.8	11.3	9.1	9.7	10.2	9.4	9.7	9.9
RC4 (%)	57.3	56.0	55.7	62.7	60.1	58.9	59.4	59.3	59.0

- d) 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;
- e) 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
- f) for credit operations, the balances of the outstanding portfolio of all the institutions' credit operations are considered.

As measured by the HHIn, the downward trend in concentration continued in the 2020-2022 period. The concentration reduction can be seen in all accounting aggregates and more intensely in total deposits. In 2022, considering the references regarding the metrics used (Financial Institutions Merger Review Guidelines, 2012), the HHIn points to low concentration regarding

⁷⁴ 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.

total assets and total deposits and moderate regarding credit operations.

From 2020 to 2022, the E.N. rose from 10.2 to 11.3 in total assets, from 9.1 to 10.2 in total deposits, and from 9.4 to 9.9 in credit operations, considering a universe of 1,114 institutions active in the credit market in 2020 and 1,100 in 2022.

The CR4 also reduced in all accounting aggregates. From 2020 to 2022, this indicator fell from 57.3% to 55.7% in total assets,⁷⁵ from 62.7% to 58.9% in total deposits,⁷⁶ and from 59.4% to 59.0% in credit operations.⁷⁷ In line with the E.N.'s behavior, the share of total deposits held by the top four institutions dropped more significantly.

Even with the assessment and approval of thirteen mergers in 2022, there was a reduction in concentration. Three of these mergers directly involved at least one bank and some type of credit among the relevant markets affected. It is noteworthy the acquisition by *Conglomerado Bradesco* of all the common stocks in *Banco Digio S.A.* and the activities combination *Banco Modal S.A.* and *Grupo XP*.

Regarding the shares of different segments, the banking segment share decreased while that of the non-banking segment increased. From 2020 to 2022, the banking segment (b1+b2) total assets grew from 88.1% to 86.8%, total deposits dropped from 93.5% to 91.1%, and credit operations fell from 86.4% to 86.1%. The non-banking segment (b3+n1+n2+n4) market share increase in all accounting aggregates is mainly due to the increase in the share of the credit unions (b3) and non-banking institutions (n1 + n2) segments in the period.

Moreover, the share reduction of institutions with state-controlled capital stands out, from 40.6% to 37.0% in total assets, from 34.9% to 32.0% in total deposits, and from 45.6% to 43.7% in credit operations.

Regarding the concentration degree in credit operations, Table 6.2 shows the concentration indicators (E.N. and

⁷⁵ In December 2022, the top four institutions in terms of total assets, in descending order, were: Banco do Brasil, Caixa Econômica Federal, Itaú and Bradesco.

⁷⁶ In December 2022, the top four institutions in terms of total deposits were, in descending order: Banco do Brasil, Itaú, Bradesco and Caixa Econômica Federal.

⁷⁷ In December 2022, the top four institutions in terms of outstanding credit operations, in descending order, were: Caixa Econômica Federal, Banco do Brasil, Itaú, and Bradesco.

CR4) by relevant market and the respective number of effective institutions⁷⁸ over the last three years. Indicators refer to credit operations granted with both non-earmarked and earmarked resources⁷⁹ in the banking and non-banking segments (b1+b2+b3+b4+n1+n2+n4).^{80 81}

Table 6.2 – Indicators of concentration of the balance of SFN credit operations, by relevant market

Relevant market	Concentration index								
	Equivalent number (E.N.)			RC4 (%)			IF effective ^{2/}		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Rural and agricultural financing (individuals + companies) ^{1/}	3.3	3.5	3.7	66.7	64.2	65.6	437	436	440
Housing financing (individuals + companies) ^{1/}	2.0	2.1	2.1	92.3	92.2	92.6	68	73	97
Infrastructure and development financing (individuals) ^{1/}	2.2	2.2	2.3	94.2	94.0	93.2	38	40	39
Transactions with receivables (individuals)	6.9	7.8	8.1	69.4	65.8	62.8	50	55	61
Working capital (individuals)	10.4	10.8	11.0	55.8	57.0	57.4	793	788	780
Personal credit with payroll deduction (individuals)	7.9	8.1	8.3	66.6	65.2	64.6	710	739	745
Personal credit without payroll deduction (individuals)	10.5	12.6	13.1	54.0	49.7	47.5	865	853	878
Vehicle financing (individuals)	7.5	7.9	8.6	66.3	65.1	61.5	636	630	625
Credit card	6.9	7.5	7.9	68.6	66.0	62.8	290	297	288
Overdraft (individuals + companies)	6.0	6.4	6.6	77.6	73.5	71.5	658	641	629

^{1/} Unlike other relevant markets, in addition to free resources, directed resources were considered.

^{2/} There were changes in the number of effective FIs in relation to the data published in the previous edition of the REB, mainly in the relevant market for infrastructure and development financing, due to improvements in the process of counting the number of institutions.

Concentration, as measured by the E.N. from 2020 to 2022 fell in all the relevant credit markets considered. When considering the CR4, increases in concentration were observed only in the housing financing (household+corporate) and working capital (corporate) markets.

Regarding the number of financial institutions operating in each market, the number of financial institutions offering housing financing (household+corporate), operations with acquired receivables (corporate), payroll-deducted personal credit (household), and non-payroll-deducted personal credit (household) increased.⁸²

The most significant concentration reduction, among the relevant credit markets considered, was observed

⁷⁸ Effective institutions are those holding a balance greater than zero in their credit portfolio in the respective modality.

⁷⁹ 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.

⁸⁰ Graphs C.1 to C.10 in Annex C show the participation of the top five institutions in each relevant credit market considered.

⁸¹ Tables B to K in Annex C show the relevant markets evolution by control type and resources origin.

⁸² Based on Tables B to K in Annex C, it is worth noting that from 2020 to 2022, the b3 segment increased its share in rural and agribusiness financing (household+corporate), housing financing (household+corporate), working capital (corporate), vehicle financing (household), credit cards (household+corporate), and overdraft facility (household+corporate).

in non-payroll-deducted personal credit (household), whose E.N. grew from 10.5 in 2020 to 13.1 in 2022, and the CR4 dropped from 54% to 47.5% in the same period. Other markets with a significant reduction in the period are, in order of size, operations with acquired receivables (corporate), vehicle financing (household), and credit cards (household+corporate).

Considering the references in the Financial Institutions Merger Review Guidelines (2012), the concentration level remains high in rural and agribusiness financing (household+corporate), housing financing (household+corporate), and infrastructure and development financing (corporate). A moderate concentration degree is observed in operations with acquired receivables (corporate), payroll-deducted personal credit (household), vehicle financing (household), credit cards (household+corporate), and overdraft facility (household+corporate). Concentrations in credit granted through working capital (corporate) and non-payroll-deducted personal credit (household) remained low.

Among the markets with high concentration, in which prevails the earmarked segment, the state-owned banks share is greater than that of private banks from 2020 to 2022. Among the markets with moderate concentration, characterized by non-earmarked resources, the participation of private banks predominates.

Regarding the concentration degree in the brokerage and distribution of retail investment products markets, Table 6.3 shows the concentration indicators (E.N. and CR4) by relevant market and the respective number of effective institutions⁸³ over the last three years.

Concentration, as measured by the E.N. from 2020 to 2022, increased in the brokerage markets and decreased in the distribution of investment products market (in this case, considering the 2021-2022 period, given the lack of data for 2020). When considering CR4, an increase in concentration was observed only in the stock brokerage market.

Regarding the number of financial institutions operating in each market, a small reduction was observed in the number of institutions in the brokerage markets and a small increase in the number of institutions in the distribution of investment products market.

⁸³ Effective institutions are those that, on the base date, hold a financial volume greater than zero in the respective modality.

Considering the references in the Merger Review Guidelines (2012), the concentration level observed in the brokerage markets (commodities and futures and stocks) is classified as low and, in the distribution of investment products market, as moderate.

Table 6.3 – Indicators of concentration of financial volumes of shares, commodities and futures and distribution of retail investment products

Relevant market	Concentration Index								
	Equivalent number (E.N.)			RC4 (%)			IF effective		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Brokerage – commodities and futures	12.6	13.3	12.0	47.4	43.6	47.1	50	47	48
Brokerage – shares	15.4	15.1	14.3	40.8	40.3	41.9	61	58	57
Distribution of investment products ^{1/}		8.3	8.7		62.9	61.0		87	91

Source: B3 e Anbima.

^{1/} Data for 2020 are not available because the information sharing agreement between BC and Anbima was signed in July 2021.

Conclusion

The HHI, the E.N., and the CR4 results suggest that the SFN's concentration decreased from 2020 to 2022 in the accounting aggregates considered, especially in total deposits. During the period, the banking segment (b1+b2) and development banks (b4) shares decreased, while increased the share of the non-banking segment (b3+n1+n2+n4) and of the privately owned institutions. The HHI indicates low concentration regarding total assets and total deposits and moderate concentration regarding credit operations, considering the 2012 Guidelines references.

When considering the E.N. indicator, the reduction in concentration was observed in all relevant credit markets.

When considering the CR4, concentration increased only in the housing financing (household+corporate) and working capital (corporate) markets. However, the concentration level remains high in rural and agribusiness financing (household+corporate), housing financing (household+corporate), and infrastructure and development financing (corporate), with predominantly earmarked funding.

In the brokerage markets (stocks and commodities and futures), concentration as measured by the E.N. increased from 2020 to 2022. In the distribution of investment products market, concentration declined, considering the 2021-2022 period. When considering CR4, concentration increased only in the stock brokerage market. Considering the references in the 2012 Guide, the concentration level observed in the

brokerage markets is low and, in the distribution of investment products market, moderate.

6.2 Competition

In this section, the Lerner index is used to analyze competition in the SFN markets of credit and financial services from 2015 to 2022.⁸⁴

Competition in credit markets

The Lerner index⁸⁵ for assessing competition in credit markets is specific to each financial institution and is defined as the difference between the price and the marginal cost (markup) in relation to the price⁸⁶ charged by the financial institution when granting credit. For a monopolistic competitor optimizing profits, the Lerner index is inversely proportional to the price elasticity of demand. In the case of the financial sector, the lower the sensitivity of demand to interest rate variations, the higher is the Lerner index and, therefore, the higher the market power and the lower the degree of competition.

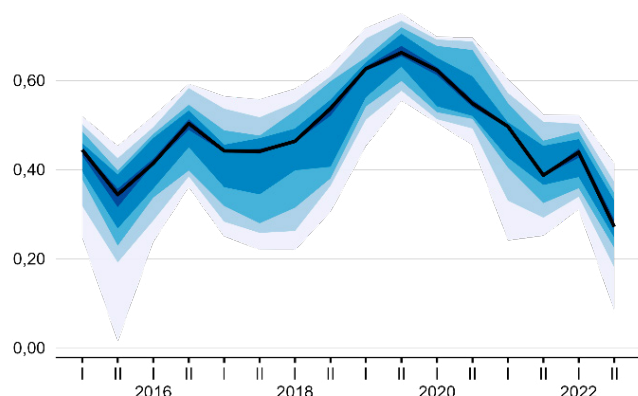
In the banking segment (b1+b2), the Lerner index for the credit market followed an upward trend from 2015 to 2019, signaling decreased competition over the period. However, it fell sharply after the outbreak of the Covid-19 pandemic, indicating increased competition among institutions. In 2022, the indicator remained relatively stable at around 0.30, although with a slight reduction when comparing the end of 2022 with the end

84 The current methodology began to be used in the previous 2021 Banking Report. See box “Updating the methodology for assessing competition in the SFN’s credit and services markets” of the 2021 Banking Report. The methodology previously used can be found in the box “Estimation of competition indicators” in the 2018 Banking Report. It should be pointed out that, since they employ different methodologies, the values published for the Lerner index in the pre-2021 Banking Reports are not comparable with the values in this edition. Moreover, in the specific case of the Financial Services Lerner, the number of accounts variable is now extracted from the CCS (Financial System Customer Register) database. Finally, every new Banking Report globally re-estimates all these parameters, including those of past periods, which may lead to some discrepancies with previous years’ graphs.

85 The graphs of the Lerner credit indicators in this section show different percentiles of distribution of financial institutions. The 50th percentile (median) is indicated by the black line. The percentiles are shown in the 25 to 75 interval and are identified by different colors every 5 points, with darker colors as one gets closer to the median. Data displayed in these graphs are smoothed for one-year windows to mitigate seasonality effects. All of the above specifications also apply to the Lerner services indicator graph.

86 In this section, the term “price” refers to interest rates on credit operations to adapt the terminology to that used in Lerner’s indicator literature. In addition, the price is net of losses due to delinquency and other factors.

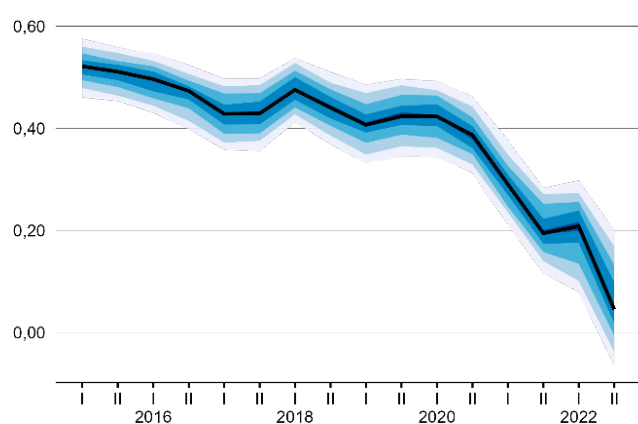
Graph 6.1.a – Credit Lerner (banking sector)



of 2021 (Graph 6.1.a). Stability in 2022 reflected a similar increase in both prices and marginal costs. The upward trend in marginal costs and prices, of nearly 45% over the period,⁸⁷ can be partly explained by the behavior of the Selic rate.

The Lerner index for the credit market in the credit union segment (b3) had been on a slightly downward trajectory since the pre-pandemic period, indicating increased competition. During the pandemic, likewise the banking segment, the indicator fell more sharply. The credit Lerner of credit unions continued to decline in 2022, reaching a median close to zero at the end of 2022 (Graph 6.1.b), indicating the persistent trajectory of increasing competition among credit unions. Expansion of marginal costs in 2022 was similar to that observed in the banking segment, but prices increase was relatively lower, leading to a decline in the Lerner index.

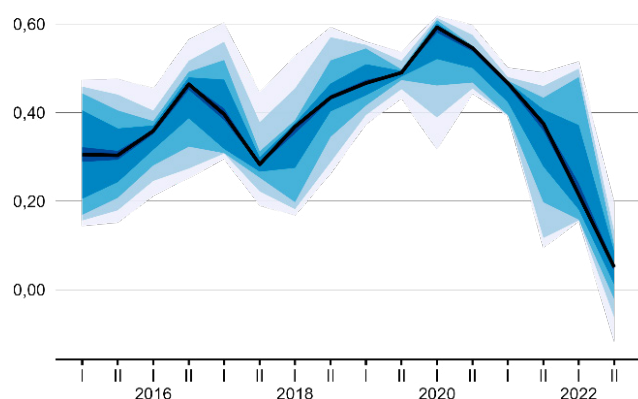
Graph 6.1.b – Credit Lerner (credit unions sector)



The behavior of the credit Lerner index for institutions in the non-banking segment (n1) was upward from 2015 until the first half of 2020 and downward thereafter (Graph 6.1.c), indicating a significant increase in competition in the latter period. Likewise the credit union segment, the Lerner index for institutions in the non-banking segment reached a median close to zero by the end of 2022. The behavior of marginal costs and prices of institutions in this segment in 2022 was similar to those of institutions in the credit union segment.

It should be noted that a Lerner index close to zero indicates a level of competition close to perfect competition or the absence of market power. It should also be stressed that the competitive analysis in this section is limited to the credit market.

Graph 6.1.c – Credit Lerner (non-banking sector)

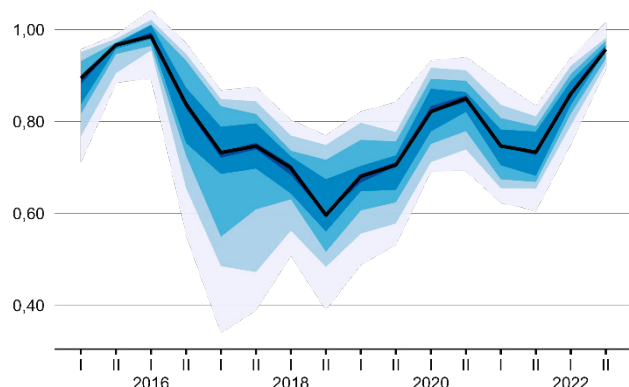


Competition in the financial services markets

Financial services markets evaluated in this section correspond to the following services: fund management, management of constitutional funds and lotteries, collection, capital market services, payment services, peer-to-peer lending and financing (SEP), and banking services provided to households and companies. The Lerner index for assessing competition in financial services markets is defined as the difference between the average price institutions charge customers for

⁸⁷ This comparison is based on the medians of marginal costs and price. This observation applies to the other analyses in this section.

Graph 6.2 – Financial services Lerner (banking sector)



its financial services and the associated marginal cost relative to the average price of the service package.

The financial services market Lerner index of the financial services market in the banking segment (b1+b2) followed an upward trend from the second half of 2018 until the second half of 2020 (Graph 6.2). After falling in the first half of 2021, the upward trend resumed until reaching a Lerner index close to one in the second half of 2022. This indicates banks' high market power in this segment. This increase reflects the marginal costs drop over the period and a small increase in prices.

Final remarks

Competition in the credit markets has increased since the outbreak of the pandemic for institutions in the banking segment (b1+b2), credit union (b3), and non-banking (n1) segments, according to the Lerner indices calculated. In all three segments, marginal costs dropped slightly in 2020, and increased significantly from 2021 onwards. Prices behavior was similar over the period, although less sharply, leading to a reduction in the Lerner index. Therefore, this indicates reducing market power and increasing competition among institutions.

In the financial services market of institutions in the banking segment (b1+b2), competition behaved differently. Competition firstly increased from 2020 to 2021 but decreased afterwards. By the end of 2022, institutions in this segment held a significant market power, with a Lerner index close to one. Marginal costs of institutions increased from 2020 to 2021 but fell more sharply by the end of 2022. During this period, prices changes were relatively small.

6.3 Financial innovations and the BCB's role

Improving the rules governing the operation of credit unions

The National Monetary Council (CMN) incorporated into current regulations the changes introduced by Complementary Law 196, of August 24, 2022, in Complementary Law 130, of April 17, 2009, which provides for the National System of Cooperative Credit (SNCC), through Resolution CMN 5,051,

of November 25, 2022, which provides for the organization and operation of credit unions.

Among the innovations established by this Resolution is the authorization for credit unions to:

- I. carry out assistance and financial support operations with the credit guarantee fund, set up by credit unions and cooperative banks that are part of the National Cooperative Credit System, which is of compulsory association by virtue of specific regulations issued by the CMN;
- II. invest funds in and obtain funds from the central credit unions or credit confederations to which they are affiliated, or from other guarantee funds set up by them;
- III. provide payment services in the form of electronic money issuers and issuers of postpaid payment instruments, exclusively to members; and
- IV. provide payment services in the form of acquirer and payment initiation service provider to members and non-members.

In addition, this resolution improves the rules on corporate governance, requiring credit unions to adopt an administrative structure made up of a board of directors and a subordinated executive board. The adoption of this administrative structure is optional for classic credit unions with average total assets of less than BRL 50 million in the last three fiscal years, as well as credit cooperatives that do not deposits.

According to this resolution, the board of directors must be made up of elected members, at least one third of whom must be replaced at each election.

The resolution also exempts credit unions that adopt an administrative structure made up of a board of directors and an executive board from the obligation to set up a supervisory board. However, it requires the credit union that sets it up to renew at least one effective member of this board at each election for a new term.

Finally, credit unions were allowed to participate in the capital of any institutions authorized to operate by the BCB that are controlled by credit unions, as opposed to the previous regulation that limited this participation to financial institutions. Hence, it ensures

that credit unions can also participate in the capital of payment institutions and consortium management companies. This allows credit unions to expand the range of products and services provided by institutions they control to their members.

Equity participation

The CMN has improved by Resolution CMN 5,043 of November 25, 2022 the rules on equity participations in Brazil and abroad and on the establishment of branches abroad by institutions authorized to operate by the BCB.

Based on these new rules, regulated institutions will only have to request authorization from the BCB to:

- I. participate, directly or indirectly, in the capital of any company based in the country or abroad;
- II. increase, directly or indirectly, the percentage of participation in the capital of any company based in the country or abroad; and
- III. set up a branch abroad.

This resolution establishes the following requirements for equity participation and for setting up branches abroad:

- I. the regulated institution must meet the operational limits and the minimum capital and equity requirements;
- II. the entity in which the equity participation is held must perform activities that are complementary or subsidiary to those of the institution holding the participation; and
- III. the institution holding the participation must demonstrate that such investment is in line with its operational strategy, when the investment is in a branch abroad or the participation represents control over a financial or similar institutions based abroad.

This resolution does not require authorization from the BCB for institutions to allocate new resources to branches abroad, as well as for capital increases in financial and similar institutions abroad that do not represent an increase in the percentage participation. In these cases, the participant financial institutions must

meet the operational limits and minimum capital and equity requirements set out in the specific regulations.

Moreover, prior authorization from the BCB was waived for participation in a financial or similar institution abroad that is the subject of a spin-off, merger, or consolidation. However, participation in the institutions resulting from these operations may require specific authorization from the BCB if they are covered by any of the authorization requirements set out in the regulations.

The rules of this resolution do not apply to equity participations acquired abroad with the purpose of future negotiations and sales, or accessing export financing instruments and international transfer of funds, as configured in the following operations:

- I. equity participations typical of investment portfolios held by investment banks, development banks, development agencies, and universal banks with investment or development portfolios;
- II. temporary equity participations in the country, not registered as permanent assets and not consolidated, in accordance with current regulations; and
- III. minority equity participations in financial organizations and institutions abroad, exclusively for the purpose of gaining access to export financing instruments and the international transfer of funds.

Finally, the BCB is authorized to adopt streamlined and more agile procedures in the case of minor participations.

New prudential framework for payment institutions

In 2022, the BCB and the CMN approved a set of regulations that updated and improved the prudential framework applicable to payment institutions. The new framework extended to financial conglomerates led by payment institutions (PI) the proportionality of the regulatory requirements already in place for conglomerates led by financial institutions. This improvement was necessary in view of the diversification and sophistication of the segment since the establishment of the legal framework for PI in 2013.

It was defined that prudential requirements for PI be applied in aggregate terms to the entire prudential conglomerate, as is already done for financial institutions. Conglomeration allows to capture all risk exposures, including, in the regulatory perimeter, institutions that incur financial risks and are controlled by PI. According to the new rule, prudential conglomerates are classified into three types:

- Type 1: prudential conglomerate led by a financial institution.
- Type 2: prudential conglomerate led by a payment institution and not integrated by a financial institution or other institution authorized to operate by the BCB.
- Type 3: prudential conglomerate led by a payment institution and integrated by a financial institution or other institution authorized to operate by the BCB.

The aim of the new framework is for the prudential treatment of groups that are similar in essence (Type 1 and Type 3) to be proportional to the risks effectively assumed, regardless of the type of corporate organization. At the same time, it allows groups that are effectively simpler, because they do not include financial institutions (Type 2), to follow a simplified regulation.

Thus, for the Type 3 conglomerate, requirements were created to calculate the Reference Equity (PR) and a methodology was established to calculate the minimum requirement. The prudential segmentation already applicable to Type 1 conglomerates has also been extended to Type 3 ones. Based on their size and complexity, Type 3 conglomerates are now classified between S2 and S5 and must comply with the prudential rules applicable to the respective segment. A rule was also established for this type of conglomerate regarding the risk management structure, capital management structure, and information disclosure policy.

In the framework improvement, the Risk-Weighted Assets for Services of Payment (RWA_{sp}) tranche was created, encompassing the activities of acquiring, issuance of electronic money, and initiation of payment transactions. The new tranche applies to all conglomerate types, except for Type 1 classified as S1 (of greater systemic importance), which will continue to follow the Basel regulatory standard.

Convergence of Cosif standards to the international standards established by IASB

In 2021, the CMN and the BCB concluded the process of converging the standards that make up the Accounting Standards of the Institutions Regulated by the BCB (Cosif) to the international accounting standards established by the International Accounting Standards Board (IASB).

The convergence process aimed to improve the quality of the accounting information produced by financial institutions in Brazil, providing a greater degree of comparability to the accounting statements published by these institutions vis-à-vis those published by foreign financial institutions operating in the world's leading markets. The convergence primary goal is to increase the competitiveness of national financial institutions in the global market.

Focusing on its commitment to safeguarding the soundness and stability of the SFN, the BCB considered that the convergence process within the scope of regulated institutions could not be restricted to the full reception of the accounting pronouncements produced by the IASB. The SFN own specificities indicated the need of adjustments whenever the contents of an accounting procedure could represent risks for the SFN or, for some reason, could not be compatible with the reality or particularities of financial institutions operating in Brazil. In this regard, prudential issues became the object of special attention by the CMN and the BCB throughout the convergence process, with a view to preserving the soundness, efficiency, and competitiveness of the SFN.

Once the convergence process was concluded, and considering the regulatory changes brought about in the accounting field, a new challenge aroused for the BCB: to create an accounting plan that included accounting headings appropriate to the changes brought about by the new regulatory framework and, at the same time, capable of improving the current accounting plan, which has been in force for more than three decades.

Faced with this new challenge, the BCB started, in 2022, the project that will make it possible to create accounting headings in line with the concepts and criteria adopted in the convergence process. Given the complexity of this project, the BCB decided to start the process by holding prior consultations with

the supervised institutions, aiming to identify any demands and indicate that changes will be implemented in a planned, transparent, and gradual manner. The new accounting plan, together with the rules issued to deal with the convergence process, is expected to come into force in 2025, ensuring sufficient time for the supervised institutions to adapt their systems and work processes to the new accounting plan.

The elaboration of the new accounting plan has been the subject of thorough analysis of specific accounting issues, fully in line with the issues dealt with in each of the IASB accounting pronouncements. The goal is to identify the accounting developments caused by each of these issues should in the Cosif list of accounts. Therefore, it is worth highlighting the activities of naming and classifying the accounting headings, culminating in the identification of the levels of detail of each accounting event and the description of the function of each heading created to make up the new plan.

From the analyses carried out by the BCB in 2022 aimed at drawing up the new accounting plan, it is worth highlighting that involving the accounting of financial instruments, for which the procedures are set out in Resolution CMN 4,966 of November 25, 2021, covering issues related to the acknowledgment, classification, measurement, witting-off, and disclosure of these assets. In this regard, the rules on setting up a provision for losses associated with credit risk stand out as the first line of action aimed at mitigating the credit risk of financial institutions. These rules have innovated by considering the allocation of the financial instrument in stages, focusing on the evolution of the operation's credit risk over time, as a reference for the constitution of this provision.

Another innovation brought in by Resolution CMN 4,966, of 2021, is the set of accounting rules for recording hedge operations, contracted with the aim of protecting financial instruments under the control of institutions against unwilling changes in their future cash flows. As the contracting of hedge operations has become a widely used market strategy to control likely volatility in the results earned by institutions, changes to the accounting rules relating to such operations arouse a lot of interest in the market.

Innovations in the accounting rules applicable to hedge instruments, combined with changes in the accounting procedures applicable to leasing

operations, permanent investments, investment properties, financial assets held for the purpose of investment or future sale, and profit generation and assets held for sale, required the creation of hundreds of new accounting headings in 2022, in a process that involved balance sheet, income statement, and settlement accounts.

Regulatory Sandbox

The BCB's Controlled Testing Environment for Financial and Payment Innovations, or Regulatory Sandbox, currently in its first cycle, was implemented in 2021 from the selection of seven projects identified among nine thematic priorities established by the BCB. The stage of the projects' development in 2022 is highlighted below.

Platform for secondary trading of securities with blockchain registries

This project involves the issuance and negotiation of credit securities and representative certificates, using blockchain-based Distributed Ledger Technology (DLT) to record transactions with the aim of reducing costs and speeding up operations. Current regulations on the subject require that the instruments issued be registered or deposited in financial market infrastructures authorized by the BCB. As the project matures, it will be possible to assess whether the proposed way of registering and controlling assets meets the conditions of security and efficiency required by current regulations. The first issuance of securities was carried out in December 2022, as one of the project's actions, totaling BRL 10 million.

Implementation of a network of physical spots of business partners of a regulated institution to receive funds in cash

This project allows payment account holders to make deposits in cash through the network of partner companies of the institution proposing the project in the Regulatory Sandbox. The physical spots are basically retailers and similar companies interested in receiving deposit funds for the proposing institution. Currently, as a result of regulations in force, this type of operation is not allowed. However, this was loosened, exceptionally, under continuous monitoring, within the scope of the Regulatory Sandbox. Thus, through the adoption of technologies and contracts with retail partners of the institution concerned, the business model to be observed

by the BCB will make it possible to assess whether the requirements of the relevant regulations can be met so that such transactions can be offered on a permanent basis.

Loan secured by real estate for a specific target audience, replicating the reverse mortgage model

This project aims to make it possible to offer credit operations to a target group with a specific profile, resident in the city of São Paulo, which currently does not have customized credit lines. This target public will be able to enjoy lower interest rates compared with existing alternatives, due to the type of guarantee offered in return. The model of loan secured by real estate, known as home equity, is similar to operations known internationally as reverse mortgages. In the Regulatory Sandbox, the applicant and the BCB will be able to observe the possibility of performing operations in a controlled environment, determining the benefits and delimiting the risks involved.

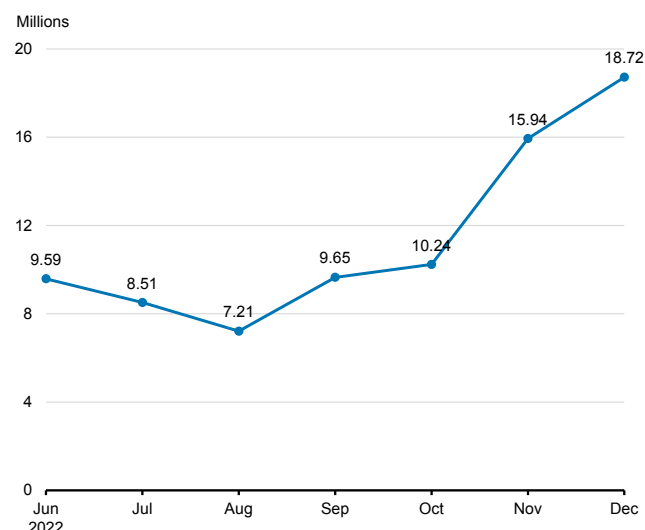
Making payments with the granting of credit using Pix payment arrangement functionalities

This project makes it possible for customers from the promoting institution to make purchases using the credit function of their credit cards, making payments in cash or in installments without interest, while the shopkeeper will receive the funds simultaneously and in cash, through the Pix payment arrangement. The main attractive feature of the project is the possibility of increasing competitiveness in this type of operation, which combines payment transactions with credit granting. The BCB, while supervising this project, will be able to evaluate new features of the Pix payment arrangement, which could increase the efficiency of the retail payments market.

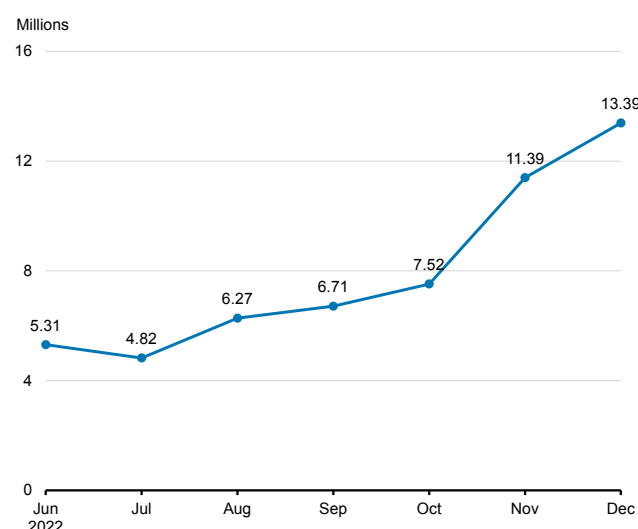
Using blockchain to execute multi-currency payment instructions for the purpose of immediate exchange of bank reserves

This project aims to carry out foreign currency purchase and sale transactions in the interbank foreign exchange market, adopting the blockchain technology standard to record the operations performed, for the purpose of exchanging funds between institutions. The project's supervision will enable the BCB to analyze alternative trading and registration models in the interbank foreign exchange market, aiming at increasing efficiency in this segment. Current regulations require the centralized registration of transactions carried out in this market,

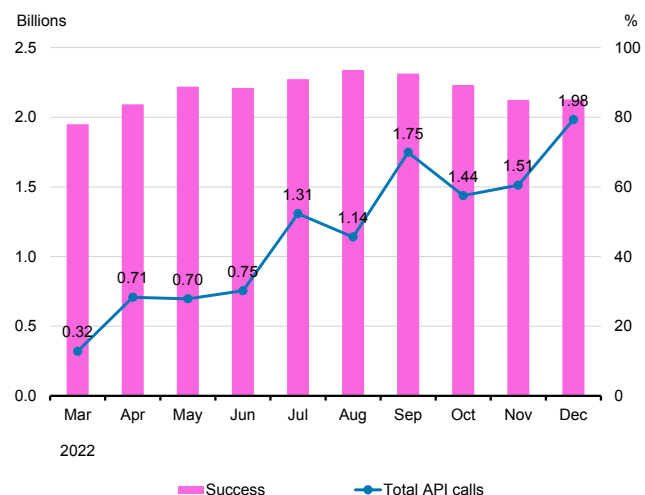
Graph 6.3 – Total active consents



Graph 6.4 – Unique individual customers



Graph 6.5 – API Calls – Total Number and Rate of Successful Calls



while blockchain technology makes it possible to decentralize this registration, in theory, without compromising transparency or security for the parties.

Development of a platform for the movement of funds, with the adoption of transitory accounts, to perform deferred payments

This project aims to develop a technological platform with the goal of moving funds between accounts, upon previously agreed conditions, by transferring funds to temporary or settlement accounts. The sponsoring institution intends with the project to offer solutions that increase security in deferred payment transactions, dependent on suspensive conditions for the transfer of funds to be effected.

The aforementioned projects are in the process of implementation and monitoring by the BCB. In 2022, as a result of this initiative, following improvements to the rules on payment accounts, the project's sponsoring institution became an institution authorized to operate by the BCB.

Open Finance

The Brazilian model of an open financial system – Open Finance continued to evolve in 2022. This model allows consumers to share their financial data between institutions and have access to financial products and services that are more aligned with their profile.

The growth in Open Finance's main figures is in line with the BCB's expectations for the current stage of implementation. Throughout the second half of 2022, the number of consents to share active customer data increased (Graph 6.3). By the end of December 2022, there were 18.72 million active consents and 13.39 million people using the Open Finance functionalities (Graph 6.4).

As the four phases are already underway, one of the focuses throughout 2022 was the technological improvement, especially regarding connectivity between participating institutions. Some of these improvements, which are necessary in projects of this magnitude, have already been achieved and others are being promoted by the participating institutions and the Governance Structure responsible for implementing Open Finance in Brazil, accompanied by the BCB.

In 2022, data requests via API⁸⁸ (API calls) from phase 2 (Graph 6.5) increased over the months, ending the year with 1.98 billion calls, of which 1.69 billion (85.11%) were successful. Since the start of phase 2 and until the end of 2022, around 12 billion API calls had been made.

In addition, in 2022, the CMN, the BCB, the National Private Insurance Council (CNSP), and the Superintendence of Private Insurance (Susep) published guidelines for developing interoperability between their two open systems – Open Finance, regulated by the BCB, and Open Insurance, regulated by Susep. Interoperability will be built jointly by the Governance Structures of both initiatives from 2023 on, expanding the benefits to the population.

With the implementation of the Brazilian Open Finance, the BCB won the Data Management Initiative Award at the FinTech and RegTech Global Awards 2022, organized by the Central Banking Institute.

The year 2022 was also marked by new functionalities made available by the participant institutions, such as financial managers that allow customers to view all data available on their banking relationships in a single institution. The payment initiating institutions, which began their participation in phase 3, already provide services aimed at improving the customer experience, such as the possibility of making payments from one institution using the balance held at another one and making shop in on line stores easier, allowing the payment via the Pix payment arrangement without leaving the e-commerce application. In addition, the institutions' internal processes, such as those related to credit risk models and the portability of credit operations, are also being improved with information shared through Open Finance.

⁸⁸ Information shared is encrypted in a completely digital and secure environment by means of API, technology that allows the systems of different institutions to interact in a secure, agile, and accurate way, without the need to centralize information. Customer data are maintained only in those institutions that share their information, based on the given consent. API calls refer to the data and information that are transmitted in these interactions between the API calls of the participant institutions. Multiple API calls are generated from a single data sharing authorization. For example, when a customer shares data, the institution that will receive information makes API calls to the originating institution to retrieve data on the account, balance, credit operations, etc. As long as the term of consent is valid, new calls can also be made to double check whether there is new information to be shared.

It is expected that the launch of new products and services will continue as Open Finance evolves and matures. The expansion of the Open Finance's scope also contributes to this scenario. It will soon be possible to share data on products and services related to investment, accreditation, insurance, open complementary pensions, and foreign exchange, as well as new functionalities aimed at companies.

Box 5 – P2P lending fintechs: features and competitive aspects

Creating a more competitive market was the BCB's aim when issuing Resolution 4,656, of April 26, 2018, regulating credit fintechs, which include Direct Credit Society (SCD) and Peer-to-Peer Loan Companies (SEP). Competition in the Brazilian credit market could increase with the entry of these new types of financial institutions, even if the market share of these new players is small. Peer-to-Peer (P2P) lending platforms are a type of fintech that has been expanding their participation in the Brazilian credit market. These platforms connect, on the one hand, investors with available resources and, on the other, companies or individuals in need of credit. An important feature of these operations is that the credit risk of the loans is borne by the investors, not by the P2P platforms. This characteristic differentiates this model from other financial institutions.

P2P loans are growing in the credit markets and their interaction with banks has gained attention in the financial literature (THAKOR, 2020) and among financial regulators (NEMOTO *et al.*, 2019). In this box, based on Ornelas & Pecora (2022), the hypothesis that loans from P2P platforms can induce an increase in competition in the working capital loan market for micro, small, and medium-sized enterprises (MSMEs) in Brazil is investigated. Naturally, when a new competitor arrives, existing lenders may react. However, little is known about the competitive response of banks or the side effects and welfare effects of a new competitor in the banking sector. This response may be particularly relevant in markets where banks hold significant market power, as in most emerging economies. This box seeks to quantify the competitive implications following the entry of online P2P platforms into the Brazilian banking markets. For this purpose, the study uses a database of unsecured working capital loans for MSMEs from both banks and P2P platforms in Brazil.

The box analysis is threefold: i) the profile of P2P platform clients; ii) a comparison between the interest rates of P2P platforms and traditional institutions; and iii) the competitive response of traditional institutions.

First, the profile of P2P borrowers is assessed. The clients of these platforms are predominantly companies with pre-existing relationships with other financial institutions (FI). Furthermore, P2P clients are smaller, more risk-prone, newer companies with younger and more educated employees when compared to clients of other FI. In addition, P2P clients have a comparatively greater presence in such sectors as information technology and professional, scientific, and technical services. In general, P2P clients are techsavvy companies, i.e. with greater knowledge of technology. Geographically, P2P platforms are more present in poorer municipalities far from the main financial centers, where banking markets are highly concentrated. These results are in line with the lower costs of P2P platforms and the fact that they do not operate physical branches, accessing distant locations where traditional banks have higher entry costs. In addition, P2P platforms have a lighter regulatory framework, giving them a comparative advantage over banks and allowing them to focus on riskier borrowers. In terms of interest rate profile, P2P clients used to pay 1.3 p.p. higher interest rates at traditional FI¹ before taking their first loan from P2P platforms, compared with similar companies that have not become P2P clients.

¹ In this box, traditional FI are banks – including digital ones – and credit unions.

The second analysis makes a direct comparison of the interest rates charged by P2P platforms and traditional FI. For the same company, these platforms offer 5.2 p.p. lower risk-adjusted interest rates compared to traditional FI. Specifically in relation to large private banks, the interest rate charged by P2P platforms is even lower, around 7.4 p.p. lower.

The third analysis assesses the competitive reaction of traditional FI by comparing their interest rates before and after a client company becomes a P2P client. After a company borrows from a P2P platform, the interest rates it will find on subsequent loans at traditional FI will be 1.4 p.p. lower, compared to the period when the company was not a P2P client. This result indicates that banks see P2P platforms as competitors – in line with previous findings in the literature (see TANG, 2019) – and try to win back borrowers by offering them cheaper loans.

Institutional framework

P2P platforms make it easier for investors and borrowers to meet in an online environment. There, investors offer credit to individuals or small businesses. The platforms charge an origination fee and offer credit risk analysis and debt collection. However, the investor bears the risk of delinquency.

As described by Nemoto *et al.* (2019), P2P platforms face different regulatory regimes depending on the country. Regulatory characteristics vary mainly in terms of the strictness of operating licenses and whether the loan originator is the P2P platform or a partner bank. Despite these requirements, P2P lenders bear lower regulatory costs than traditional banks, which may explain their growth since the 2008 financial crisis (see THAKOR, 2020).

P2P lending is very recent in Brazil, with only a few online platforms starting to operate in 2016. Originally, P2P Fintechs had a partner FI that had to be authorized, regulated and supervised by the Banco Central do Brasil (BCB). The partner FI originated the P2P loan, but the credit risk was transferred to the investor. Therefore, in this structure there were four agents: the borrower, the investor, the P2P platform, and a partner FI. The P2P platform and the partner institution shared the origination fee.

There were two types of partnership. In the first type, the partner FI kept the loans on their balance sheets and included them in the BCB Credit Information System (SCR). Although these loans appeared on the balance sheets of the FI, they were not obliged to make provisions, since the credit risk belonged to the investors.² In the second type, the partner FI did not keep the loan on their balance sheet, so the loan was not included in the SCR.

To simplify this configuration and encourage credit operations on these platforms, the BCB introduced new regulations in 2018 (BCB Resolution 4,656 of April 26, 2018). The Resolution introduced two new types of financial institutions: the Direct Credit Company (SCD), which grants loans with funds from its own balance sheet; and the Peer-to-Peer Loan Company (SEP), which makes P2P loans. These new financial institutions can only operate through loans on online platforms.

