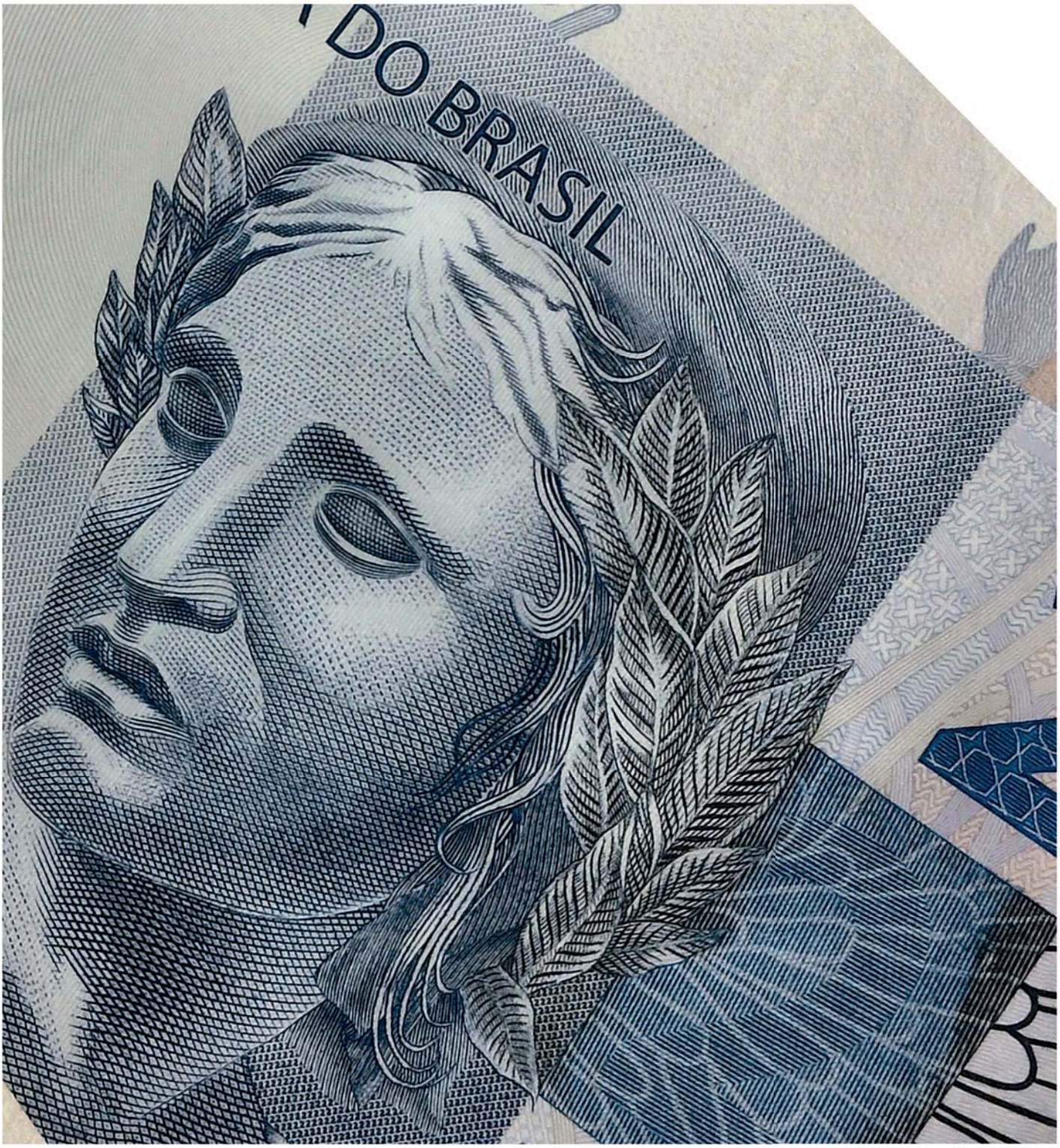

Banking Report
2020

BANCO CENTRAL
DO BRASIL

Banking Report

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Banking Report*

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Banco Central do Brasil
SBS – Quadra 3 – Bloco B – Edifício-Sede – 1º subsolo
70074-900 Brasília – DF – Brazil
Telephone: 0800 979 2345
Internet: http://www.bcb.gov.br/?ATENDIMENTO

Contents

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 issue focuses on events that occurred in 2020, featuring the main implications of the Covid-19 pandemic to the SFN and measures taken to combat its effects.