Thus, SEP represent an alternative for P2P platforms to operate without a partner FI, concentrating all the origination fees charged to clients. SEP is a financial institution regulated by the BCB, but the requirements to open and operate it (and SCD) are more flexible than those of traditional FI. Hence, the new regulation aims to reduce entry barriers in the credit market and encourage competition. As they grow, P2P platforms operating with partner FI tend to file for a SEP license.³

² However, FI would have to allocate regulatory capital if the loan fell into arrears.

³ In the sample of this study, four platforms operated only with partner FI, one operated only as a SEP, and one started to operate with a partner FI and then became a SEP.

Data description

Most P2P loans come from SEP or Fintechs that operate with partner banks that record the loans on their balance sheets. Information on these loans is available in the SCR, the main source of data for this box.

However, a small percentage of P2P loans are not registered in the SCR, as they were made by platforms operating through a partner bank that does not write the loan on its balance sheet. To reduce biases related to the unavailability of these data in the SCR, loan data from the largest P2P platform in this situation were obtained via web scraping.⁴

For the purpose of comparing banks and P2P platforms, the focus should be on working capital loans for MSMEs, since they comprise almost the entire P2P market. The data series starts in 2016, when P2P activity began in Brazil, and ends in February 2020, before the Covid-19 pandemic affected the market.

The database prepared for this study contains information on the characteristics of the loan, such as the interest rate, volume, maturity, and ex-ante risk rating of the borrower. Financial institutions classify each loan into one of ten risk levels: AA-A-B-C-D-E-F-G-H-HH. Each risk level is linked to a probability of delinquency and must be based on information and criteria that can be monitored by the regulator. This rating is the benchmark for capital requirements and loss provisions set by the regulator for all FI.

However, P2P platforms and their partner banks do not have to make provisions for these loans, as they do not assume their credit risk. For this reason, the platforms' risk ratings are not informative. In an attempt to avoid this problem, the company's rating is now based on the loan ratings of traditional FI. For each company, for each month, the SCR checks the worst rating recorded by traditional FI for that company's outstanding loans. This rating should better reflect the likelihood of delinquency because it is subject to BCB's rules on possible loan delays. A disadvantage of this rating is that it is impossible to observe the ratings for companies without outstanding loans. In Table 4, the rating based on loans in progress is used, since this regression includes P2P loans, and the ex-ante rating of these loans is not available. In Tables 3 and 5, the ex-ante risk rating available in the SCR is used, since these regressions do not include non-P2P loans.

Characteristics of P2P clients

Table 1 shows descriptive statistics for clients of P2P platforms and banks, showing company size, risk, lending volume, interest rate, and number of installments. P2P borrowers are, on average, smaller and riskier than bank borrowers. They obtain relatively higher unconditional interest rates, as shown by the volume weighted averages in Panel B of Table 1, although this difference is not statistically significant. Table 2 explains additional firm-specific characteristics, such as economic activity and employee profile according to the Annual Report on Social Information (RAIS). P2P clients are younger companies with a relatively greater presence in information technology and professional, scientific, and technical services. They have younger employees with more years of formal education than traditional FI clients. Overall, P2P clients can be characterized as companies with expertise in technology.

4 Web scraping is the process of collecting structured data from web pages in an automated way.

Table 1 – Sample loan statistics

	Large private banks	Non-large private bank	Federal public bank	State public bank	Credit union	P2P
Panel A - Types of creditors (arithmetic mean)						
% medium-sized firms	0.13	0.47	0.14	0.06	0.06	0.09
% small firms	0.52	0.41	0.44	0.61	0.40	0.79
% micro firms	0.34	0.12	0.43	0.33	0.54	0.12
% <i>rating</i> AA/A/B	0.43	0.32	0.47	0.56	0.49	0.31
% <i>rating</i> C/D/E	0.53	0.50	0.49	0.35	0.45	0.65
% F-HR <i>rating</i>	0.04	0.18	0.04	0.08	0.06	0.04
Interest rate (%)	59.16	43.16	40.10	49.65	34.66	36.73
Term (months)	20.55	11.79	25.31	15.91	20.20	20.63
Volume (R\$)	83,072	294,615	60,773	24,498	39,298	94,991
# of companies per borrower	10.60	35.36	7.31	6.40	22.97	1.34
Panel B - Types of creditors (volume-weighted average)						
% medium-sized firms	0.61	0.83	0.48	0.47	0.35	0.22
% small firms	0.31	0.11	0.34	0.43	0.43	0.73
% micro firms	0.08	0.06	0.18	0.10	0.22	0.05
% <i>rating</i> AA/A/B	0.41	0.35	0.41	0.41	0.41	0.26
% <i>rating</i> C/D/E	0.54	0.55	0.55	0.49	0.52	0.67
% F-HR <i>rating</i>	0.06	0.10	0.04	0.10	0.08	0.07
Interest rate (%)	26.54	21.67	29.11	32.21	27.43	29.16
Term (months)	26.25	17.39	36.00	23.72	25.39	23.32
# loans	2,123,354	135,618	605,516	179,025	776,673	3,388
# institutions	4	60	4	5	750	6

/ This table shows the average working capital loans broken down by type of lender. The data is from the SCR. Each risk level AA-A-B-C-D-E-F-G-H-HH is directly linked to a default probability range and is calculated by every financial institution based on information and criteria that can be monitored by the BCB.

Table 2 – Firm statistics

	Exclusive clients of traditional FIs		P2P clients	
Loan characteristics	Average	Standard deviation	Average	Standard deviation
Interest rate	47.88	30.78	42.06	22.98
Term (years)	1.81	0.94	1.80	0.62
Volume (R\$)	65,100.74	498,290.80	99,292.33	244,832.90
Characteristics of firms	Average	Standard deviation	Average	Standard deviation
Company revenue (millions)	51.40	13.60	4.03	16.20
Age of the firm (years)	10.69	9.76	9.43	8.34
Banking relationship (years)	6.30	8.08	2.99	4.47
Number of employees	13.86	110.52	18.50	56.10
Years of employee education	11.46	1.88	12.34	1.95
Median age of employees	34.31	8.05	33.25	7.24
Payroll (R\$)	25,399.18	295,686.40	38,732.98	116,593.00
Average salary per employee (R\$)	1,463.98	651.53	1,842.19	1,027.96
Economic activities	Observations	Frequency (%)	Observations	Frequency (%)
Agriculture, forestry and fishing	5,927	0.46	11	0.38
Mining	1,447	0.11	2	0.07
Manufacturing	132,310	10.34	337	11.70
Construction	55,988	4.37	103	3.58
Trade (wholesale and retail)	734,066	57.36	1,096	38.04
Information and communication	23,000	1.80	318	11.04
Real estate, finance and insurance activities	22,161	1.73	64	2.22
Professional, scientific and technical activities	52,392	4.09	296	10.27
Other service activities	123,110	14.68	290	13.15
Public administration	64,754	5.07	275	9.54

/ This table shows descriptive statistics of traditional financial institutions and characteristics of P2P platform borrowers. Data from the Central Bank combined with the RAIS (Annual Social Information Report) labor database. The classification of Economic Activities comes from the CNAE (National Classification of Economic Activities).

Interest rates obtained by clients at banks before P2P loans

Before directly comparing the loan rates of banks and P2P platforms, it is important to analyze what interest rate levels clients used to find at traditional FI before becoming P2P clients. The following econometric specification is estimated:

$$Int. Rate_i = \beta(Future\ P2P\ Client)_f + \gamma X_i + \tau_b + \tau_{fc} + \tau_{ts} + \tau_{rs} + u_i \quad (1)$$

The subscript i refers to the loan from FI b to company f in period t . The sample contains only loans from traditional FI. The interest rate on the loan is the dependent variable. The dummy variable “Future P2P Client” indicates whether the company will have a P2P loan in the future but has not yet borrowed from the platform, i.e. the dummy captures the interest rate charged by banks to clients before they migrate to a P2P platform. X_i is a vector of control variables: the logarithm of the loan size, the term and the age of the company. τ_b are financial institution fixed effects, τ_{ts} time company size fixed effects x , and ex-ante company size x risk rating fixed effects τ_{rs} . The fixed effects τ_{fc} control for two characteristics of the company: economic activity (industry) and location (municipality).

Results are shown in Table 3 and indicate that companies that migrate to the P2P sector used to pay interest rates around 1.3 p.p. higher at traditional FI before migrating. This result is stronger for micro-enterprises, which used to pay interest rates around 4.2 p.p. higher, while small companies paid rates around 0.7 p.p. higher, already adjusting for such factors as size, risk, sector, location, and age. No significant results are found for medium-sized clients. A more saturated variation of specification (1) can be found in Table A1⁵ of Ornelas & Pecora (2022).

Table 3 – Interest rates for future P2P clients at traditional FIs

	(1) Interest rate	(2) Interest rate	(3) Interest rate	(4) Interest rate
Future P2P client	1.2934*** (5.58)	4.1806*** (6.24)	0.7079** (2.22)	0.3980 (1.28)
Firm size	All	Micro	Small	Average
# firms	1,443,912	816,235	719,832	140,614
# future P2P clients	1,901	613	1,375	423
# IFs	821	768	742	620
Average interest rate	58.02	68.67	54.27	37.79
Number of observations	4,734,402	1,917,395	2,218,868	597,533
Adjusted R ²	0.6843	0.7240	0.6386	0.5629

/ This table shows the results of the regression at loan level (1). The sample includes only bank loans. The *dummy* "Future P2P client" is equal to 1 if the firm borrows from a P2P platform in the future. The control variables contained in X_i are the loan maturity (years) and the logarithm of the loan volume. Bank, industry $\times$ municipality, firm size $\times$ time and *rating* $\times$ firm size fixed effects are employed. Standard errors clustered at bank level. The *t*-statistics are shown in brackets. Coefficients that are statistically significant at 1%, 5% and 10% are shown with ***, ** and *, respectively.

Therefore, future P2P clients used to pay higher interest rates at traditional lenders before their first P2P loan. In other words, P2P platforms capture clients who paid particularly high interest rates at traditional FI. The following subsection tests the hypothesis that the P2P sector is a cheaper alternative to traditional lenders.

Do P2P clients pay lower interest rates?

This section makes a direct comparison of the interest rates of traditional FI with those of P2P platforms. The following regression is used:

$$Int. Rate_i = \beta (P2P Loan)_i + \gamma X_i + \tau_f + \tau_{ts} + \tau_{rs} + u_i \quad (2)$$

where interest rate is the dependent variable, "P2P loan" is a dummy variable that indicates the loan i is from a P2P platform, X_i is a vector of loan variables (log of loan volume and maturity in years) and $\tau_f, \tau_{ts}, \tau_{rs}$ are respectively fixed effects of company, time $\times$ firm size and rating⁶ $\times$ company size.

The use of company fixed effects (τ_f) makes it possible to compare the interest rates on loans from the same company when it borrows from traditional FI and from P2P platforms, thus capturing the unobserved heterogeneity of the company.

5 In this specification, interactive fixed effects of five variables are added: municipality $\times$ industry $\times$ company's age quintiles $\times$ formal education level of the company's employees $\times$ company's employees age quintiles.

6 It is worth noting that the P2P risk rating used in this regression is based on all other outstanding loans for that company, as described above. Hence, the absence of P2P lenders ratings is overcome, but the sample is reduced to those companies with outstanding loans.

Column 1 of Table 4 shows the results of this specification. There is evidence that companies find better loan conditions on P2P loan platforms. Compared to traditional FI, companies borrow at a rate around 4 p.p. lower in P2P, controlling for the set of control variables and fixed effects.

Table 4 – Interest rates by type of financial institution

	(1) All	(2) Large Private	(3) Non-large private	(4) Federal public	(5) Local public	(6) Cooperative
P2P lending	-3.9651** (-2,16)	-7.3904** (-2,64)	-0.0587 (-0,06)	-0.2989 (-0,27)	4.2845*** (3,51)	-0.4254 (-0,52)
Firm size	All	All	All	All	All	All
Firm (E.F.)	Yes	Yes	Yes	Yes	Yes	Yes
Time × firm size (E.F.)	Yes	Yes	Yes	Yes	Yes	Yes
Rating × firm size (E.F.)	Yes	Yes	Yes	Yes	Yes	Yes
# firms	389,631	214,247	11,002	87,925	20,377	84,316
% micro firms	0.29	0.26	0.12	0.34	0.22	0.41
% small firms	0.53	0.56	0.34	0.47	0.69	0.49
# traditional financial institutions	760	4	54	4	5	686
# P2Ps	6	6	6	6	6	6
Average interest rate	51.51	62.01	40.02	41.67	54.20	35.64
# observations	2,032,104	1,042,112	82,384	348,256	102,670	365,300
# fintech loans	1,672	1,403	796	1,000	734	942
Adjusted R ²	0.8408	0.8809	0.8514	0.8068	0.8286	0.6587

/ Each column shows a different sample covering a specific type of bank and P2P platforms. The "P2P loan" dummy indicates whether the loan is from a fintech rather than a traditional bank. The control variables in X_i are the loan maturity (years) and the logarithm of the loan volume. Firm, time × firm size and rating × firm size fixed effects are applied. The first column only includes loans from firms that had any outstanding loans in the banking system at the time. Standard errors clustered at bank level. The *t*-statistics are shown in brackets. Coefficients that are statistically significant at 1%, 5% and 10% are shown with ***, ** and *, respectively.

In addition, the sample is broken down considering each type of FI. This breakdown is made in columns (2) to (6) of Table 4. It provides an enlightening result: P2P platforms offer a lower risk-adjusted price only when compared to large private banks (around 7.4 p.p.) as seen in column (2). For federal state-owned banks, credit unions, and not-so-large private banks, interest rates are statistically similar to those of P2P platforms. As for regional state-owned banks, the coefficient shows that they charge a lower interest rate (around 4.3 p.p.) than P2P platforms.

Do incumbent banks try to win back former clients?

In previous sections, evidence indicates that P2P clients are smaller and more prone to risk than the average pool of bank clients and that a high percentage of P2P clients (96%) have already had a previous loan with a bank, indicating that P2P platforms and banks are competing for the same clients. In this context, the entry of P2P loans should generate a reaction from incumbent banks. Traditional lenders could reduce their interest rates to win back borrowers who have migrated to P2P platforms.

This section tests this hypothesis. The idea is that if traditional FI and P2P platforms are substitutes, the traditional FI will react to the lower prices practiced by P2P by offering lower rates to clients who have migrated to the platforms.

As in Table 4, only loans from traditional lenders are used. The date of the first P2P loan is taken as the date of the treatment effect, i.e. after this date, incumbent banks should react by reducing rates. The econometric specification uses FI-company () fixed effects, focusing on the time variation (before and after treatment) for the same FI-company pair. The econometric specification is as follows:

$$Int.Rate_i = \beta (After\ 1^{st}\ P2P)_i + X_i + \tau_{bf} + \tau_{ts} + \tau_{rs} + u_i \quad (3)$$

The dummy variable “After 1st P2P” indicates a bank loan after the company borrowed from a P2P platform for the first time. The specification also has fixed effects for company size x time (τ_{ts}) and company size x rating (τ_{rs}).

Column (1) of Table 5 shows the result. The coefficient of the dummy variable in column (1) indicates that once companies borrow from a P2P platform, they obtain an interest rate reduction of approximately 1.3 p.p. on subsequent loans with traditional lenders. This result suggests that, to win back fleeing borrowers, traditional FI may react to P2P competition by reducing their interest rates.

Table 5 – Interest rates after P2P lending

	(1) Interest rate	(2) Interest rate	(3) Interest rate
After 1 st P2P	-1.3766** (-2.14)		
After 1 st P2P $\times$ recent relationship		-1.6350** (-2.12)	-2.5141** (-2.26)
After 1 st P2P $\times$ old relationship		-1.0118 (-1.20)	-0.6162 (-0.55)
Firm sizes	All	All	Micro and small
Firma $\times$ financial institution (E.F.)	Yes	Yes	Yes
Time $\times$ firm size (E.F.)	Yes	Yes	Yes
Rating $\times$ firm size (E.F.)	Yes	Yes	Yes
# firms	336,262	336,262	299,084
# firms treated	446	446	337
# firms (micro) treated	68	68	68
# firms (small) treated	278	278	278
# firms (average) treated	115	115	0
# financial institutions	703	703	677
Number of observations	1,691,742	1,691,742	1,418,495
Adjusted R ²	0.8795	0.8795	0.8777

The control variables in X_i are: loan maturity (years) and the logarithm of the loan volume. Fixed effects of firm $\times$ financial institution, time $\times$ firm size and rating $\times$ firm size are applied. The term “After 1st P2P” indicates a bank loan after the firm has borrowed from a P2P platform. The dummy “Recent relationship” is equal to 1 if the firm borrowed from the bank in the six months prior to the date of the new post-P2P loan. Standard errors clustered at bank level. The *t*-statistics are shown in brackets. Coefficients statistically significant at 1%, 5% and 10% are shown with ***, ** and *, respectively.

Other factors, different from the competition channel, could be driving these better loan conditions found by P2P borrowers at traditional banks. For example, banks can observe when a company takes out a P2P loan and interpret it as a positive sign for the quality of borrowers. To rule out these possibilities and further consolidate the competition channel, companies were differentiated based on their relationship with FI and tested whether the companies with the most recent loans from their previous bank are the ones that obtain the cheapest post-P2P loans. This result would point to a strategic action by FI to win back their essential clients rather than other factors such as signaling or improvements in their credit conditions.

Equation (3) is therefore extended by adding an interaction of “After 1st P2P” with dummy variables indicating whether the client took out a loan with the same bank recently or a long time ago. This strategy was adopted by Ongena *et al.* (2020) with data from the Italian market, where the treatment in this case was the issuance of minibonds. Suppose that the results are only valid for companies with more recent relationship with banks.

In this case, they point to greater bargaining power of companies over banks, rather than other factors such as signaling or improvements in their credit conditions. The econometric specification is as follows:

$$Int. Rate_i = \alpha + \beta_1 (After\ 1^{st}\ P2P\ x\ Old)_i + \beta_2 (After\ 1^{st}\ P2P\ x\ Recent)_i + X_i + \tau_{bf} + \tau_{ts} + \tau_{rs} + u_i \quad (4)$$

The specification is similar to Equation (3), except that the term “After the 1st P2P” interacts with two dummy variables: “Old” and “Recent”. The “Recent” dummy is equal to 1 if the company borrowed from the bank up to six months before the date of the new post-P2P loan. The “Old” dummy is equal to 1 if the company borrowed from the bank more than six months before the date of the new post-P2P loan.

Column 2 of Table 5 shows the results. Companies with more recent ties to banks are in fact the ones that obtain a lower subsequent rate, around 1.6 p.p., which is statistically significant. Older relationships also have a lower subsequent rate, around 1 p.p., but this is not statistically significant.

Since the results in Table 3 show that only small and micro-enterprises used to pay higher interest rates at traditional banks, column (3) of Table 5 displays the estimation restricted to these companies, i.e., medium-sized companies are excluded. In this case, the recent relationship coefficient after the first P2P loan is even higher, at around 2.5 p.p.

It should be noted that this analysis focuses on the reaction in interest rates, but other unobserved variables may be relevant. For example, the quality of the services provided may be important, as may the offer of other financial services.

Conclusion

This box analyzes the characteristics of P2P platforms and the competitive reaction of traditional FI. First, companies that are clients of P2P platforms are characterized. They are smaller, more risk-prone, younger companies, with younger and more educated employees than companies that are clients of traditional FI.

These companies also used to pay higher fees at traditional FI before becoming platform clients. When interest rates of P2P platforms are compared with those of traditional FI, the finding is that P2P platforms offer lower interest rates than large private banks. Finally, the competitive reaction to the entry of P2P Fintechs is analyzed. P2P clients find cheaper loans at traditional FI after taking out their first loan on the platforms, indicating a strategic reaction by banks to keep their clients. All regressions were performed with loan-level data.

Results suggest that, in credit markets dominated by a few banks, P2P platforms have great potential to increase welfare by improving credit conditions for smaller players overlooked by the traditional banking market. Ornelas and Pecora (2022) develop and estimate a structural model of demand for credit to provide intuition for the empirical results and measure welfare effects. The model describes the mechanism of how a peculiar competitor, such as a P2P platform, can force a broad strategic response from banks. In a counterfactual experiment using the model, P2P platforms are removed from the markets and social welfare is estimated from the moment they have entered the markets. Without competition from P2P platforms, the interest rates charged by banks increase substantially, especially for more risk-prone borrowers.

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Box 6 – Evolution of concentration levels in the digital investment platforms market

Introduction

Customers can buy securities issued by several financial institutions on digital investment platforms. The recent consolidation of this market brings up an important and still under-explored topic; the competition assessment, which can be seen from an intra-platform or inter-platform perspective. This box aims to describe the relationship between the rates of return of the main bank funding instruments traded in digital investment platforms and the consolidation movement in this market. Specifically, Banking Deposit Certificates (CDB), Real Estate Bills (LCI) and Agribusiness Credit Bills (LCA) are investigated when trading takes place on these platforms. The analysis focuses on the results generated by market consolidation for the investor's platform side, rather than for both the investors and issuers sides.

Context

Since 2010, the operations of securities brokers in Brazil have been based on the American model of “investment supermarkets”, with transactions being carried out on online investment platforms. As in a supermarket, brokers have become a place where final consumers (investors) have access to financial products from a variety of providers, such as banks, independent asset managers, private security issuers, etc.

This new brokers' operating model contrasted with the traditional model of offering products and services based on a closed architecture, in which an institution (e.g., a bank) only sells its own products (e.g., a CDB). As a result, competition for financial resources has intensified, with financial product providers now competing for resources in the same operating environment, provided by the investment platform. At the same time, there has been an increase in competition between platforms, due to newcomers, the reaction of incumbent companies¹ and the reduction of barriers of entry for new providers, since the structuring of large and costly customer service networks has become unnecessary (CADE, 2017).

When brokers offer their clients financial products from different issuers, they are acting as open² two-sided³ platforms. Open two-sided platforms can generate gains for all participants. By offering products from different issuers in the same environment, there are economic gains which are distributed to both investors and financial products providers. For investors, it gives them access to a greater variety of financial products, which makes easier to match the investor's profile with the characteristics of the products on offer and giving better return rates on the amounts invested. For fund raisers, the main benefits are the distribution costs reduction for

¹ Incumbents are traditional companies with established operations in a given market.

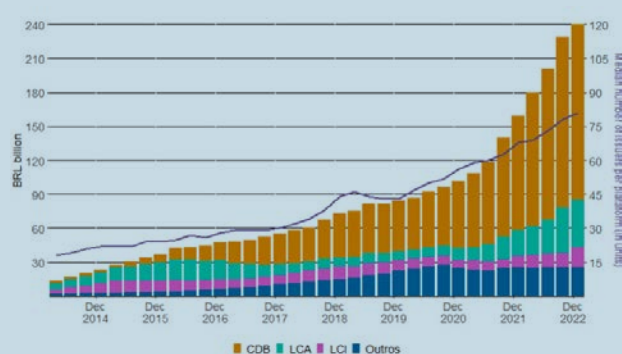
² The distribution of third-party funds/assets can take place through: i. closed platforms, in which the distributor only sells shares of funds managed and/or assets issued by its economic group; or ii. open platforms, in which the distributor also sells shares of funds managed and/or assets issued by third parties (CADE, 2020).

³ Two-sided or multi-sided markets are defined as markets in which one or more platforms allow interaction between final users and try to get them “on board” by charging each side properly (ROCHET; TIROLE, 2006).

financial products and the funding stability, due to the spreading out of the client base and the longer maturities of securities (CADE, 2017; BCB, 2019).

Intermediated funding (private securities issuance through open investment platforms) has become relevant in the SFN, especially for banks that do not have a branch network and have credit as their main activity (BCB, 2019). According to B3 data, the stock of intermediated funding by financial institutions increased 52.8% between December 2021 and December 2022, from BRL 159 billion to BRL 243 billion (Graph 1), representing 6.4% of total bank funding in the country⁴ in December 2022. This amount is concentrated in the top four intermediaries in the market, which together are responsible for 82% of the total stock of intermediated funding. Moreover, the number of issuers per platform in the period increased, with its median going from 18 issuers per platform in March 2014 to 81 in December 2022.

Graph 1 – Evolution of the stock of intermediated funding and the number of issuers per platform



Source: self-elaboration, based on B3 data.

If, on the one hand, the development of platforms tends to increase competition in the bank funding market, on the other hand, concentration within the open platform segment has the potential to restrict the benefits generated by this type of structure, both for consumers and for financial products providers. With less competition between platforms and, consequently, the increase in market power of some agents, there can be consistent increases in the discount on transactions to raise the platform's remuneration. This can both raises the cost of funding for issuers and reduces the remuneration paid to investors, which causes negative impacts on both sides of the market.

Notwithstanding the possible adverse effects of market concentration, platforms need to be large enough to offer a wide variety of securities in their trading structure. This benefits the market in at least two ways (CADE, 2021): i. by increasing competition between the several providers on the same platform (competition within the platform), which makes it possible to offer better rates of return to consumers; and ii. by strengthening the platforms so that they can compete with traditional banking agents in offering bank funding instruments, which favors the reduction of the distribution cost, especially for banks that do not have branch networks.

Brief literature review

In the modern digital economy, platform-based business models are becoming predominant in several economic sectors, such as telecommunications, e-commerce, and financial services. For the latter, there has been a proliferation of digital financial platforms (DFP), defined as multilateral information technology systems that

⁴ Considering funding through the following instruments: term deposits, bills, box operations, subordinated debt, and Structured Operations Certificates (COE).

connect a network of participating agents to each other and, at the same time, link these agents to the operators of each system to make it possible to carry out financial transactions (CROXSON *et al.*, 2022).

Digital investment platforms are DFP set up to build an underlying operating system that connects individual investors to financial products and market information (ZETZSCHE *et al.*, 2020), i.e. they act as matchmakers between final consumers and the financial instruments providers, such as banks, brokers, and private securities issuers. They are considered two-sided platforms or even multi-sided platforms which, by bringing together two or more economic agents closer together, reduce costs (transaction, research, switching, fixed, and marginal costs), reduce information asymmetries, and support savers find investments that are more suitable to their preferences (FEYEN *et al.*, 2021).

DFP activities have high economies of scale,⁵ since after the initial investment to develop the operating interface, new customers are connected at a low marginal cost. This feature means that investment platforms are more commonly used by smaller companies, since they do not have the financial capacity to develop their own trading software or suitable physical structures for distributing their assets. For these companies, the use of investment platforms is a way of reducing their fixed costs and, consequently, increasing their results (ZETZSCHE *et al.*, 2020).

A key aspect in the analysis of multi-sided platforms is externality, classified by Rochet and Tirole (2006) into two types: usage externality and membership externality. Both are associated with the concept of network effect, which refers to the value added to a product traded in a business network due to the addition of a new user to the network (ZETZSCHE *et al.*, 2020). Usage externality occurs when the sides of the platform act together, i.e. when they effectively use the platform together. The platform increases the usage externality to the extent that it makes it easier for agents to meet, so that they prefer to carry out the transaction through the platform rather than using other means. Usage externalities increase with the agents' decisions to use the platform, which in turn depend on the service fees charged by the platform.

Membership externality, in turn, is formed when the value generated for one side increases with the number of agents participating on the other side (EVANS; SCHMALENSEE, 2013). Thus, for example, in the investment platform market, the service provided by the platform is more valuable to consumers the greater the variety of securities offered by issuers. This phenomenon results in the so-called positive feedback loop, i.e., the feedback on users' earnings, in which the greater number of agents on one side attracts more and more agents on the other side, promoting the continuous growth of the business.

In the initial development phase of a platform market, there is intense competition to capture the membership externality, with platforms trying to differentiate themselves to attract as many participants as possible from at least one side of the market. As the number of participants increases, so does the use of the network (usage externality), so that it becomes more attractive to other members, who, by joining the network, further increase their activity (membership externality), creating an "attraction loop" process. In a later phase of market development, this process can create a winner-takes-all situation, in which the platform that attracts more users in the initial phase establishes a natural monopoly. Once the monopolistic position is established, the platform can charge higher prices and keep the market in a sub-optimal equilibrium (CROXSON *et al.*, 2022).

Another approach relates the conditions of competition and prices between platforms to the market structure of the product(s) they transact (KARLE; PEITZ; RESINGER, 2020). The authors found a negative relationship between market concentration and fees in the platform industry. In markets with fiercer competition, with homogeneous products, sellers try to offer their products on different platforms, so that buyers are not informed of all the offers available, and competition is reduced. This market segmentation allows platforms to coexist and

⁵ Economies of scale refer to the reduction in unit production costs as a result of producing units of a given good in large quantities (ZETZSCHE *et al.*, 2020).

charge their participants high fees. In contrast, in markets with less competition, with differentiated products, buyers are informed about all the offers available and platforms compete via price to become dominant.

Concentration in the digital investment platform market and effects on the interest rate on intermediated bank funding

Quarterly data provided by B3 for the period between March 2014 and December 2022 is used to investigate some of the effects of the concentration process in the digital investment platform market on CDB, LCI, and LCA rates traded on platforms.⁶ The amounts correspond to the stocks of securities held in custody at B3 at the end of each month, expressed in BRL. When necessary, the operations interest rates were transformed to correspond to the percentage of the CDI (Interbank Deposit Certificate) rate, regardless of their original indexers.

As there is no information available on the means used to trade these securities, for simplification they were all considered to be traded digitally, i.e., all security holders were classified as digital financial platforms.

Evolution of inter-platform competition

To verify the recent evolution of the concentration level among the platforms, the Herfindahl-Hirschman Index (HHI) was calculated for the stock of selected bank funding securities (CBD, LCI, and LCA) held by each platform “i”, in each period “t”, by using the following formula:

$$IHH_e = \sum_{i=1}^n s_i^2$$

Where:

IHH_e = inter-platform HHI;

n = number of platforms in each period “t”; and

s = share of the stock, in BRL, of selected bank funding securities held by each platform “i” in the total of securities held by the entire market, at the end of period “t”.

The higher the HHI_e value, the greater the degree of concentration in the market. Graph 2 shows the HHI evolution in the period between March 2014 (the first period with available data) and December 2022 (the most recent period with available data), together with the number of platforms in each period. Despite some stabilization in recent years, the data shows an increase in inter-platform concentration in the period under analysis, in line with the theory of the evolution of this market, which predicts more intense competition between agents in the market’s initial periods and greater concentration in the later phases, in which the platforms differentiate themselves and become larger as they capture membership externalities.

The HHI_e rose from 969.85 in March 2014 (non-concentrated market) to 3,364.41 in December 2022 (high concentration),⁷ while the number of platforms fell by 32.6% in the period (from 92 to 62 platforms), mainly due to mergers and acquisitions.⁸

6 These are the most relevant funding instruments in terms of financial volume in the digital investment platform market. Intermediated trading means that the securities are issued by an institution other than the one listed as their custodian.

7 The HHI scale is established in the BCB’s Merger Review Guidelines, with a scale ranging from 0 to 10,000, indicating the following levels of market concentration: I – below 1,000 – non-concentrated; II – from 1,000 to 1,800 – moderately concentrated; and III – above 1,800 – highly concentrated (BCB Statement 22.366, of April 27, 2012).

8 Between June 2014 and December 2022, the BCB analyzed 34 mergers in which at least one of the parties was a securities broker or distributor.

Graph 2 – Evolution of the inter-platform HHI and number of platforms



Source: self-elaboration based on B3 data.

The increase in the securities stock (Graph 1), coupled with the increase in the HHI and the decrease in the number of platforms (Graph 2), suggests that some platforms are concentrating the custody of bank funding securities over the period analyzed. This means that the platform market has been growing in Brazil, but some platforms are capturing most of this growth by concentrating resources in their structures and acquiring competitors.

This interpretation is reinforced by the analysis of the evolution of the Concentration Ratio of the top four institutions operating in the market (CRC), calculated by the sum of the market shares of these institutions in the total stock of securities held in custody by all platforms. Graph 3 shows the evolution of this indicator over the period, from 53% in March 2014 to 82% in December 2022.

Graph 3 – Evolution of the Concentration Ratio (CR4) in the investment platforms market



Source: self-elaboration based on B3 data.

This scenario shows that the platform market in Brazil is maturing and is in line with the theoretical premises that suggest that, as the market develops, the platforms that are most effective at capturing usage and membership externalities in the initial phase of the process tend to become dominant in the following phases. The regulator must monitor this evolution and adopt targeted policies, if necessary, to avoid a winner-takes-all situation, in which the platform that attracted the most users in the initial phase of market development establishes a natural monopoly with adverse impacts on the balance between agents.

Investigation of the relationship between funding securities' interest rates and intra-platform competition

From the investor's (user of the platform) viewpoint, it is expected that the growth of the platforms will boost competition between securities providers and, as a result, the return rate on capital invested will rise. To assess this hypothesis, it is defined the concentration indicator between the issuers operating on each platform, called the intra-platform HHI (IHH_i):

$$IHH_i = \sum_{j=1}^n s_{j(i)}^2$$

Where:

IHH_i = intra-platform HHI;

n = number of issuers in each platform; and

s = share of the stock, in BRL, of selected bank funding securities issued by each institution "j" and held in custody on platform "i" in the total securities held by platform "i" at the end of period "t".

Table 1 shows the descriptive statistics for the variables average funding rate, weighted by the value of the securities stock of each issuer held in custody on each platform, and the HHI calculated for each platform, considering the period from March 2014 to December 2022. The statistics are presented for three groups of platforms, built according to the HHI calculated in the quarter and following the concentration criteria established in the BCB's Merger Review Guidelines.⁹

Table 1 – Descriptive statistics of intra-platform concentration and interest rate

Market	Interest Rate					Average HHI
	Mean	Median	Standard Deviation	Minimum	Maximum	
Unconcentrated	115.9	108.0	27.3	84.4	333.9	771.2
Moderate concentration	109.5	101.8	22.7	80.7	247.5	1,344.4
High concentration	109.2	99.4	43.0	38.3	722.9	3,999.6

Source: Own elaboration based on data from B3.

Table 1 shows that the central tendency measures (mean and median) of the funding securities' interest rate analyzed decrease as the concentration level of the group of institutions increases. This suggests a negative relationship between the funding interest rate and intra-platform concentration index variables, which allows the proposition that platforms with a greater variety of issuers on their catalog (less concentrated) tend to offer better rates of return to investors.

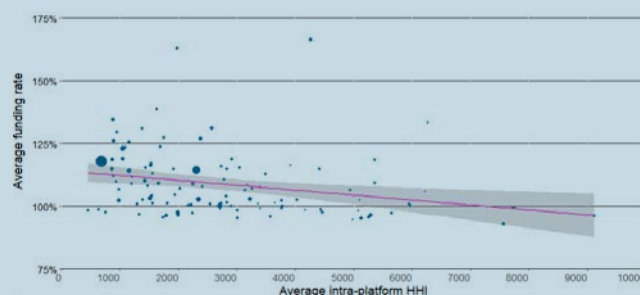
To explore this hypothesis, Graph 4 relates the average funding rate, weighted by the value of the securities stock of each issuer held in custody on each platform, with the average HHI of each platform (arithmetic mean for the entire period of analysis). Only institutions with an average HHI of less than 10,000 were considered, i.e., with at least two different issuers over the entire period, since the aim is analyzing competition within the platform. In addition, when calculating the average interest rate on securities, long-term securities were

⁹ As such, a non-concentrated market was defined as a group of institutions with a HHI below 1,000 on the base date, a moderately concentrated market was defined as a group of institutions with a HHI greater than or equal to 1,000 and less than or equal to 1,800 on the base date and, finally, a highly concentrated market was defined as a group of institutions with a HHI greater than 1,800 on the base date.

disregarded, i.e., those with maturities of more than 720 days, so to compare securities with similar maturities (only short-term ones).

The slope of the trendline (in blue, with the gray shading representing the 95% confidence interval) indicates a negative (non-causal) relationship between the average security interest rate and the average HHI. This result may be due to several factors, in addition to concentration levels, such as the greater dispersion of risk and return brought about by a greater number of issuers on a given platform; the possible selectivity of platforms with greater concentration; and, finally, the specific characteristics of the platforms' operations.

Graph 4 – Intra-platform concentration and average security interest rate



Source: self-elaboration based on B3 data.

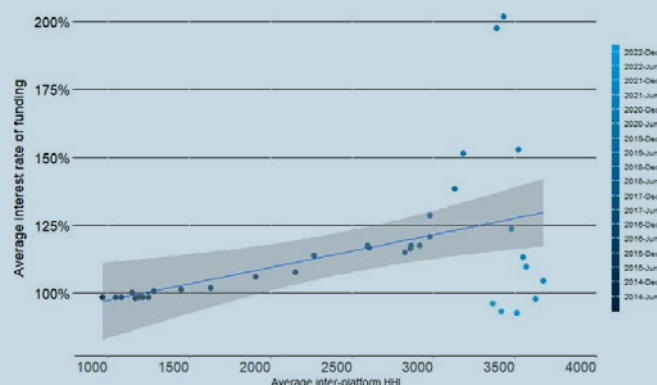
Investigation of the relationship between funding securities' interest rates and intra-platform competition

To investigate the relationship between inter-platform concentration and the funding rate of the securities under analysis, the variable average funding rate, weighted by the value of the securities stock held in custody on each platform in each quarter, was related to the HHI_e calculated for the same period.

Graph 5 shows that in the period between March 2014 and December 2019 the higher levels of concentration among platforms were associated with higher securities' rates of return, which is a favorable situation for individual investors. This relationship suggests that the digital investment platform market has been consolidating since 2014, with agents competing and trading securities that offer better return rates with the aim of gaining a greater market share.

However, in the subsequent period, this relationship is no longer observed. One possibility could be the effects of the stimulus and tightening of monetary policy in the period.

Graph 5 – Inter-platform concentration and average funding rate



Source: self-elaboration based on B3 data.

Finally, Graph 6 shows the evolution of the average interest rate of funding instruments traded on platforms and the Selic rate in the period between March 2014 and December 2022. As can be seen, there was a significant dispersion in the average interest rate on funding instruments and a significant drop in the Selic rate in the 2019-2020 period and a subsequent return to pre-2020 conditions. In addition to the change in the Selic rate, other macroeconomic variables were affected, which makes difficult to analyze any trends observed in the post-2020 period.

Graph 6 – Evolution of the average funding rate and the Selic rate



Source: self-elaboration based on data from the B3 and the BCB.

Note: the boxplot shows the median (dash inside the box), the 1st and 3rd quartiles (bottom and top of the box), the outliers (dots), the minimum value without outliers (end of the lower line segment), and the maximum value without outliers (end of the upper line segment). The minimum is calculated as the 1st quartile minus 1.5 times the interquartile range. The maximum is calculated as the 3rd quartile plus 1.5 times the interquartile range. To improve the visualization of the data, the average funding rate was capped at 300% of the CDI to eliminate some of the outliers.

Conclusion

This box provides an exploratory analysis of the consolidation of the digital investment platform market in Brazil and the return rates on intermediated bank funding instruments. The analysis was restricted to the securities with the greatest relevance in the total stock of intermediated funding (CDB, LCI, and LCA issuances through open investment platforms), for the period from March 2014 to December 2022.

Analysis of the data revealed that, in the period analyzed, there was a strong growth in the stock of these securities, as well as in the levels of “inter-platform” and “intra-platform” concentration. At the same time, there was a reduction in the number of operating platforms in the market, which indicates a concentration of resources in large players and reveals that some platforms are growing consistently and concentrating resources in their structures.

The analysis shows a negative correlation between the level of intra-platform concentration and the average interest rate of securities. This suggests that increased competition between issuers on a platform benefits the investor, who may find an offer of securities with higher return rates.

Conversely, regarding the relationship between inter-platform concentration and the average interest rate of funding instruments, it was observed that the average funding rate was positively related to the level of concentration in the period up to the end of 2019, in a move towards consolidation of the platform market. However, it was not possible to observe the maintenance of this relationship from 2020 onwards.

The subject of this study deserves further exploration, preferably using more granular data. More robust tests¹⁰ are needed to properly explore the relationships identified in this exploratory study, but the results found here suggest that the regulator should monitor market developments to make decisions that contribute to consumer welfare. The main challenge facing the regulator is to allow the platforms and the funding market as a whole to grow, without the market becoming concentrated on a few platforms, harming investors.

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¹⁰ Tests such as multiple regressions or panel data regressions were not performed as they are not within the scope of this box.

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Box 7 – Evolution of digital media for carrying out payment transactions in Brazil

Introduction

The use of digital media for carrying out financial transactions in Brazil increased sharply in the last decade. Several factors contributed to this growth, from the legal and infra-legal framework,¹ that led to the flourishing of markets for payment arrangements and payment institutions, to technological innovations and the introduction of Pix. The digitalization process was accelerated by the effects of the social distancing measures adopted during the Covid-19 pandemic.

This box presents and analyzes compiled data on the evolution of payment transactions carried out by digital media (alternative instruments to cash) in Brazil in the last decade, using information submitted by market participants and information collected from the infrastructures operated by the BCB.

The digital media for carrying out payments that are the subject of this analysis, include interbank and intra-bank balance transfers; credit, debit and prepaid cards transactions; and payments carried out through Pix, payment slips, agreements (for example, electricity bills, water bills etc) and direct debit (such as previously authorized automatic debit of bills and fees, interests and other charges made to the account by financial institutions). In this scenario, the trends in the use of the various electronic payment instruments in Brazil are compared, with an emphasis on Pix.

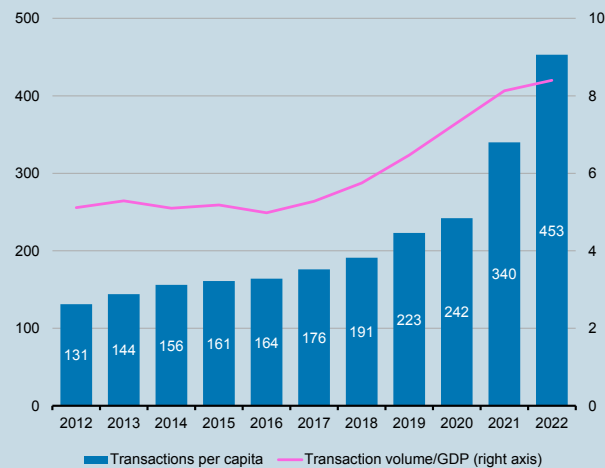
Use of digital media for carrying out financial transactions in Brazil

Three distinct moments in the use of digital media for carrying out payments in Brazil can be observed (Graph 1). Until 2016, an increase in the number of transactions *per capita*² was noticed, while the ratio between the financial volume transacted and GDP remained relatively stable. From 2017 to 2020, a significant increase in the financial volume transacted by digital media compared to the rate of growth of economic activity was observed. This phenomenon was accompanied by a faster increase in the number of transactions carried out by each individual. Finally, from 2021 to 2022, a vigorous increase in the number of transactions per capita, as well as continued relative growth in the financial volume transacted, was noted.

¹ Law 12,865, of October 9, 2013, and subsequent infra-legal regulations are the regulatory framework for the creation of payment arrangements and payment institutions. This law gave the BCB competence to regulate, monitor and supervise payment arrangements and payment institutions.

² Based on the 15 and older age group.

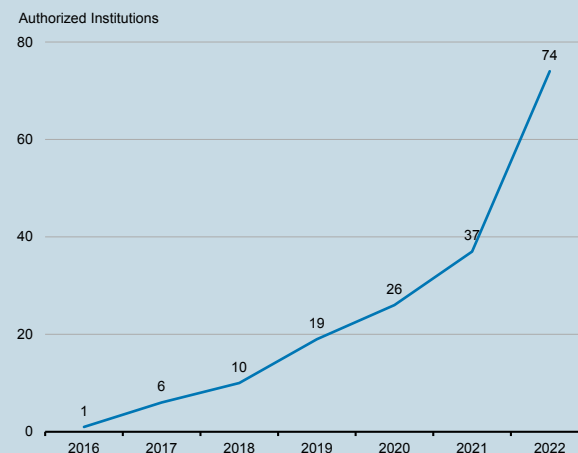
Graph 1 – Evolution of Digital Transactions



This revolution in the way payments are carried out also mirrors a continuous process of digitalization of the economy, which includes the advance of e-commerce, as well as the review and adaptation of the business model of traditional financial institutions, at the same time as FinTechs, BigTechs, large retailers and even non-financial companies have intensified their activities in the financial system.³

As of 2016, payment institutions (PIs) began to be authorized to operate by the BCB (Graph 2), with growth in the financial volume transacted and the number of transactions accelerating between 2017 and 2020.

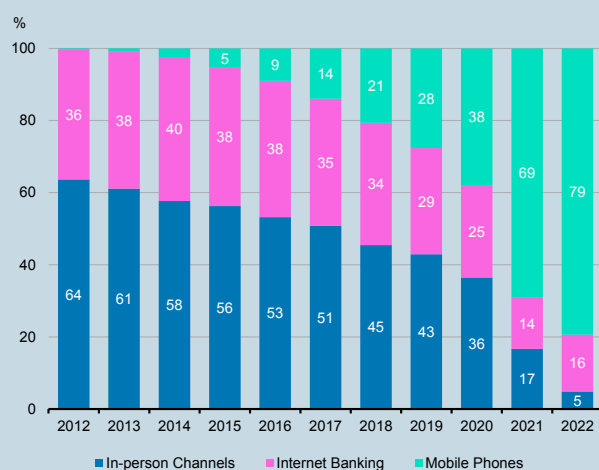
Graph 2 – Number of Payment Institutions Authorized to Operate by the Central Bank



In the same period, the use of cell phones for financial transactions began to grow (Graph 3). The proportion of use of this service channel, which in recent years has far exceeded not only face-to-face channels but also Internet Banking, represents a new phase in the digitalization of the use of the financial system by the Brazilian population.

³ 2021 Banking Report – Box 7 – New competition dynamics in the SFN and the SPB.

Graph 3 – Service Access Channels⁴
Number of transactions



/ In-person channels: branches, ATMs, service centers, banking correspondents and cooperative service points.
Products: bill and tax payments, credit transfers and Pix

The regulatory evolution in favor of competition and financial inclusion, while maintaining soundness and efficiency, also allowed the development of a payment ecosystem whose maturity led to the introduction of Pix – an instant payment scheme created and operated by the BCB – in November 2020, after fruitful interaction with several market players. Pix started off amid Covid-19 pandemic, whose unprecedented mobility restrictions and social distancing measures were already stimulating the digitalization process. In addition, the speed of adoption of this new instrument was boosted by the reduction in costs compared to other payment instruments, such as transfers (TED and DOC), payment slips and debit and prepaid cards, combined with a strategy of universalization, ease use, meeting of final users needs, among others.

Regarding the average ticket evolution for different means of payment (Table 1), data points to an intensive use of Pix and cards (especially prepaid ones) for lower-value transactions, indicating their important role in financial inclusion, leaving traditional interbank and intra-bank transfers as the main options for corporate transactions of substantially higher values. Thus, it is reasonable to assume that Pix and cards have played an important role in the digitalization process, contributing to the large increase in transactions per capita from 2020 onwards (Graph 1).

Table 1 – Average Ticket of Payment Methods

Year	Credit Card	Debit Card	Prepaid Card	Boleto/Bank payment slip	Check	Direct Debit	Interbank Transfers	Pix	Intrabank Transfers	Withdrawals
2012	110	58		1,851	1,994	934	88,639		8,542	1,055
2013	113	60		1,882	2,251	1,125	69,980		9,603	1,111
2014	114	62		1,887	2,405	904	56,552		9,379	1,003
2015	117	63		1,903	2,482	795	48,877		9,019	922
2016	115	63	457	1,989	2,531	1,221	35,434		8,165	883
2017	114	62	114	2,108	2,582	1,345	30,179		9,094	796
2018	114	62	95	2,222	2,644	908	29,623		9,693	769
2019	111	61	72	2,233	2,765	772	25,489		9,780	719
2020	119	71	42	2,060	2,894	692	18,296	851	9,737	707
2021	123	67	31	2,340	3,354	714	30,683	552	14,746	667
2022	126	64	29	2,628	3,794	744	43,336	453	19,059	777

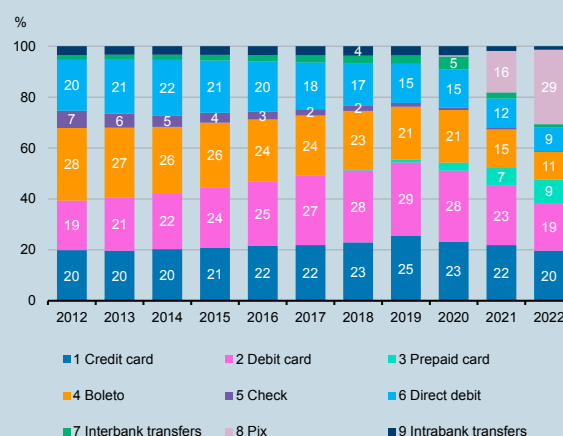
4 Physical presence channels: Bank branches, ATM, call centers, correspondents in the country, and credit union service points Products: Payment of bill/tax, Credit Transfer, and Pix.

Number of transactions by payment instrument⁵

This section aims to verify the impact of financial digitalization on the use of payment instruments. This allows us to make inferences, albeit not causal ones, about possible changes in Brazilian citizens' payment habits.

When evaluating the share of each payment instrument in the total number of financial transactions over the last decade (Graph 4), a reduction in the use of payment slips and checks and a moderate increase in debit cards were observed from 2010 to 2016. Since 2017, a faster growth in the use of cards has been noticed, possibly due to the establishment of payment institutions, which issue credit and prepaid cards.

Graph 4 – Number of Transactions
Participation by Instrument – Annual Data



As of the end of 2020, the significant growth in the use of Pix reduced the share of other means of payment and transfers in the total number of financial transactions, in relative terms. However, in absolute terms (Graph 5), the trend observed previously was maintained, with a continuous increase in the use of cards,⁶ a slight growth in direct debit, stagnation in the use of payment slips and a sharp reduction in the use of checks.

5 a. Direct debit transactions include:

- agreements with third parties – customer's previously authorized debits in their current account, relating to the payment of bills. Includes both payments to utilities (water, electricity, telephone, pay-TV etc) and to other enterprises; and
- banking relationship – debits in customers' current accounts carried out by financial institution due to tariffs charged for services rendered; interests, fees and commissions on credit operations and those relating to the sale of products or the use of services. Source: Institutions in the SPB

b. Pix: start Nov/2020. It includes purchase and transfer transactions. Source: BCB.

c. Book transfers: transfers carried out between the financial institution's clients' accounts, including those involving investments and redemptions in investment funds. Source: Institutions in the SPB

d. Interbank transfers: transfers made by TED (Electronic Available Funds Transfer), DOC (Credit Order Document) or TEC (Special Credit Transfer). Source: Institutions in the SPB

e. payment slip + agreements: in addition to transactions with payment slip, comprises transactions through agreements, which include:

- government collections: collection of taxes and social charges due to agreements signed between the financial institution and government entities (federal, state and municipal tax forms, FGTS, INSS, DPVAT, Ibama etc); and
- non-governmental collections: collections relating to agreements signed between the financial institution and private entities, except those paid through payment slips - collections from utilities; philanthropic entities; registration fees; contributions from professional associations etc. Source: Institutions in the SPB

f. The data does not include credits known as "Direct Credit" or "Government Transfers", understood as credits that an institution carries out to its clients' accounts due to transfers from the federal, state and municipal governments (payment of benefits; retiree's social security benefits; PIS/Pasep income; transfers from social programs, income tax refunds, FGTS etc).

6 In 2020, credit cards saw a point stagnation in the amount transacted resulting from the social distancing measures adopted during the Covid-19 pandemic, which had a greater impact in the first half of that year, with subsequent growth resuming. However, the same effect was not seen with debit and prepaid cards, since the payment of Emergency Aid ended up stimulating the use of such instruments.

Regarding interbank and intra-bank transfers, both functionalities grew until 2020, when they reached their peak, more strongly in interbank transfers, probably due to the Emergency Aid paid by the federal government and transferred by many users to other banks or payment institutions. In 2021 and 2022, both types of transfer dropped in relation to the number of transactions, possibly due to the introduction of Pix.

Graph 5 – Number of Transactions
Annual Data – Billions



Furthermore, the increase in the number of transactions carried out through Pix indicates that this instrument has played an important role in the increase in the number of transactions in the payment ecosystem, allowing people who had never made transfers to participate.⁷ In just two years, between November 2020 and December 2022, Pix became the instrument with the highest annual number of transactions.

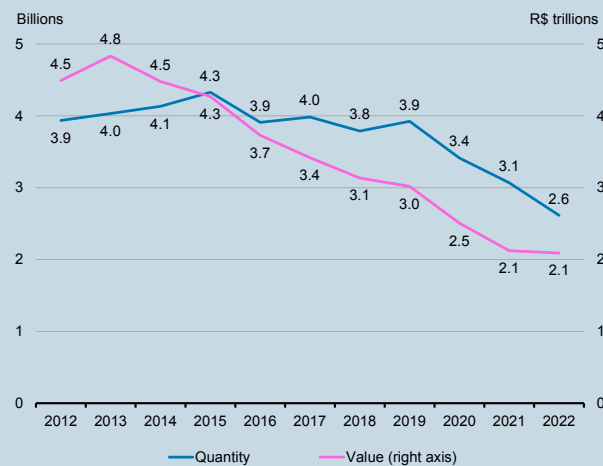
At the same time, one observes a significant increase in the number of transactions carried out through debit and prepaid cards, the latter contributing to the growth of payment institutions. These institutions have played an important role in financial inclusion by giving people who previously had no relationship with the financial system the chance to open payment accounts, such as many young people who, in this way, begin their relationship with the financial system.⁸

Possibly, this broad process of digitalization of means of payment is accompanied by a gradual reduction in the use of cash by the Brazilian population. Graph 6 shows that the amount and financial volume of ATM and bank branches withdrawals has been gradually reducing over time. From 2020 onwards, this reduction seems to be more pronounced, which can be explained by the behavioral changes caused by the pandemic, the introduction of Pix and the increase in card transactions.

⁷ Financial Citizenship Report (RCF) 2021, pages 127 and 128.

⁸ Financial Citizenship Report (RCF) 2021, pages 62 to 65.

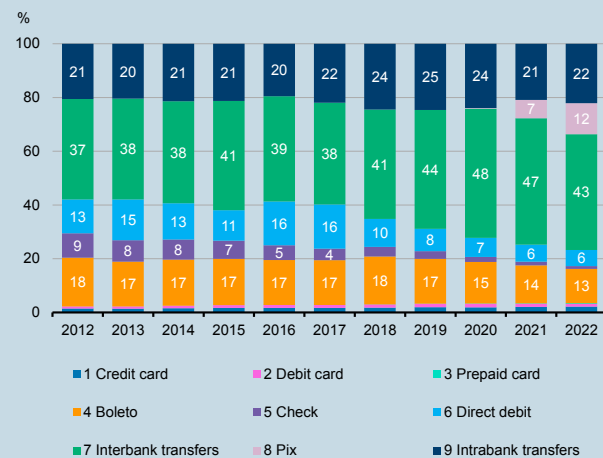
Graph 6 – Withdrawals at ATMs and bank branches



Value traded by payment instrument

When analyzing the recent evolution of the share of each payment instrument in the total financial volume of transactions (Graph 7), the gradual emergence and growth of Pix is present, but to a lesser extent. This is due to the fact that interbank and intra-bank transfers continue to be widely used for higher value transactions, accounting for around 65% of the financial volume transacted in 2022.

Graph 7 – Financial Volume of Transactions
Participation by Instrument – Annual Data

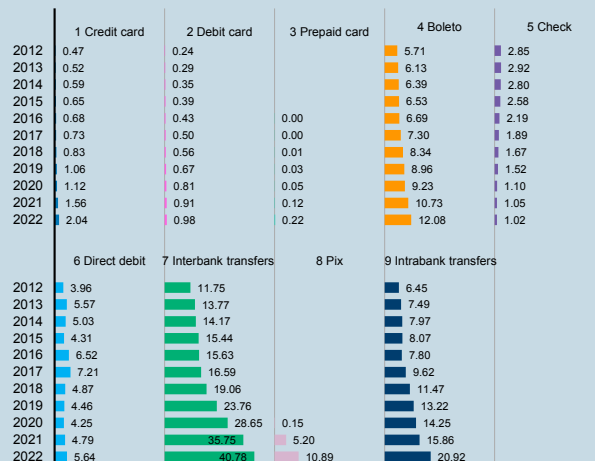


The absolute annual volume data (Graph 8) shows significant expansion of the market as a whole, with the only exceptions being direct debit, which, after peaking in 2016-2017, has contracted and remained relatively stagnant in recent years, and checks, which have been in constant decline since 2013. Cards showed sustained growth throughout the period, but their financial volumes are still relatively small. Payment slips, on the other hand, has a growing and relevant financial volume. Regarding interbank and intra-bank transfers, both continue to grow in terms of absolute financial volume and account for the largest volume transacted throughout the period.

Although Pix represents a relatively small proportion of the total volume of transactions, it has shown accelerated growth in the volume transacted, generating an increase in its share in an expanding market. The financial volume carried out through cards, payment slips and transfers has increased, suggesting that Pix may have

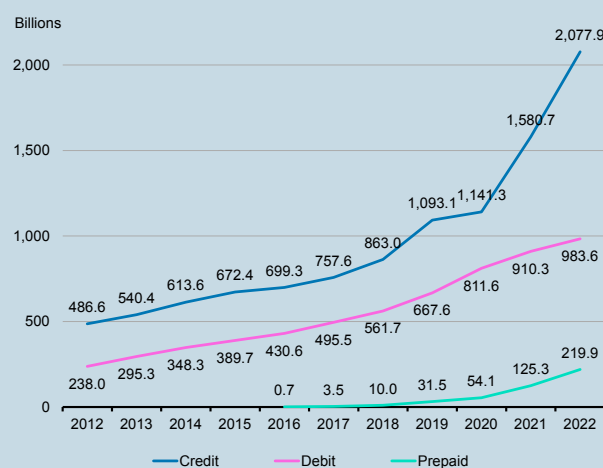
brought new transactions to the electronic payment ecosystem, due to the flourishing of new business models, in line with what has already been observed in previous studies, such as the one presented in the Financial Citizenship Report 2021 (Note 9).

Graph 8 – Transaction Volume
Annual Data – R\$ Trillions



Finally, with specific regard to the cards market, when analyzing the evolution of credit, debit and prepaid card volumes (Graph 9), it is possible to identify, within this group of instruments, a phenomenon similar to that which occurred with Pix regarding the payments market. Pre-paid cards still represent a small proportion of the total volume carried out through cards, but this is the modality that shows the greatest growth within a context in which the card market has growing volumes, highlighting its role in financial inclusion.

Graph 9 – Financial Volume
Card Market



Conclusion

This box presents the significant growth in digital transactions (alternative payment instruments to cash and checks) over the last decade in Brazil. This transformation was the result of a number of conjunctural and, above all, structural factors.

The process of digitalization of payment instruments was accompanied by a change in the pattern of use of the different access channels to financial services, with a continuous and substantial reduction in the use of face-to-face channels.

The introduction of Pix by the BCB, a low-cost payment arrangement using public infrastructure, accessible to all the users of financial services, played an important role in this process. Mobility restrictions resulting from the Covid-19 pandemic were also relevant in accelerating the process of digitalizing financial transactions in Brazil.

Card transactions have also contributed to progressive digitalization. The quantities and volumes transacted have grown in credit, debit and prepaid cards, especially the latter, which, despite having a small share of the card market, grew significantly, due to the participation of FinTechs with new business models that promoted the financial inclusion of new segments of the population.

Regulatory developments aimed at promoting innovation and competition in the National Financial System (SFN) and in the Brazilian Payment System (SPB) have led to a safe business environment, with lower barriers to entry and better opportunities, increasing the supply of new financial products and services and encouraging incumbent institutions to readjust their business models to a new reality.

Box 8 – Profile and evolution of digital entities in the Brazilian National Financial System

Introduction

The Brazilian regulatory framework has encouraged the evolution of digital activities as an instrument to promote increased competition and efficiency in the National Financial System (SFN). The result of this incentive can be seen in the increase in the number of People-to-People Loan Companies (SEP), Direct Credit Companies (SCD) and Payment Institutions (PI), which operate predominantly through digital channels, and the evolution in the market share of banks that call themselves “digital”.

The purpose of this box is to detail the operating profile of the group of digital entities and provide an overview of the evolution and characteristics of credit, funding instruments, profitability, and their clients.

Concept and classification

It is noteworthy that there is no regulatory name for the “Digital Banks” or “Digital Financial Entities” category. As such, there is no specific authorization to act as a “digital entity”. This definition has come to be used spontaneously by the market and is mainly a self-designation by the entities because of their strategy for operating in the market and their service and business channels with their clients. Nevertheless, important characteristics of these institutions can be seen, such as: a) use of digital platforms; b) predominantly remote service; and c) Public interaction through intensive use of technology.

To define the scope of digital entities for this study, the following characteristics were considered: a) being entities **authorized** by the Banco Central do Brasil – BCB; b) having customers **predominantly** served through **digital platforms** that provide financial products and services; and c) having customers almost exclusively contacted through the use of remote and non-face-to-face channels.

The scope of digital entities has resulted in a group of institutions with heterogeneous characteristics and different business models. This reinforces that classification as digital does not define the business model, but rather the way in which financial institutions, payment institutions or conglomerates interact with clients and the market to make their business model viable.

To better address the study’s objectives, digital entities were segmented into three groups: one represented by SCDs, SEPs and IPs (Group 1); another group called “Specific brands”, which are digital structures of traditional entities that do not have their own legal identification, but represent a business segment separate from the entity’s traditional structure (Group 2); and a third group represented by other entities that call themselves or are widely recognized as “digital banks” and compete with traditional entities, usually offering various products, such as digital accounts and credit operations (Group 3). In the latter, there are both entities born digital and others that

have been transformed into digital over time, through the strategic direction of their business models. For the aspects of this study, Group 3 was the scope chosen for greater in-depth analysis.

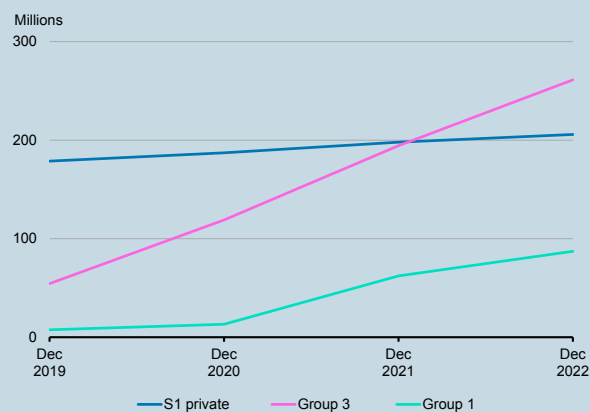
This box has been divided into four main sections: i) active relationships; ii) credit portfolio, iii) funding, iv) profitability.

Active relationships

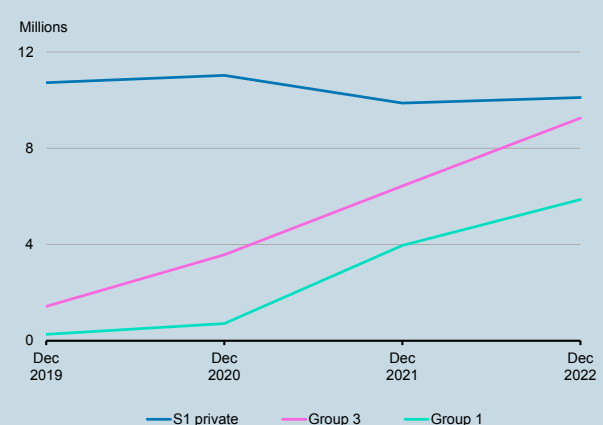
The evolution of digital entities' active individual customer relationships showed strong growth from December 2019 to December 2022. During this period, Group 3's active relationships grew by 380%, from approximately 54 million to 261 million. In Group 1, growth was 1,045%, from approximately 8 million to 87 million. Compared to the active relationships of the country's three large private banks (private S1), the increase over the period was 15%, from 179 million to 206 million (Graph 1). As these are digital structures without their own legal identification, there is no information available to analyze Group 2's active relationships.

In terms of active relationships with corporate clients, growth was also significant over the period. Group 3 relationships increased by approximately 557%, from 1.4 million to 9.2 million. As for Group 1, the increase was 2,101%, from around 260,000 to around 6 million (Graph 2). During this period, the private S1 group lost 6% of its active relationships base, around 615,000 clients.

Graph 1 – Evolution of active relationships
Households



Graph 2 – Evolution of active relationships
Corporates



The active relationships of digital entities (Group 1 and Group 3) evolved much more significantly than the evolution of private S1s. As there was no significant reduction in the active relationships of private S1s, there are two possible causes of this faster evolution – the inclusion of new customers in the banking system or old customers who now have multiple active relationships.

In this context, the evolution of exclusive corporate relationships with digital entities was assessed (Table 1). This type of relationship is still not very representative and has not evolved significantly over the period. One explanation for this may be that customers prefer to maintain their relationships with a “traditional” entity, even when they start using banking services of “digital” entities.

Table 1 – Exclusive Relationships – Digital Entities

	2019	2020	2021	2022
				%
Households - Exclusive relationship with only one digital entity	2.5	1.1	1.3	1.3
Households - Exclusive relationship with digital entities	3.5	1.7	2.3	2.3
Corporates - Exclusive relationship with only one digital entity	31.7	30.3	29.3	28.4
Corporates - Exclusive relationship with digital entities	37.9	42.1	43.5	39.9

Digital entities' more aggressive strategies of offering free or low-cost products and services, especially from 2019 onwards, may have contributed to attracting “unbanked” and “banked” customers to digital entities, without this necessarily resulting in the termination of the relationships with another entity.

In the case of exclusive corporate relationships, the percentage held by digital entities is more relevant. Some possible explanations include the provision of services tailored to the client's profile, as opposed to the mass treatment of services for business clients, and the significant evolution in the number of smaller companies that tend to seek out digital entities for their first relationship or even to replace their previous relationship. A more detailed analysis of these characteristics of the profile of corporate customers exclusively served by digital entities may be carried out in the future.

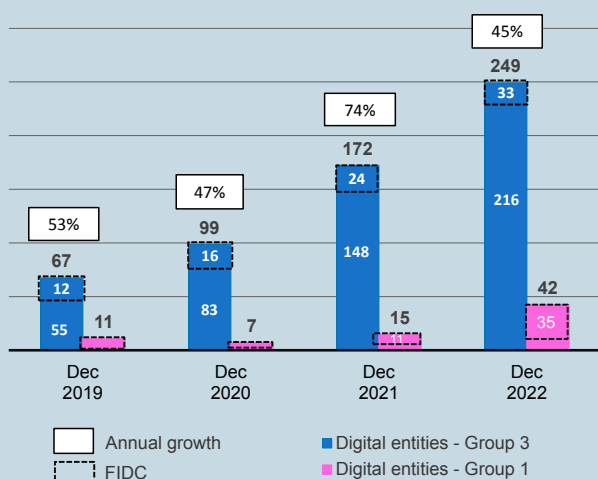
Credit portfolio

The credit portfolio of digital entities has grown significantly over the last few years. In Group 3 entities, the portfolio grew by 45% in 2022 (Graph 3), reaching BRL 249 billion, with a predominance of bank credit (BRL 216 billion) and Credit Rights Investment Funds – FIDCs (BRL 33 billion). In the portfolio of the entities in Group 1, operations in FIDCs predominate (BRL 35 billion) compared to bank credit (BRL 7 billion). It was not possible to obtain data for Group 2, as these are digital structures of traditional entities that do not have their own legal identification.

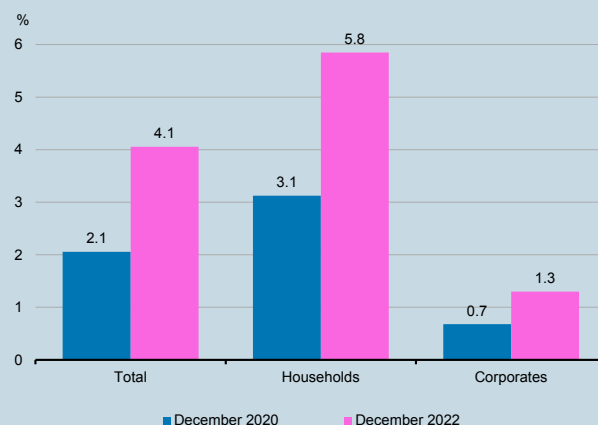
As Group 1 has most of its operations in FIDCs, whose data is only available in aggregate form, and because they are less representative, the following analysis of the credit portfolio is focused on Group 3.

The share of Group 3 digital entities in the SFN's credit portfolio has increased significantly in recent years, rising from 2.1% in 2020 to 4.1% in 2022 (Graph 4). This increase was led by household credit, which came to represent 5.8% of the SFN in 2022.

Graph 3 – Portfolio
R\$ bn (FIDC and CCB included)



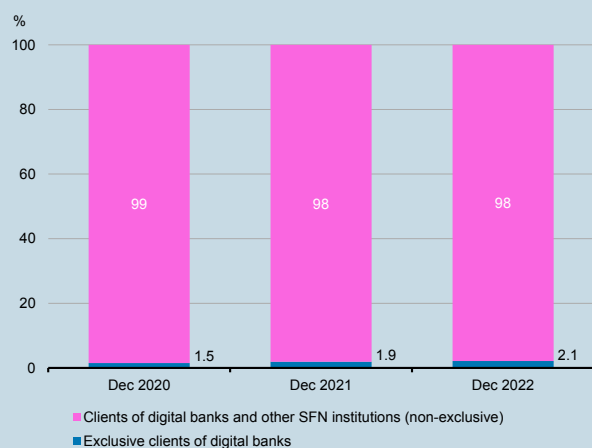
Graph 4 – Representation of Group 3 in the SFN (National Financial System)



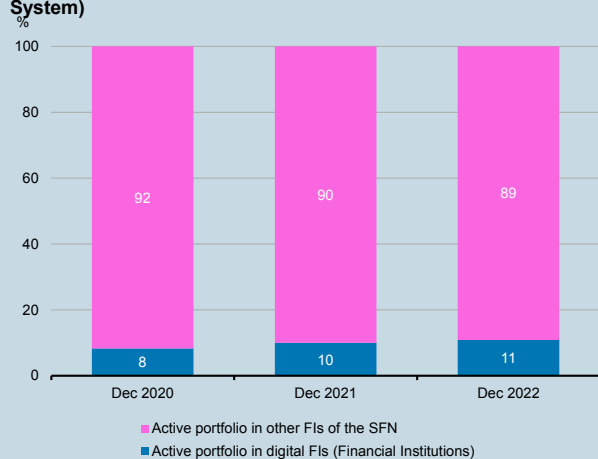
Despite the significant growth in the number of relationships in recent years, mentioned in the previous section, credit taken out by exclusive clients of digital entities is not very significant, representing 2.1% of the amount taken out by digital clients in the financial system (Graph 5).

Credit from non-exclusive customers, who borrowed from both digital entities and another entity in the financial system, represents the largest part of the balance (97.9%). Of this percentage, the most representative amount (89%) was granted by other entities, while 11% was from digital entities (Graph 6).

Graph 5 – Active client portfolio of digital banks in the SFN (National Financial System)



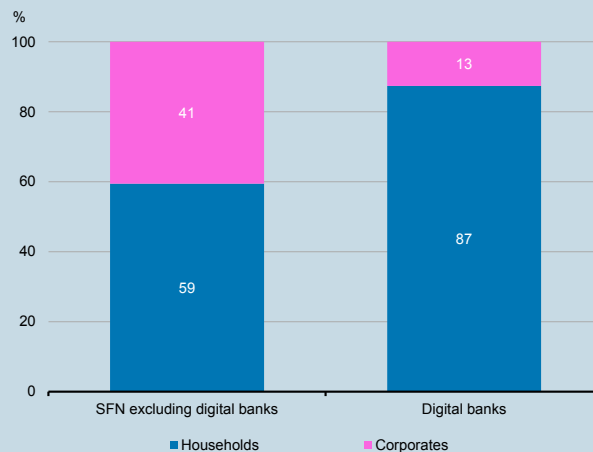
Graph 6 – Active client portfolio of non-exclusive digital bank clients in the SFN (National Financial System)



The same behavior can be observed in relation to loans to households and companies. This data shows that digital entities have made significant progress in increasing the number of relationships. However, most of their clients' demand for credit is still met by the traditional financial system. This indicates that there is room for expansion in the supply of digital credit and the consequent increase in the market share of their portfolios.

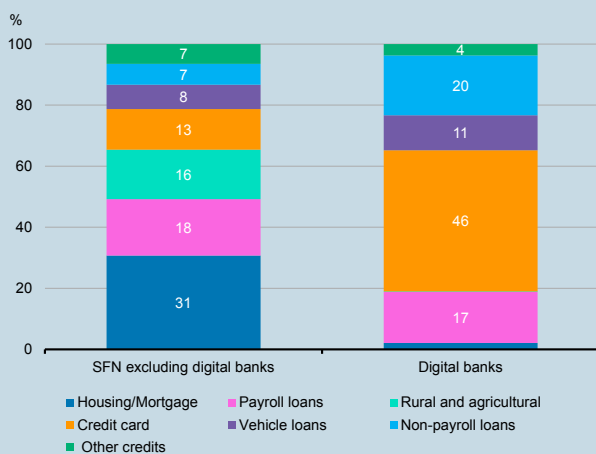
In terms of profile, the credit portfolio of Group 3 entities is concentrated on operations with households. In December 2022, 87% of these entities' portfolios were aimed at households, which is above the SFN average of 59% (Graph 7).

Graph 7 – Households – Client
December 2022

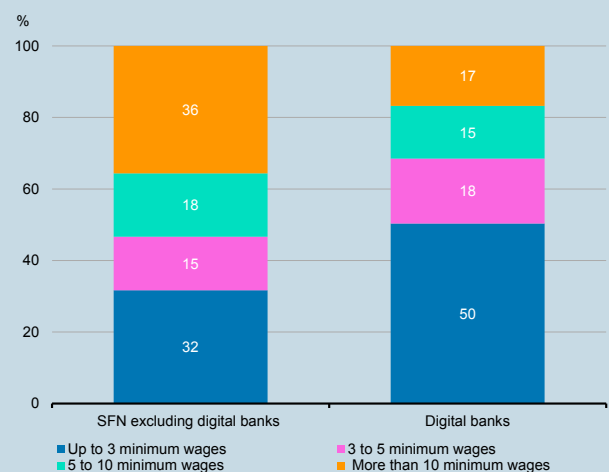


Digital entities operate in household credit with higher risk products and fewer associated guarantees than other SFN entities, notably credit cards and non-consolidated credit (Graph 8). In addition, borrowers generally have a lower average income than the SFN (Graph 9) and a younger age profile (Graph 10). These characteristics refer to the digital entities segment, which when assessed individually show significant heterogeneity within the group.

Graph 8 – Households – Loan Types
December 2022



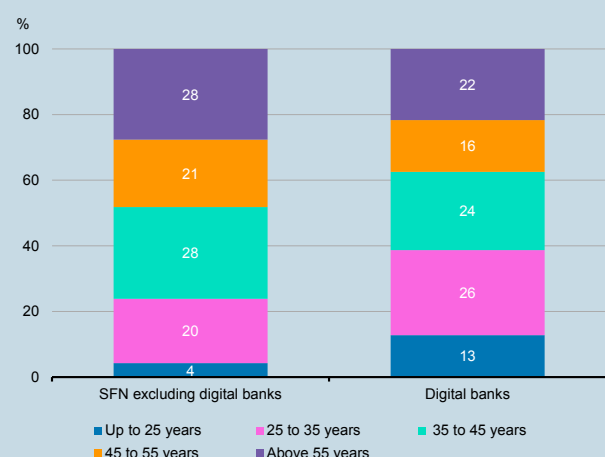
Graph 9 – Households – Income
December 2022



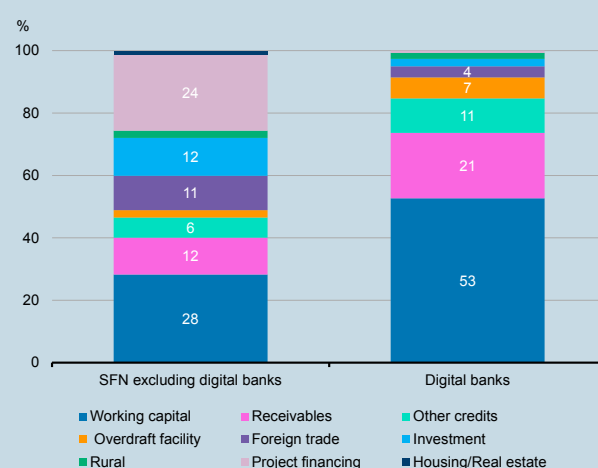
One characteristic of Group 3 digital entities is the high share of household credit card transactions in the portfolio. In addition to credit cards, some entities offer payroll-deducted loans to INSS retirees and pensioners, while others operate in rural credit and investment financing, whose borrowers tend to have higher income levels. There are also those that provide vehicle and housing loans.

The corporate portfolio of digital entities is also heterogeneous and differs from the profile of the rest of the SFN. Digital entities have a higher concentration of working capital (53%) and receivables (21%) than other SFN entities, whose portfolios also predominate in working capital, but to a lesser extent (28%), and project finance (24%) (Graph 11). Some digital entities operate more intensively in modalities such as foreign trade and guaranteed accounts. Digital entities share in corporate credit is more focused on medium-sized companies (Graph 12) and activities related to services in general, financial services, construction, wood and furniture (Graph 13), which also differs from the SFN.

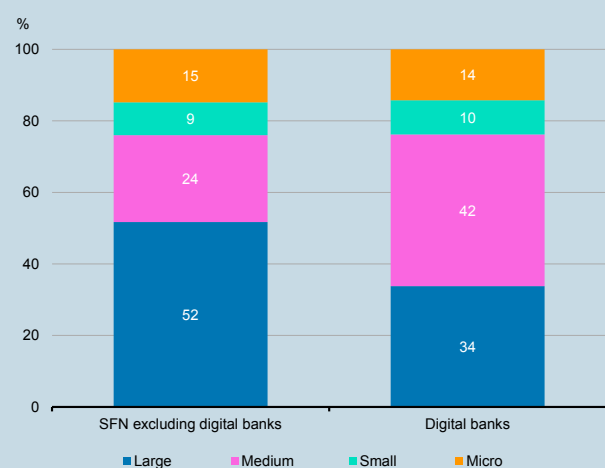
Graph 10 – Households – Age
December 2022



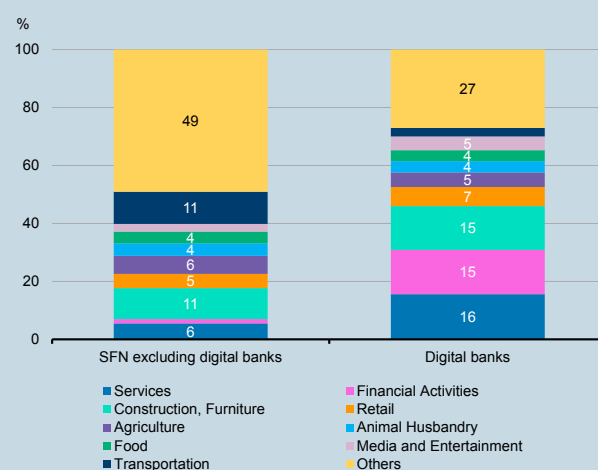
Graph 11 – Corporates – Loan Types
December 2022



Graph 12 – Corporate – Size
December 2022



Graph 13 – Corporate – Activity
December 2022

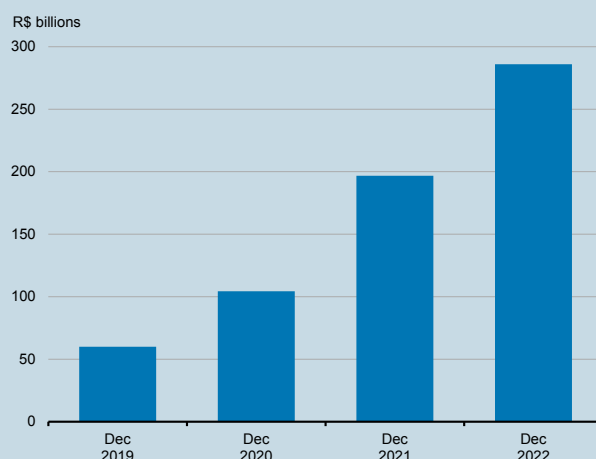


Funding

Like the credit portfolio, the amount raised by Group 3 digital entities has grown significantly over the last few years, representing around 4.0% of the total volume raised by the financial system. The total funding¹ of Group 3 reached BRL 286 billion in December 2022, compared to BRL 197 billion in December 2021, an annual increase of 45% (Graph 14).

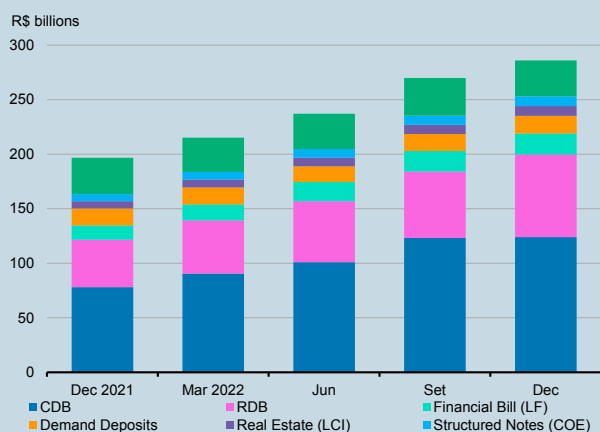
¹ Total funding, excluding instruments eligible for Tier II or complementary capital and e-money. The Group 3 e-money stock in December 2022 was BRL 26.5 billion.

Graph 14 – Funding Stock
Digital entities of group 3

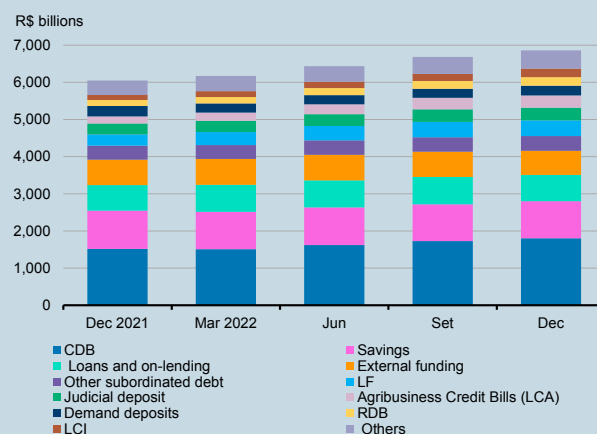


These entities have a more simplified mix of funding products than the other entities in the national financial system. The volume raised via CDBs/RDBs represented 70% of the total stock in December 2022, while in the rest of the SFN it represented 32% (Graphs 15 and 16).

Graph 15 – Funding Stock by Instrument
Digital entities of group 3



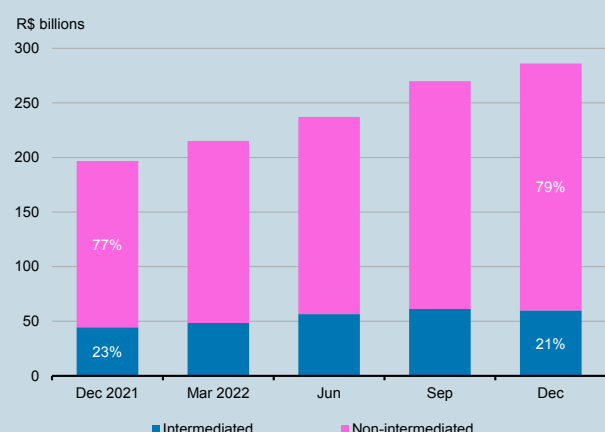
Graph 16 – Funding Stock by Instrument
Financial System excluding digital entities of group 3



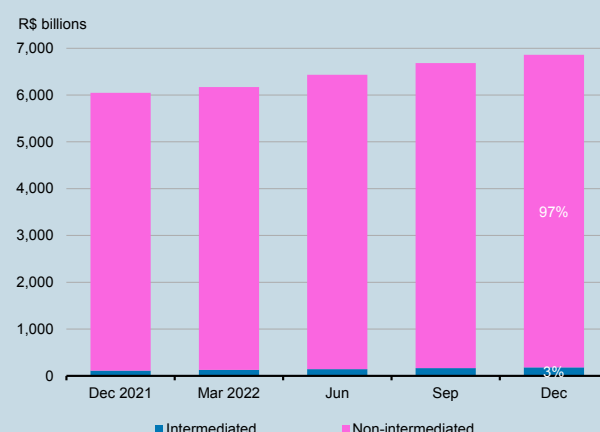
Digital institutions have autonomous ways of raising funds, since the use of intermediated funding is relatively low. In a year of expansion in the volume raised by the sector, the share of intermediated funding fell, reaching 21% of the total funding stock in December 2022, compared to 23% in December 2021 (Graph 17). In turn, the percentage is significantly higher than that observed for the rest of the SFN (Graph 18).