The 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 BCB. Chapter 7 discloses actions taken in the context of the Agenda BC#.

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

Executive Summary

In early 2020, the household segment, sustaining the 2019 growth, was the main drive of the credit market, whereas the corporate segment remained relatively stable. At the end of March, when the Covid-19 pandemic started, corporate credit expanded strongly, at first fueled by large companies. The implementation of credit-oriented programs and structures (such as the Emergency Program for Employment Support – Pese, the Emergency Credit Access Program – Peac, and the National Program for Support to Micro and Small Enterprises – Pronampe), started to meet the need for credit under differentiated conditions for Micro, Small and Medium Enterprises (MSMEs).

Household credit dropped sharply in the March-April 2020 period, in line with the fall in consumption, mainly in operations with credit cards and vehicle financing. The resumption of these credit lines followed throughout the year, in addition to the expansion of payroll-deducted operations, stimulated by the temporary increase of 5% in the borrowing upper bound for pensioners in 2020Q4. Real estate financing also expanded significantly, stimulated by low interest rates.

In this context, the stock of corporate credit grew 21.8% in 2020, with respective increases of 21.2% and 22.8% in the non-earmarked and earmarked segments. The household credit balance rose 11.2%, reflecting expansions of 10.8% and 11.7% in the non-earmarked and earmarked segments, respectively. Considering the total credit to the non-financial sector, the outstanding balance grew 16.8% in 2020, representing 160.5% of the Gross Domestic Product (GDP) in December 2020.

The average interest rate of new credit operations declined throughout 2020, reflecting the reduction in the basic interest rate and anti-cyclical measures for credit support, which provided banks with liquidity and kept the delinquency rate at low levels. Similarly, the Average

Cost of Outstanding Loans (ICC) – the average cost of the overall financial system portfolio – fell throughout 2020, recording in December, the lowest value of the time series started in 2013.

The reclassification authorized by the National Monetary Council (CMN) of the credit operations renegotiated between March and December to the level they were at in February allowed financial institutions to actively restructure the debts of households and companies, thus reducing the delinquency rate associated with bank credit throughout 2020. In December 2020, the delinquency rate on the corporate and household loan portfolios reached 1.2% and 2.9%, respectively, the lowest values in the series since 2011.

Although the number of portability requests fell 19.1% in the year, the value of the ported credit balance increased 6.5%. On the one hand, regarding the payroll-deducted credit line, the sharp increase in the average value of ported contracts (17.4%) smoothed the decline in the total ported value (-5.6%), in face of a sharp decrease in the number of effected contracts (-19.5%). Real estate portability, on the other hand, more than tripled in 2020, reaching 14.7% of the total value of ported operations.

The banking system funding in 2020 was influenced by the agents' reaction to the uncertainty scenario associated with the Covid-19 pandemic, increasing households' propensity to save and stimulating the accumulation of available funds by companies, with the allocation of resources in more traditional funding instruments, such as savings deposits and bank deposit certificates (CDBs).

As for the cost of funding, reflecting the conduct of the monetary policy, the Interbank Deposit (DI) rate, on the one hand, dropped sharply in 2020, reaching new historical lows, whereas funding rates as a proportion of the DI increased.

The ICC decomposition reveals that all components contributed to the significant decline observed in 2020 (-2.1 p.p. under the adjusted yearly average criterion). The main factor underlying the ICC decline was the funding cost (-1.04 p.p.), followed by delinquency (-0.39 p.p.), administrative expenses (-0.35 p.p.), financial margin (-0.27 p.p.), and, finally, taxes (-0.03 p.p.). The decline of the funding cost was due to the monetary easing. The Selic target rate, after remaining stable at 6.50% p.a. between March 2018 and July 2019, started to follow a downward trajectory, further intensified by

the outbreak of the Covid-19 pandemic, reaching 2.00% p.a. in August 2020. Despite a 4.1% decline in 2020 GDP, the delinquency rate followed a quite stable trajectory in view of several measures adopted to mitigate the pandemic effects, including increased renegotiations of credit contracts.