There is a difference between clients who operate directly with institutions and those who operate via intermediaries. Most of this stock of intermediated funding is covered by the FGC. Considering the main funding instruments covered by the fund, 81% of the stock of intermediated funding of digital entities in December 2022 was concentrated in holders with up to BRL 250,000 per entity, compared with 49% in the non-intermediated stock (Graph 19). These percentages are above the SFN average without digital entities (Graph 20).

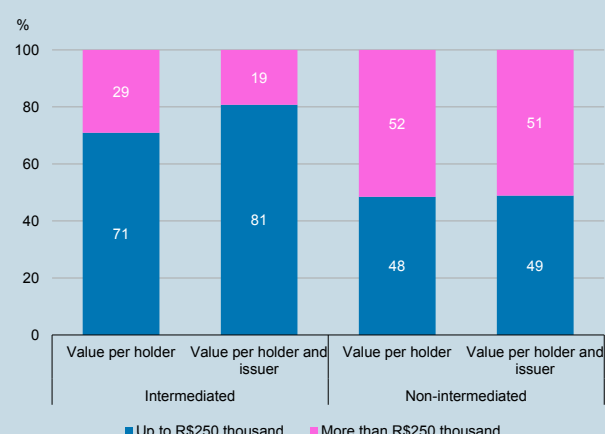
Graph 17 – Funding Stock
Digital entities of group 3 Excluding electronic money



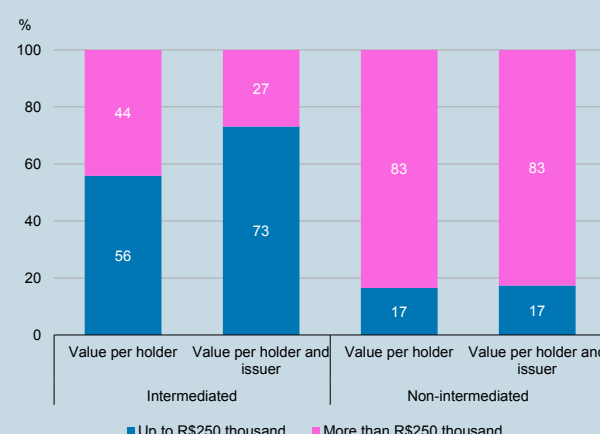
Graph 18 – Funding Stock
Financial System excluding digital entities of group 3
Excluding electronic money



Graph 19 – Intermediated Funding Balance
Digital entities of group 3 CDB, LCA, LCI and LC -
December 2022



Graph 20 – Intermediated Funding Balance
Financial System (excluding digital entities of group 3)
CDB, LCA, LCI and LC - December 2022



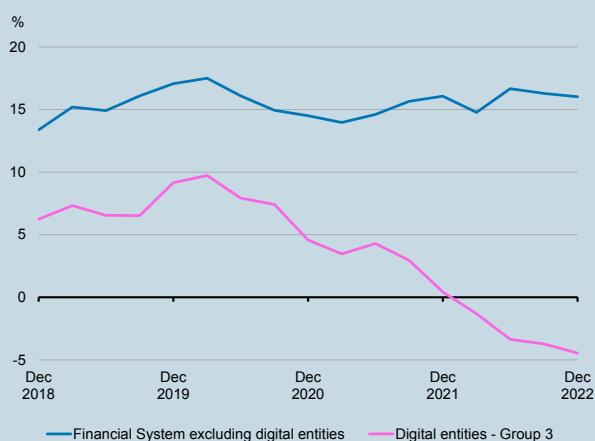
Profitability

Entities in Group 3 have shown lower profitability than the aggregate group of traditional companies, with a decline in ROE over practically the entire period evaluated (Graph 21). However, this evolution does not allow us to say that all the entities in this group have low or declining profitability, since the ROE of each entity shows heterogeneous behavior.

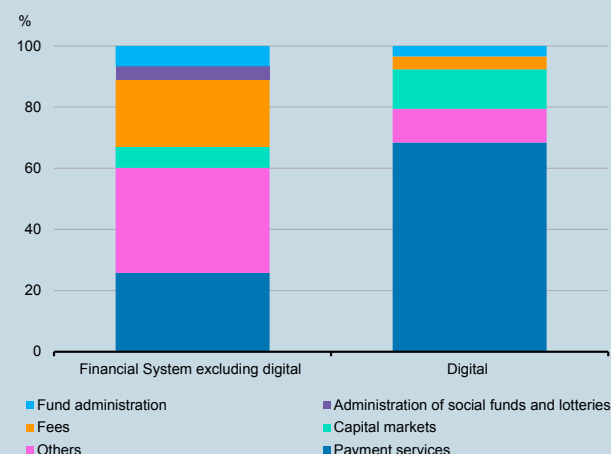
In general, the challenge to the favorable evolution of profitability in the digital entities segment may be associated with the operating strategy focused, at first, on attracting clients and gaining market share. Another possible factor is a more concentrated approach to providing services or a few products, rather than a diversified approach, which can reduce the potential for monetizing their relationship base, particularly in periods of fluctuating economic cycles.

In terms of the digital group's service revenue profile, payment transactions and those related to the capital market stand out (Graph 22). Regarding payment transactions, the main inbound product offered by most institutions is credit and debit cards and payment accounts. Regarding capital markets revenues, these come from the participation of specific institutions in securities trading and intermediation segment. Participation in the other lines of service income is less relevant.

Graph 21 – ROE by Segment
12-month accumulated

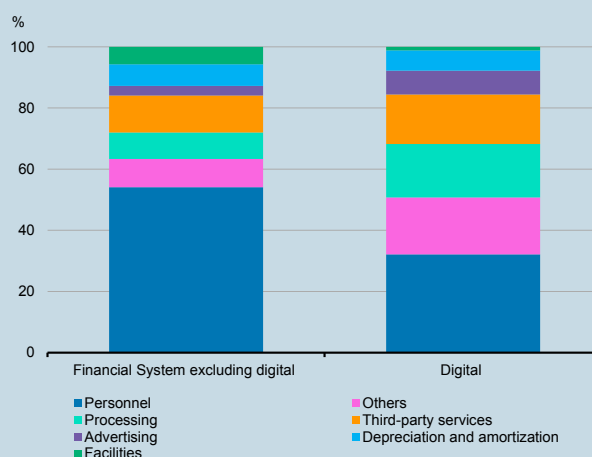


Graph 22 – Service Revenue Profile
12-month accumulated



As for the profile of administrative expenses, there is a lower share of personnel expenses and physical facilities, when compared to the profile of “traditional” entities, which is characteristic of operations focused on operational efficiency, digitalization and without a significant physical presence. Conversely, there is a greater share of technology, data processing and advertising costs, which is in line with the profile of digital entities (Graph 23).

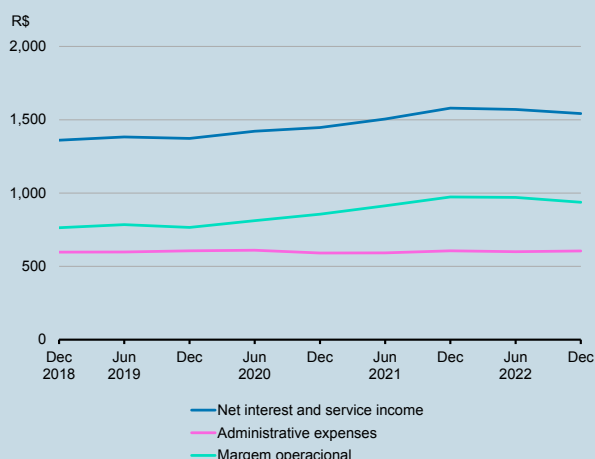
Graph 23 – Administrative Expenses Profile
12-month accumulated



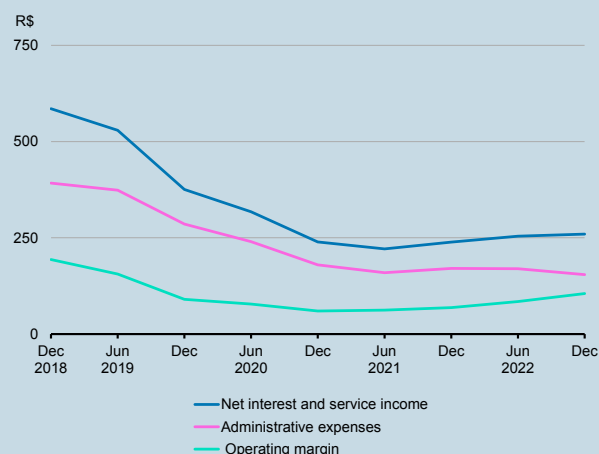
The big challenge for digital entities is to monetize their client base. Although operating costs per customer are lower, which gives them greater potential for operating leverage, the operating margin for digital entities is lower due to lower revenues (Graphs 24 and 25).

The growth strategy of some of these institutions was based on offering low-cost or free financial services as a way of attracting new customers. Given the growth of the customer base, the greater participation of intermediation products (such as credit) and new services can contribute to expanding the return per customer.

Graph 24 – Result per Active Relationship
S1 Private Banks – 12-month accumulated

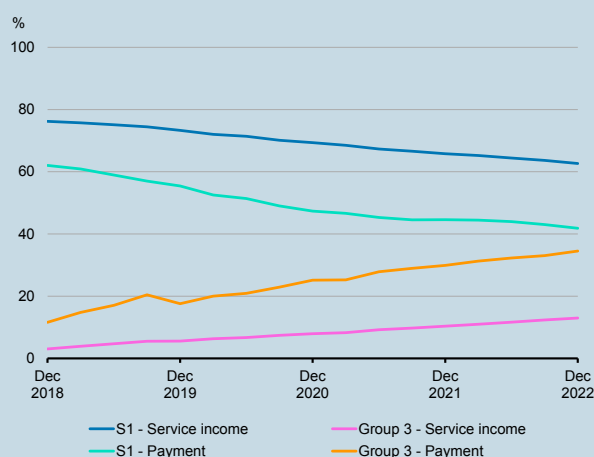


Graph 25 – Result per Active Relationship
Digital Entities – 12-month accumulated



In terms of what has already been achieved, digital entities have managed to increase their market share of SFN service revenues. This increase has been most significant in payment revenues (cards). The gain in market share in this line of service was significant, rising from 12% in 2018 to 34% in 2022 (Graph 26).

Graph 26 – Share of Financial System Service Revenues



Conclusion

Digital entities represent a heterogeneous group of institutions with different business models. The common characteristics among them are the use of digital platforms, predominantly remote service, and the intensive use of technology in interaction with their public.

These entities have seen a significant increase in the number of active relationships (clients) in recent years. However, most of these relationships are not exclusive. Regarding corporate clients, for example, the percentage of exclusive relationships is low, which indicates that clients choose to maintain their relationship with a traditional entity.

The credit portfolio of digital entities reached 4.1% of the total portfolio in December 2022, with a large predominance of corporate credit. The rate of growth has been significantly higher than the rest of the SFN in

both portfolios (companies and households). The main types of credit in which digital entities operate are non-consolidated loans and credit cards, with the latter standing out. The profile of the portfolio shows that digital entities grant credit to customers with lower or younger incomes and to smaller companies, although the pattern is heterogeneous between them.

From the point of view of customers who have links with digital entities and those in the traditional financial system, the largest volume of credit still comes from the traditional financial system, which shows that there is room for expansion of the digital portfolio.

The funding stock of digital entities has been growing in recent years and represents around 4.0% of the total volume raised by the financial system. Most of this funding comes from term deposits, with low dependence on funding intermediated by brokerage platforms.

Profitability remains a major challenge for digital entities. Despite lower operating costs per client, the operating margin is lower due to lower revenues. To improve profitability, the challenge is therefore to increase revenue by offering new products and services, especially credit, where there is potential for expansion.

The BCB, in face of several challenges, seeks to continuously improve the SFN. Therefore, the strategy of the Agenda BC# aims to promote the financial democratization, with lower interest rates, better financial services, and increasingly participation in the financial market. The Agenda BC# has five dimensions: Inclusion, Competitiveness, Transparency, Education, and Sustainability. Each dimension encompasses several strategic initiatives, part of them already concluded. The annual evolution of implemented measures is described in the previous Banking Reports.

Among 57 strategic initiatives that were in progress throughout 2022, 10 were concluded. Sections 7.1 to 7.5 present the main results achieved in each dimension. Section 7.6 deals with some of the initiatives in progress.

7.1 Inclusion

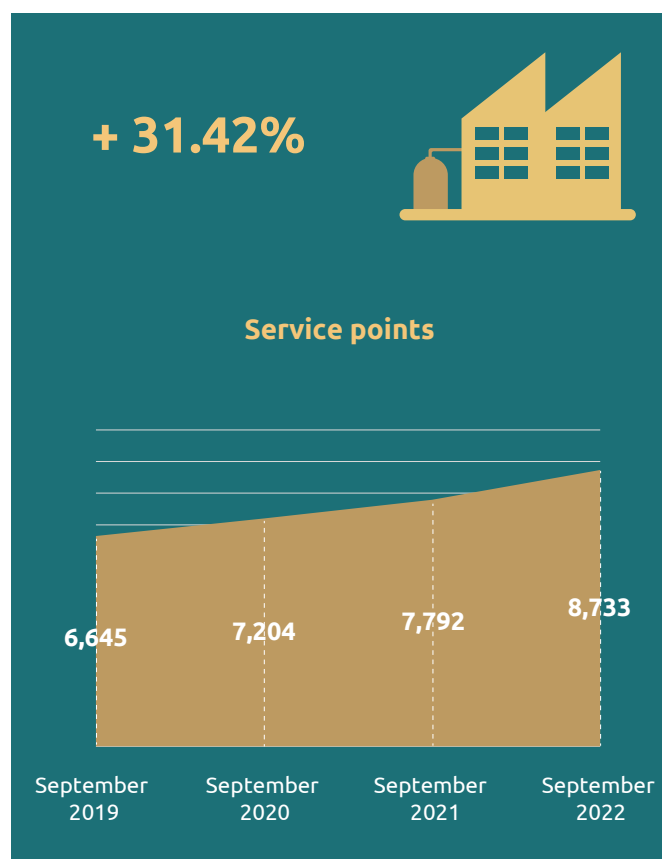
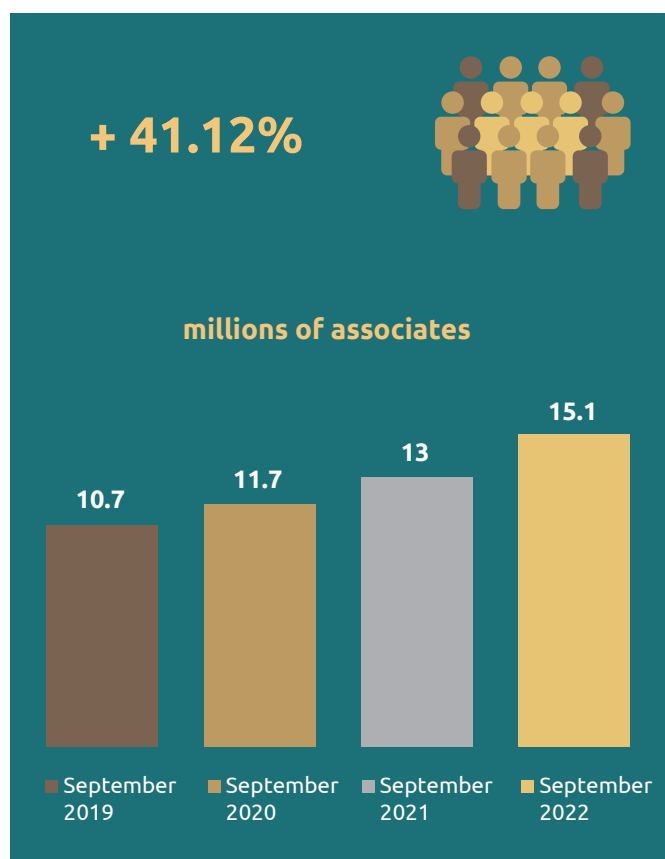
This section reports the initiatives implemented in the dimension Inclusion of the Agenda BC# and main achievements in 2022.

In this dimension, initiatives seek to facilitate overall access to the financial markets, either by small and large users, investors and borrowers, Brazilians, and foreigners. The goal is to streamline and reduce the bureaucracy of procedures to facilitate the entrance of new participants.

The revision and improvement of the regulations of the cooperative segment was one the main initiatives in the Inclusion dimension in 2022. This initiative aimed to strengthen the operations of this segment. The new legislation provides cooperatives with better conditions for expanding their business, benefiting cooperates and communities, with the possibility of operating in

an increasingly developed and competitive financial market.⁸⁹

The cooperative credit market sector has expanded strongly over the last three years. From September 2019 to September 2022, the number of cooperates rose by 41.12%, while the number of cooperatives grew by 31.42%.⁹⁰



Still in the cooperative segment, the BCB conducted a Regulatory Result Assessment (ARR) on cooperative auditing. This ARR analyzed the effects of regulations that implemented the cooperative auditing as of 2015 in this segment. It revealed improved information of the operational situation and economic-financial soundness, in addition to better management and governance of credit unions.⁹¹

Finally, for the society, an increased participation of cooperative in the SFN was observed, contributing to fuel competitiveness and expand the process of inclusion and financial education.

⁸⁹ Complementary Law 196, of August 24, 2022.

⁹⁰ Available at: <https://www.bcb.gov.br/estabilidadefinanceira/coopcredpanorama>.

⁹¹ Available at: https://www.bcb.gov.br/estabilidadefinanceira/avaliacao_resultado_regulatorio/ARR_CMN_dez22.

The improvement of the process of authorization for the operation of supervised entities was another advance in regulation. All authorizations' requirements have been consolidated in a single regulation, so as to simplify and increase transparency of the process and provide uniformity to requirements and applicable conditions to each type of authorization.

New rules will provide for the reduction in the compliance costs, speeding up the process of authorization to the benefit of market competitiveness.⁹²

The Exchange and International Capital Law and respective regulation became effective in late 2022, potentially increasing juridical safety to businesses carried abroad, streamlining procedures, as well as providing increased agility to Brazilian citizens and companies in operations abroad, for obtaining both financing and raising of foreign investments.⁹³

The BCB received suggestions from the society to elaborate the infralegal Exchange and International Capital Law regulation through public consultation. The first suggestion consisted in regulations related to the exchange market and the definition of the concept of residence. The second involved a minute of regulation about foreign capital in Brazil in direct investment operations and external credit. The third is related to the proposal for the regulation of the Brazilian capital abroad.⁹⁴

7.2 Competitiveness

This section reports the initiatives implemented in the dimension Competitiveness of the Agenda BC# and main achievements in 2022.

This dimension seeks to foster the SFN competitiveness by increasing the number of participants and solutions. The development of new products and services, mainly digital ones, benefits the increase of quality and market diversification.

The main initiative in this dimension concerns the evolution of the Pix agenda. Pix is a means of payment in which resources are transferred between accounts instantaneously, all day long.

⁹² Resolution CMN 4,970 of November 25, 2021.

⁹³ Law 14,286, of December 29, 2021, and respective regulations.

⁹⁴ Available at: <https://www3.bcb.gov.br/audpub/AudienciasEncerradas?4>.

Pix was created to democratize the access to electronic means of payment, increasing their convenience, contributing to the digitalization of the economy's payment operations, promoting financial inclusion, and fostering the SFN competitiveness and efficiency by reducing costs to final users. After launching the *Pix Saque* (Withdrawal) and *Pix Troco* (Change) in 2021, the BCB sought in 2022 to improve the already existing Pix functionalities.⁹⁵

Another initiative to be highlighted in the Competitiveness dimension is the Open Finance, a standardized sharing of data and services of customers between institutions participating in this arrangement established and regulated by the BCB.

Through this arrangement, a bank's customer may authorize the sharing of data with another participating institution to obtain the supply of services. Another possibility is to obtain credit in one institution and request the debit in the current account of another bank.



95 See videos #18 and #60 of the series “BC te Explica” (BCB explains).

In 2022, the BCB worked together with supervised entities in solving problems during the phase of Open Finance data sharing, mainly related to the interoperability, the consumption, and the quality of data.

An additional initiative of great impact on the society is the *Real Digital*. The BCB has conducted, since 2018, initiatives related to the issue of digital currencies to monitor and promote the digital evolution of the Brazilian economy. The initiative *Real Digital* consists in the establishment of a market infrastructure, under the BCB governance and regulation, in which technologies with programmable currency and intelligent contracts will be available to the development of new business models.⁹⁶

In 2022, the BCB started evaluating cases of use and technological feasibility of the Real Digital,⁹⁷ through the LIFT Challenge Real Digital. This initiative, conducted by the BCB and Fenabac, has selected technological projects for the development of “minimally feasible products”. The projects included apps of delivery versus payment, payment versus payment, Internet of Things (IoT), and decentralization and payment solutions when both payer and receiver have no internet access.⁹⁸ Based on the results of the LIFT Challenge, the BCB will be able to advance to a trial phase in 2023.

Another important initiative in this dimension is the Financial and Technological Innovation Lab (LIFT), which develops prototypes of innovative products. All projects are proposed by the society, which makes the LIFT an open environment for the society’s direct participation in the promotion of innovation in the SFN.

It should also be mentioned the Regulatory Sandbox, an environment in which institutions are authorized by the BCB to test, in a given period, an innovative project in the financial or payment field. In this environment, participants have the opportunity to observe a specific sector of regulations that support the controlled and delimited operation of their activities.

The BCB has selected seven projects out of 52 participating in the 1st Regulatory Sandbox Cycle. In December 2021, the projects were authorized to operate in the 1st Regulatory Sandbox Cycle for one year, extendable once for the same period. Of the authorized projects, six of them had their

⁹⁶ Available at: https://www.bcb.gov.br/conteudo/home-ptbr/TextosApresentacoes/AP_RCN_Evento_13.12.22.pdf.

⁹⁷ Available at: https://www.bcb.gov.br/estabilidadefinanceira/real_digital.

⁹⁸ Available at: <https://liftchallenge.bcb.gov.br/site/liftchallenge>.

authorization extended, so that these companies will have their business models monitored until December 2023, when the 1st cycle will end, with no regulatory forecast for a new extension of the deadline.

After the conclusion of the 1st cycle, projects are expected to become effective and may be implemented permanently through the modernization of regulations, contributing to the supply of improved services to users of the SFN and the Brazilian Payment System (SPB).⁹⁹

Still in the Competitiveness dimension, it should be highlighted the initiatives involving cybersecurity. The main initiative refers to the improvement of the BCB and SFN cyber resilience.

One of the workgroups of the SFN and SPB Cyber Resilience Enhancement Program consists in the wide discussion with main associations representing the sector about the organization of simulation exercises of cyber incidents aimed to financial institutions, payment institutions, and financial market infrastructures.

BCB cyber resilience

Purchase of solutions for continuous improvement of the cyber security of the Pix ecosystem and other BCB systems.

Cybersecurity awareness actions.

Conducting penetration tests to assess the security of critical BCB systems.

Policy on safe use of cloud computing resources.

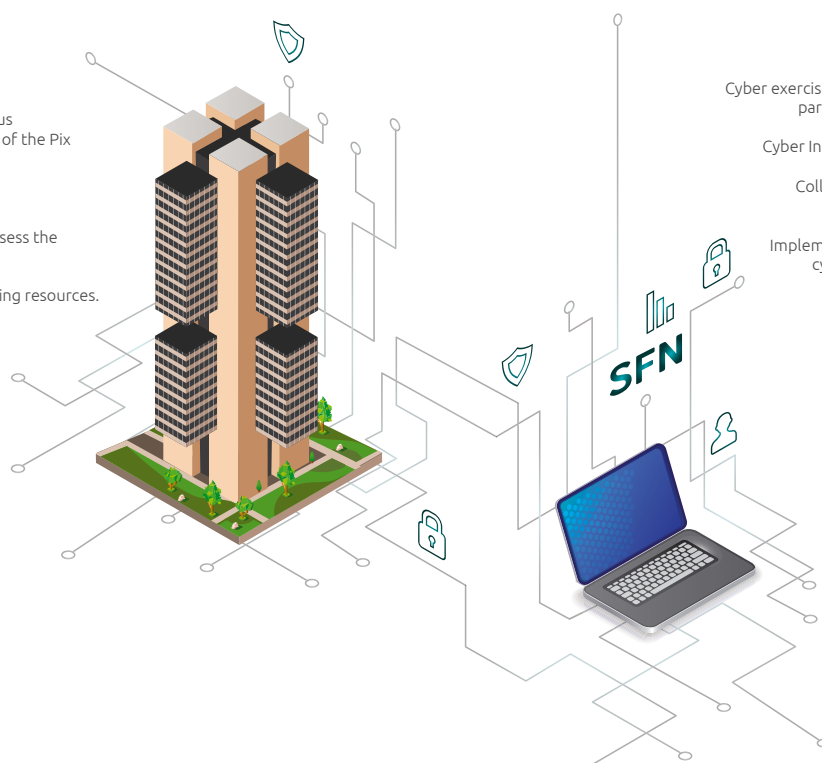
SFN cyber resilience

Cyber exercise of the financial sector with the participation of Supervised Entities.

Cyber Incident Management framework.

Collaboration between the BCB and Supervised Entities.

Implementation of a plan to respond to cyber incidents with the potential to trigger a financial crisis.

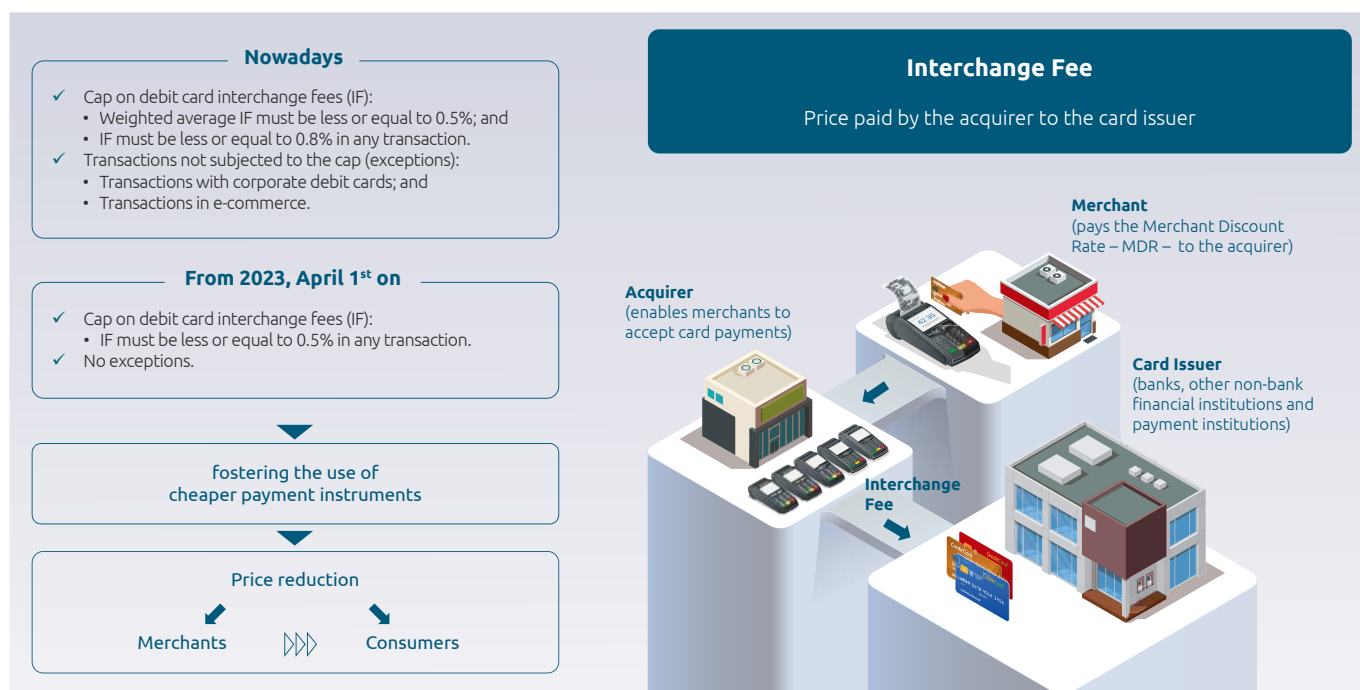


As part of this program, the first cyber exercise specifically targeted to the financial sector took place in mid-2022 in the Cyber Security Lab of the Brazilian Federation of Banks (Febraban) with representatives of financial market infrastructures and seven associations.

⁹⁹ See *Relatório de Gestão do Sandbox Regulatório – 1º ciclo 2022* for further information.

This exercise was essential for training procedures of response and recovery to cyber incidents. This initiative aimed at measuring the responses of technical, tactical, and strategic teams to simulated situations of crises entailed by cyber attacks to the SFN.

The stimulus to competition for credit operations backed by receivables was another BCB's initiative. Sellers may already negotiate the anticipation of values of receivables, both those already registered in the card machines and those to be set up (estimated according to the historical of revenues of the company), following rules that provides greater freedom to choose with whom negotiate. Receivables are used as financing guarantees and allow to supply lower cost credit, thus benefiting small and medium enterprises.



The BCB has also improved the regulation on limits and rules involving transactions with receivables of credit and debit card. New rules standardize the denomination of fees and the methods for charging services provided by card receivables registrars. The BCB has also established that accrediting institutions make available a channel for sellers to access information on their agenda of registered receivables, including the already celebrated negotiation contracts. Therefore, sellers will be able even to send complaints related to these agendas. This measure will provide greater transparency to this market.¹⁰⁰

100 Resolution BCB 269 of November 25, 2022.

The BCB also established a governance structure for the interoperability among system for the record of receivables of credit cards and other financial assets. Therefore, systems are expected to operate in a more smooth, safe, and efficient way, allowing the supply of better services and increased competitiveness.¹⁰¹

The BCB regulated the limits for the interchange fee and the settlement term for pre-paid credit card operations and debit cards. The goal is to stimulate the reduction of costs for companies by making available cheaper payment instruments. Therefore, it is expected that savings provided to companies may be passed through to final consumers, thus reducing the prices of products.¹⁰²

Another initiative was the conducting of an ARR on the effects resulting from the implementation of ceilings for the interchange fee practiced within the debit card arrangements that are part of the SPB. The discount rate declined with the application of the ceiling. The pass-through of the interchange fee to the discount rate encourages sellers to reduce prices to consumers in debit card purchases. Furthermore, there is evidence of fall of revenues related to the active card of issuers of debit cards with the interchange fee. Finally, it was not observed any evidence of increase in the flag tax charged by the accrediting institution in card transactions.¹⁰³

In January 2022, Brazil received an invitation letter from the Organization for Economic Cooperation and Development (OECD) for opening discussions for the process for adhesion to this organization. Brazil is currently the non-member country that adhered to the largest number of OECD instruments, in 106 out of 260 legal effective instruments.

In May 2022, Brazil was invited to adhere to two additional basilar OECD instruments: the Code of Liberalization of Capital Movements and the Code of Liberalization of Current Invisible Operations. The OECD letter that formalizes the invitation to the adhesion was received by the BCB.

Both liberalization codes consolidate the recommendations consolidated after decades of studies and are based on principles of non-discrimination and transparency, among others.

101 CMN Resolution 5,045, of BCB Resolution 267 and BCB Resolution 264.

102 Resolution BCB 246 of September 26, 2022.

103 Available at: https://www.bcb.gov.br/estabilidade/financeira/avaliacao_resultado_regulatorio/ARR_CMN_dez22.

It has been also strengthened the secondary market of government securities in the country. An instrument that permits the acceptance of the registration of encumbrances and liens on federal government securities was made available, in compliance with regulations.

In the framework of the Special Settlement Custody System (Selic), the BCB introduced an instrument of previous confirmation, the pre-matching Selic, which consists in a digital platform that combines and confirms data related to the post-negotiation of federal government securities. This tool automatizes process of compliance of operations and specification (allocation and transfer of collateral) and automatically generates commands for registration in the Selic.

An additional BCB concern is to reduce the occurrence of frauds, with the consequent improvement of the SFN transactional security. The articulation with supervised entities, associations that represent financial institutions, and security bodies was essential for the elaboration an implementation of initiatives that mitigate this type of risk.

7.3 Transparency

This section reports the initiatives implemented in the dimension Transparency of the Agenda BC# and main achievements in 2022.

In this dimension, initiatives aim to improve the transparency of information related to the BCB, the financial market, and the price setting, providing the entire population with the understanding of the BCB and SFN roles.

The transparency in the relationship among the customer, financial institution, and the BCB also benefits the strengthening of the entire SFN and the better employment of public and private resources. The use of technologies or the integration of information systems facilitate the supervision of operations by financial institutions and the BCB. Cost reduction and operational simplification can result in discounts on fees and interests, as well as greater understanding of the entire process by citizens. Clarity of information benefits the decision-making process and the exercise of financial citizenship.

In 2022, citizens were able to access the *Sistema Valores a Receber* (Values to be Received System) to check if

In 2022, financial institutions returned

R\$2.7 billion to:

» **7.6 million** individuals; and

» **340,000** legal entities.

they had forgotten money in any bank or other SFN institutions, related to balances in closed current or savings accounts; in closed consortium groups; and in capital shares and participation in net surplus to beneficiaries and participants in credit unions.

Individuals also directly sought the customer service channels of banks and other financial institutions to check the existence of forgotten values.

It is estimated that there is still BRL 4.6 billion to be returned to society, with BRL 3.6 billion for 32 million individuals and BRL 1 billion for 2 million legal entities.¹⁰⁴

The BCB tool for responding citizens, “Din”, simplified its language, and now offers new services. Din allows self-service 24 hours, every day of the week. In 2022, more than 850.000 requests were carried out through the virtual assistant. This figure is more than eight times higher than the number of requests in 2021, nearly 102.000. The Din technological evolution made it safer and permitted the introduction of new subjects in a clearer and faster way.

Din now includes information about the *Sistema Valores a Receber* and all *Registrato* report, including the Report on Checks Returned due to Insufficient Funds and the Report of Debts registered in the Registry of Outstanding Credits of Federal Agencies and Entities (*Cadin Federal*). It has been also included the services of the Citizen’s Calculator (*Calculadora do Cidadão*), the consultation about the status of demands registered at the BCB (complaints against banks and information requests) and the research of authorized institutions.

In the framework of the Digital Transformation Plan, the BCB provides a series of digital services to citizens, registered at [Portal gov.br](https://portal.gov.br).¹⁰⁵ As for information requiring confidential information, login will be possible through the “gov.br” account, which allows user to access other electronic services of the Federal Executive Branch.¹⁰⁶

A module was also introduced to allow users to evaluate the level of satisfaction regarding the supply of these services. It should also be highlighted the BCB initiatives concerning the secrecy and protection of personal data, with the disclose of the *Política de Privacidade e Termos de Uso dos Serviços Digitais* (Privacy Policy and Terms of Use of the BCB website, applications

¹⁰⁴ Available at: <https://www.bcb.gov.br/meubc/faqs>.

¹⁰⁵ Available at: <https://www.gov.br/pt-br/orgaos/banco-central-do-brasil>.

¹⁰⁶ Decree 10,332, of April 28, 2020.

and digital services – Portuguese only).¹⁰⁷ Finally, information regarding authorization processes related to the operation of institutions participating in the SFN, SPB, and the Consortium System have been gathered in a [specific homepage](#) (Portuguese only),¹⁰⁸ with the aim of facilitating the consultation by citizens. Some initiatives contributed to increase the efficiency of the Guarantee Program of the Agriculture and Livestock Activity (Proagro) for the agricultural harvest 2022-2023. Proagro's quotes have been adjusted to rebalance expenditures in view of the increase of damages observed over the last years. Furthermore, a system has been introduced for the processing of coverage requests when events causing losses occur and lead to an accumulation of requests or of resources to financial institutions. These measures, combined with the development of new features of the System of Rural Credit and Proagro Operations (Sicor) will allow for a reduction in the time frame for producers to receive indemnities.

It is worth noting that, in 2022, the execution of the agreement that transfer resources from the Proagro to the Brazilian Company of Agriculture and Livestock Research (Embrapa) for the development of research targeted to the improvement of the Agricultural Zoning of Climate Risk (Zarc) continued. This instrument mitigates the risk of losses in crops covered by the Proagro. It is an investment that seeks to increase the Zarc's efficacy, which, in turn, also contributes to increase the efficiency of the Proagro's expenditures.

Proagro's regulation was improved in 2022. The regulation that became effective in January 2023 made explicit the responsibility of the Proagro's agent for the monitoring and fiscalization of operations under the program. It also reinforces the autonomy in the choice of procedures used by the agent, as long as is observed the effectiveness of procedures adopted and that the criteria and methods employed are consistent, verifiable, and subject to the BCB assessment.¹⁰⁹

This measure also adjusts the period for the analysis and evaluation of the coverage request by the Proagro agent of 45 business day to 90 consecutive days. The regulation also simplifies the required procedures in exceptional cases that prevent the regular processing of coverage requests.¹¹⁰

107 Available at: <https://www.bcb.gov.br/acessoinformacao/politicaprivacidade>.

108 Available at: <https://www.bcb.gov.br/estabilidadefinanceira/autorizabc>.

109 Resolution CMN 5,039 of September 29, 2022.

110 Available at: <https://www.bcb.gov.br/estabilidadefinanceira/creditorural>.

Rural credit operations processed with administered resources are now published on the BCB homepage. The goal is to provide the broadest possible dissemination of data on rural credit and Proagro operations registered at Sicor. Operations based on administered resources account for nearly 60% of total operations. Administered resources for rural credit are those subject to values, interest rates, guarantees, and maturities defined by the federal government.

Microdata of operations carried out with free or mandatory resources are disclosed, except for information subject to bank secrecy.¹¹¹

The legislation of public registration was also modernized, aiming to improve the business environment in the country. These changes reduce the bureaucracy of registry services, information, and guarantees in the national territory. The new legal framework regulates the implementation of a public, integrated, and electronic system of legal acts and businesses – Electronic System of Public Registration (Serp), simplifying the procedures related to public registration of legal acts and businesses.

The measures that were adopted provide more adequate conditions for the full operation of the credit market, including the carry out of loans to natural persons guaranteed by residential units (home equity), allowing to reduce costs, maturities, and risks associated with the processes of contracting and recovery of credits. In addition, the increase of security for the use of goods as guarantees enlarged the access to credit, with consequent positive impacts on the economy.¹¹²

In 2022, a new regulation of the traditional Credit Information System (SCR) was approved, which will enable the evolution of the SCR as a key tool for credit granting in the SFN. The new regulation will allow to share more detailed and granular information of credit operations in the financial system. It will also expand the access to some SCR information by other relevant agents participating in the credit granting process, as database managers and credit operations guarantors.¹¹³

111 Resolution BCB 204 of March 22, 2022.

112 Complementary Law 14,382, of June 27, 2022.

113 Resolution CMN 5,037 of September 29, 2022.

7.4 Education

This section reports on the initiatives developed and the main 2022 achievements aligned with the dimension Education of the Agenda BC#.

These initiatives seek to increase the understanding about products, concepts, and financial risks.

Besides, they seek to provide greater understanding to citizens about the financial risks and opportunities and also where to look for information or help in the decision-making process. Through accurate information and simple language, financial consumers and investors develop knowledge and skills to make choices that improve their financial well-being.¹¹⁴

The main initiatives relative to education in 2022 will be mentioned above.

Two collective efforts have been carried out for the negotiation of debts and financial guidance.

In the collective efforts carried out in 2022, four million delayed contracts have been renegotiated, of which 1.7 million in March 2022 and 2.3 million in November 2022. The BCB carried out these collective efforts jointly with the Febraban, the National Consumer Secretariat, and Procons of the whole country.

Another initiative with great impact the *Aprender Valor* program, which provides free financial education to students at elementary public schools in all federation units.

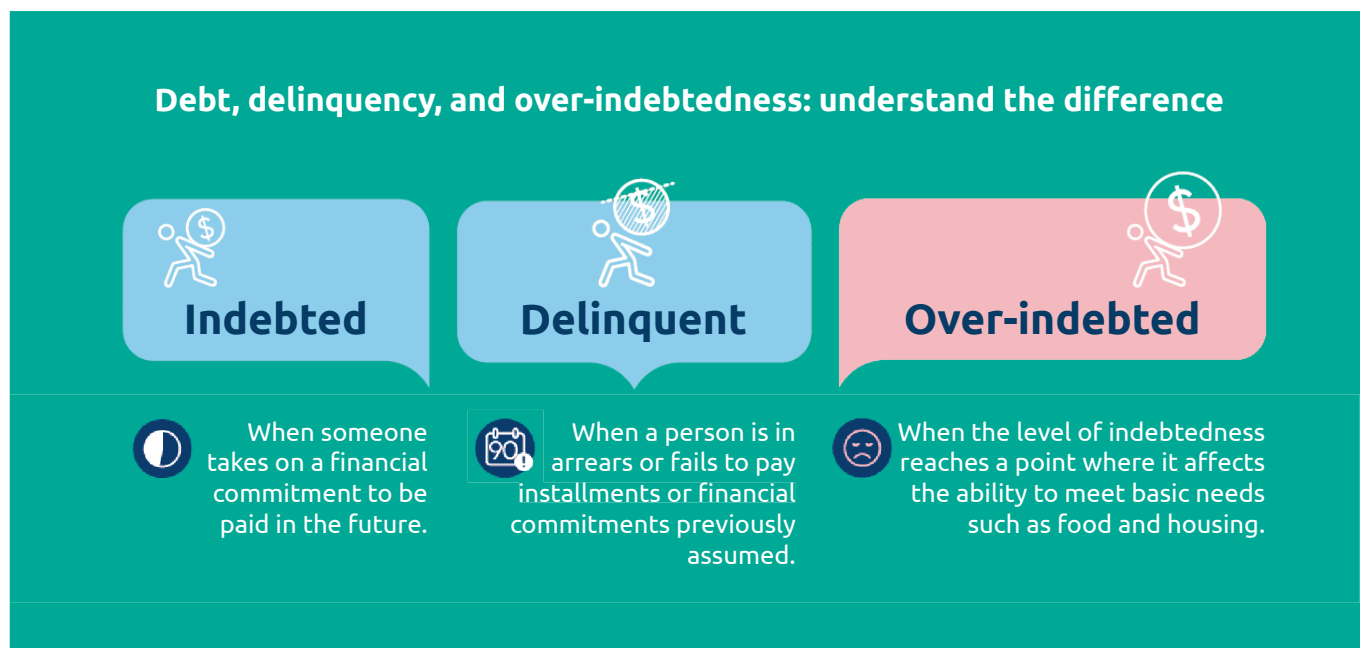
The program, designed by the BCB, is supported by resources of the Fund for the Defense of Diffuse Rights (FDD) of the Ministry of Justice and Public Security, developed in partnership with the Center for Public Policies and Educational Assessment of the *Universidade de Juiz de Fora* (CAEd/UFJF).

Aprender Valor exceeded the significant level of 1.2 million students enrolled in 2022. The program involved nearly 106.000 educational professionals (teachers, directors, and professionals from the education secretariats, among others) and 17.000 schools across more than 2,400 Brazilian municipalities of the entire country.¹¹⁵

¹¹⁴ Available at: https://www.bcb.gov.br/acessoinformacao/bcmais_educacao.

¹¹⁵ Available at: <https://aprendervalor.bcb.gov.br/site/aprendervalor/NoticiaAprenderValor/32/noticia>.

In 2022 was also released the Brazilian Financial Health Index (I-SFB). The survey identified the progress in the number of individuals declaring to have a current account, debt card, and savings account. However, a slight decline has been observed in the average financial health of Brazilians over the last two years. The overall average fell 1.2 percentage points, from 57.2, in late 2020, to 56.0 in early 2022.¹¹⁶



This is the second edition of this survey, which was carried out from January to March 2022. The sample comprised 4,797 individuals of the five federation units, aged 18 or above with bank registration. The I-SFB is measures from a questionnaire that allows to calculate a score that goes from 0 to 100, with a classification varying from “bad” to “optimal”. The I-SFB was developed by the Febraban with the technical support of the BCB. The index elaboration involved more than 70 experts.¹¹⁷

A new edition of the Guide of Excellence in the Supply of Products and Financial Services – Credit Operations was also launched. The guide’s purpose is to provide financial institutions with good practices of responsible credit, contributing for better decision-making of consumers for borrowing.

The BCB already regulates issues concerning the relationship between citizens and financial and payment institutions, as transparency, adequate and fair treatment,

116 Available at: https://pefmbddiag.blob.core.windows.net/cdn/downloads/Febraban_ISFB_2022_SITEVs3.pdf.

117 Available at: <https://indice.febraban.org.br/>.

and provides citizens with financial education through several projects. The Guide of Excellence in the Supply of Products and Financial Services¹¹⁸ seeks to complement other BCB initiatives, indicating good practices in the credit supply for financial institutions.

7.5 Sustainability

This section reports the initiatives and results that contributed, in 2022, related to dimension Sustainability of the Agenda BC#.

Initiatives in this dimension deal with the promotion of sustainable finance, the adequate management of socio-environmental and climate risks in the economy and in the SFN. These initiatives mostly aim to fuel a balanced relationship between the human action and the environment as a whole. The focus of intervention is on the BCB action scenarios and involves several participants of the economic-financial environment.

It also aims to increase the availability of SFN resources to sustainable initiatives: the exchange of experiences, the implementation of best international practices in this subject, and the alignment with the world sustainability agenda.

In this dimension the main achievements will be presented below.

The BCB has joined the Directive Committee of the Network for Greening the Financial System (NGFS). Since 2022, the BCB has joined the group of 15 central banks that target to part of this network, comprising more than 100 members. In late 2022, 19 of the central banks of the G20 were already NGFS members.

After less than two years of joining the NGFS, the BCB is already involved in several network initiatives, having more recently coordinated the elaboration of a progress report within the supervision framework.

Joining the Directive Committee brings an increased probability of participating actively in discussions and influence the NGFS decisions.

¹¹⁸ Available at: https://www.bcb.gov.br/content/cidadaniafinanceira/documentos_cidadania/guia_de_excelencia/guia_de_excelencia_oferta_de_produtos_servi%C3%A7os_financeiros.pdf.

In 2022 was disclosed the 2nd Edition of the BCB Report on Social, Environmental, and Climate-related Risks and Social Opportunities (RIS). This report was based on the structure proposed by the World Economic Forum (WEF) with a wider scope in relation to the Task Force on Climate-related Financial Disclosures (TCFD) by addressing not only climate but also social and environmental issues. The TCFD recommendations also supported the introduction, in 2021, of the request for disclosure by SFN institutions of the Report on Social, Environmental, and Climate Risks and Responsibilities (GRSAC).

The 2nd RIS edition presented an overview of the initiatives of the dimension Sustainability in progress since the release of its 1st edition, in September 2021, as well as new initiatives included in the agenda throughout 2022.

The first phase of the project Sustainable Brazilian Finance (FiBraS) was concluded in March 2022. Started in October 2018, FibraS was originally conceived with a focus on specific supervision issues, aiming to guarantee the implementation of rules in effect on the management of social, environmental, and climate risks by financial institutions in their credit granting operations.

The project provided the BCB with access to relevant tools for the improvement of the monitoring of rural credit operations, with the wider use of geospatial data in this process. It has also contributed to improve BCB regulations.

Still in the rural credit segment, new rules allowed the sharing of data on rural credit operations. The aim is to widen the sources of financial resources to rural producers, improve available financial products and services, and reduce the asymmetry of information in this segment.

Since May 2022, rural credit borrower can share data on credit operations with any individual, legal entity, or financial institution.

Furthermore, as of November 2022, verification began to ascertain whether there is overlap of the financed project with indigenous or *quilombolas* lands at the time of credit borrowing.

The sharing of information is directly conducted by the BCB in the system targeted to register rural credit

operations. Third parties are granted access to data only upon previous consent by borrowers. Such information may also be used by rating agencies, auditing, certifiers and their peer entities, which also may contribute to widen the credit supply to rural producers.

These new rules are expected to provide greater transparency on the leverage level of rural credit operations, especially for potential financing agents other than financial institutions.¹¹⁹

The supervision process of social, environmental, and climate risks has been improved, considering the improvement of regulations in 2021, which introduced requirements related to the climate risk and enlarged requirements related to the social and environmental risks within the framework of integrated risks management. The process has been updated in the Guide of Supervision Practices (GPS), publicly disclosed to clarify to financial institutions the assessment criteria of the BCB's supervision regarding compliance with these requirements, including best practices examples.

Information gathered by the BCB's supervision is used to enhance monitoring of financial institutions' exposures, specifically regarding climate risks, as well as the development of climate stress tests within the assessment process of the SFN's stability.

It should also be highlighted that the BCB disclosed, in the section II of the Financial Stability Report (REF)¹²⁰ of November 2022, the first assessments regarding the physical and transitional climate risks in the scope of the SFN.

Physical climate risk deals with the possibility of losses caused by frequent severe weather events or long-term environmental changes that might be related to changes in climate standards.

According to the improvement of regulations introduced in 2021, the transitional climate risk refers to the possibility of losses caused by the process of transition to low carbon economy, in which the issuance of greenhouse gases is reduced or counterbalanced. These are the first analyses resulting from continuous BCB initiative, associating and adapting several methodologies and databases.

¹¹⁹ Resolution BCB 204 of March 22, 2022.

¹²⁰ Available at: <https://www.bcb.gov.br/publicacoes/ref/cronologicos>.

An analysis of the sensitiveness of the SFN credit portfolio to the physical risk has been presented, based on projections of extreme droughts developed by the National Institute of Special Research (INPE).

As for the transitional risk, it has been measured the exposure of the SFN credit portfolio channeled to borrowers more exposed to the process of transition to a low carbon economy.

One of the main goals of the presented studies is to disseminate this issue and promote a wider understanding of the climate risk in the financial system.

An additional advance in the Sustainability area refers to BCB adjustments introduced in the accounting of sustainability assets in the Accounting Standards of the Institutions Regulated by the BCB (Cosif). Sustainability assets are related to mechanisms that contribute to the social, environmental, and climate sustainability.

The aim of this measure is to provide greater transparency to the use of these assets by financial institutions, as well as to solve likely uncertainties and standardize accounting, so that the BCB is able to monitor the sustainability assets held by these institutions in their investment portfolios, monitor the market evolution, and, when necessary, to adopt timely measures.

7.6 On-going initiatives

Since the announcement of the Agenda BC#, several initiatives have been concluded and another 47 of great relevance are in progress. Part of this set of ongoing initiatives is under discussion in the National Congress, because of their dependence on legal changes, while others depend on the collaboration with other government agencies, with infra-legal changes. Standing out among those initiatives are:

- Real estate collaterals: deals with the main collaterals in real estate operations (fiduciary alienation and real estate mortgage), mitigating distortions identified in the market, in addition to increase its potential use through specific mechanisms (extension of fiduciary alienation and real right of fiduciary alienation over subsequent ownership of real estate), ultimately benefiting the real estate credit market (lenders and borrowers).

- **Bank Resolution Law:** proposes a new legal framework for resolution in case of failure of large institutions involving systemic risk, including federal state-owned banks, stock exchanges, and depository centers. This law is part of the commitment signed by Brazil in the G-20 to provide the BCB with more efficient instruments to deal with financial.
- **Rural credit insurance instrument:** proposes the integration of Proagro and the PSR. It makes part of the programs for mitigating climate risks managed by the Ministry of Agriculture, Livestock and Food Supply, with the gradual migration of beneficiaries and Proagro budget to the PSR.
- **Bill for the Financial Market Infrastructure:** aims to consolidate and update the legal norms applicable to financial market infrastructure and the respective operating entities, making them clearer and safer, in line with the best international.
- **Bill of the Authorizations Law – revision of articles of the Law 4,595, of December 31, 1964:** proposes the modernizing of processes of authorization, regulation, supervision, and organization of the SFN, providing greater proportionality in authorization requests, regulating the participation of new institutions in the financial market and providing new competences to the CMN and the BCB to regulate and carry out authorization and surveillance procedures more aligned with the promotion of stability, competitiveness, and financial inclusion.

Box 9 – Digital BRL: a platform for tokenized finance

The discussion about digital currencies, in addition to being multidisciplinary, involving areas as diverse as information technology, law, and economics, is multifaceted in each of its areas. This characteristic allows issues concerning the Digital BRL to be approached from different perspectives. In this box, which is not intended to exhaust the issue or present all aspects of the subject, the focus is to discuss how the Digital BRL and tokenized versions of bank currencies can meet the demand for a digital representation of liquidity, required for the proper operation of a tokenized environment.

Discussions and initiatives about the possible issuance of a digital currency started in the Banco Central do Brasil (BCB) in August 2020, leading to the establishment of the Digital BRL guidelines in May 2021. Since then, the BCB has closely monitored the growing trend of using financial transactions in Distributed Ledger Technology (DLT) in the Brazilian economy.

DLTs and smart contracts have the potential to enable innovative business models in several areas. Dialog with the private sector and academia, especially through the LIFT Challenge, allowed a thorough analysis of potential use cases related to the Digital BRL. Next, practical examples of how these technologies have been applied during the program will be detailed.

One example is the Aave, which uses DeFi tools to gather resources of several savers in a liquidity pool, with the aim of providing loans in compliance with the financial system regulations, in partnership with Fireblocks and the Polygon. The interaction of the project's team with the LIFT Challenge team allowed to increase the regulator's understanding about the establishment of a regulated DeFi environment and its application to the daily life of citizens.

Another example is the Banco Santander's proposal, which dealt with the tokenization of vehicles and real estate property rights focused on delivery-versus-payment transactions (DvP), in partnership with Parfin. This project delves into complex issues related to the representation and negotiation of real assets in an environment of distributed registries – with the potential to reduce transactional costs and automate business procedures related to the life cycle of these assets.

Febraban has also worked on a DvP solution for financial assets, which requires functionalities directly linked to the Digital BRL infrastructure, shedding light on essential elements for the definition of the next steps of this initiative.

The Giesecke + Devrient proposed a dual off-line payments solution, in which none of the participants in the transaction has connectivity, facing even greater technological challenges than those present in online applications of a Central Bank Digital Currency (CBDC), but with great potential for financial inclusion and increase of the resilience of digital payments, especially in remote regions of the country.

The Itaú Unibanco's project dealt with international payments using CBDCs with the participation of the Central Bank of Colombia. This project supports discussions in international forums, in the attempt to improve transnational payments channels conducted by the G20.

The Bitcoin Market has teamed up with the CPQD, ClearSale, and Bitrust to provide a use case of DvP with the tokenization of court-ordered debts issued on a public DLT network. The case also explored the adoption of decentralized identities and verifiable credentials.

The Tecban's proposal combined DvP elements, integrating intelligent contracts with an Internet of Things (IoT) solution, seeking to provide a logistical solution in a system in which different e-commerce platforms can have access to safe and automatized delivery points.

Vet's association with Digital Asset, with the support of Oliver Wyman, proposes rural financing based on programmable payment token with a value linked to that of Digital BRL. This proposal aims to provide greater fluidity and efficiency to the use of resources, at the same time that, through the use of programmability, allows monitoring and fiscalizing its destination.

Finally, Visa, associated with Microsoft, Sinqia, and Agrotoken, presents a proposal that seeks to demonstrate how a regulated DeFi platform can be designed to allow the interaction of Brazilian SMEs with the global financial market looking for competitive financing through an open platform.

As a result of the lessons learned, in February 2023, after the end of the LIFT Challenge, the BCB revised the Digital BRL guidelines and, as of March, began testing a platform for operations with the Digital BRL, the "Pilot RD", aligned with the new guidelines.

Concerning the Digital BRL guidelines, it should be stressed the emphasis on the promotion of innovative models through the democratization of access to new technologies, such as DLT-based solutions, through the Digital BRL platform.

Tokenized finance

As a mechanism to facilitate innovation in financial markets, CBDC platforms allow to incorporate new methodologies and new business models with the potential to meet the population's demand for natively digital means of settlement, similar to those available in the cryptoassets ecosystem.

A trend that is favored by technologies that support the cryptoassets ecosystem is the tokenization of assets.¹ The dissemination of tokenization has the potential to generate concrete gains in the accessibility to assets and promote greater efficiency in its transactions. In general, tokenized assets can be transferred easily, fractionally, and in just seconds. They can be used in decentralized applications and stored in smart contracts, which are executed automatically when predetermined terms and conditions are met.

The expected benefits of tokenization are: i) greater programmability,² providing new automation forms; ii) atomic settlement,³ in which the automated and conditional exchange between tokens reduces counterparty risks; iii)

1 Highlighting blockchain and DLT technologies, already well disseminated in Decentralized Finance (DeFi). Further information on this issue [s.l.: s.n.]. Available at (Portuguese only): <https://www.anbima.com.br/data/files/02/30/82/CB/68001810C27A8F08882BA2A8/Tokenizacao%20de%20ativos.pdf>. Accessed on: Mar 9th. 2023.

2 LEE, A. *What is programmable money?* Available at: www.federalreserve.gov, June 23, 2021.

3 BECH, M. L. *et al. On the future of securities settlement.* Available at: www.bis.org, March 1, 2020.

decentralized registries that break down information silos;⁴ and iv) the possibility of registering assets of different natures in the same environment (multi-asset registry), facilitating negotiations and increasing market liquidity.

Nevertheless, given the non-existence of a BCB currency compatible with operations in DLTs environments, market participants have been using private issued digital currencies that are not subject to an adequate regulation, the so-called stablecoins,⁵ for the financial settlement of transactions involving tokenized assets. Thus, in the absence of an infrastructure that operates natively with the BCB currency in digital format, these transactions are exposed to private risks, which could jeopardize financial stability.

Therefore, the existence of a regulated infrastructure compatible with transactions with tokenized assets, in which the settlement currency is a digital version of the official currency, provides a suitable environment to the proposal of innovations by the various market agents. Furthermore, the benefits of these technologies may be supplied to a larger base of citizens without exposing their businesses to the uncertainties of an unregulated financial environment.

Decentralization of financial services

Despite the high interest and progress of research and tests about CBDCs, most countries are wondering about which would be the best use of this technology. The list of potential applications ranges from the expansion of financial inclusion to the elimination of cash and the improvement of digital payment services.

In general, the main CBDCs uses are those related to digital payment solutions. In Brazil, however, these services are already provided by systems that are a global benchmark, such as Pix, for instance.

Therefore, studies for the implementation of Brazil's sovereign digital currency, the Digital BRL, had to consider the possibilities brought by technologies of digital currencies for applications that go beyond payment services. As a consequence, the BCB has sought to design a more open financial system, which benefits the incorporation of new technologies and the provision of services for a wider share of the population. Specifically, this initiative of the BCB innovation agenda seeks to promote a greater level of financial inclusion, through the democratic availability of investment, credit, and insurance tools, among others.

To achieve this goal, the incorporation of financial transactions and tokenized assets into the regulatory framework seems to be a natural and even unavoidable step. Therefore, the BCB has been following the model presented by Schär (2021),⁶ which allows the evolution of the financial system towards these innovations, the incorporation of characteristics and functionalities existing in the DeFI ecosystem and, at the same time, is compatible with the innovation agenda conducted by the BCB, the Agenda BC#.⁷

These characteristics and functionalities allow to reduce costs in the establishment and administration of financial services, obtained through standardization and interoperability; the reuse of protocols; and the composability of financial services, in which the components of the decentralized finance ecosystem are put together to design

4 Data storage unities or arrangements, maintained by different market participants, which do not communicate or have their interoperability made difficult by the interest of their maintaining agents. Conversely, in DLT networks, information can be registered and consulted for the entire network, although this may bring challenges related to the treatment of sensitive data.

5 Regulating the Crypto Ecosystem: the case of stablecoins and arrangements. Available at: <https://www.imf.org/en/Publications/fintech-notes/Issues/2022/09/26/Regulating-the-Crypto-Ecosystem-The-Case-of-Stablecoins-and-Arrangements-52372>.

6 Fabian Schär (2021), "Decentralized Finance: On Blockchain- and Smart Contract-Based Financial Markets", Economic Research – Federal Reserve Bank of St. Louis.

7 See <https://www.bcb.gov.br/acessoinformacao/bchashtag>. Although the BCB's strategic innovation agenda is cross-cutting, the most relevant initiatives are in the Competitiveness Dimension.

new products.⁸ In addition to these characteristics, these technologies provide a high degree of accountability, traceability, and transparency, ensuring the necessary tools for supervision and regulation, as well as the compliance with legal requirements, especially related to the combat of money laundering and financing of terrorism (PLD/FT).

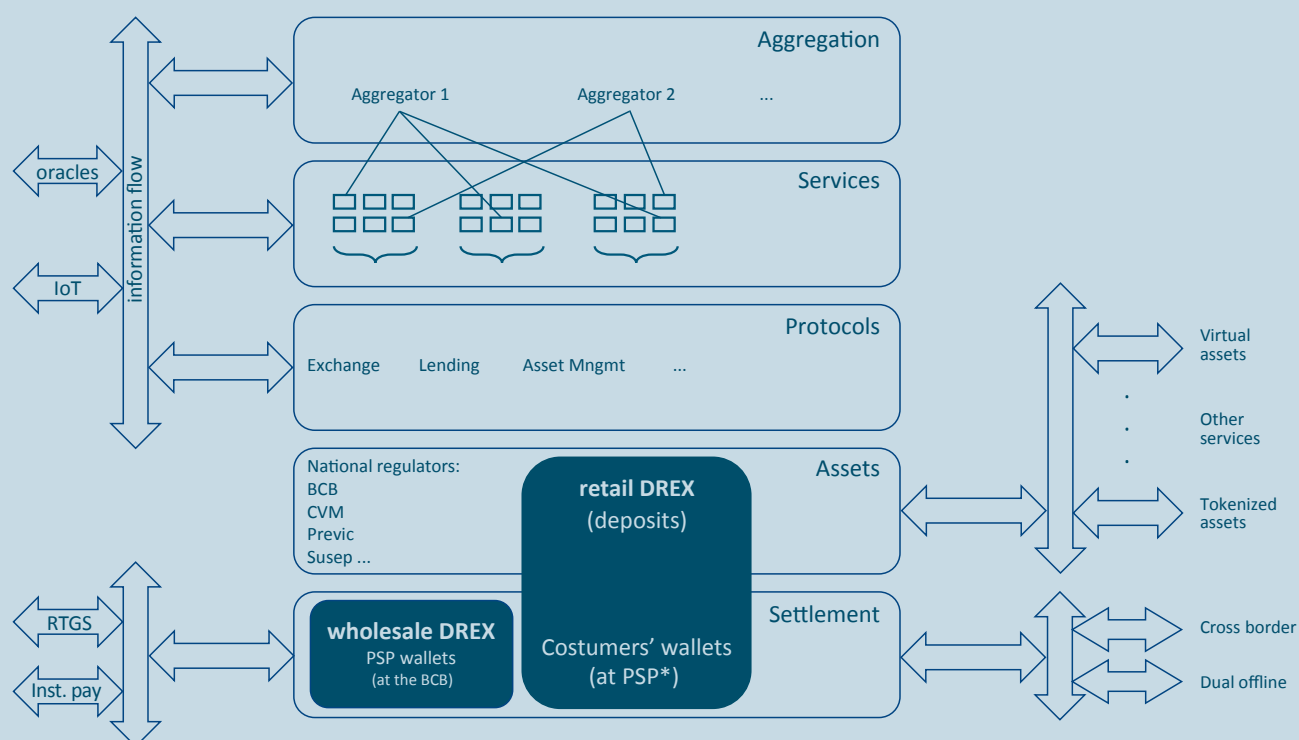
In this model, adapted to the Digital BRL context, as illustrated in Image 1, the negotiations environment is divided into layers that are dedicated to: i) the settlement; ii) the registry of assets; iii) the negotiation protocols; iv) the modular supply of financial services – applications; and v) the aggregation of these services:

- Settlement layer – basic infrastructure, mainly composed of DLT infrastructure and its native token.
- Assets layer – environment in which are defined standards for issuing tokens and representing financial instruments.
- Protocol layer – in which standards are defined for specific business models, such as the management of assets, loans, exchange rate, derivatives, among others. In this layer, the BCB can define a series of basic protocols, which will function as financial primitives for several applications to be created by the market in the Digital BRL platform.
- The BCB should not be, however, the only provider of protocols, not even seek to provide protocols in final format for any specific business models. New market participants can rely on these protocols to facilitate compliance with regulatory requirements – thus reducing barriers to entry. Sophisticated market participants can develop their own versions of these protocols, gaining flexibility but increasing their responsibility in the environment.
- Applications layer – basic services and products are developed by authorized entities such as banks, credit unions, IPs, and Fintechs. These basic services, or applications, can ensure the atomicity in their operations, serving as the basis for the design of final services that meet the users' needs.
- Aggregation layer – in line with the principles defined in the BCB Open Finance initiative,⁹ applications are aggregated through composability mechanisms so as to generate final contracts.

8 The term composability refers to the possibility of the composition of financial services designed separately and provided by different agents so as to obtain a final transaction that occurs in an atomic way, i.e., where all the transaction parts carried out by different services are concluded or no transaction is concluded at all.

9 See <https://www.bcb.gov.br/estabilidadefinanceira/openfinance>.

Image 1 – Digital BRL platform



Against this backdrop, the BCB's focus in the development of the Digital BRL platform is on the three initial layers – settlement, assets, and protocols. The other layers of this model are the object of other initiatives in the BCB innovation agenda. Regulatory initiatives in the digital assets markets, for instance, strongly affect the design of the protocols layer, while the applications and aggregation layers are aligned with the Open Finance initiatives. Therefore, this model provides a convergence point for several innovation initiatives under progress in the Agenda BC#.

The role of the Digital BRL

Despite the positive potentials presented in this box resulting from the implementation of a CBDC, the possibility of financial disintermediation is an issue that concerns all central banks that have been assessing the adoption of this technology. A retail CBDC has the potential of changing funding and lending credit mechanisms in the economy (see Financial Stability Report - FSR, 2022).¹⁰

Therefore, BCB's discussions with society have contributed to consolidate a view that, to achieve the main objectives of the Digital BRL implementation, it is important to maintain the financial intermediation mechanisms and the banking system capacity of credit leverage and generation. Conversely, experiments and tests developed so far indicate that payment and settlement services in this environment do not require to be exclusively provided by the BCB currency.¹¹

Thus, to provide retail services in a digital environment it would be enough the use of digital currencies issued by BCB authorized agents, as long as these are well-regulated, safe, and widely accepted by the population.

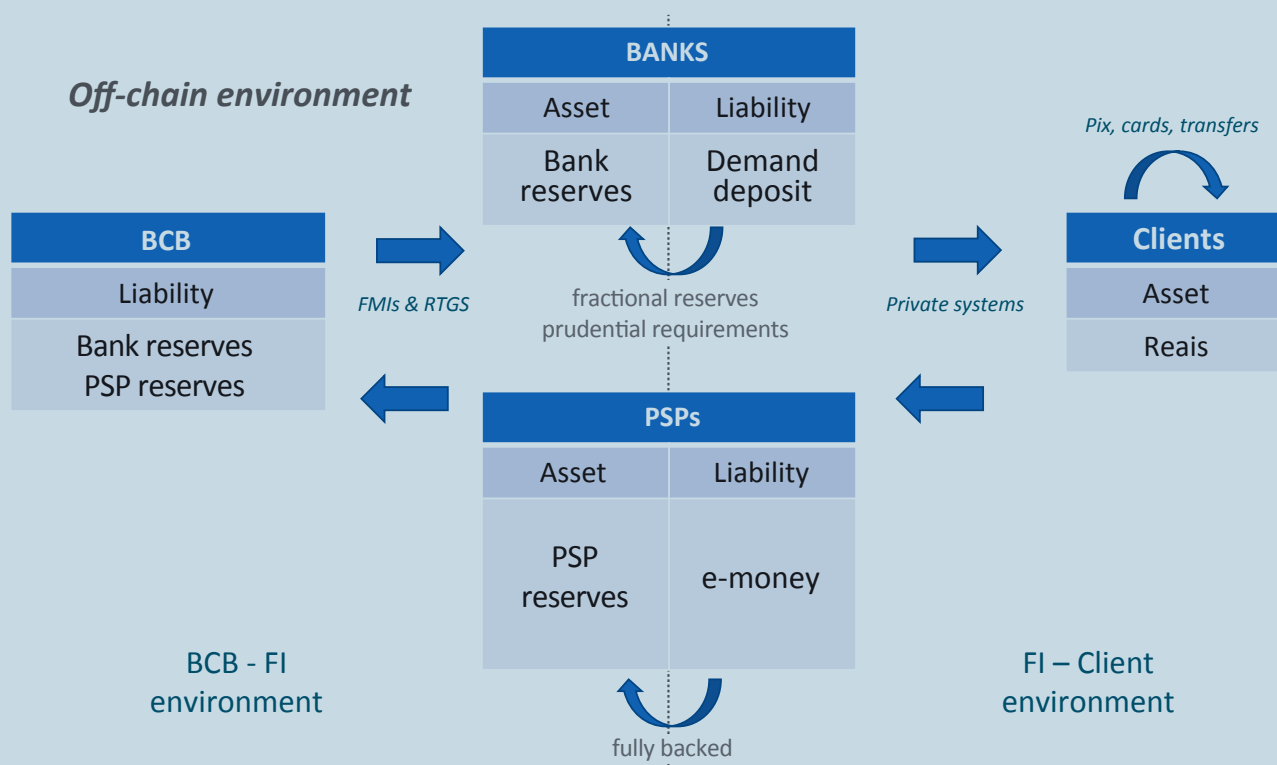
¹⁰ Financial Stability Report – Vol. 21, November 2, 2022 – “The impact of CBDCs on financial intermediation”, p. 67.

¹¹ Several use case have been explored throughout the program LIFT Challenge Digital BRL.

Therefore, the option was to employ **tokenized versions of demand deposits in banks and credit unions and payment accounts held in IPs**, since these instruments present all these desirable characteristics.

This model, on the one hand, prevents the banking disintermediation and, at the same time, allows the BRL to be negotiated in a DLT based network, enhancing the currency programmability and enabling new functionalities through smart contracts. In this environment, the Digital BRL functions as an anchor to operations between tokens referring to deposits, providing settlement mechanisms for tokens from different issuers regulated by the BCB, in a framework analogous to that used in the Reserves Transfer System (STR).

Image 2 – Operations in the traditional platform



Currently, entities authorized to receive deposits divide the financial transactions and payments environment in two business rooms: one between the BCB and the institutions it authorizes, and the other between these institutions and the final users of the financial system (Image 2). With the implementation of the Digital BRL, it is proposed the creation of an analogous system in a digital environment, maintaining the regulatory framework and incorporating new technologies. Summing up, the goal is to gain efficiency and democratize the access to operations with digital assets, which can be incorporated to the daily life of citizens in their economic interactions.

Image 3 – Operations in the Digital BRL platform

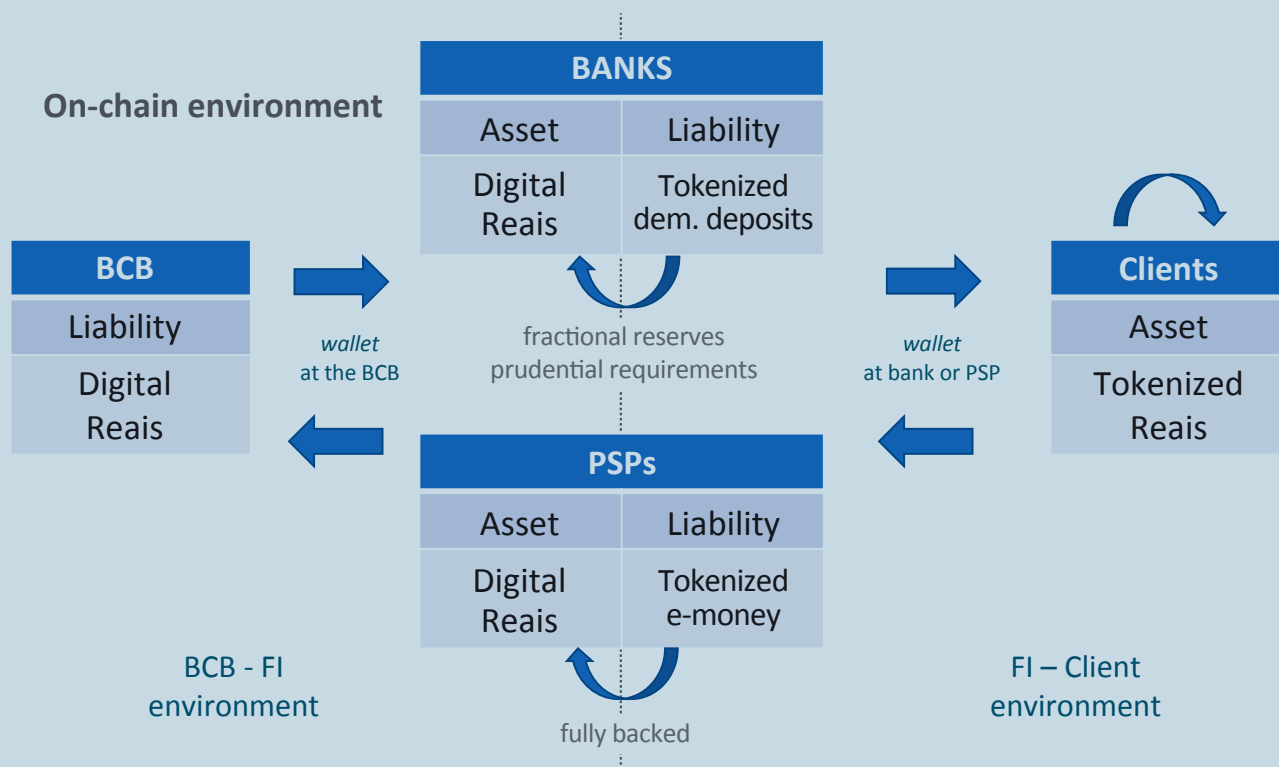


Image 3 shows the separation between the business environments mentioned in the previous paragraph. In the BCB-FI environment,¹² the settlement asset is the Digital BRL. In the FI-Customer environment, the settlement asset is the tokenized BRL – tokenized version of BRL held in banks, credit unions, and IPs.

Despite this logical division, in the Digital BRL platform, all operations will be carried out in a single permitted DLT environment¹³ and multi assets,¹⁴ while the traditional platform is composed of several systems – such as the STR, the National Financial System Network (RSFN), the Instant Payments System (SPI), as well as private networks and systems, as illustrated in Image 2. The fragmentation of traditional business environments imposes difficulties of interoperability and has the potential for the creation of information silos that can be sorted out in the new platform.

The proposed architecture for the Digital BRL platform brings together three fundamental characteristics for the successful implementation of the Brazilian digital currency. Firstly, it promotes the access of the population to digital services that can increase the efficiency of the provision of financial services, enlarging financial inclusion in the country. Furthermore, the new architecture will use Digital BRL as a source of final guarantee for operations while providing the BCB with supervision tools, so as to increase security to this space, and, finally, it will allow the current regulatory framework to be transposed to a new environment, preventing regulatory asymmetries.

12 The acronym is used to simplify the text. In fact, these business areas do not include only financial institutions, but all institutions authorized to operate by the BCB that provide financial services.
 13 Access or exclusion are processed by an entity responsible for the network governance, which, in the case of Digital BRL, would be the BCB.
 14 It records different kinds of assets.

Conclusion

The transition to a digital economy in which tokens play a leading role is accelerating. The BCB is responsible for building the path for this transition in the most orderly way possible, without compromising financial stability. Against this backdrop, through the Digital BRL initiative, the BCB has been approaching this new environment, which presents great potential and challenges.

To spread the benefits of these new technologies, the BCB will have to keep up with the changes underway in the economy. In this structure, new systems will have to be implemented, and new procedures coupled with a new organizational culture will have to be established – adjusting, among others, regulatory frameworks and new supervision models. Therefore, the BCB is responsible for providing a safe environment for the generation of new businesses, while promoting access to the benefits of the digitalization of the economy to a larger share of citizens and entrepreneurs.

Box 10 – Has portability increased banking competition?

The decline in the credit cost is an important issue for the BCB, and several initiatives have been adopted with this aim over the years. Among them, credit portability stands out, established by Resolution 3.402 of September 6, 2006, and amended by Resolution 4,292 of December 20, 2013, when the actual implementation of portability requests began.¹

This regulatory change provides an almost experimental design² for assessing the causal effects of increased banking competition on the interest rates and volume of loans in the country. The goal of this box is to estimate the effects of portability on consumer credit markets.³ To isolate the effect of portability on the conditions of these markets, one considers that some localities are more strongly affected by the portability regulation than others. Assuming that, in markets with just one bank, the portability would have no effect on the local banking competition, one employs an empirical strategy of “differences in differences” that compares markets that were affected and non-affected by the portability regulations. The analyses are based on detailed administrative data on banking loans in the country (e.g., credit modality, volume, interest rate, maturity) from the Credit Information System (SCR). In particular, one investigates the payroll-deducted personal loans, the most representative among the completed portability requests.⁴

Descriptive analysis

The market power of banks is one of the relevant factors for explaining interest rate spreads (difference between banks’ lending credit operations and funding). Graph 1 shows the Herfindahl-Hirschman Index (HHI)⁵ distribution, which measures the banking concentration in each Brazilian municipality in 2012, 2014, and 2016. In those years, the HHI distribution moved to the right, which implies that the level of banking concentration rose from 2012 to 2016. Graph 2 shows that, throughout the period, nearly 80% of the banking credit originated in roughly eight banks in the country.⁶

1 Portability grants to the borrower the possibility to request that its credit operations are transferred from one financial institution to another, upon early settlement of the operation at the original institution. The terms of the new transaction must be negotiated between the customer and the institution that will grant the new credit. Further details about credit portability in boxes “Real estate credit portability” of the 2019 Banking Report, and “Evolution of credit portability in Brazil: behavior and profile” of the 2020 Banking Report.

2 This is an almost experimental design, because in order to actually use portability, the customer would need to have more than one bank to do the “price” research and decide whether to change banks or not. At the time of the new regulation (Resolution 4,292), on December 20, 2013, only 44% of municipalities had more than one different bank. These were the municipalities considered as treatment group in the analysis. The other municipalities will be the control group in this analysis. Since the distribution between treatment and control is not merely random, the result is an almost experimental design.

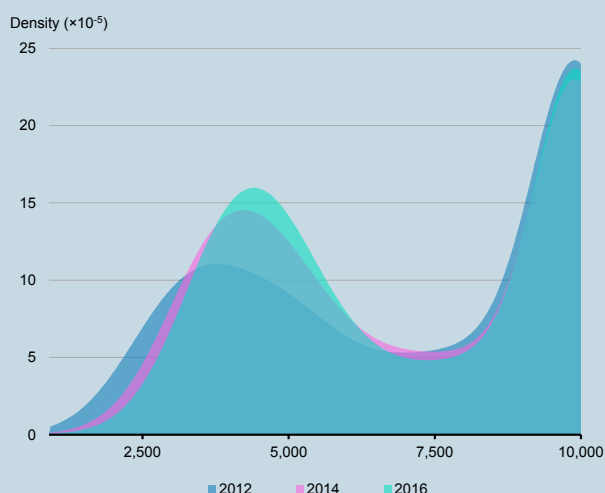
3 Results shown in this box are based on the survey in progress “Does Loan Portability Promote Bank Competition?”, developed by Tiago Cavalcanti (University of Cambridge and FGV-EESP), Marco Bonono (Insper), Fernando Chertman (Banco Central do Brasil), and Amanda M. Fantinatti (FGV-EESP).

4 Among completed portability requests, 99.85% in 2014, 99.96% in 2015, and 99.99% in 2016 refer to the payroll-deducted credit modality. In terms of credit balance, the shares are 95.32%, 98.79%, and 99.83%, respectively.

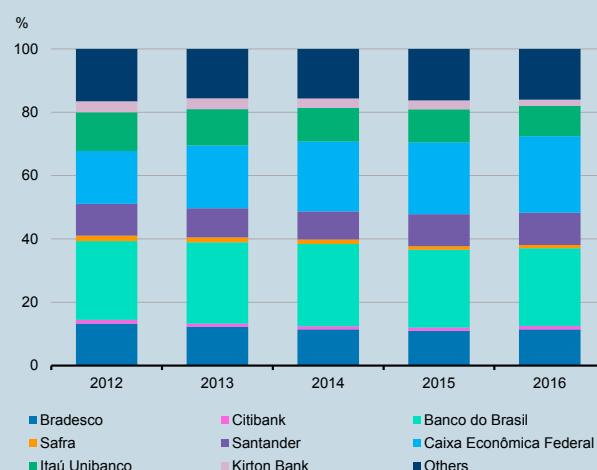
5 The HHI refers to the sum of squares of the participation of each bank in credit operations of each municipality. The index ranges from 0 to 10,000. The higher the HHI, the higher the concentration level. The maximum value is 10,000, which corresponds to the case of only one bank operating in a municipality.

6 Household and corporate banking credit. Monthly Estban (Banking Statistics) by each municipality (Portuguese only) available at <https://www4.bcb.gov.br/fis/cosif/estban.asp?frame=1>.

Graph 1 – HHI Index by Municipality in Brazil



Graph 2 – Total Credit Granted by Bank

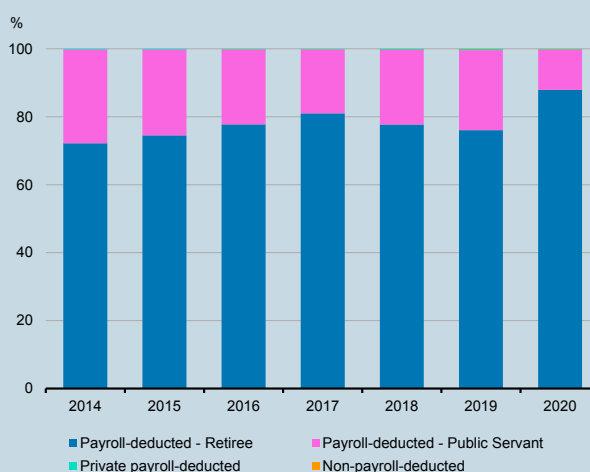


Analyzing only ported credit operations in the period (as outlined in Resolution 4,292 in May 2014 until December 2016), one realizes that more than 99.9% of completed requests and 97.9% of the credit balance, on average, refer to the payroll-deducted credit modality.⁷

Payroll-deducted is a credit modality whose fixed monthly installments are debited directly from the payrolls (CLT workers or civil servants) or social assistance benefits. Therefore, the delinquency risk of this modality is reduced, which is reflected in its lower interest rates. The average interest rate of the payroll-deducted credit from May 2014 to December 2016 was 27.9% p.a., while, for the personal non-payroll-deducted credit, the average rate reached 117.3% in the same period.

Furthermore, Graph 3 shows that amongst completed payroll-deducted portability requests, nearly 75% referred to National Social Insurance Institute (INSS) retirees, and the remainder came from civil servants.

Graph 3 – Ported Credit
Payroll-deducted vs. non-payroll-deducted



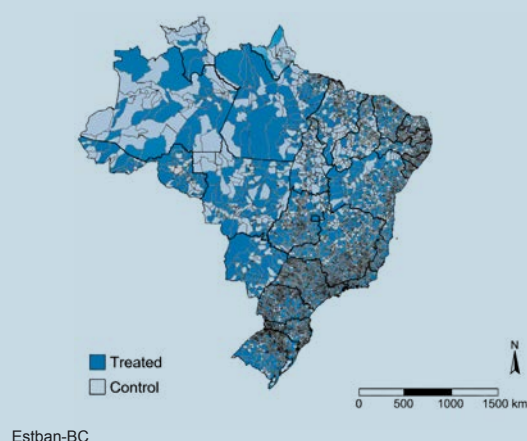
⁷ Among completed portability requests, 99.85% in 2014, 99.96% in 2015, and 99.99% in 2016 refer to the payroll-deducted credit modality. In terms of balance, the shares are 95.32%, 98.79%, and 99.83%, respectively. Further details on payroll-deducted credit are available in the box “Overview of the payroll-deducted credit portfolio” in the 2020 Banking Report.