Considering the average for the period 2018-2020, the Funding Cost – a more stable and less subject to cyclical components indicator – stands out as the main ICC component (an average of 33.0% of the ICC decomposition), followed by Delinquency (average of 21.3), Administrative Expenses (average of 19.8%), Taxes and the Credit Guarantor Fund – FGC (average of 13.1%), and, finally, ICC Financial Margin (average of 12.7%).

In 2020, the most relevant foreign exchange products were those related to portfolio investment operations by non-residents and foreign trade operations, with respective participations of 38.1% and 25.8% in the primary market (operations between authorized institutions and their clients). Most foreign exchange transactions are in US dollars (91.3% of the total value for the primary market and 99.0% for the interbank market).

As for concentration, in 2020, ten banks accounted for 81.2% of the total value of operations in the primary market and 71.4% in the interbank foreign exchange market. If banking and non-banking segments are considered, the latter has a low participation in the total foreign exchange market, but stands out in cash delivery and prepaid card, which were strongly affected by the pandemic. These are predominantly small value operations, contracted with households and classified as International Travel. Households' share on the number of operations on the primary market reached 77.0%, but the value corresponded to only 1.8% of the total volume.

The pandemic interrupted the improvement in the banking system profitability that had been taking place since the end of the recession occurred between 2015 and 2016. In December 2020, the Return on Equity (ROE) of the system was 11.5%, the lowest in the time series. The profitability reduction was widespread, affecting banks of different types of control, size, and activity segment. Loan loss provisions (LLP) expenses increased, margins were under pressure, and service revenues were impacted by the economic activity decline. Administrative costs, however, remained under control. The main factor responsible for the profitability decline was the increase in LLP expenses.

Gross credit margin was under pressure and retreated slightly in 2020 due to the combined effect of increased portfolio and lower income. The latter was due to both the decrease in interest rates during the year and the cap imposed on the overdraft facility interest rate. The cost of funding fell, despite increasing in relation to the rate Selic rate.

The reduction in in the National Financial System (SFN) concentration between 2017 and 2019 – observed in the previous Banking Report – continued in 2020. This reduction involved both the banking and non-banking segments, as well as the three accounting aggregates (total assets, total deposits and credit operations). For example, in the case of credit operations involving the banking and non-banking segments, the equivalent number of the Normalized Herfindahl-Hirschman index (HHIn), which depicts what would be the number of financial institutions with identical market share that would generate the same observed HHIn, increased from 8.9 in 2019 to 9.4 in 2020.

The market share reduction of Banco do Brasil (BB), Caixa Econômica Federal (CEF), and the Brazilian Development Bank (BNDES) was an important factor to reduce concentration in the SFN. Overall, the participation of these three banks credit operations dropped from 48.9% in 2018 to 42.8% in 2020. Specifically in relation to the rural credit segment, both for households and firms, the concentration has been declining, due to increased participation of the other commercial and multiple banks and of the credit unions. In contrast, CEF sustained its 70% share in the real estate credit segment.

The pandemic and the measures to combat its effects greatly affected banking competition indicators, mainly due to the reduction in the financial institutions' income and the rescheduling of the disbursement timetable of the debt service. The fall in the income flow of financial institutions has reduced the average price of credit, significantly reducing Lerner's indicator. In normal situations, this drop would indicate an increase in competition, but the specificity of the crisis makes it difficult to draw such a conclusion. In turn, the pandemic affected less the Boone indicator – only indirectly affected by the average price –, which increased slightly in 2020.

The Agenda BC# is a work agenda of the Banco Central do Brasil (BCB) that comprises strategic dimensions and actions based on the promotion of financial

democratization. Through Agenda BC#, the BCB has been carrying out a wide range of reforms to expand access to financial products and services, extend the availability of cheaper credit to a more significant number of people and improve the transparency of the SFN. Additionally, the Agenda BC# focusses on technological evolution to develop structural solutions for the SFN and facilitate the accountability of the BCB's initiatives set for the short, medium, and long terms.

The Agenda BC# has five dimensions: Inclusion, Competitiveness, Transparency, Education, and Sustainability. In 2020, the Agenda BC# comprised 51 actions and concluded 14% of them, while 86% are still in progress.

The main change in the Agenda BC# in 2020 was the inclusion of a new dimension, Sustainability. The new dimension acknowledges the importance of sustainability for the economy and the SFN and aims to respond to several structural transformations in the economy. This dimension deals with the promotion of sustainable finance, the adequate management of socio-environmental and climate risks in the economy and in the SFN, besides integrating sustainability variables in the BCB's decision-making process.