Methodology

In an attempt to isolate the effect of portability on the country's local credit market, one employs an empirical strategy of “differences in differences” that compares changes in the markets with at least two different banks in December 2013 (when portability was made available) and those with only one bank. The assumption is that, in markets with only one bank, customers are not able to get better prices (i.e., interest rates) for their loans, and portability has no effect on the local banking competition. Our assumption is of a parallel trend of both markets in terms, for instance, of interest rates of loans and that the new regulation led to a greater change in interest rates in markets with at least two different operating banks.

Figure 1 shows that municipalities in the treatment group (those with at least two different operating banks), accounted for 44% of the sample, and municipalities in the control group (with only one operating bank), accounted for 56% of the sample. It should be noticed the spatial distribution of control and treatment groups across all the country's regions.

Figure 1 – Treated and control municipalities in December 2013



Results

Table 1 presents the main results. The coefficient in the first line (Treatment, Dec 2013 x Post) shows the effect of portability on interest rates of payroll-deducted loans in municipalities with more than one operating bank compared with municipalities with just one bank. A reduction of nearly 0.8 p.p. is observed in municipalities with more than one operating bank compared with those with just one bank. This reduction is statistically significant and economically relevant. In this period, the average spread was nearly 16 p.p.⁸ for payroll-deducted loans, this implies that the change of portability resolution alone resulted in a decline of nearly 5% of the average spread. The results are robust to different specifications and sub-samples – for example, excluding municipalities with more than 200 thousand inhabitants.

It can also be shown that some groups were more benefited than others. Graph 4 shows that ported payroll-deducted credit of retirees almost did not register interest reduction in the period (i.e., several borrowers changed banks to obtain a slight interest rate reduction). However, the reduction of interest rates of payroll-deducted loans of civil servants was much larger (Graph 5).

⁸ The average interest rate of payroll-deducted credit from January 2012 to December 2016 was 26.7%. In the same period, the average Selic rate was 11.1%. Therefore, the average spread (the difference between the payroll-deducted interest rate and the Selic rate) in the period was 15.6%.

Table 1 – Effect of Portability on Interest Rates

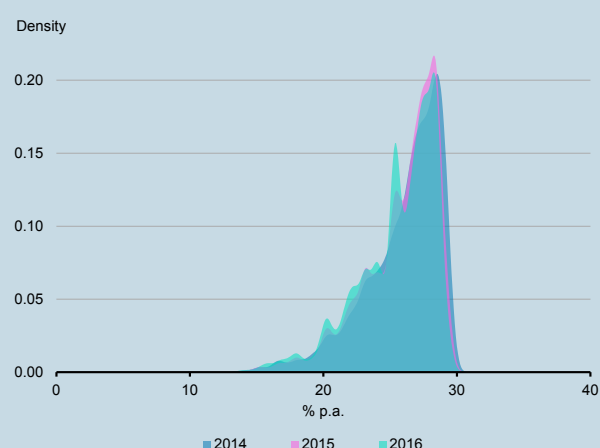
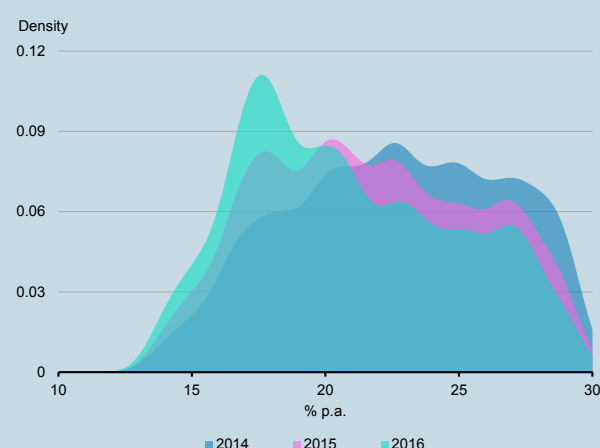
Sample: 2012.01 – 2016.12, all municipalities

Variables	(1)	(2)	(3)
Treatment, Dec 2013 × Post	-0.804*** (0.0774)	-0.809*** (0.0773)	-0.795*** (0.0765)
HHI Index		0.279*** (0.0718)	2.178*** (0.464)
HHI Index squared			-2.105*** (0.501)
Constant	28.64*** (0.0175)	28.51*** (0.0350)	28.75*** (0.0654)
Number of observations	333,992	333,992	333,992
R ²	0.497	0.497	0.497
Municipality fixed effect	Sim	Sim	Sim
Time fixed effect	Sim	Sim	Sim

Robust standard deviation in parentheses; ***p<0.001, **p<0.05, *p<0.1.

Using regressions for the two sub-samples (retirees and civil servants), one can quantify the effect of the heterogeneity for both groups. Applying the same previous regressions to these samples, one observes no statistically significant interest rate reduction for the sub-sample of payroll-deducted loans for INSS retirees in the surveyed period. Nevertheless, for the sub-sample of civil servants, one notices interest reduction between 2.0 and 3.3. p.p., or nearly 11% of the previously paid interest rate and 15% of the average payroll-deducted spread.

Decomposing even further this sample of civil servants, one observes interest rate reduction of federal civil servants from 3.8 and 7.0 p.p., depending on the assumed specification. Therefore, these were the groups that most benefited from interest rate reduction following the portability law.

**Graph 4 – Interest Rate for Ported Payroll-deducted Loans
Retirees****Graph 5 – Interest Rate for Ported Payroll-deducted Loans
Public Servants**

Conclusion

This box investigated the effect of portability in payroll-deducted credit operations. The paper provides robust and economically significant evidence that the credit portability reduced interest rates and increased the volume⁹ of the credit types most benefited by this regulation during the analyzed period.

Portability gains especially benefited the group of federal civil servants, with little impact on INSS retirees.

Initiatives such as the Open Finance/Banking¹⁰ have the potential of increasing portability gains, since they reduce informational advantages of original institutions, and can make the search for better credit conditions easier.

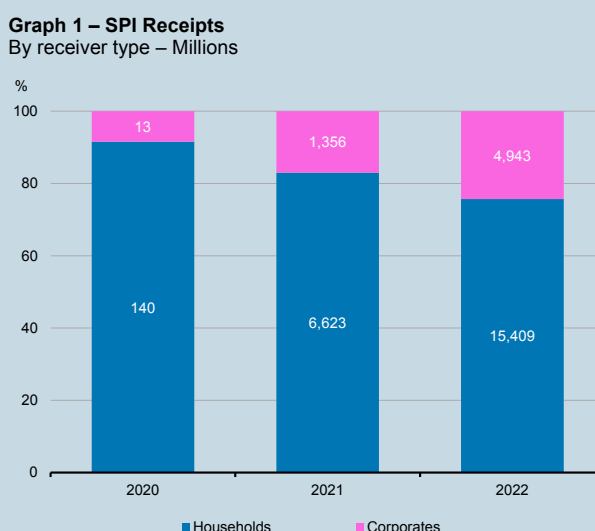
9 Causal evidence showed that the portability law increased the *per capita* credit volume (nearly 3%) in the treated municipalities compared with the control ones.

10 Joint Resolution 1, of May 4, 2020. Defined as the standardized data and services sharing through the opening and integration of systems, the Open Finance/Banking will allow clients to share their data to obtain better products and services.

Box 11 – Pix as an instrument for companies, businesses and government entities to receive funds

Since its launch in November 2020, Pix has been widely adopted as a means of digital transfer, especially among individuals. Furthermore, its use as a means of payment by companies, government, and formal and informal entrepreneurs has been growing rapidly.

In 2022, Pix surpassed the mark of 24.1 billion transactions, compared with 9.4 billion in 2021, and reached a transacted value of BRL 10.9 trillion, which is equivalent to 110% of GDP (compared with BRL 5.2 trillion in 2021, or 58% of GDP). It is worth highlighting that transactions received¹ by companies came to represent 24% of the total in 2022, compared with 17% in 2021, as shown in Graph 1.



In this scenario, this box aims to assess the use of Pix evolution in payments received by companies or individuals who had a Pix usage profile similar to companies, according to the criteria detailed below.

Groups definition

For the purpose of this analysis, Pix transactions were classified² into the following groups, according to the payee profile:

- ¹ Transactions between different participants. The analyses in this box do not include transactions in which the payer and the payee have used accounts in the same participant or settled by the same settling participant.
- ² For all groups, only transactions in which the payer is different from the payee were considered.

- **Government**³: transactions received by companies classified in division 84 of the National Classification of Economic Activities (CNAE): public administration, defense, and social security.
- **Individual micro-entrepreneur (MEI)**⁴: transactions received by micro-entrepreneurs (MEI) and individuals who are listed as responsible for active MEI in the National Registry of Legal Entities (CNPJ) of the Brazilian Federal Revenue Service (RFB) and who received an average monthly amount of more than thirty^{5,6} transactions in 2022.
- **Companies**: transactions received by companies (except those classified as Government and MEI) and by individuals with a monthly average of more than thirty transactions received in 2022 and who are listed as responsible for active companies in the RFB CNPJ.
- **Informal**⁷: transactions received by individuals who have a monthly average of more than thirty transactions received in 2022, and who are not responsible for active companies in the RFB CNPJ.
- **Individual after reclassification**: transactions received by individuals that were not reclassified in the previous groups.

Therefore, based on the above criteria, for each month of 2022, individuals that fit these rules were reclassified. For example, in December 2022, 5,871 thousand individuals were reclassified as Companies, MEI or Informal, as shown in Table 1.

3 This division covers all activities which, by their nature, are normally carried out by the Public Administration and, as such, are essentially non-market activities, including general administration (Executive, Legislative, tax management, etc, in the three spheres of government) and the regulation and supervision of social and economic activities (group 84.1); defense, justice, foreign relations activities (group 84.2); and the management of the social security system (group 84.3).

The legal nature is not in itself a determining factor for the classification of a unit in this section, but rather the fact that it carries out an activity which, due to its specific nature, is a prerogative of the state. Thus, some public institutions that carry out activities comprised in other categories of CNAE 2.0 are classified in classes corresponding to the services provided, and not in division 84, as is the case with teaching and health activities, which, even when carried out by the state, are classified in the corresponding divisions (85 and 86).

The agencies that regulate, control or coordinate these activities, however, are classified in division 84. Likewise, some activities described in division 84 may be carried out by non-governmental units. The outsourcing of services or parts of services traditionally carried out by the state can lead to the presence of business entities and private non-profit institutions in activities included in division 84.

Division 84 includes units that are entities created by law, with their own legal personality, which carry out support activities for the public administration aiming to facilitate the management of public resources, providing support in areas of typical state function, in the execution of such actions as: purchasing goods and services, contracting services for economic and social development, administration and management of human resources, etc. These units act as appendages to agencies of the Brazilian Public Administration and should be classified in the same classes in which the agencies to which they are linked to are (Source: CNAE/IBGE).

4 MEI, although not considered a legal entity, is a simplified individual business model, with an annual revenues limit of BRL 81,000, created to formalize the work of people who are self-employed. MEI was created in 2009 to take self-employed professionals and small entrepreneurs out of the informal labor market. It is a simpler type of classification of individual entrepreneur that suits the needs of those who are self-employed. By formalizing as MEI, an individual entrepreneur has a CNPJ number and is able to issue invoices and access Social Security benefits.

5 It was decided on thirty transactions, as stated in article 87-A, item I, paragraph a, of the Regulation annexed to the BCB Resolution 1, of August 12, 2020 (Pix Regulation): above thirty transactions, the transfer is presumed to have a different purpose, including allowing a fee to be charged by the participant: “Art. 87-A. The purpose of the transfer is presumed for a given transaction: I – where the receiving user is an individual, when: a) the payer is the individual who initiates the transaction by entering data from the transactional account, Pix key, QR Code or payment transaction initiation service, in cases where the participant has all the payee's information, limited to 30 (thirty) transactions per month [...]”.

6 To calculate the thirty monthly transactions, only transactions over BRL 1 and transactions in which the payer is different from the payee were considered.

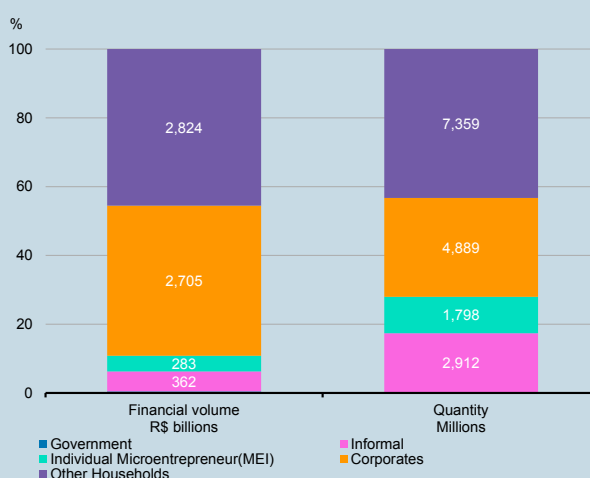
7 The IBGE considers informal workers those employed in the private sector without a formal labor contract, domestic workers without a formal labor contract, self-employed workers or employers without a CNPJ, as well as those who help relatives in a particular professional activity.

Table 1 – Reclassification from Households to Corporates in December 2022

	Number of Households (thousand)
Reclassified to Corporate group	609
Reclassified to Individual Microentrepreneur group	1,530
Reclassified to Informal group	3,733
Total reclassified Households	5,871

For convenience, the group made up of Government, MEI, Companies, and Informal will be called Broad Companies segment. The number of Pix transactions received by the Broad Companies segment in 2022 reached 57%, while the financial volume reached 54%, according to Graph 2.

Graph 2 – Pix – Quantity and Financial Volume by Receiver Type



Volumetry of the groups

In 2022, of the total of the Broad Companies segment, 51% of the Pix transactions received refer to the Companies group, while Informal reached 30%, followed by MEI with 19% and Government, with only 0.4%. In terms of financial volume, the Companies group reached 80%, followed by the Informal group with 11%, as shown in Table 2.

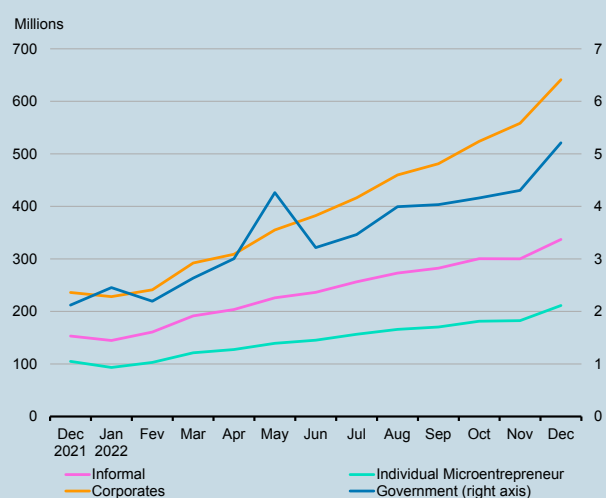
Table 2 – Accumulated Volume in 2022 by Group

Groups	Quantity		Volume		Average Ticket
	Millions	%	R\$ billions	%	R\$
Corporates	4,888.7	50.7	2,705.3	80.1	553
Informal	2,912.3	30.2	362.4	10.7	124
MEI	1,797.8	18.6	283.4	8.4	158
Government	42.9	0.4	26.8	0.8	623
Total	9,641.7		3,377.9		

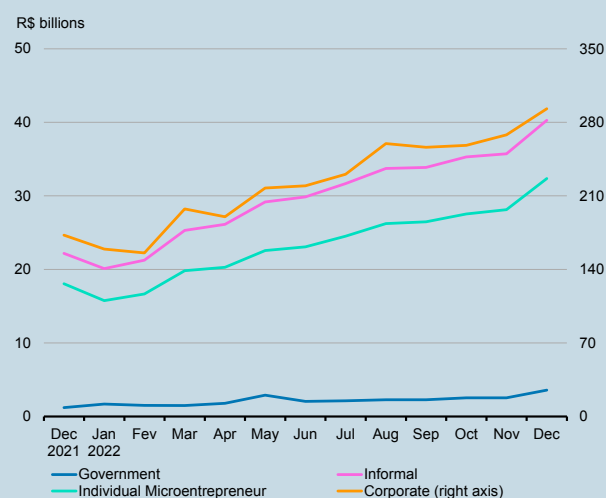
From the average ticket viewpoint,⁸ Government and Companies stand out with higher values than the Informal and MEI groups. It should also be noted that the Informal group, with the lowest average ticket (BRL 124,00), had both a higher number and volume of transactions received than MEI, whose average ticket was BRL 158,00, as shown in Table 2.

Throughout 2022, both the quantity and the volume of transactions received by the selected groups grew sharply, highlighting the quantities, which increased more than 100%. The Companies group stood out with a 172% increase in the number of transactions, compared with a 135% increase in the universe of transactions, reaching 641 million in December 2022 compared with 236 million transactions in December 2021 (Graph 3). The Government group's financial volume of transactions increased 196% , compared with a 107% growth in the universe of transactions, reaching BRL 3.58 billion in December 2022 compared with BRL 1.21 billion in December 2021 (Graph 4).

Graph 3 – Pix Transaction Quantity

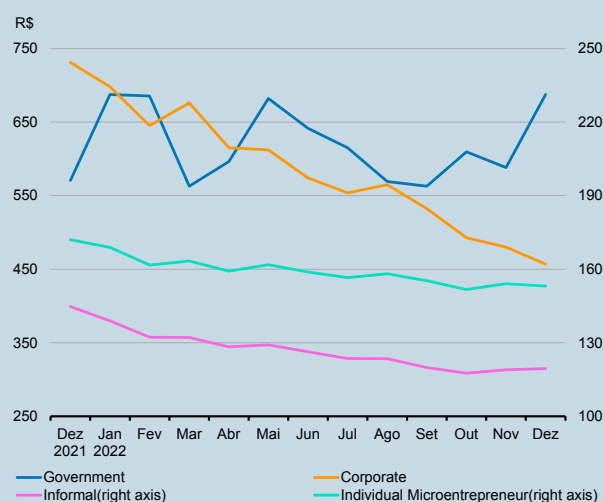


Graph 4 – Pix Transaction Volume



Throughout 2022, there is a downward trend in the average tickets of all groups except the Government (with a 20% increase in 2022), as a result of the increase in transactions with smaller tickets, as illustrated in Graph 5. The average ticket of the Companies group was the most affected, with a 37% reduction in 2022, well above the average reduction of 11% shown by the Broad Companies segment.

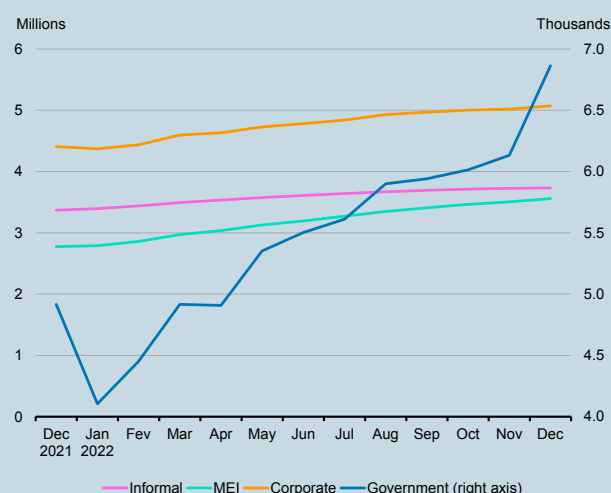
Graph 5 – Average Ticket by Group



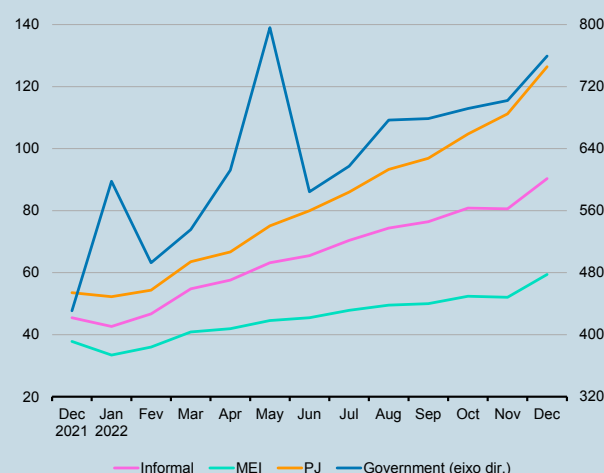
⁸ The total volume carried out divided by the total number of transactions.

Graph 6 shows that all groups have seen an increase in the number of payees. The Government group increased 40% and the MEI 28%, for an average growth of 23% in the segment. The average monthly number of transactions received per payee also increased significantly in all groups – an average growth of 92%, which demonstrates an increase in the use of Pix (Graph 7). It is noteworthy the Companies group, which grew 136% in December 2022, with 126 transactions per payee compared with 54 transactions per payee in December 2021.

Graph 6 – Number of Recipients by Group



Graph 7 – Number of Transactions Received/Number of Recipients



Regional differences in receiving Pix

Around 44% of the operating companies registered as so in the RFB in Distrito Federal, Mato Grosso, Paraná, Rondônia, and Santa Catarina received Pix payments in 2022, above the national average of 40%. By contrast, the lowest percentages of operating companies registered as so in the RFB that received Pix payments were in Piauí and São Paulo (33% and 34%, respectively).

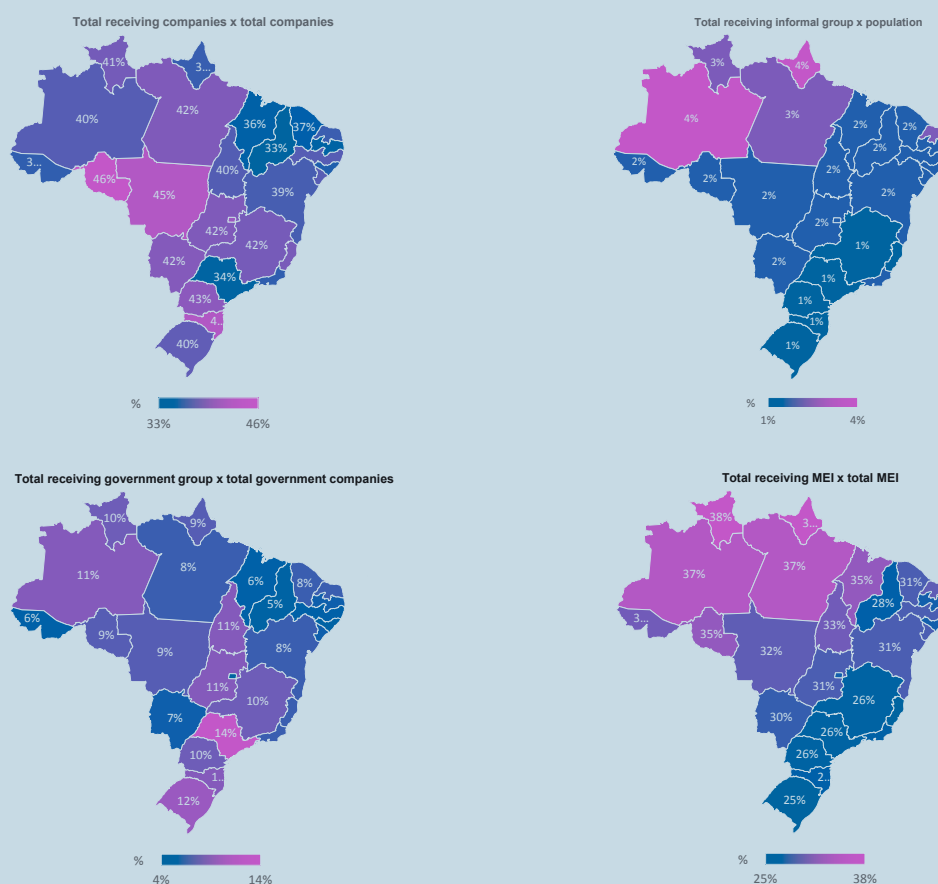
In turn, São Paulo stands out with the highest percentage (14%) of operating institutions in the RFB in the Government group receiving via Pix, while Distrito Federal had the lowest adherence (4%).

Regarding the number of individuals belonging to the Informal group in proportion to the population of each state,⁹ the Northern region stands out, particularly Amapá and Amazonas (4% of adherence), while the Southern and the Southeast regions have the states with the lowest proportion, with the exception of Rio de Janeiro (2%).

The proportion of MEI receiving Pix in relation to operating registered MEI was similar to the Informal Group, especially in the Northern region, which had the highest ratio between the number of MEI receiving Pix in relation to the total number of MEI in the region (37%), while the Southern and the Southeast regions had the lowest ratio (26%). Figure 1 shows these proportions by state.

⁹ Source: IBGE. Research Directorate (DPE), Technical Coordination of the Demographic Census (CTD). Population forecast calculated based on the results of the 2022 Demographic Census up to December 25, 2022.

Figure 1 – Average number of recipients by State



Company sizes¹⁰

Considering the classification of the Companies group by size, as well as the average ticket for each group for 2022, micro-enterprises stand out with both the largest number of Pix transactions received (1.6 billion) and the largest total volume transacted (BRL 825 billion). Medium-sized companies had the highest average ticket (BRL 828.00), while small companies had the lowest – BRL 463.00 (Table 3).

Table 3 – Corporate Group by Company Size

Company Size	Transactions		Average Ticket R\$
	Volume R\$ billions	Quantity Millions	
Micro	825.4	1,610.5	513
Medium	616.0	743.8	828
Large	557.4	826.5	674
Small	436.9	944.7	463

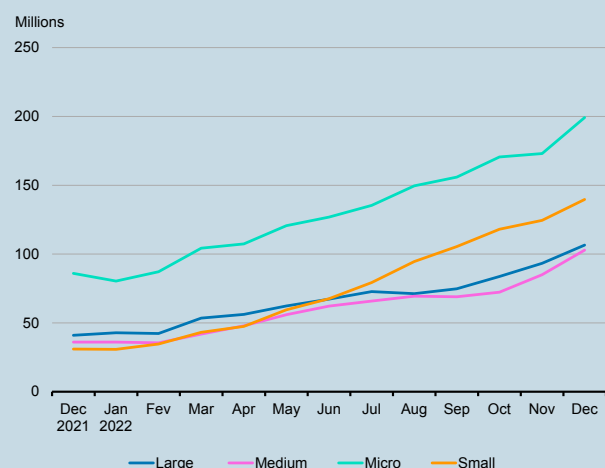
/ Transactions received by entrepreneurs (corporate group) as individuals were disregarded due to the absence of size information or CNAE (National Classification of Economic Activities) code.

¹⁰ Company sizes are defined by an internal algorithm, which considers three sources of information: i) the label of micro and small enterprises in the RFB's register of legal entities; ii) the mode of size reported by financial institutions to SCR (in case of a tie, the size reported by the financial institution in which the borrower has the largest debt is considered); and iii) broad credit values (bank credit, debentures, commercial notes, and internalized foreign debt) to delimit the size brackets. Criteria (i) and (ii) consider the annual gross revenue criteria of Complementary Law 123, of 2006, and of Law 11.638 2007. Criterion (iii) is used to classify companies that do not have a labeled size according to criterion (i) or that do not have size information according to criterion (ii).

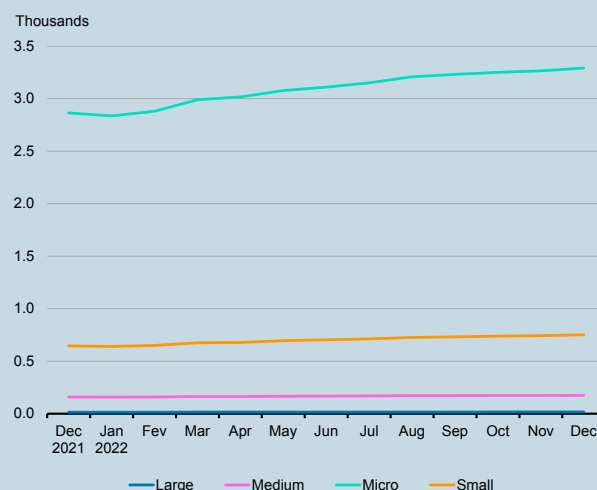
Graph 8 shows a sharp increase in 2022 in the number of Pix transactions received, mainly by medium and small companies (186% and 351% respectively), as well as an increase in the number of companies.

Graph 9 shows a slighter increase in the number of companies, especially large ones. Among these, the percentage of institutions receiving Pix went from 7% to 8% of all operating companies registered in the RFB.

Graph 8 – Number of Transactions by Company Size



Graph 9 – Number of Companies by Size



Type of activity carried out by companies receiving Pix

The division “Retail” of the CNAE represents 32% of the total number of transactions received in the Companies group, followed by the division “Office services, administrative support and other services provided to companies”, with 13% (Table 4). From the average ticket perspective, the “Financial services activities” category had the highest value, BRL 2,596.00, followed by “Wholesale trade, except motor vehicles and motorcycles” with BRL 2,586.00. The lowest average ticket was for the “Food” category, at BRL 120.00.

Table 4 – Accumulated Volume in 2022 for the Corporate Group by CNAE

CNAE - Division	Transactions				Average Ticket R\$
	Volume		Quantity		
	R\$ billions	%	Millions	%	
Retail trade	487.7	18	1,541.9	32	316
Wholesale trade, except motor vehicles and motorcycles	349.1	13	135.0	3	2,586
Trade and repair of motor vehicles and motorcycles	168.2	6	118.0	2	1,426
Office services, administrative support and other services provided mainly to businesses	145.4	5	607.1	13	240
Financial service activities	108.5	4	41.8	1	2,596
Land transport	94.6	4	38.9	1	2,435
Auxiliary activities of financial services, insurance, complementary pension plans and health plans	90.2	3	321.9	7	280
Other professional, scientific and technical activities	83.4	3	478.8	10	174
Food product manufacturing	70.2	3	80.1	2	877
Human health care activities	59.0	2	45.9	1	1,287
Food service	47.5	2	396.8	8	120
Others	945.2	36	1,016.5	21	930
Total	2,648.9		4,822.5		

Within the “Retail” category, the “Non-specialized retail” and “Retail of new products not previously specified and used products” activities stood out in terms of the number of transactions received. The “Construction materials” and again “Retail trade in new products not previously specified and used products” activities stood out in terms of volume (Table 5).

Table 5 – Details of the Retail Trade Division by CNAE Group – Corporate Group

Division: Retail Trade	Volume %	Quantity %
Retail trade of construction materials	19	8
Retail trade of new products not previously specified and used products	18	17
Retail trade of computer and communication equipment; equipment and articles for household use	16	7
Non-specialized retail trade	16	28
Retail trade of fuels for motor vehicles	12	10
Retail trade of food products, beverages and tobacco	9	15

In the MEI group, more than half of the payments received from all Pix transactions refer to the “Retail” and “Food” categories.

MEI in the “Specialized Construction Services” business had the highest average ticket (BRL 382.00) and those in the “Food” had the lowest (BRL 85.00).

Table 6 – Volume for the Year 2022 for the MEI Group by CNAE

CNAE - Division	Transactions				Average Ticket R\$
	Volume		Quantity		
	R\$ billions	%	Millions	%	
Retail trade	99.9	35	617.4	34	162
Food service	35.8	13	421.5	23	85
Manufacturing of clothing articles and accessories	33.5	1	13.4	1	261
Other personal service activities	24.7	9	210.9	12	117
Trade and repair of motor vehicles and motorcycles	18.2	6	68.2	4	267
Specialized construction services	13.6	5	35.6	2	382
Land transport	12.1	4	67.2	4	179
Office services, administrative support and other services provided mainly to businesses	10.5	4	37.5	2	281
Advertising and market research	10.0	4	41.8	2	239
Repair and maintenance of computer and communication equipment and personal and household items	7.0	2	31.7	2	221
Education	5.8	2	23.4	1	250
Food product manufacturing	5.1	2	52.3	3	98
Storage and auxiliary transport activities	5.1	2	49.4	3	102
Mail and other delivery activities	4.0	1	31.2	2	128
Others	28.2	10	96.4	5	292
Total	283.4		1,797.8		

In the “Food” category, “Restaurants and other food and beverage services” stood out with both the largest volume and the largest number of Pix transactions received in 2022 (Table 7).

Regarding the “Retail” category, the “Retail of new products not previously specified and used products” and “Retail of food, beverages and tobacco products” groups also stand out in terms of the volume and quantity of transactions received (Table 7).

Table 7 – Details of CNAE Divisions by CNAE Group – MEI Group

	Volume %	Quantity %
Division: Food Service		
Restaurants and other food and beverage services	75	77
Catering services, buffet and other prepared food services	25	23
Division: Retail Trade		
Retail trade of new products not previously specified and used products	38	30
Retail trade of food products, beverages and tobacco	23	32
Retail trade of computer and communication equipment; equipment and articles for household use	16	11
Non-specialized retail trade	10	16
Retail trade of pharmaceutical products, perfumery and cosmetics and medical, optical and orthopedic articles	6	5
Retail trade of construction materials	5	3
Retail trade of cultural, recreational and sporting articles	3	3

Table 8 shows that the “Public Administration” category stands out among the Pix transactions received in the Government group, with 95% of the transactions received and an average ticket of BRL 631.00. The CNAE “Social security”¹¹ has the highest average ticket (BRL 24,545.00), followed by the “Foreign relations” group (BRL 5,614.00). The lowest average ticket was observed for the “Civil Defense” group (BRL 61.00).

Table 8 – Volume for the Year 2022 for the Government Group by CNAE

CNAE – Atividade	Transactions				Average Ticket R\$
	Volume		Quantity		
	R\$ millions	%	Thousands	%	
General public administration	25,772.1	96.3	40,877.1	95.2	631
Mandatory social security	319.1	1.2	13.0	0.0	24,545
Public security and order	240.2	0.9	1,367.3	3.2	176
Justice	192.5	0.7	322.3	0.8	597
Regulation of health activities, education, cultural services and other social services	127.3	0.5	42.6	0.1	2,986
Regulation of economic activities	94.5	0.4	218.6	0.5	432
Foreign affairs	7.1	0.0	1.3	0.0	5,614
Civil Defense	5.3	0.0	87.5	0.2	61
Defense	4.0	0.0	2.6	0.0	1,556
Total	26,762.2		42,932.2		

¹¹ The activities of compulsory social security, involving the management, financing, and granting of retirement, sickness, birth, and funeral benefits; the activities of the Ministry of Social Security; the granting of unemployment insurance.

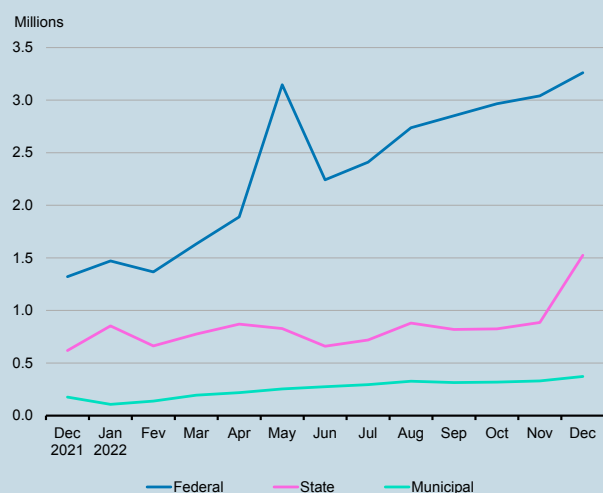
Spheres of government activity

The Government group was subdivided by its legal nature¹² into three spheres: federal, state, and municipal. Graphs 10 and 11 show an increase in both the amounts and the transactions received throughout 2022 in all spheres of government.

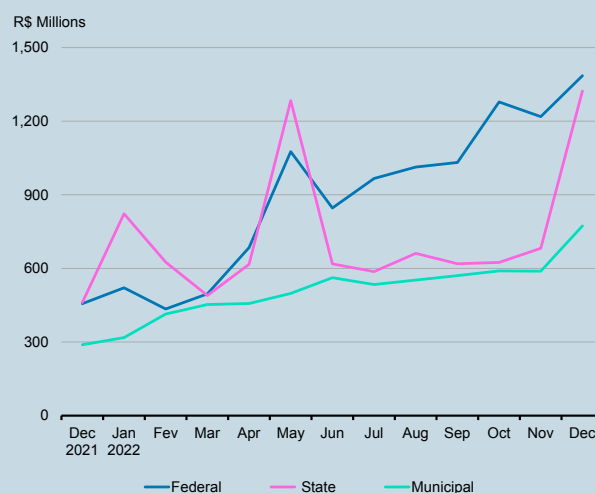
Transactions received by the federal government accounted for 67% and 41% of the volume and value of transactions, respectively, in the Government group in 2022. State governments accounted for 24% of the volume and 33% of the value. Regarding payments received throughout 2022, it is worth noting:

- **Federal:** an increase in both the quantity and value of payments received throughout 2022, especially in May, due to the receipt of income tax amounts.
- **State:** stable volume of payments received throughout 2022, with the exception of May, due mainly to the collection of the Treasury Departments of Rio Grande do Sul, Bahia, and Paraná, and of December, due to the collection of the Treasury Department of Rio Grande do Sul.¹³
- **Municipal:** an increase in both the quantities and payments received throughout 2022, especially in May and December, given the tax collecting in Fortaleza.

Graph 10 – Number of Receivables



Graph 11 – Volume of Receivables



Considering the legal nature,¹⁴ federal and state agencies stand out, with 68% of the financial volume and 78.8% of the transactions received (Table 10). The lowest average tickets were for federal agencies, while the highest was for the Municipal Public Law Foundation.

¹² Corporate taxpayer registries whose legal nature does not specify their sphere of activity were disregarded.

¹³ Prepayment of IPVA in 2023. According to the Rio Grande do Sul Treasury Department, paying the tax between December 14 and 29, 2022 would result in a 10% discount and would not be subject to the UPF/RS variation.

¹⁴ RFB classification.

Table 9 – Volume for the Year 2022 by Legal Nature of the Government Group

Legal Nature	Financial Volume		Quantity		Average Ticket R\$
	R\$ billions	%	Millions	%	
Federal Executive Branch public agency	10.92	40.8	28.87	67.2	378.29
State or Federal District Executive Branch public agency	7.35	27.5	4.96	11.5	1,482.17
Municipal Executive Branch public agency	5.16	19.3	2.72	6.3	1,896.64
State or Federal District autarchy	1.04	3.9	4.82	11.2	215.75
Municipal direct administration public fund	0.48	1.8	0.08	0.2	5,760.33
Notary and registry service (registry office)	0.34	1.3	0.35	0.8	956.31
Municipal autarchy	0.23	0.9	0.22	0.5	1,065.16
Municipal public foundation of public law	0.19	0.7	0.01	0.0	18,519.37
State or Federal District	0.18	0.7	0.24	0.6	736.96
Others	0.87	3.2	0.66	1.5	1,322.96
Total	26.76		42.93		

Conclusions

Although 76% of Pix transactions settled in 2022 had as a recipient an individual account, a considerable portion of payments received were used to carry out economic activity, by companies and businesses. After the reclassification carried out in this work, the group of companies, informal businesses, and government entities accounted for 57% of the payments received and settled.

The use of Pix by companies, informal businesses, and government entities rose significantly in 2022 and continues on an upward trend, as seen in the monthly variation of the number of transactions, the number of active users, and the financial volume.

Furthermore, this upward trend is also confirmed by the graphs obtained when segmenting Pix adherence by company size, economic activity, and geographical location.

The Pix adherence as a payment tool for economic activities was higher among small businesses, with the retail and food sectors standing out in 2022.

The Northern region, followed by the Central West, had the highest share of recipients compared with the population in all groups studied.

Despite the significant increase in the adoption of Pix by the Public Administration in 2022, it still presents a relative low share among the other Pix recipients. Regarding the legal nature, federal and state agencies had the highest volumes.

Despite the significant increase in the use of Pix as a tool for companies and businesses to receive money, there are still several segments and regions with great potential for expanding the use of Pix.

Box 12 – Skills, competencies, and financial well-being of primary education professionals enrolled in the *Aprender Valor* (Learn Value) program

The *Aprender Valor* program is one of the actions included in the “Education” dimension of the Agenda BC# and supports public elementary schools willing to implement financial education teaching.¹ As part of the professional training offered by the program, teachers and school managers can take a 40-hour online training module on Personal Financial Education, which has the dual function of helping them to manage their own financial resources and to introduce and integrate the subject into the school context. Before taking part in the training, participants are asked to answer an online questionnaire about their demographic profile, behaviors, attitudes, and previous financial knowledge.

The aim of this box is to present and analyze the results of this collection of information from professionals that work in the schools participating in the program. School managers and teachers, as those responsible for pedagogical planning, educational practices, and student engagement, play a central role in the implementation and success of this type of project. Therefore, these analyses can help to identify opportunities and challenges for the development of public policies on financial education in primary education.

Data

Before starting the training, participants answer a questionnaire with 129 items. Besides collecting demographic data, the questionnaire assesses participants’ financial literacy² based on the three core financial competencies of *Aprender Valor*: planning the use of resources (*PLA*); actively saving (*POU*); and managing the use of credit (*CRE*). Data were collected during the second half of 2021, from questionnaires answered by 3,788³ professionals who subsequently completed the Personal Financial Education module.

Profile of primary education professionals

Of the 3,788 professionals, 25% are school managers and 75% are elementary school teachers, 45% of whom are in the early years (1st to 5th grade) and 55% in the final years (6th to 9th grade). Most are women: 93% of the early years teachers, 74% of final years teachers, and 84% of managers. The professionals are concentrated in the Southeast (35%), Northeast (25%), and South (22%) regions, according to Table 1.

1 The participation of education networks and of each primary school in the public network is optional by signing up on the program’s platform. Learn more about the program at: <https://aprendervvalor.bcb.gov.br/>.

2 The International Network on Financial Education (OECD/INFE) defines financial literacy as “a combination of awareness, knowledge, skills, attitudes, and behaviors necessary to make sound financial decisions and, in the end, achieve individual financial well-being outcomes.” Available at: <https://www.oecd.org/financial/education/2018-INFE-FinLit-Measurement-Toolkit.pdf>.

3 For different analyses, this number may vary, since some blanks due to non-mandatory items in the questionnaire that may have been left unfilled.

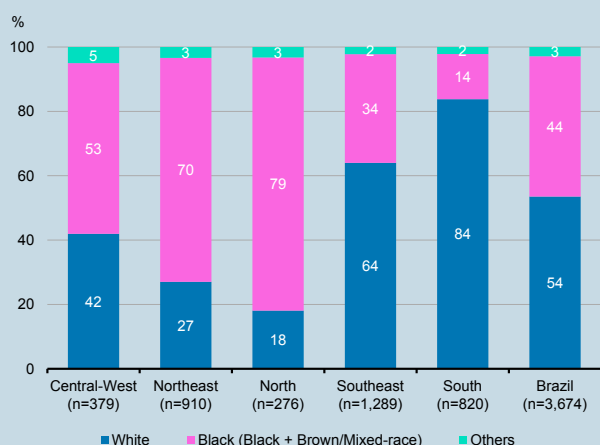
Table 1 – Distribution of the Sample Among Regions, Positions, and Gender of Professionals

Região	Teachers				Managers			Professionals	
	Female	Male	Total	%	Female	Male	Total	Total	% by region
Central-West	250	48	298	11	70	10	80	378	10
Northeast	459	172	631	23	216	73	289	920	25
North	128	64	192	7	66	21	87	279	8
Southeast	879	143	1,022	37	228	35	263	1,285	35
South	553	52	605	22	196	15	211	816	22
Brazil	2,269	479	2,748	100	776	154	930	3,678	100

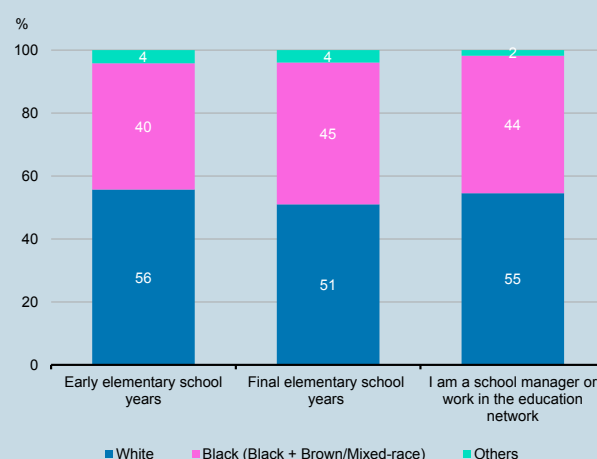
The population concentration by region presented by the 2021 School Census, from INEP, does not present data for managers. For Elementary School teachers, this sample shows some deviations: Central-West has 7.6% of the total, Northeast, 28.2%, North, 9.7%, Southeast, 39.6%, and the South 14.9%.

Post Graduate Diploma (at least 360 hours) is the highest level of education for 64% of the professionals, and undergraduate degree for 29%; working at school is the only paid activity for 77% of them. Sixty-nine percent of teachers and 84% of managers are permanent employees. The racial distribution varies greatly across regions. The variation is smaller in relation to the positions held (Graph 1).

Graph 1a – Population of white and black people by geographic region (n=3,674)
Race x geographic region



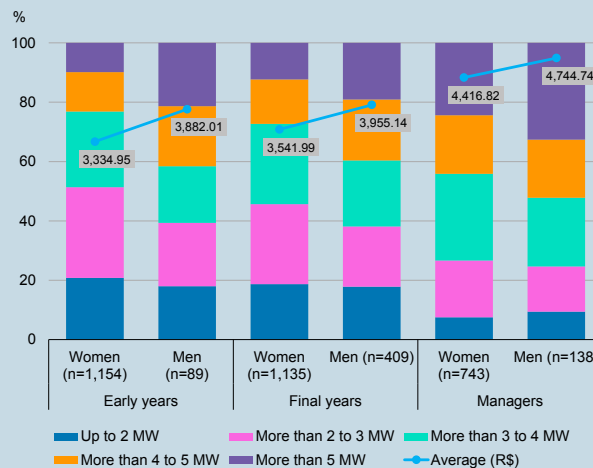
Graph 1b – Population of white and black people by position held (n=3,674)
Race x position



The average income of teachers in the early years is lower than that of teachers in the final years, while managers have higher income⁴ compared with teachers (Graph 2). Income differences are also observed across the country's regions, with higher values in the Central-West region and lower values in the Northeast region (Graph 3).

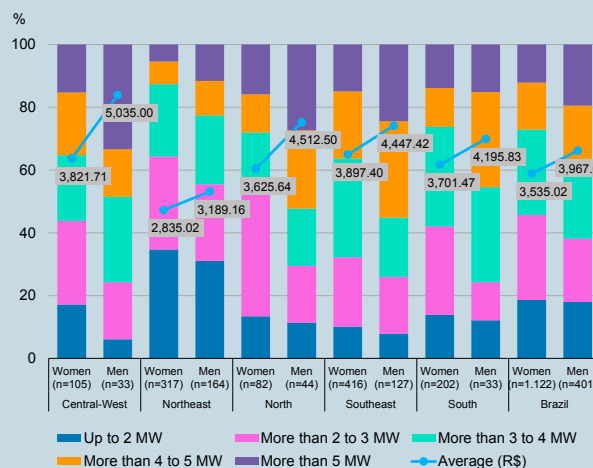
4 In the questionnaire, respondents saw the ranges in BRL, in multiples of BRL 1,045.00 – the minimum wage in force as of February 2020.

Graph 2 – Average income by position held in school and gender (n=3,668)



Graph 3 shows, by region, the distribution of final years teachers⁵ by income range and highlights the difference between women and men on average. In all regions and salary ranges, men's income is higher than that of women.

Graph 3 – Income ranges by gender and geographic region, final years teachers (n=1,523)



Planning (PLA)

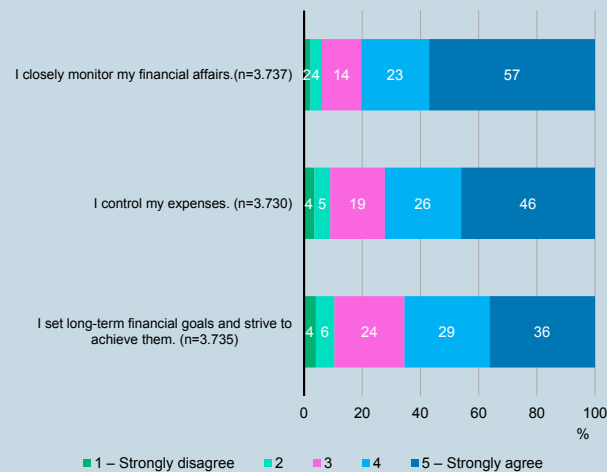
Planning is the basis for the other skills and includes setting short-, medium- and long-term goals, prioritizing, organizing, drawing up and monitoring a personal or household budget.

Graph 4 shows that most professionals report closely monitoring their financial affairs (80%), controlling spending (72%), and setting long-term goals and striving to achieve them (65%).⁶ The professionals who agreed with all three statements (Graph 4) will be referred to as “planners” and correspond to 55% of respondents, distributed similarly between men and women and among income ranges.

⁵ Only the income of final years teachers, where the proportion of men is higher, which consists in a more representative sample, was detailed. Even so, the pattern of higher income for men was also found among managers and early years teachers.

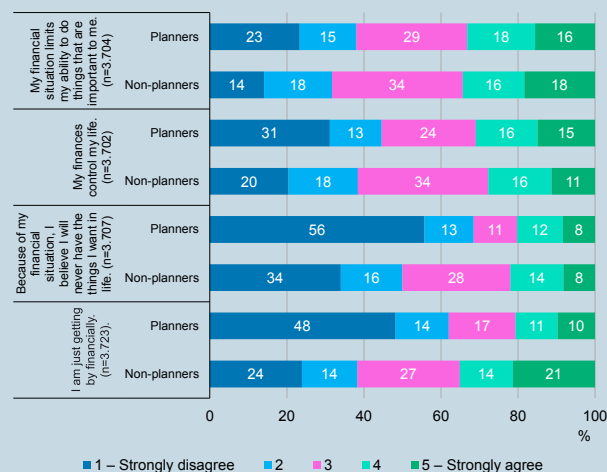
⁶ Most of the questions had a scale with 5 levels of agreement, from “strongly disagree” to “strongly agree”. In these analyses, those who marked 1 or 2 disagreed with the statement, while those who marked 4 or 5 agreed with it.

Graph 4 – Agreement on financial planning and expense control



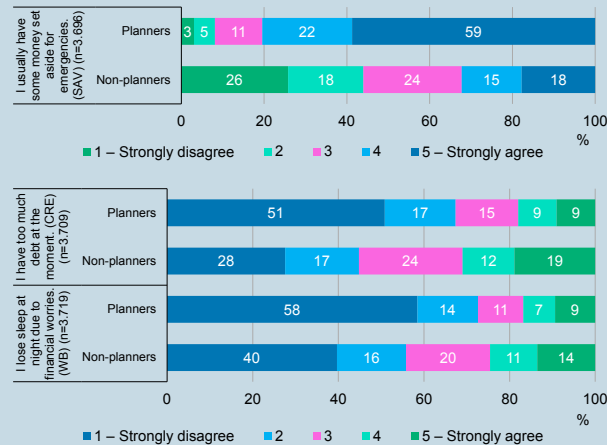
Although most of the professionals are planners, they still report difficulties and limitations arising from the financial situation. The difference in behavior between planners and non-planners can be seen in Graph 5.

Graph 5 – Financial difficulties between planners and non-planners



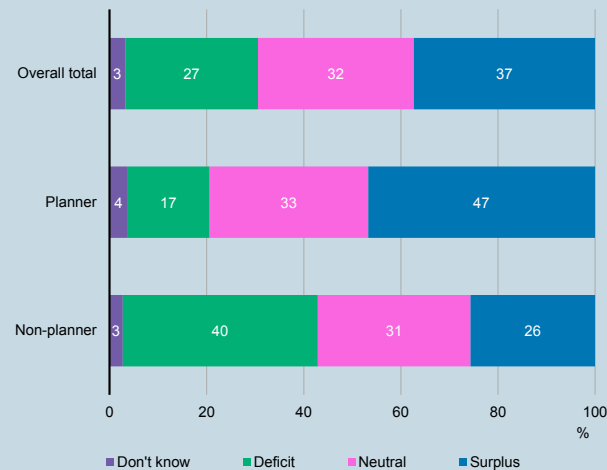
Planners tend to have more money saved for emergencies than non-planners (81% × 33%, considering grades 4 and 5), report less excessive debt (18% × 31%), and are less subject to sleep interruption due to financial worries (16% × 25%), as can be seen in Graph 6.

Graph 6 – Difference in selected indicators of savings, credit, and well-being between planners and non-planners



To assess respondents' financial balance, they were asked about the relationship between household income and spending in the twelve months prior to the survey. Spending exceeded income (deficit budget) for 27% of professionals, which suggests possible indebtedness. For 32% of respondents, the budget was considered neutral, with spending equivalent to income – these budgets could turn into deficit in the event of an unexpected expense. Only 37% of professionals reported to have spent less than their income (surplus budget), which would make it easier to build up savings. When comparing planners with non-planners, 47% of planners reported a budget surplus, while 17% reported a budget deficit. Among non-planners, 26% reported a budget surplus and 40% a budget deficit (Graph 7).

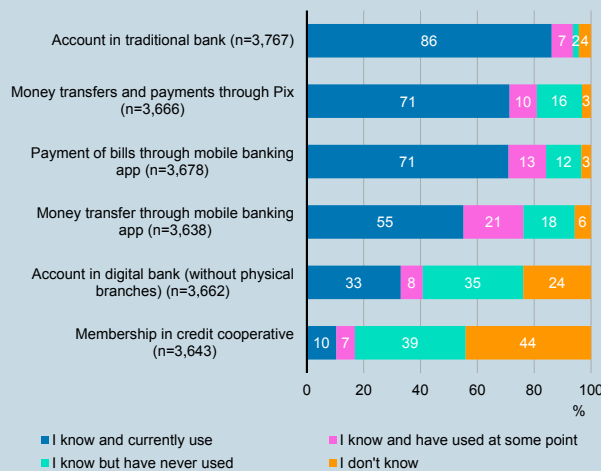
Graph 7 – Comparison between total income and expenses in the previous 12 months (n=3.708)



Regarding the relationship with the National Financial System (SFN), 86% of professionals hold a traditional bank account, 71% use Pix, and 71% pay bills via the bank's mobile app (Graph 8). Digital banks are used by 33% of professionals and are unknown to 24%, while credit unions are unknown to 44% of professionals, while only 10% use them. As civil servants, they probably receive their income from a traditional bank and end up using more often the products and services provided by them.

Among the elementary school professionals assessed by the survey, the planner profile was predominant. The financial education content to be produced for this audience should consider that prevalence and the existing correlation between this profile and other behaviors, such as having a balanced budget. In addition, despite their planner profile, many professionals feel limited by their financial situation, showing signs of financial difficulties. Finally, findings in this section suggest that programs such as *Aprender Valor* and others aimed at this audience should consider the fact that there is still a lack of familiarity with some financial products and services, such as those offered by credit unions and Fintechs.

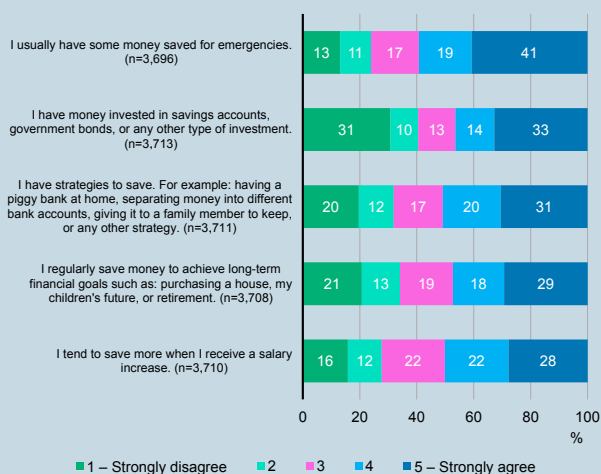
Graph 8 – Relationship with the National Financial System and Financial Products



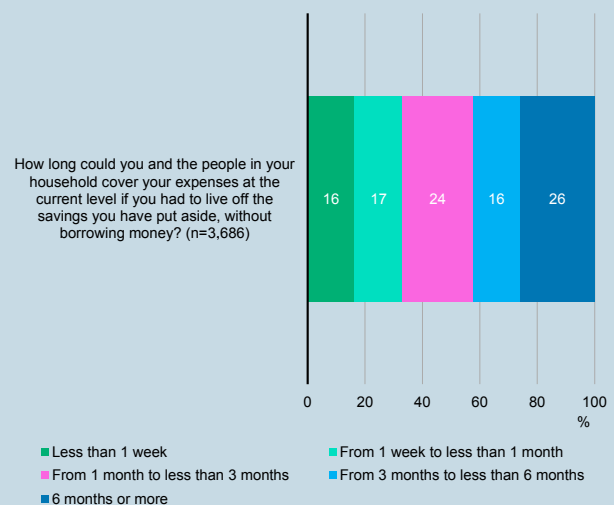
Savings (POU)

Graph 9 shows the savings behavior. About half of respondents reported to save money regularly for long-term goals and increase savings when they get a pay raise. It is interesting to note that 60% report having savings for emergencies, but only 47% report having some kind of financial investment, which suggests the existence of alternative savings strategies. In fact, 51% of respondents reported to have savings strategies. One can also presuppose that part of the answers arises from a social desirability bias (you wish to save, but not actually do so). This hypothesis is corroborated by the low percentage of people who, if had to live on their savings, would be able to cover current expenses without borrowing money for six months or more (26%), while 33% would be able to do so for less than a month (Graph 10).

Graph 9 – Savings-Related Behaviors



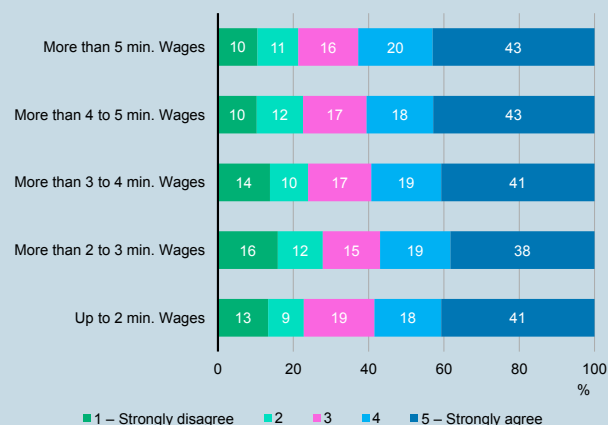
Graph 10 – Financial Resilience



Savings behaviors are quite similar among income ranges. For example, “I usually have savings for emergencies” was reported by around 60% of respondents in any income range (Graph 11, left-hand panel). However, having investments of any kind is directly related to the income range (Graph 11, right-hand panel).

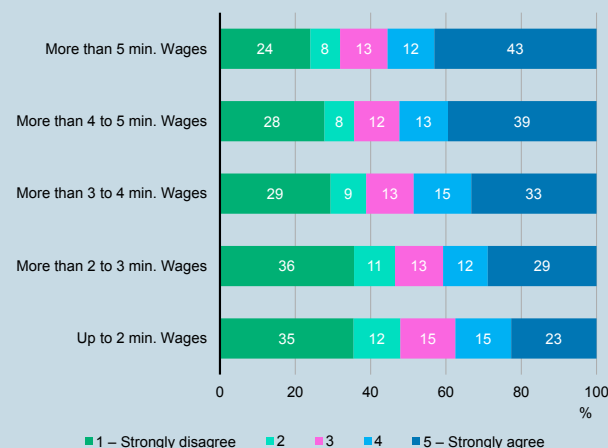
Graph 11a – Savings-Related Behaviors by Income Range

"I usually have some money saved for emergencies"(n=3,611)



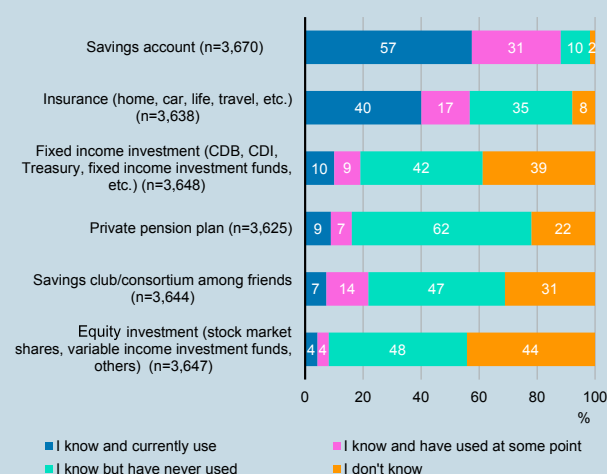
Graph 11b – Savings-Related Behaviors by Income Range"

I have money invested" (n=3,627)



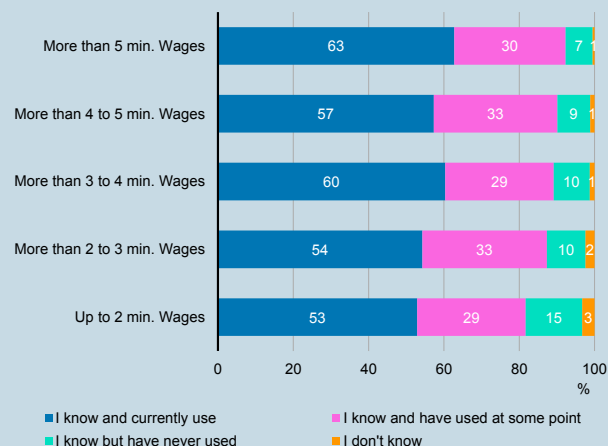
The most commonly used savings instrument by respondents is the savings account (57%), and the least known and used product is the equity investment (Graph 12). Insurance is used by 40% of teachers and managers.

Graph 12 – Familiarity and Use of Savings Products and Services



Savings accounts are known and used in a similar way among different income ranges. Unlikely, knowledge and use of other types of financial investments, such as fixed income, are directly related to income. In other words, the higher the income, the greater the number of people that know about and use these instruments (Graph 13).

Graph 13a – Familiarity and Use of Savings Products and Services by Income Range
Savings account (n=3,615)



Graph 13b – Familiarity and Use of Savings Products and Services by Income Range
Fixed income (n=3,594)

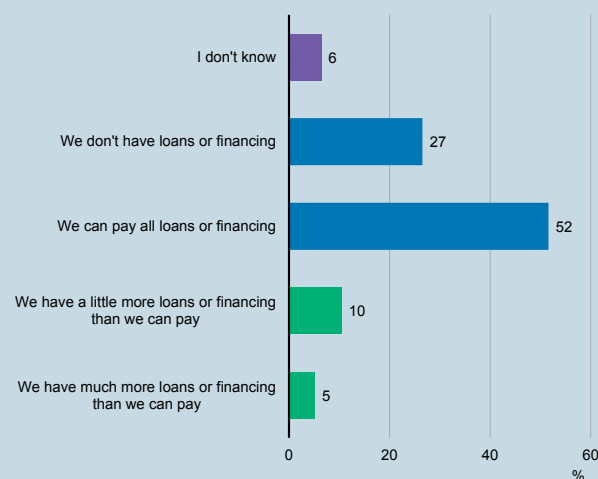


Despite reporting savings behaviors regardless of income level, it is possible to identify interesting opportunities for progress on this topic with elementary school professionals, such as the *Aprender Valor* participants. Exploring the different investment instruments in greater depth will provide teachers with experience that seems to be held by only those with higher income, which can be important for diversifying their savings strategies, increasing their resilience, and better preparing them to explore these topics in classroom.

Credit (CRE)

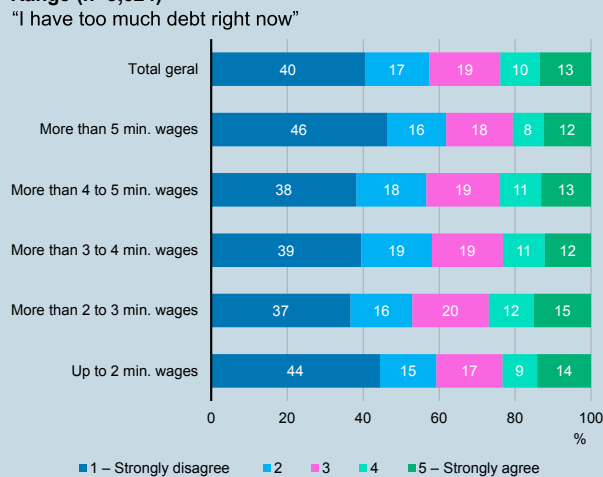
Most respondents (67%) reported having some kind of loan or financing, and 52% said they were able to pay off all these commitments. However, 15% reported having more credit than they could pay off (Graph 14).

Graph 14 – Ability to Pay Loans and Financing
(n=3,703)



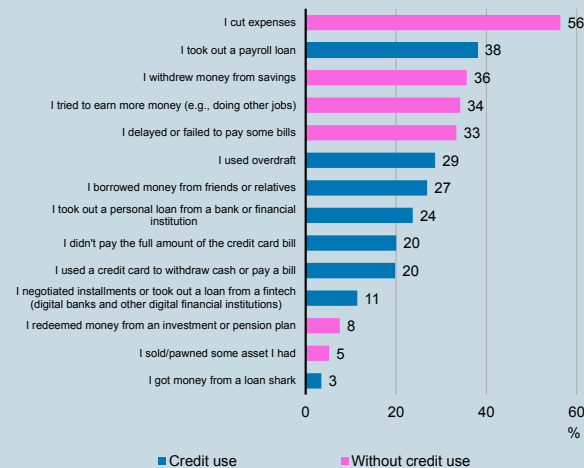
Interestingly, the self-perception of excessive indebtedness did not depend on income (Graph 15), with similar percentages between the lowest and highest declared income groups.

Graph 15 – Level of Indebtedness, by Income Range (n=3,624)



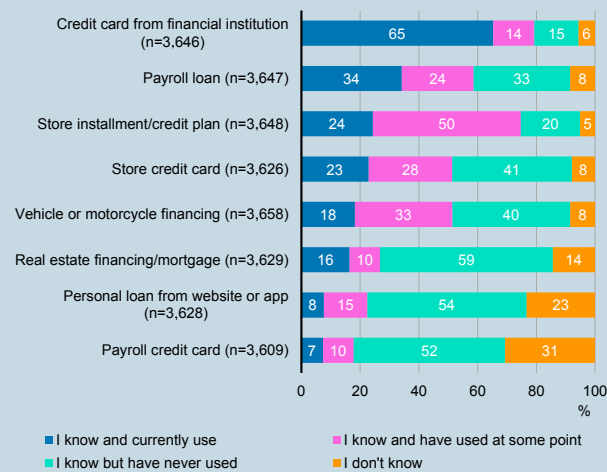
Considering the twelve months prior to the survey, half of respondents indicated that their household income was not enough to cover expenses and bills at some point. Of the five strategies most commonly adopted to meet commitments in these situations (Graph 16), only one involved taking on debt: payroll-deducted credit, which was the second most mentioned strategy (38%). The others were cutting expenses (56%), withdrawing money from savings (36%), trying to earn more money (34%), and delaying the payment of bills (33%). Other credit-related options came next: overdraft facilities were cited by 29%, followed by borrowing money from friends or relatives (27%), and borrow from a financial institution (24%). Credit cards with interest payments were mentioned by 20% of respondents. Considering the group of more expensive credit lines, made up of overdraft facilities, personal loans (with banks, finance companies, or fintechs), revolving credit card, and getting money from loan sharks, 57% of respondents referred to the use at least one of these strategies.

Graph 16 – Strategies to Deal with Expenses Greater than Income (n=1,786)



Respondents are quite familiar with most credit instruments (Graph 17). Credit cards ranks first, used by 65% of respondents, followed by payroll-deducted loans (34%). Among the least known and least used instruments are payroll-deducted credit card and personal loans made through websites or apps.

Graph 17 – Familiarity and Use of Credit Products and Services



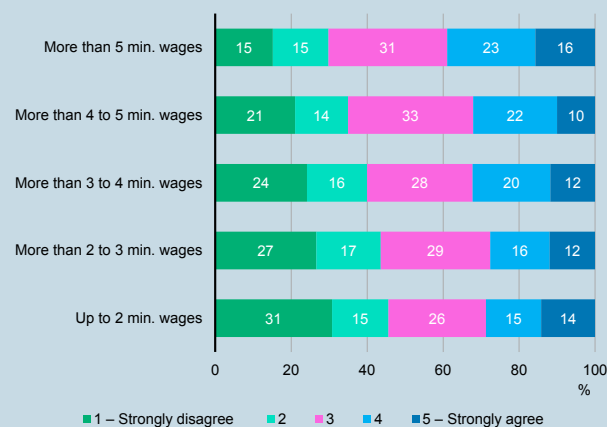
Respondents showed familiarity with most credit instruments, indicating that the topics covered in this module are part of their personal experience. It is noteworthy that payroll-deducted credit plays an important role in their use of credit, an aspect that can be worked on in the program. In addition, once again, the professionals' lack of familiarity with digital financial products and services was evident.

Financial well-being (BE)

Some questions captured aspects relative to the individuals worries or satisfaction with the quality of their current financial life. In general, they were more dissatisfied (39%) than satisfied (32%). As expected, Graph 18 shows that satisfaction increases with income.

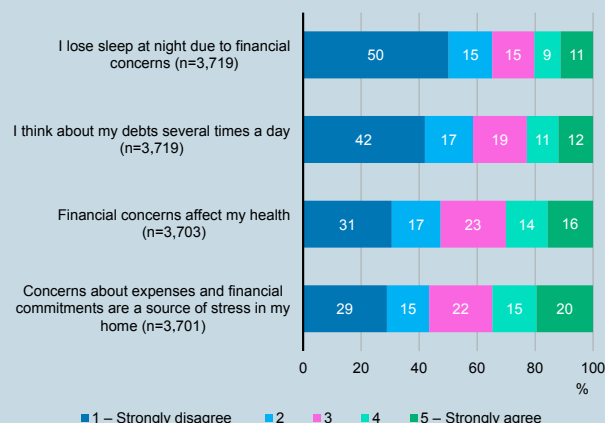
Graph 18 – Financial Well-being: Level of Satisfaction by Income Range

"I am satisfied with my current financial situation"(n=3,599)



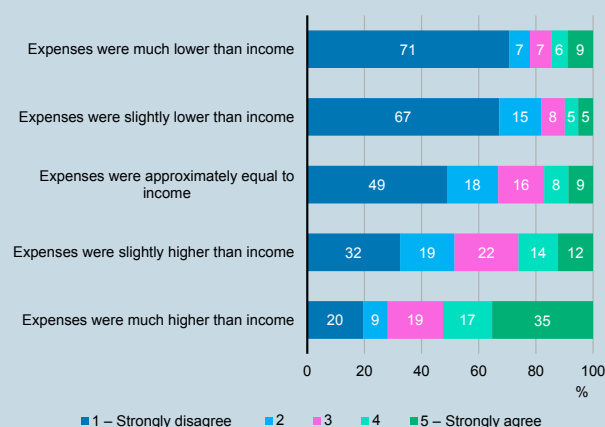
Situations of financial worries affect from 20% to 35% of respondents (Figure 19).

Graph 19 – Financial Well-being: Financial Worrying
 "I am satisfied with my current financial situation"
 (n=3,695)



To better understand financial well-being indicators, some items related to planning, savings, and credit were evaluated with relation to were analyzed regarding their association with the indicator related to sleep interruption due to financial worries. This indicator was chosen because it possibly best represents how financial worries harm people's general well-being. Sleep interruption is more often reported among non-planners (24%) than planners (16%) – Graph 7. Considering the question "In the last 12 months, which sentence best describes the comparison between total income and spending in your household?", among those who spend much more than their income, 52% said they faced sleep interruption at night (Graph 20). For those who spent much less than their income, only 15% reported sleep interruption due to financial worries.

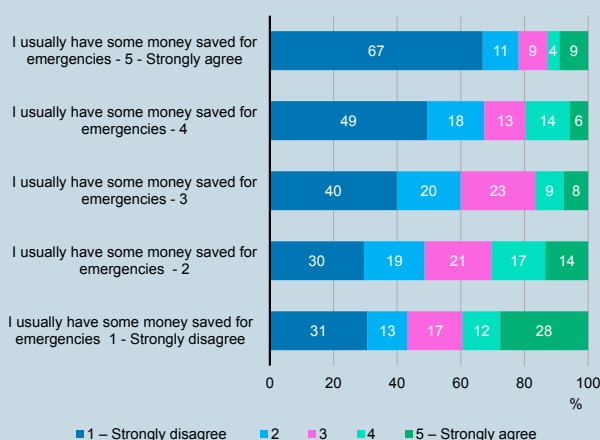
Graph 20 – Planning and Financial Worrying
 "I lose sleep at night due to financial concerns"
 (n=3,649)



Graph 21 shows that those who usually have savings for emergencies also have better sleep quality in general.

Graph 21 – Savings and Financial Worrying

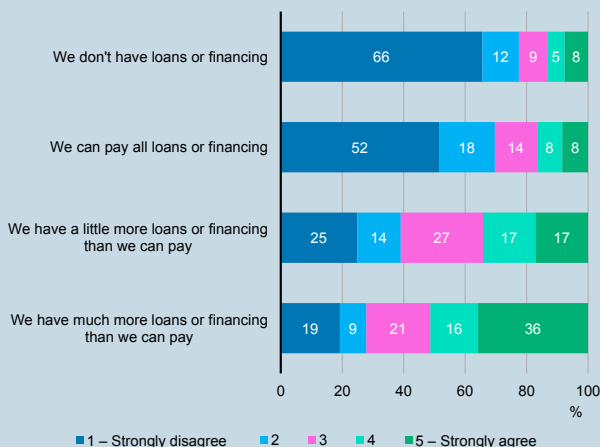
"I lose sleep at night due to financial concerns"(n=3,668)



Graph 22 shows that respondents with no financing or loans are less subject to sleep problems (13%), followed by those who manage to pay off everything they owe (16%). In turn, those who said to have much more loans or financing than they can afford to pay have worse sleep quality.

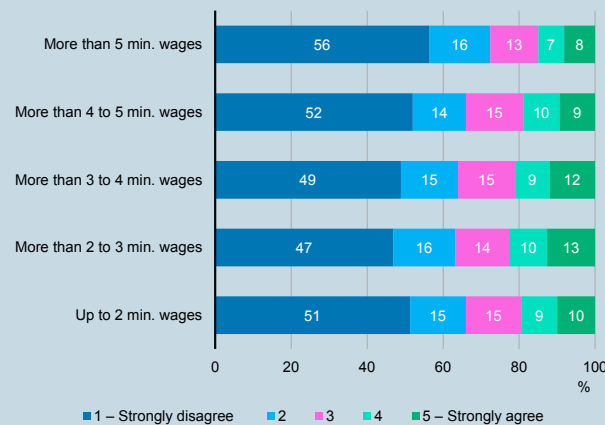
Graph 22 – Credit and Financial Worrying

"I lose sleep at night due to financial concerns"(n=3,719)



Although financial dissatisfaction seems to be directly related to income (Graph 18), the damage to sleep caused by financial worries seems to be more linked to the lack of an emergency reserve, a deficit budget, and excessive indebtedness (Graphs 20, 21, and 22) than to income (Graph 23).

Graph 23 – Financial Concerns, by Income Range
 "I lose sleep at night due to financial concerns"(n=3,634)



Financial education knowledge

Eleven items evaluated the respondents' knowledge of topics such as inflation, interest rates, price comparison, and investments. The items with the most correct answers involved simple statements about inflation, investment risk, and price comparison, while those with the fewest correct answers were related to interest on loans and investments. On average, the performance of managers and teachers, from the early or final years, was similar. The comparison between genders showed a more significant difference – the average for men was 8.41 and, for women, 7.63 (Table 2).

Table 2 – Correct Answers in Financial Knowledge Questions, by Group

Group	Category	Correct Answers		Observations	t-test means
		Mean	Standard Deviation		
Function	Teachers	7.77	2.33	2,810	1.62
	Managers	7.63	2.23	948	-0.104
Gender	Men	8.41	2.19	640	8.15***
	Women	7.60	2.30	3,048	(<0.001)
Stages	Initial years	7.52	2.31	1,261	-4.15***
	Final years	7.85	2.29	2,444	(<0.001)

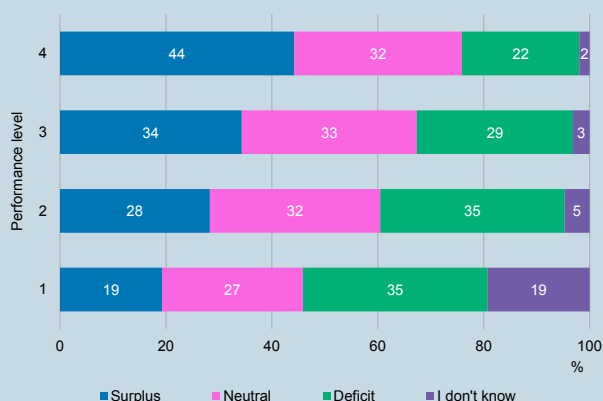
Respondents who indicated that they had already sought out financial education content on their own had a higher level of correct answers, with an average of 8.11, compared with 7.35 for those who had never done it. In addition, previous interest in financial education was more common among men: 63% had already searched for contents in books, websites, and lectures, compared with 47% of women.

Respondents were classified into four groups according to their performance on the financial knowledge questions.⁷ Those with the best performance were more likely to report surplus budgets, to have savings for emergencies (Graph 24), and to report the ability to pay their credit operations (Graph 25). It is noteworthy that, among the professionals with the lowest performance, only 19% said to have spent less than earned in the previous year.

⁷ Level 1 (n = 118): zero to two correct answers. Level 2 (n = 477): three to five correct answers. Level 3 (n = 1,552): six to eight correct answers. Level 4 (n = 1,611): nine to eleven correct answers.

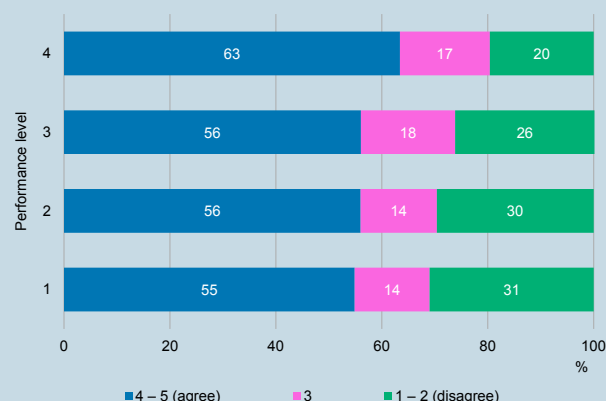
Graph 24a – Budget and Money Saved for Emergencies, by Level of Performance in Financial Knowledge Test

"Relationship between expenses and income (budget)"(n=3,687)

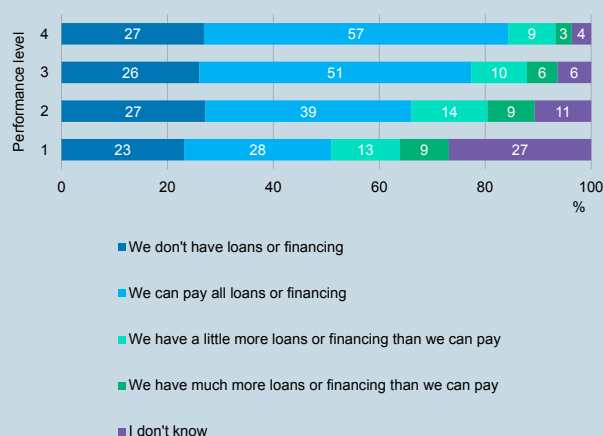


Graph 24b – Budget and Money Saved for Emergencies, by Level of Performance in Financial Knowledge Test

"I usually have some money saved for emergencies"(n=3,678)



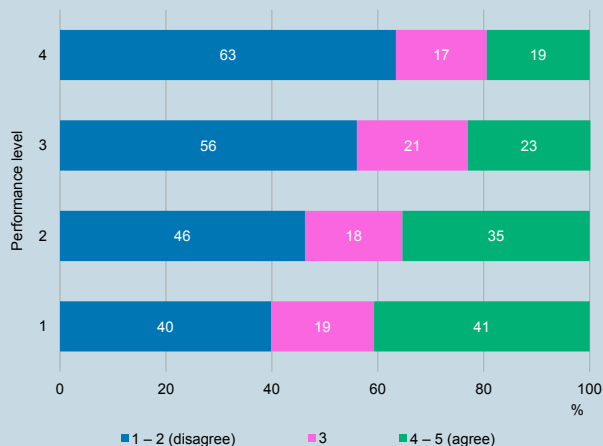
Graph 25 – Description of Household Loans and Financing by Level of Performance in Financial Knowledge Test(n=3,687)



Lower financial knowledge levels also increase the likelihood of having excessive debt, as well as reporting a negative impact on well-being (Graph 26).

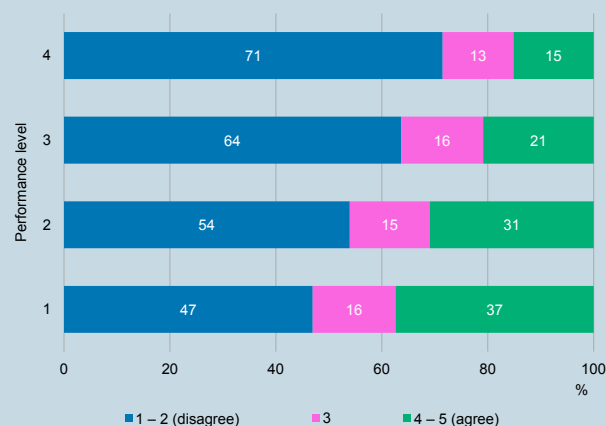
Graph 26a – Financial Concerns, by Performance Level

"I have too much debt right now" (n=3,695)



Graph 26b – Financial Concerns, by Performance Level

"I lose sleep at night due to financial worries" (n=3,705)



The correlation between the level of performance in the knowledge tests and positive financial behaviors among respondents corroborates the idea that financial education can benefit both professionals and students. By improving the individuals' financial knowledge, positive financial skills and attitudes are encouraged, which are always related to better indicators of financial well-being. Moreover, it is worth emphasizing the need to pay special attention to the female audience, awakening their interest in topics related to financial literacy, seeking to reduce the gap captured by the research in their performance on both the financial literacy tests and in the level of prior interest in the subject.

Conclusion

This box presented the results of a survey carried out with managers and teachers from public elementary schools that had joined the *Aprender Valor* program. Knowing the profile and financial knowledge gaps of professionals and the target audience of Financial Education programs makes it possible to adjust and work on contents of greater interest. Beyond the personal benefits for education professionals, greater mastery of financial skills should help them teach financial education to their students.

The survey findings suggest that the specificities of working in schools encourage the habit of planning beyond professional activities (planning classes, exams, vacations in a predetermined period), since most of professionals were financial planners. These professionals were more likely to report having emergency reserves, lower debt, and greater financial well-being, for all income ranges.

The analysis also showed that higher financial knowledge levels were associated with a household budget surplus, better credit management, lower risk of excessive debt, and lower levels of financial worries.

Most respondents used the most common financial products and services such as traditional bank account, savings account, and Pix. Few know about and use digital accounts, credit union accounts, or equity investments, which suggests an opportunity to broaden their repertoire through the *Aprender Valor* program.

It was observed that women earn less than men in any of the positions analyzed (manager or teacher in the early or final years), have less prior interest in the subject of financial education, and a lower financial knowledge level. These differences suggest a crucial role for the *Aprender Valor* program in training these professionals, thus contributing to increase their life quality.

Thus, this initial assessment and its findings are expected to not only strengthen the development of the program, but also to inspire further research and the design of new initiatives – whether within academia or among practitioners and stakeholders committed to, or interested in, advancing financial education.

Annex A – Definitions – Chapter 1

The definitions below were used in Chapter 1 and are based on data of the Credit Information System (SCR) from the BCB, considering the period between December 2015 to December 2022.

Credit

Original lender: Institution with which the client already has the operation.

Delinquency: the ratio of the sum of operations with installments overdue for more than 90 days to the sum of all credit operations granted. The sum of credit – including overdue and not yet due installments – is deemed to be delinquent if installments are more than 90 days overdue. This process, called hauling (*arrasto*), assumes that the debtor in such a situation will not pay the not-yet-due installments while there are installments overdue for more than 90 days.

Credit type: subtypes of credit within the SCR, whose description may be found in the document “*Instruções de Preenchimento do Documento 3040*” (Document 3040 filling instructions), available at: < https://www.bcb.gov.br/content/estabilidadefinanceira/Leiaute_de_documentos/scrdoc3040/SCR_InstrucoesDePreenchimento_Doc3040.pdf>. Related subtypes were grouped, for the sake of simplicity.