The implementation of Pix – the instant payments system created by the BCB – stands outs among the 2020 Agenda BC# actions. Pix allows transfers and payments – between individuals, companies, and the government – in a few seconds, 24/7, including weekends and holidays.

Other important actions implemented were the authorization for credit unions to issue Real Estate Letters of Credit (LCI); the beginning of the implementation of the Open Banking System; the regulation of the first regulatory sandbox cycle; the launch of the BRL 200.00 bill; and the 7th edition of the National Week on Financial Education (Enef Week).

Boxes Summary

Box 1 – Payroll-deducted portfolio outlook

This box presents a picture of the payroll-deducted credit market. Payroll-deducted credit is one of the main household credit types, with a steady growth over the years. The outlook for this credit facility, which includes the payroll-deducted credit card, shows that among the beneficiaries of the National Social Security (INSS) prevail borrowers with income of up to two minimum wages. It also shows that there is some portfolio concentration within the payroll-deductible margin, which indicates that the payroll-deducted credit may work for a portion of the retired public as a gateway to the financial system, but, at the same time, it may generate a relevant reduction in disposable income over time.

Box 2 – Evolution of credit portability in Brazil: behavior and profile

Broadly speaking, the aim of credit portability is to allow the borrower to seek more advantageous conditions for an outstanding credit transaction. This box aims to assess the impact of that practice on such indicators as interest rates, terms, and borrowers' balances, by comparing credit conditions before and after portability. The objective of this box is to evaluate the impact of the mechanism on indicators such as interest rates, terms, and borrowers' balances, by comparing credit conditions before and after portability. The analyses revealed a reduction in interest rates in the two loan types analyzed, real estate (year average of 2.9 p.p.) and payroll-deducted (year average of 5.7 p.p.). This indicates that portability may improve borrowers' credit conditions. From an operational point of view, the analysis of requests made in 2020 points to a satisfactory functioning of this instrument, with a 75% success rate in the outcome of the portability requests registered at the Interbank Chamber of Payments (CIP) and less than 5% of the total complaints filed with the BCB in the same period. To expand the use of portability,

it is essential that borrowers are provided with the access to easy and quick comparisons of the conditions offered by different financial institutions, which may become easier with the implementation of the Open Banking.

Box 3 – Household debt and economic recession in Brazil

After the global financial crisis of 2008, state-owned banks fueled the credit supply to households in Brazil, thus sharply increasing their indebtedness. Next, the greatest recession in the recent Brazilian history was observed, in 2015 and 2016. This box, using a new database at the individual level, combining information from credit registry and the labor market, shows that individuals with higher increase of the debt-to-income ratio during the period of credit expansion presented lower values of credit card purchases in the subsequent recessive period. To identify the effect of the credit supply, the study used data from individuals that borrowed from both state and private-owned banks. The analysis revealed that, during the end of the expansionary period, state-owned banks increased credit supply at a higher rate than private-owned banks for the same individuals. To evaluate the effect of the credit supply shock on individual consumption, the study used the credit variation in the sector in which the borrower was employed. Individuals employed in the public sector were much more targeted as clients of payroll-deducted loans offered by state-owned banks and registered a sharper decline in credit card purchases during the following recessive period.

Box 4 – The evolution of bank switching costs in the Brazilian credit market

In recent years, several measures have been taken to reduce the information asymmetry between financial institutions and their clients, in order to facilitate the client's ability to switch institutions and benefit borrowers. This box seeks to evaluate whether these measures are being followed by a reduction in bank switching costs. The results presented indicate that there is a reduction in the ability of banks to "capture and extract income" through information asymmetry in relation to their clients, improving the situation for the latter. Additionally, the findings suggest that bank switching costs, as far as credit borrowing is concerned, are higher for households than for firms.

Box 5 – Microcredit

This box presents an outlook of the microcredit market, especially focusing on four aspects: (i) microcredit concepts; (ii) evolution of microcredit in a broad sense and production-oriented microcredit; (iii) ongoing actions for the development of the supply of production-oriented credit to micro-entrepreneurs and micro-companies; and (iv) overview of this segment in 2020. Thus, the box describes the regulatory and institutional framework and leading quantitative performance indicators, seeking to highlight the role played by microcredit in the current economic scenario.

Box 6 – Credit unions growth

The credit portfolio of credit unions increased 33.4% in 2020, considering their relevant credit types and target-public, maintaining a higher growth trend than the rest of the SFN over the last five years. As possible explanations for such growth, this box identified (i) an increased number of members; (ii) a growth of credit operations with existing members; (iii) an increased credit operations in such specific types as rural credit and working capital for micro and small companies; (iv) a strong market participation in lower competitiveness markets, especially municipalities with up to 50 thousand inhabitants; and (v) changes in their business models. The survey comprised a bibliography review and a descriptive data analysis of the 2016-2020 period.

Box 7 – Financing Brazilian companies and their subsidiaries abroad in the international capital market by bond issuance

Between 2015 and 2020, Brazilian non-financial companies with access to the international securities market faced two major challenges, which resulted in temporary interruption of this type of financing: (i) the withdrawal of the sovereign issuer's investment grade by major rating agencies; and (ii) the outbreak of the Covid-19 pandemic. The lack of investment grade for most of the issuing companies since the withdrawal of the sovereign grade was not an impediment to the access to the international securities market on a regular basis and at favorable conditions. High global liquidity benefited the resumption of international issuances, without representing a rise in corporate vulnerability associated with the increase in foreign currency funding. As they had been doing since at least 2015, companies keep their stocks stable, while issuing securities with the main goal

of refinancing and lengthening debt. In this scenario, this box presents a profile of foreign issuances from 2015 to 2020, encompassing their main characteristics when compared to issuances in the domestic securities market.

Box 8 – Portfolio investments of non-resident investors

Portfolio investments represent the most relevant flows in the financial account of the Balance of Payments and the second largest stock of non-residents' claims in the International Investment Position. This box deals with foreign portfolio investments in the country from a historical perspective. It covers from 2015, the year the first credit rating agency withdrew the Brazilian sovereign issuer's investment grade –, to 2020, with the impacts of the Covid-19 sanitary crisis, when the portfolio accounted for almost half of the total foreign exchange flows and for the most negative balance of the series in the worst month of the crisis.

It highlights the contribution of portfolio investments to primary foreign exchange market flows and their relevance on the expansion of international reserves after the 2008 global financial crisis. The major characteristics of portfolio investments include:

(i) composition – predominance of equities and federal government securities; (ii) concentration of stocks and its effects – main recent variations in portfolio investment flows are associated with the movements of the largest investors; (iii) participation of non-resident investors (NRIs) in the markets of equities and securities – the relevant participation in the volume traded in the B3 spot markets may be associated with the volatility of such indicators as the Ibovespa; and (iv) portfolio maturities – several terms according to the NRI type.

Box 9 – Modernization of foreign exchange and international capital legislation – Foreign Exchange Bill

This box deals with Bill 5,387 (Foreign Exchange Bill – FX Bill), of October 7, 2019, which aims to modernize, simplify, and consolidate the legal framework of the foreign exchange market and international capitals. Regarding modernization, the FX Bill aligns the legal and regulatory framework to an economy inserted in global value chains and allows a safe adoption of new business models to increase market efficiency, competition, and financial inclusion. As for simplification, the FX Bill allows the adoption of proportionality principles in bylaw regulation, creating requirements appropriate to business

values and to participants' risks. Regarding consolidation, the FX Bill consolidates in one single legal instrument more than 40 legal provisions issued since 1920, increasing the legal certainty of international operations. Finally, the approval of the FX Bill is a key step in the country's process to become a full member of the Organization for Economic Cooperation and Development (OECD).

Box 10 – Public consultation on the regulation of innovations in the foreign exchange market

This box deals with the Public Consultation Notice 79, of November 12, 2020, on improvements in the current foreign exchange regulation concerning advancements related to technological innovations and new business models applied to international payments and transfers. The improvements consider recent developments in cross-border payments and transfers, advancing towards competition, financial inclusion, and innovation in the segment within the operational possibilities allowed by the current legal framework. It is worth mentioning that structural innovations in the Brazilian foreign exchange market are subject to the updating of the legal framework of this market (FX Bill 5,387/2019). The measures submitted to public consultation cover three major themes: (i) remittances, usually understood as resources sent, with no counterpart, by migrants to their families in their country of origin; (ii) payment institutions and payment accounts in the foreign exchange market; and (iii) modernization of the regulation of cross-border payment or transfer services in the foreign exchange market.