Identified operations: when the same client operations sum up an amount over BRL 200.00¹ in a single FI, the operation is identified at the SCR, meaning that both client and operation are individualized, and their information is detailed. When the sum does not surpass BRL 200.00, the information is aggregated without identification of client or operation. The indicators herewith presented were built based on identified operations, which comprise most of the credit operations within the SFN.

Credit portability: The client may request the transfer of credit operations (loans and financing) and leasing from one financial institution to another, upon early settlement of the operation at the original institution by the new financial institution. The terms of the new transaction must be negotiated between the customer himself and the institution that will grant the new credit.

Proposer: Institution offering new credit to which the operation will be ported.

¹ In force since June 2016, as per Circular 3,567 of December 12, 2011, modified by Circular 3,786 of March 10, 2016, and Circular 3,870 of December 19, 2017.

Number of loans granted: a number of loans contracted and effectively realized, which have outstanding installments at the reference date, both overdue and not yet due. The number of loans encompasses not only grants performed on the reference date, but also the outstanding credit stock on that date, regardless of the date the loan was granted.

Number of borrowers: number of clients with outstanding credit operations (outstanding portfolio, as aforementioned). Individuals or corporations that: i) reside abroad; or ii) do not have a Corporate Taxpayer Register Number (CNPJ) or an Individual Taxpayer Register Number were disregarded.

Reimbursement of Loan Origination Fees (RCO) is a compensation paid by the proposer to the original creditor when portability is granted. The value is defined by the Portability Management Committee (self-regulation), in accordance with the credit type and value ported. The cost for payroll-deducted loans is relatively higher than the other loan types in all the delimited bands of outstanding debt balance, taking the band's average value as reference.

Credit portfolio balance: is equivalent to the total of the outstanding portfolio, and includes both overdue and not yet due installments, excluding operations accrued as losses. The active portfolio encompasses not only grants performed on the reference date, but also the outstanding credit stock on that date, regardless of the date the loan was granted.

Granting segment: a segment of financial institutions that grant credit.

Banking segment: independent banks (excluding credit unions) and financial institutions that grant credit and are part of a conglomerate bank.

Non-banking segment: credit unions, cooperative banks, and financial institutions that are not part of a bank conglomerate (the so called “independent FI”): economic development agencies, saving and loans associations, mortgage companies, leasing companies, credit companies to micro-entrepreneurs and small business, credit, financing, and investment companies, and on-lending real estate financing companies.

In Chapter 1, credit unions were presented apart from the non-banking segment (cooperative banks belong to the non-banking segment).

Origin of resources

Non-earmarked resources: refer to loans granted with interest rates agreed between financial institutions and borrowers (market interest rates). In non-earmarked operations, the financial institutions decide how to apply the funds raised in the market.

Earmarked resources: operations regulated by the National Monetary Council (CMN) or linked to budgetary resources to foster the long-term and mid-term production of goods and investment in the real estate, housing, rural and infrastructure segments. Resources come from a part of the on-demand deposits and savings accounts, and from public funds and programs. The Production-Oriented Microcredit National Program (PNMPO) is an example.

Annex B – Statistical annex – Chapter 1

Table A – Credit Operations Balance for Households by Federal Unit

	R\$ millions						
	Dec 2020	Dec 2021	Dec 2022	Variation %			
				2020	2021	2022	Average
Total Brazil	2,241,084	2,710,829	3,189,655	11.1	21.0	17.7	16.5
North	116,104	151,268	188,986	13.9	30.3	24.9	22.8
Acre	5,859	7,560	9,489	14.5	29.0	25.5	22.8
Amapá	5,513	7,089	8,519	12.0	28.6	20.2	20.1
Amazonas	19,938	25,036	30,761	11.6	25.6	22.9	19.8
Pará	43,807	57,618	72,566	13.6	31.5	25.9	23.5
Rondônia	21,961	29,017	36,111	17.7	32.1	24.4	24.6
Roraima	4,447	5,708	7,139	11.7	28.3	25.1	21.5
Tocantins	14,578	19,240	24,402	13.4	32.0	26.8	23.8
Northeast	356,324	433,867	513,515	9.5	21.8	18.4	16.4
Alagoas	20,850	25,180	29,705	8.9	20.8	18.0	15.8
Bahia	92,257	112,195	132,522	9.0	21.6	18.1	16.1
Ceará	52,502	64,036	76,250	11.4	22.0	19.1	17.4
Maranhão	38,528	48,527	59,525	11.7	26.0	22.7	20.0
Paraíba	31,070	37,057	43,044	9.5	19.3	16.2	14.9
Pernambuco	58,714	71,507	84,531	9.5	21.8	18.2	16.4
Piauí	18,884	23,263	27,107	9.6	23.2	16.5	16.3
Rio Grande do North	26,497	31,754	36,754	7.7	19.8	15.7	14.3
Sergipe	17,022	20,349	24,078	5.7	19.6	18.3	14.3
Central-West	301,867	372,464	445,328	13.9	23.4	19.6	18.9
Distrito Federal	60,262	70,826	78,770	10.4	17.5	11.2	13.0
Goiás	109,513	137,917	169,988	13.5	25.9	23.3	20.8
Mato Grosso	82,052	101,789	122,334	17.4	24.1	20.2	20.5
Mato Grosso do South	50,040	61,932	74,236	13.7	23.8	19.9	19.0
Southeast	1,013,455	1,212,626	1,404,033	10.5	19.7	15.8	15.3
Espírito Santo	34,535	40,609	47,739	6.9	17.6	17.6	13.9
Minas Gerais	212,114	254,684	301,212	10.9	20.1	18.3	16.3
Rio de Janeiro	163,153	197,762	223,727	8.6	21.2	13.1	14.2
São Paulo	603,653	719,570	831,354	11.1	19.2	15.5	15.2
South	451,767	538,968	635,933	11.3	19.3	18.0	16.2
Paraná	172,235	207,605	245,967	11.5	20.5	18.5	16.8
Rio Grande do South	170,669	201,266	239,568	10.5	17.9	19.0	15.7
Santa Catarina	108,863	130,097	150,398	12.4	19.5	15.6	15.8
Not identified	1,567	1,636	1,860	-12.8	4.4	13.6	1.1

Table B – Credit Density for Households by Federal Unit

	R\$ per inhabitant						
	Credit Density			Variation %			Average
	Dec 2020	Dec 2021	Dec 2022	2020	2021	2022	
Total Brazil	10,552	12,672	14,807	10.3	20.1	16.8	15.7
North	6,189	7,965	9,834	12.4	28.7	23.5	21.3
Acre	6,512	8,289	10,267	12.9	27.3	23.9	21.2
Amapá	6,350	8,018	9,468	9.9	26.3	18.1	17.9
Amazonas	4,709	5,828	7,061	9.9	23.8	21.1	18.1
Pará	5,019	6,538	8,157	12.5	30.3	24.8	22.3
Rondônia	12,173	15,920	19,615	16.5	30.8	23.2	23.3
Roraima	7,071	8,790	10,673	8.0	24.3	21.4	17.7
Tocantins	9,126	11,919	14,962	12.2	30.6	25.5	22.5
Northeast	6,198	7,509	8,844	9.0	21.2	17.8	15.9
Alagoas	6,210	7,470	8,779	8.4	20.3	17.5	15.3
Bahia	6,170	7,477	8,802	8.6	21.2	17.7	15.7
Ceará	5,701	6,914	8,187	10.8	21.3	18.4	16.7
Maranhão	5,403	6,769	8,260	11.1	25.3	22.0	19.3
Paraíba	7,678	9,110	10,530	9.0	18.7	15.6	14.3
Pernambuco	6,090	7,373	8,666	8.8	21.1	17.5	15.7
Piauí	5,751	7,068	8,218	9.3	22.9	16.3	16.0
Rio Grande do North	7,473	8,890	10,216	6.9	19.0	14.9	13.5
Sergipe	7,314	8,672	10,179	4.8	18.6	17.4	13.4
Central-West	18,200	22,186	26,218	12.5	21.9	18.2	17.5
Distrito Federal	19,638	22,792	25,042	9.0	16.1	9.9	11.6
Goiás	15,308	19,033	23,170	12.0	24.3	21.7	19.2
Mato Grosso	23,163	28,407	33,762	16.0	22.6	18.9	19.1
Mato Grosso do South	17,736	21,723	25,777	12.5	22.5	18.7	17.8
Southeast	11,354	13,492	15,520	9.7	18.8	15.0	14.5
Espírito Santo	8,460	9,842	11,450	5.8	16.3	16.3	12.7
Minas Gerais	9,939	11,869	13,964	10.3	19.4	17.7	15.7
Rio de Janeiro	9,375	11,301	12,718	8.0	20.5	12.5	13.6
São Paulo	13,000	15,378	17,637	10.2	18.3	14.7	14.4
South	14,922	17,680	20,724	10.5	18.5	17.2	15.4
Paraná	14,913	17,852	21,011	10.7	19.7	17.7	16.0
Rio Grande do South	14,918	17,527	20,789	10.0	17.5	18.6	15.3
Santa Catarina	14,940	17,647	20,171	11.1	18.1	14.3	14.5

Table C – Default Rates for Household Credit Operations by Federal Unit

				%		
	Dec 2020	Dec 2021	Dec 2022	Variation p.p.		
				2020	2021	2022
Total Brazil	2.9	3.0	3.9	-0.7	0.2	0.9
North	3.1	3.1	4.1	-0.8	0.0	1.0
Acre	2.6	2.9	3.7	-1.0	0.3	0.8
Amapá	4.2	3.7	4.6	-0.6	-0.5	0.9
Amazonas	3.7	4.2	6.0	-0.6	0.5	1.8
Pará	3.3	3.5	4.5	-1.0	0.1	1.1
Rondônia	2.0	1.9	2.4	-0.5	-0.1	0.5
Roraima	3.5	3.2	4.0	-0.7	-0.3	0.8
Tocantins	2.7	2.4	2.8	-1.0	-0.4	0.4
Northeast	3.8	4.0	5.4	-0.7	0.2	1.3
Alagoas	3.9	4.3	5.6	-0.7	0.3	1.3
Bahia	3.7	4.0	5.4	-0.7	0.2	1.4
Ceará	3.6	4.1	5.5	-0.6	0.4	1.5
Maranhão	3.8	3.5	4.3	-0.5	-0.4	0.9
Paraíba	3.6	4.0	5.3	-0.9	0.4	1.3
Pernambuco	4.3	4.8	6.2	-0.5	0.5	1.5
Piauí	3.4	3.8	5.0	-1.0	0.4	1.2
Rio Grande do North	4.0	4.1	5.5	-0.7	0.1	1.4
Sergipe	3.1	3.3	4.5	-0.8	0.3	1.2
Central-West	2.2	2.3	2.8	-0.6	0.1	0.5
Distrito Federal	2.6	2.9	4.1	-0.6	0.3	1.2
Goiás	2.5	2.4	3.0	-0.7	0.0	0.6
Mato Grosso	1.8	1.7	1.9	-0.6	0.0	0.1
Mato Grosso do South	2.0	2.1	2.6	-0.6	0.1	0.4
Southeast	3.0	3.2	4.1	-0.7	0.2	0.9
Espírito Santo	3.1	3.0	3.8	-1.2	0.0	0.8
Minas Gerais	2.4	2.6	3.3	-0.8	0.2	0.7
Rio de Janeiro	4.6	4.9	6.5	-0.2	0.3	1.6
São Paulo	2.7	2.9	3.7	-0.7	0.1	0.9
South	2.1	2.3	2.8	-0.6	0.1	0.5
Paraná	2.2	2.4	2.9	-0.6	0.2	0.5
Rio Grande do South	2.1	2.2	2.6	-0.6	0.0	0.5
Santa Catarina	2.1	2.3	2.9	-0.6	0.2	0.6
Not identified	12.4	2.8	2.9	-1.1	-9.6	0.1

Table D – Credit Operations Balance for Corporate Entities by Federal Unit

R\$ millions

	Dec 2020	Dec 2021	Dec 2022	Variation %			
				2020	2021	2022	Average
Total Brazil	1,780,250	1,968,540	2,145,713	22.0	10.6	9.0	13.7
North	57,981	70,865	82,085	25.7	22.2	15.8	21.2
Acre	2,888	3,081	3,471	13.6	6.7	12.7	10.9
Amapá	3,659	3,878	4,213	11.2	6.0	8.6	8.6
Amazonas	16,792	19,360	20,724	33.2	15.3	7.0	18.0
Pará	20,494	26,160	31,752	26.8	27.6	21.4	25.2
Rondônia	5,738	7,770	9,029	20.0	35.4	16.2	23.6
Roraima	1,807	2,049	2,636	15.0	13.4	28.7	18.8
Tocantins	6,603	8,567	10,260	27.4	29.7	19.8	25.6
Northeast	166,445	190,751	221,331	16.4	14.6	16.0	15.7
Alagoas	6,795	8,131	9,835	28.3	19.7	21.0	22.9
Bahia	50,262	56,286	66,205	17.2	12.0	17.6	15.6
Ceará	35,606	38,349	42,162	15.0	7.7	9.9	10.8
Maranhão	12,337	15,245	18,552	12.8	23.6	21.7	19.3
Paraíba	7,650	8,715	9,787	28.7	13.9	12.3	18.1
Pernambuco	28,672	31,978	38,389	11.0	11.5	20.0	14.1
Piauí	9,210	12,865	15,414	19.0	39.7	19.8	25.8
Rio Grande do North	11,069	12,801	14,268	18.3	15.7	11.5	15.1
Sergipe	4,844	6,381	6,718	19.4	31.7	5.3	18.3
Central-West	177,439	192,640	218,526	23.2	8.6	13.4	14.9
Distrito Federal	55,906	58,841	64,553	13.6	5.2	9.7	9.5
Goiás	52,051	59,854	64,483	26.1	15.0	7.7	16.0
Mato Grosso	51,582	51,863	63,722	29.7	0.5	22.9	17.0
Mato Grosso do South	17,899	22,082	25,769	29.5	23.4	16.7	23.1
Southeast	1,037,838	1,116,677	1,177,545	21.5	7.6	5.5	11.3
Espírito Santo	25,933	31,514	35,230	19.8	21.5	11.8	17.6
Minas Gerais	150,419	176,702	187,383	26.3	17.5	6.0	16.3
Rio de Janeiro	263,042	249,502	256,729	15.5	-5.1	2.9	4.1
São Paulo	598,444	658,959	698,203	23.2	10.1	6.0	12.9
South	331,274	389,808	440,005	26.4	17.7	12.9	18.8
Paraná	125,555	146,037	164,593	30.5	16.3	12.7	19.6
Rio Grande do South	102,873	119,382	136,315	24.4	16.0	14.2	18.1
Santa Catarina	102,845	124,389	139,098	23.6	20.9	11.8	18.7
Not identified	9,273	7,799	6,220	0.7	-15.9	-20.2	-12.2

Table E – Default Rates for Corporate Credit Operations by Federal Unit

	Dec 2020	Dec 2021	Dec 2022	Variation p.p.			%
				2020	2021	2022	
Total Brazil	1.1	1.2	1.7	-1.0	0.1	0.5	
North	1.2	1.7	2.4	-2.7	0.5	0.7	
Acre	1.9	1.4	2.1	-1.3	-0.6	0.8	
Amapá	0.6	1.4	2.9	-0.6	0.8	1.5	
Amazonas	1.0	1.4	2.5	-1.7	0.4	1.2	
Pará	1.4	2.1	2.5	-5.2	0.6	0.5	
Rondônia	1.4	2.1	2.5	-2.0	0.7	0.4	
Roraima	0.6	1.0	1.7	-0.6	0.4	0.6	
Tocantins	0.9	1.4	2.2	-0.8	0.5	0.8	
Northeast	1.2	1.7	2.4	-2.0	0.5	0.6	
Alagoas	2.1	1.6	2.2	-1.7	-0.5	0.6	
Bahia	1.1	1.8	2.3	-2.9	0.7	0.5	
Ceará	0.6	1.3	2.2	-1.2	0.7	0.8	
Maranhão	1.5	1.5	2.5	-0.2	0.1	0.9	
Paraíba	2.9	2.1	3.5	-1.4	-0.8	1.4	
Pernambuco	1.3	2.0	2.2	-3.5	0.7	0.2	
Piauí	0.9	1.4	1.9	-0.3	0.5	0.5	
Rio Grande do North	1.4	2.3	3.1	-0.6	0.9	0.8	
Sergipe	1.9	2.7	3.3	-0.9	0.7	0.6	
Central-West	1.1	1.1	1.9	-1.1	0.0	0.8	
Distrito Federal	0.6	0.8	1.4	-0.3	0.2	0.6	
Goiás	1.2	1.3	2.8	-1.0	0.1	1.5	
Mato Grosso	1.0	1.1	1.4	-1.0	0.1	0.3	
Mato Grosso do South	1.9	1.1	1.9	-4.9	-0.8	0.8	
Southeast	1.1	1.2	1.5	-0.8	0.1	0.3	
Espírito Santo	0.8	1.2	1.7	-3.5	0.4	0.5	
Minas Gerais	0.7	0.9	1.5	-0.6	0.2	0.7	
Rio de Janeiro	0.7	1.2	1.3	-0.5	0.5	0.1	
São Paulo	1.3	1.3	1.6	-0.9	-0.1	0.3	
South	1.1	1.1	1.6	-0.9	-0.1	0.5	
Paraná	1.3	1.2	1.8	-1.3	-0.1	0.6	
Rio Grande do South	1.4	1.2	1.6	-0.8	-0.2	0.5	
Santa Catarina	0.7	0.8	1.2	-0.5	0.1	0.4	
Not identified	1.4	2.0	6.2	-0.2	0.6	4.2	

Table F – Credit Operations Balance for Corporate by Activity Sector

Sector	R\$ millions						
	Dec 2020	Dec 2021	Dec 2022	Variation %			
				2020	2021	2022	Average
Total	1,780,250	1,968,540	2,145,713	22.0	10.6	9.0	13.7
Agriculture, livestock, forestry production, fishing and aquaculture	32,246	38,663	45,126	25.0	19.9	16.7	20.5
Extractive industries	16,568	14,891	19,480	8.0	-10.1	30.8	8.3
Manufacturing industries	433,933	454,442	475,248	21.5	4.7	4.6	10.0
Food products manufacturing	111,882	127,233	133,214	16.8	13.7	4.7	11.6
Beverage manufacturing	7,567	8,452	9,047	0.3	11.7	7.0	6.2
Tobacco products manufacturing	1,794	2,373	3,347	28.7	32.3	41.1	33.9
Textile products manufacturing	8,508	8,977	9,277	20.2	5.5	3.3	9.4
Manufacture of wearing apparel and accessories	10,648	11,275	12,739	32.1	5.9	13.0	16.5
Preparation of leather and manufacture of leather goods, travel items and footwear	5,579	6,434	7,001	22.8	15.3	8.8	15.5
Wood products manufacturing	7,516	9,220	10,285	25.9	22.7	11.6	19.9
Pulp, paper and paper products manufacturing	21,260	23,420	25,197	6.9	10.2	7.6	8.2
Printing and reproduction of recordings	3,227	3,522	3,865	56.2	9.1	9.8	23.2
Manufacture of coke, petroleum products and biofuels	41,781	22,488	25,037	32.4	-46.2	11.3	-7.4
Chemical products manufacturing	26,030	26,351	30,837	41.6	1.2	17.0	18.8
Manufacture of pharmaceutical chemicals and pharmaceuticals	6,945	6,780	6,615	68.9	-2.4	-2.4	17.2
Manufacture of rubber and plastic products	18,194	18,612	19,442	43.4	2.3	4.5	15.3
Manufacture of non-metallic mineral products	12,223	13,982	16,501	16.5	14.4	18.0	16.3
Metallurgy	35,881	39,351	43,360	10.6	9.7	10.2	10.2
Manufacture of metal products, except machinery and equipment	17,009	21,959	23,409	31.6	29.1	6.6	21.9
Manufacture of computer equipment, electronic and optical products	5,873	7,585	6,172	63.4	29.1	-18.6	19.8
Manufacture of electrical machines, appliances and materials	13,159	14,342	14,324	29.1	9.0	-0.1	12.0
Manufacture of machinery and equipment	15,399	18,756	19,358	20.2	21.8	3.2	14.7
Manufacture of motor vehicles, trailers and semi-trailers	43,570	41,354	31,011	12.0	-5.1	-25.0	-7.3
Manufacture of other transport equipment, except motor vehicles	5,381	5,035	6,016	-15.4	-6.4	19.5	-1.8
Furniture manufacturing	6,227	7,280	8,011	36.5	16.9	10.0	20.7
Manufacture of miscellaneous products	4,249	4,729	5,285	40.8	11.3	11.7	20.5
Maintenance, repair and installation of machinery and equipment	4,031	4,932	5,896	35.6	22.4	19.6	25.7
Electricity and gas, water, sewage and waste management	208,711	217,669	234,554	14.5	4.3	7.8	8.8
Electricity and gas	185,757	195,313	210,732	15.1	5.1	7.9	9.3
Water, sewage, waste management and decontamination activities	22,954	22,356	23,822	9.6	-2.6	6.6	4.4
Construction	77,133	84,584	104,314	15.9	9.7	23.3	16.1
Trade, repair of motor vehicles and motorcycles	411,539	496,625	559,260	29.0	20.7	12.6	20.6
Trade and repair of motor vehicles and motorcycles	45,316	54,313	70,438	-3.8	19.9	29.7	14.4
Wholesale trade, except motor vehicles and motorcycles	178,993	215,323	239,331	34.2	20.3	11.1	21.5
Retail trade	187,229	226,989	249,491	35.1	21.2	9.9	21.7
Transportation, storage and mail	169,926	183,550	207,164	22.1	8.0	12.9	14.2
Land transport	100,107	115,799	138,688	25.0	15.7	19.8	20.1
Water transport	22,897	21,888	19,337	24.9	-4.4	-11.7	1.8
Air transport	3,396	1,492	2,085	36.7	-56.1	39.7	-5.7
Storage and auxiliary transport activities, postal services and other delivery activities	43,526	44,372	47,054	13.9	1.9	6.0	7.2
Public administration, defense and social security	163,042	165,256	167,332	15.6	1.4	1.3	5.9
Other services	265,612	305,644	324,770	32.1	15.1	6.3	17.3
Accommodation and food	22,449	25,337	26,497	62.9	12.9	4.6	24.3
Information and communication, except telecommunications	11,823	13,166	14,548	26.0	11.4	10.5	15.7
Telecommunications	10,204	12,074	7,123	-24.8	18.3	-41.0	-19.3
Financial, insurance and related service activities	65,244	80,279	78,453	44.1	23.0	-2.3	20.1
Real estate, professional, scientific, technical, administrative and complementary services activities	112,902	126,426	145,483	29.6	12.0	15.1	18.6
Education	12,735	13,572	13,953	33.0	6.6	2.8	13.4
Human health and social services	25,472	29,357	32,401	38.5	15.3	10.4	20.8
Arts, culture, sports and recreation	4,782	5,433	6,312	20.9	13.6	16.2	16.9
Corporate entities headquartered abroad or not classified	1,540	7,216	8,465	-86.3	368.6	17.3	-9.1

Table G – Default on Credit Operations for Corporate by Activity Sector

Sector	Dec 2020	Dec 2021	Dec 2022	Variation p.p.		
				2020	2021	2022
Total	1.1	1.2	1.7	-1.0	0.1	0.5
Agriculture, livestock, forestry production, fishing and aquaculture	1.3	0.8	0.8	-2.6	-0.5	0.0
Extractive industries	0.2	10.4	1.0	-0.5	10.2	-9.4
Manufacturing industries	0.8	0.6	1.0	-1.6	-0.2	0.4
Food products manufacturing	0.5	0.6	0.8	-0.5	0.1	0.2
Beverage manufacturing	0.2	0.3	0.5	-0.1	0.1	0.2
Tobacco products manufacturing	0.0	0.0	0.1	-0.1	0.0	0.1
Textile products manufacturing	1.7	0.6	1.5	0.6	-1.1	0.9
Manufacture of wearing apparel and accessories	3.8	3.5	3.9	0.0	-0.3	0.4
Preparation of leather and manufacture of leather goods, travel items and footwear	4.3	4.2	2.7	-3.7	-0.1	-1.5
Wood products manufacturing	0.8	0.5	0.9	-0.6	-0.3	0.4
Pulp, paper and paper products manufacturing	0.2	0.4	0.2	0.0	0.2	-0.2
Printing and reproduction of recordings	1.5	3.3	6.4	-2.3	1.8	3.1
Manufacture of coke, petroleum products and biofuels	0.3	0.1	0.0	-8.8	-0.2	-0.1
Chemical products manufacturing	0.3	0.3	0.4	-3.0	0.0	0.1
Manufacture of pharmaceutical chemicals and pharmaceuticals	0.7	0.2	0.1	0.5	-0.5	-0.1
Manufacture of rubber and plastic products	0.7	0.7	1.3	-0.7	0.0	0.6
Manufacture of non-metallic mineral products	0.8	0.5	1.1	-0.7	-0.3	0.6
Metallurgy	0.3	0.0	0.1	0.0	-0.3	0.1
Manufacture of metal products, except machinery and equipment	1.2	0.9	1.4	-1.8	-0.3	0.5
Manufacture of computer equipment, electronic and optical products	0.4	0.2	1.4	-0.6	-0.2	1.2
Manufacture of electrical machines, appliances and materials	2.1	0.4	3.0	1.0	-1.7	2.6
Manufacture of machinery and equipment	2.6	0.8	1.1	1.1	-1.8	0.3
Manufacture of motor vehicles, trailers and semi-trailers	0.3	0.1	0.4	0.0	-0.2	0.3
Manufacture of other transport equipment, except motor vehicles	1.6	0.2	0.1	-22.9	-1.4	-0.1
Furniture manufacturing	1.6	1.7	2.5	-1.3	0.1	0.8
Manufacture of miscellaneous products	1.1	1.5	2.5	-0.7	0.4	1.0
Maintenance, repair and installation of machinery and equipment	2.1	2.8	4.0	-1.1	0.7	1.2
Electricity and gas, water, sewage and waste management	0.5	0.1	0.1	0.4	-0.4	0.0
Electricity and gas	0.0	0.0	0.0	0.0	0.0	0.0
Water, sewage, waste management and decontamination activities	4.1	0.5	0.5	3.6	-3.6	0.0
Construction	3.7	2.9	2.8	-2.9	-0.8	-0.1
Trade, repair of motor vehicles and motorcycles	1.6	1.8	2.6	-0.9	0.2	0.8
Trade and repair of motor vehicles and motorcycles	1.4	1.8	2.2	-0.2	0.4	0.4
Wholesale trade, except motor vehicles and motorcycles	1.4	1.0	1.4	-0.7	-0.4	0.4
Retail trade	1.8	2.6	3.8	-1.3	0.8	1.2
Transportation, storage and mail	0.9	1.4	1.3	-0.6	0.5	-0.1
Land transport	0.8	1.8	1.6	-0.2	1.0	-0.2
Water transport	0.1	0.0	0.4	-0.3	-0.1	0.4
Air transport	4.8	7.9	0.3	4.6	3.1	-7.6
Storage and auxiliary transport activities, postal services and other delivery activities	1.3	0.9	1.1	-2.0	-0.4	0.2
Public administration, defense and social security	0.0	0.0	0.0	-0.3	0.0	0.0
Other services	1.7	2.0	2.6	-0.8	0.3	0.6
Accommodation and food	3.8	7.0	7.8	-2.8	3.2	0.8
Information and communication, except telecommunications	2.0	1.6	2.5	-0.1	-0.4	0.9
Telecommunications	0.3	0.7	2.4	0.1	0.4	1.7
Financial, insurance and related service activities	2.0	0.6	0.6	-1.0	-1.4	0.0
Real estate, professional, scientific, technical, administrative and complementary services activities	1.1	2.0	2.4	-0.8	0.9	0.4
Education	1.8	2.7	2.8	-0.9	0.9	0.1
Human health and social services	0.8	1.0	1.9	-0.3	0.2	0.9
Arts, culture, sports and recreation	1.7	2.2	3.6	-0.2	0.5	1.4
Corporate entities headquartered abroad or not classified	1.0	1.6	2.2	-3.0	0.6	0.6

Annex C – Statistical annex – Chapter 6

Table A – Summary of SFN Concentration Indicators

Indicators	Banking and non-banking segment				Banking segment				Commercial banking segment			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Total assets												
HHIn	0.1071	0.0981	0.0928	0.0888	0.1308	0.1206	0.1179	0.1148	0.1367	0.1255	0.1229	0.1208
RC5 (%)	69.8	66.9	65.1	63.8	79.2	76.0	74.9	73.5	81.0	77.5	76.5	75.4
Equivalent number	9.3	10.2	10.8	11.3	7.6	8.3	8.5	8.7	7.3	8.0	8.1	8.3
Total deposit												
HHIn	0.1263	0.1103	0.1032	0.0982	0.1419	0.1261	0.1213	0.1182	0.1456	0.1303	0.1258	0.1231
RC5 (%)	77.6	72.7	70.0	68.0	82.3	77.7	75.9	74.7	83.4	79.0	77.3	76.2
Equivalent number	7.9	9.1	9.7	10.2	7.0	7.9	8.2	8.5	6.9	7.7	8.0	8.1
Credit operations												
HHIn	0.1124	0.1068	0.1034	0.1015	0.1427	0.1367	0.1344	0.1329	0.1532	0.1455	0.1431	0.1430
RC5 (%)	69.8	68.5	67.9	66.9	80.7	79.2	78.7	77.6	83.7	81.8	81.3	80.6
Equivalent number	8.9	9.4	9.7	9.9	7.0	7.3	7.4	7.5	6.5	6.9	7.0	7.0

Table B – Summary of SFN concentration indicators

Rural and agricultural financing – Individuals and companies

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	83.4	81.9	82.6
b3	13.4	15.6	15.3
b4	2.9	2.2	1.9
n1+n2	0.4	0.3	0.2
n4	0.0	0.0	0.0
By type of control			
Public	61.0	61.4	64.3
Private	39.0	38.6	35.8
By source of funds			
Free	13.1	12.5	15.4
Directed	86.9	87.5	84.6
Concentration indices			
HHI	0.2999	0.2860	0.2740
EN	3.3	3.5	3.7
RC4 (%)	66.7	64.2	65.6

Table C – Concentration indicators in the credit stock

Housing finance – Individuals and companies

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	99.8	99.7	99.7
b3	0.1	0.1	0.2
b4	0.0	0.0	0.0
n1+n2	0.2	0.1	0.2
n4	0.0	0.0	0.0
By type of control			
Public	77.4	73.1	72.7
Private	22.6	26.9	27.3
By source of funds			
Free	0.9	0.8	0.8
Directed	99.1	99.2	99.3
Concentration indices			
HHI	0.5061	0.4654	0.4660
EN	2.0	2.1	2.1
RC4 (%)	92.3	92.2	92.6

Table D – Concentration indicators in the credit stock
Financing infrastructure and development – Legal entities

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	34.3	34.6	34.7
b3	0.0	0.0	0.0
b4	65.0	64.7	64.6
n1+n2	0.7	0.7	0.6
n4	0.0	0.0	0.0
By type of control			
Public	95.6	95.6	95.9
Private	4.4	4.4	4.2
By source of funds			
Free	2.0	2.0	2.1
Directed	98.0	98.0	97.9
Concentration indices			
HHI	0.4475	0.4457	0.4427
EN	2.2	2.2	2.3
RC4 (%)	94.2	94.0	93.2

Table E – Concentration indicators in the credit stock
Transactions with acquired receivables – Legal entities

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	100.0	99.8	99.9
b3	0.0	0.0	0.0
b4	0.0	0.0	0.0
n1+n2	0.0	0.2	0.1
n4	0.0	0.0	0.0
By type of control			
Public	1.4	1.1	1.4
Private	98.6	98.9	98.6
By source of funds			
Free	100.0	100.0	100.0
Directed	0.0	0.0	0.0
Concentration indices			
HHI	0.1457	0.1287	0.1227
EN	6.9	7.8	8.1
RC4 (%)	69.4	65.8	62.8

Table F – Concentration indicators in the credit stock
Working capital – Legal entities

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	89.3	87.0	85.5
b3	10.2	12.3	13.7
b4	0.2	0.4	0.3
n1+n2	0.4	0.4	0.5
n4	0.0	0.0	0.0
By type of control			
Public	23.9	27.2	30.2
Private	76.2	72.8	69.8
By source of funds			
Free	100.0	100.0	100.0
Directed	0.0	0.0	0.0
Concentration indices			
HHI	0.0964	0.0928	0.0906
EN	10.4	10.8	11.0
RC4 (%)	55.8	57.0	57.4

Table G – Concentration indicators in the credit stock
Personal loans with payroll consignment – Individuals

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	96.6	96.3	96.3
b3	3.0	3.2	2.9
b4	0.0	0.0	0.0
n1+n2	0.4	0.5	0.7
n4	0.0	0.0	0.0
By type of control			
Public	45.6	44.6	44.3
Private	54.4	55.4	55.7
By source of funds			
Free	100.0	100.0	100.0
Directed	0.0	0.0	0.0
Concentration indices			
HHI	0.1272	0.1234	0.1203
EN	7.9	8.1	8.3
RC4 (%)	66.6	65.2	64.6

Table H – Concentration indicators in the credit stock
Personal loans without payroll consignment – Individuals

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	78.3	77.2	76.0
b3	19.8	17.3	17.3
b4	0.0	0.0	0.0
n1+n2	1.9	5.5	6.6
n4	0.0	0.0	0.0
By type of control			
Public	32.9	27.5	26.1
Private	67.2	72.5	73.9
By source of funds			
Free	100.0	100.0	100.0
Directed	0.0	0.0	0.0
Concentration indices			
HHI	0.0952	0.0796	0.0765
EN	10.5	12.6	13.1
RC4 (%)	54.0	49.7	47.5

Table I – Concentration indicators in the credit stock
Vehicle financing – Individuals

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	95.4	94.7	94.3
b3	3.1	3.7	4.1
b4	0.0	0.0	0.0
n1+n2	1.5	1.6	1.6
n4	0.0	0.0	0.0
By type of control			
Public	2.1	2.0	1.7
Private	97.9	98.0	98.3
By source of funds			
Free	100.0	100.0	100.0
Directed	0.0	0.0	0.0
Concentration indices			
HHI	0.1335	0.1263	0.1160
EN	7.5	7.9	8.6
RC4 (%)	66.3	65.1	61.5

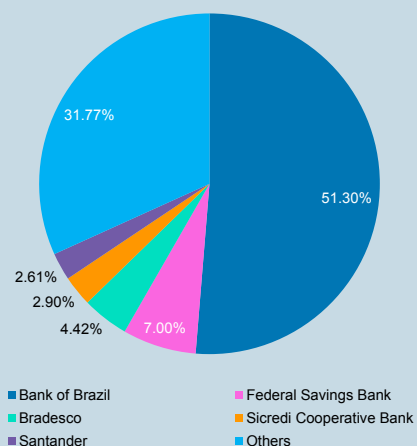
Table J – Concentration indicators in the credit stock
Credit cards – Global analysis – Individuals and companies

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	87.1	85.5	83.0
b3	1.4	1.7	2.0
b4	0.0	0.0	0.0
n1+n2	11.2	12.4	14.7
n4	0.3	0.4	0.3
By type of control			
Public	16.2	16.5	15.7
Private	83.8	83.5	84.3
By source of funds			
Free	100.0	100.0	100.0
Directed	0.0	0.0	0.0
Concentration indices			
HHI	0.1451	0.1338	0.1260
EN	6.9	7.5	7.9
RC4 (%)	68.6	66.0	62.8

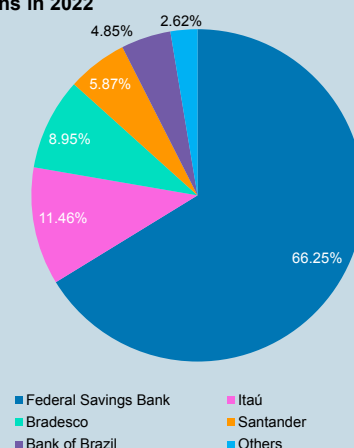
Table K – Concentration indicators in the credit stock
Overdrafts – Individuals and companies

	2020	2021	2022
Share (%)			
By type of segment			
b1+b2	91.0	86.8	85.0
b3	9.0	13.2	15.0
b4	0.0	0.0	0.0
n1+n2	0.0	0.0	0.0
n4	0.0	0.0	0.0
By type of control			
Public	24.8	20.7	19.3
Private	75.2	79.4	80.7
By source of funds			
Free	100.0	100.0	100.0
Directed	0.0	0.0	0.0
Concentration indices			
HHI	0.1679	0.1557	0.1508
EN	6.0	6.4	6.6
RC4 (%)	77.6	73.5	71.5

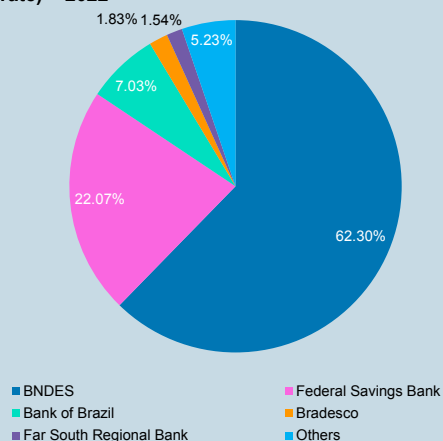
Graph C.1 – Market Share of Leading Institutions in Rural and Agribusiness Financing for Households and Corporations in 2022



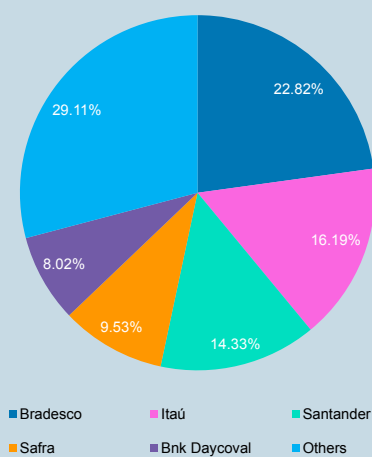
Graph C.2 – Market Share of Leading Institutions in Mortgage Lending for Households and Corporations in 2022



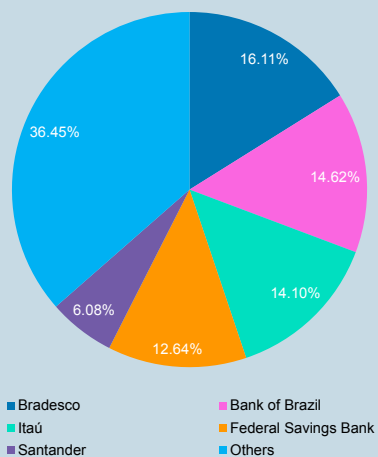
Graph C.3 – Leading Institutions' Market Share in Infrastructure and Development Financing (Corporate) – 2022



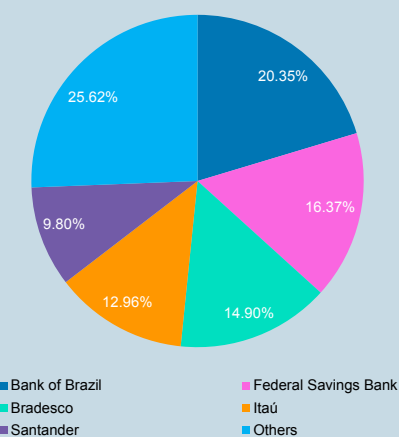
Graph C.4 – Market Share of Leading Institutions in Corporate Receivables Purchased in 2022



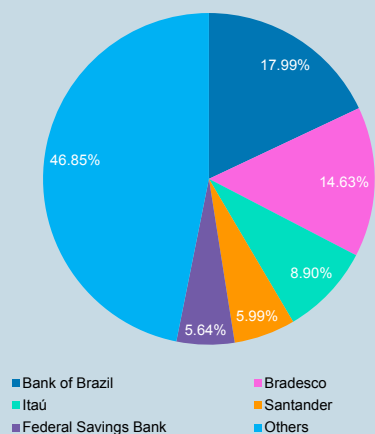
Graph C.5 – Market Share of Leading Institutions in Corporate Working Capital Financing in 2022



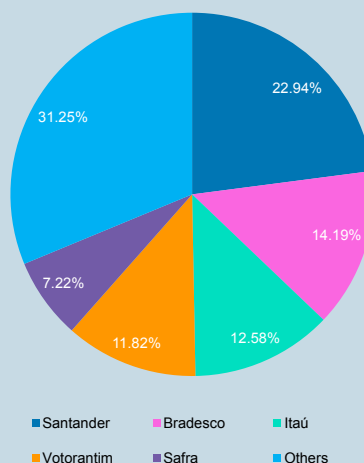
Graph C.6 – Share of leading institutions in personal loans with payroll deduction for individuals in 2022



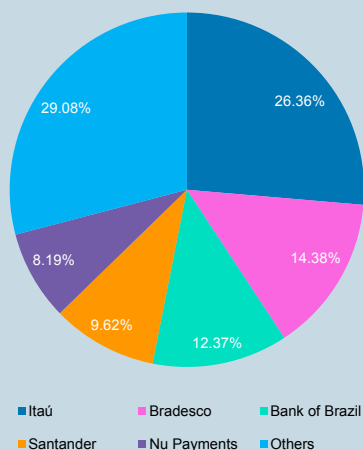
Graph C.7 – Market Share of Leading Institutions in Non-Payroll Personal Loans for Households in 2022



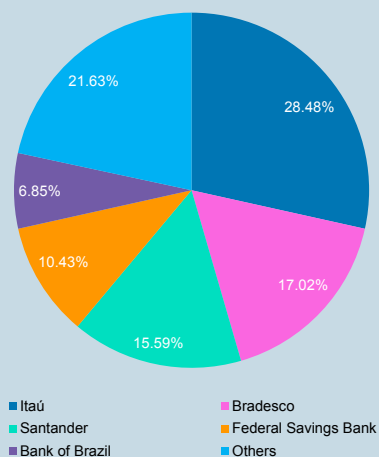
Graph C.8 – Market Share of Leading Institutions in Vehicle Financing for Households in 2022



Graph C.9 – Share of leading institutions in credit cards for individuals and corporate clients in 2022



Graph C.10 – Participation of leading institutions in overdrafts for individuals and corporate clients in 2022





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