Box 11 – Bank competition in regional credit markets

Central banks and the academy evaluate bank competition considering the credit market at the national level due to the lack of data with local granularity. The content of this box overcomes this limitation by using several databases and proposing a methodology for analyzing competition in regional credit markets of Brazilian localities. The survey reveals a great heterogeneity of average price, marginal cost, and Lerner indicator among Brazilian localities, even the ones within the same state and in neighboring areas. The decline of average prices in 2020 seems more related to the exogenous effects of the Covid-19 pandemic rather than to market competition conditions. An exploratory analysis seeks to understand how socio-economic and geographic factors relate to local competition indicators.

Box 12 – FinTechs: conceptual framework and regulatory practices

This box presents a broad conceptual framework of the FinTech phenomenon in both theoretical and practical terms and considers the main regulatory solutions adopted around the world to explain its materialization within the SFN. In this context, the focus for the identification and the understanding of this process is enlarged to incorporate not only the financial institutions which perform these activities, under the conventional model of authorization and supervision, but also – and mainly – the activities, products, and services created or transformed through technological innovations, including production chains that make it feasible and the participants involved, inside or outside the conventional regulatory framework.

Box 13 – SCDs and SEPs – performance in the credit market

Regulated in 2018 and beginning activities in 2019, Direct Credit Companies (SCD) and Peer-to-Peer Loan Companies (SEP) – credit FinTechs – are important instruments to implement financial inclusion policies. These institutions, characterized by intensive use of technology and performance of transactions exclusively through electronic means, have a high potential of increasing the capillarity of the SFN. This box attempts to categorize these institutions, taking as a starting point the analysis of business plans submitted to the BCB and an aggregate credit data analysis, indicating their capability of making available credit products and services for several market niches, in all Brazilian regions.

Box 14 – Transformation of payment service providers into financial services conglomerates

Payment institutions (PIs) authorized by the BCB to operate may become financial services conglomerates. This box analyzes the transformation of their business models and its impact on regulation and supervision of the SFN. The platform that offers payment services often serves as a way into the SFN to provide other services that were previously an exclusivity of other institutions. These service providers tend to expand and consolidate their operations, moving closer to a digital banking concept. Broadly speaking, the entire financial industry and the payments ecosystem continue to find opportunities to offer new solutions and services better suited to their customers. The new challenges that supervision must face with increasing frequency are the entry of non-traditional

players, innovative business models, and products and services based on new technologies. In that sense, regulation has a considerable influence over the creation of new business models, the mitigation of risks, and the consequent financial inclusion potentially generated.

Box 15 – Rural credit

Some countries consider agriculture and livestock a strategic sector to both ensure domestic food supply (food security) and compete in export markets. Therefore, this sector receives different forms of subsidy or support from governments. Law 4,829, of November 5, 1965, institutionalized rural credit and, among other provisions, established, in its 4th Article, the powers of the CMN and, in its 5th and 6th Articles, the attributions of the BCB to regulate this type of credit. This law also enlarged the base of resources of financial institutions subject to the earmarking of rural credit. This box aims to present this market evolution, especially focusing on its concentration indexes.

Box 16 – Impact evaluation of capping the overdraft facility interest rate

This box analyses the effects of the Resolution CMN 4,765, of November 27, 2019, on the evolution of the supply and usage of the overdraft facility. The Resolution, among other aspects, established a cap for interest rates on overdraft facilities in demand deposits of households and individual micro-entrepreneurs (MEIs). Data analysis indicates that the regulation effectively contributed to reduce interest rates, leading to an estimated annual reduction of BRL 10.0 billion in interests paid. In addition, the reduction in the volume of grants in overdraft facility reached the same level of the revolving credit card. As both were emergency revolving credit types with similar interest rates levels until the issue of the regulation, this indicates that the decrease resulted from external factors (Covid-19) rather than regulatory change. Reduction of interest rates and evidence that there was no supply restriction for this credit facility point to an increase in the consumer welfare, without any loss of economic efficiency. Therefore, the conclusion is that the policy adopted to limit interest rates achieved the expected results. It is worth mentioning that specific overdraft facility conditions, such as the low elasticity of demand to interest rates, some market power degree, and regressiveness, among other factors, justified the regulatory intervention.

Moreover, the adequate calibration of the measure adopted was an essential factor for not affecting the supply of this credit facility. It is worth highlighting that interest rate interventions without calibration and analysis of market conditions may affect the supply and, consequently, consumer welfare.

Box 17 – Analysis on the implementation of the Positive Credit Report

Complementary Law (LC) 166, of April 8, 2019, established the automatic registration of individuals and firms in the Cadastro Positivo (Positive Credit Report), preserving to registered people the right to cancel or reopen the register upon request (aka opt-out regime). This box analyses the process of implementation of the Positive Credit Report (PCR) after the enactment of this law. This analysis uses information collected from meetings with representatives of entities related to the PCR and from questionnaires sent to Database Managers (DBMs) and to institutions authorized by the BCB to operate. There was a significant increase in the number of registered individuals under the new regime. Although the full implementation of the PCR is still ongoing, institutions that use credit scores based on it – large banks, confederations of cooperatives, and other financial institutions that operate in the consumer credit segment – already mention effects such as increased discriminatory power of credit risk models and approval rates for new borrowers.

Box 18 – Analysis of the Positive Credit Report effects

As mentioned in the box "Analysis on the implementation of the Positive Credit Report", the change in the opt-in regime, in which the individuals had to opt expressly to have their data included in the PCR, to the opt-out regime accelerated the implementation of this instrument. This box describes an empirical survey about the effects of the PCR using BCB and DBMs available data in the period from August to December 2020. Results reveal that LC 166/2019 resulted in an average drop of about 31 p.p. in spreads of non-payroll-deducted personal credit operations for new borrowers with scores based on the PCR when compared with those who did not have them. Furthermore, the spread reduction was statistically significant and economically relevant for new borrowers with a further improvement in their credit quality resulting from PCR information included in the credit score.

Box 19 – Pix: the new Brazilian instant payment scheme

This box deals with Pix, the new payment scheme created by the BCB launched in November 2020. The text highlights key Pix features, as well as its benefits and potential effects on the Brazilian economy. It also presents aggregate data concerning Pix usage in the first operating months, emphasizing its quick adoption by the population.

1 Credit Market

Table 1.1 – Credit trajectory[1/]

Credit component	R$ billion			% change		
	2018	2019	2020	2018	2019	2020
Total	3,265	3,477	4,021	5.1	6.5	15.6
Non-earmarked resources	1,765	2,013	2,323	10.9	14.0	15.4
Non-financial corporations	811	900	1,091	10.1	11.0	21.2
Households	954	1,112	1,232	11.6	16.5	10.8
Earmarked resources	1,500	1,465	1,698	-0.9	-2.4	15.9
Non-financial corporations	651	560	688	-8.1	-14.0	22.8
Households	849	905	1,010	5.4	6.6	11.7
Non-financial corporations	1,462	1,460	1,779	1.2	-0.1	21.8
Households	1,803	2,017	2,242	8.6	11.9	11.2
	Ratio %			p.p. change		
Total credit/GDP	46.6	46.9	54.0	-0.5	0.3	7.1

Note: 1/ Values referring to December of each year.

1.1 Credit aggregates[1]

National Financial System (SFN) credit operations increased sharply in 2020. In the context of the Covid-19 pandemic, programs and arrangements targeted to credit granting (Emergency Credit Access Program – Peac,[2] National Program for Support the Micro and Small Enterprises – Pronampe,[3] credit renegotiations etc.) contributed to the credit expansion in the year. Corporate borrowing increased because of the reduction of revenues and uncertainties associated with the pandemic. The pace of household credit expansion, instead, remained relatively stable since the lower availability of consumption credit lines was offset by the acceleration of real estate financing. The balance of loans and financing grew 15.6% in the year, compared with an expansion of 6.5% in 2019 (Table 1.1). The credit-to-Gross Domestic Product (GDP) ratio increased from 46.9% in 2019 to 54.0% at the end of 2020.

In early 2020, the credit market was mainly driven by the household segment, which had risen 11.9% in 2019, whereas the corporate segment had remained relatively stable. At the end of March, however, with the beginning of the pandemic and the implementation of measures for restricting the circulation of people and the operation of firms, corporate credit registered a sharp expansion. At first, an increase of credit borrowing by large firms was observed, mainly in export financing lines, discount of receivables, and working capital (non-earmarked segment). The need for credit at special conditions for micro, small and medium-sized enterprises (MSMEs)

1 The values presented in this Report refer to data available as of February 28, 2021, unless otherwise stated.

2 Established by Law 14,042, of August 19, 2020; aimed at small and medium enterprises through the Investment Guarantee Fund (FGI) to provide guaranties for financial agents.

3 Established by Law 13,999, of May 18, 2020: emergency credit aimed at micro and small enterprises for investments and working capital, by means of the Operations Guarantor Fund (FGO).

was met with emergency credit programs, mainly Pronampe[4] and Peac[5] (earmarked segment).

At the same time, household credit dropped sharply in March-April – in line with the fall in consumption –, mostly in credit card and vehicle financing operations. Afterwards, the resumption of these credit lines occurred throughout the year, in addition to the expansion of payroll-deducted operations, stimulated by the temporary increase of the 5% in the borrowing ceiling of pensioners in 2021Q4. Despite the pandemic economic effects, the reduction of the basic interest rate contributed to stimulate the sharp increase of real estate financing, both by enlarging the number of households eligible for borrowing, as a result of the reduction of installments due to lower interest rates, and by the migration of household investments, considering the decline of profitability of fixed-income investments.

Accordingly, outstanding corporate credit rose 21.8% in 2020, reflecting expansions of 21.2% in the non-earmarked segment, mostly involving working capital operations, and 22.8% in the earmarked segment, highlighting borrowings under emergency credit programs. The balance of household credit operations grew 11.2% in 2020, as a result of expansions of 10.8% in the non-earmarked segment, especially payroll-deducted operations, and 11.7% in the earmarked segment, fueled by real estate and rural financing.

Table 1.2 – Broad credit trajectory[1/]

Credit component	R$ billion			% change		
	2018	2019	2020	2018	2019	2020
Total	9,348	10,232	11,952	9.1	9.5	16.8
Government	4,143	4,540	5,372	8.9	9.6	18.3
SNF Loans	138	141	163	4.0	1.8	15.6
Capital markets	3,326	3,684	4,354	9.3	10.7	18.2
External debt	678	715	854	7.7	5.5	19.5
Corporations	3,216	3,478	4,128	10.0	8.2	18.7
SFN loans	1,376	1,382	1,686	2.0	0.4	22.0
Capital markets	547	752	749	16.2	37.4	-0.5
External debt	1,293	1,344	1,693	17.1	4.0	26.0
Households	1,990	2,213	2,452	8.2	11.2	10.8
SFN loans	1,936	2,158	2,390	8.5	11.5	10.8
Capital markets	41	40	42	-7.2	-1.1	4.3
External debt	13	15	19	17.6	15.1	29.6
	Ratio %			p.p. change		
Total credit/GDP	133.5	138.1	160.5	3.4	4.7	22.3
Credit to government/GDP	59.1	61.3	72.1	1.4	2.2	10.8
Credit to corporations/GDP	45.9	47.0	55.4	1.5	1.1	8.5
Credit to households/GDP	28.41	29.88	32.92	0.49	1.47	3.04

Note: 1/ Values referring to December of each year.

Considering the total credit to the non-financial sector[6] (Table 1.2), the balance of debts totaled BRL 12.0 trillion (160.5% of GDP) in December 2020, up 16.8% in the year, against 9.5% in 2019. The sharpest increase occurred in the balance of foreign debt operations (23.7%), because of the local currency (BRL) depreciation in the period (28.9%). The balance of total credit granted to the general government corresponded to 44.9% of the total, up 18.3% in the year. The share of credit granted to non-financial firms accounted for 34.5% of the total, up 18.7%. Household debts accounted for 20.5%, increasing 10.8% in the year.

4 Credit line with interest rate limited to Selic + 1.25% p.a., with term of 36 months allowed to firms with annual revenues up to BRL 4.8 million.

5 Credit line for small and medium-sized firms that granted BRL 20 billion through the FGI to cover up to 30% of losses of the released funds for overall operations by financial agents within the program. Interest rates limited to 1.0% p.m., terms from 1 to 5 years channeled to firms with gross revenues between BRL 360 thousand and BRL 300 million.

6 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.

Figure 1.1 – New transactions
12 months accumulated

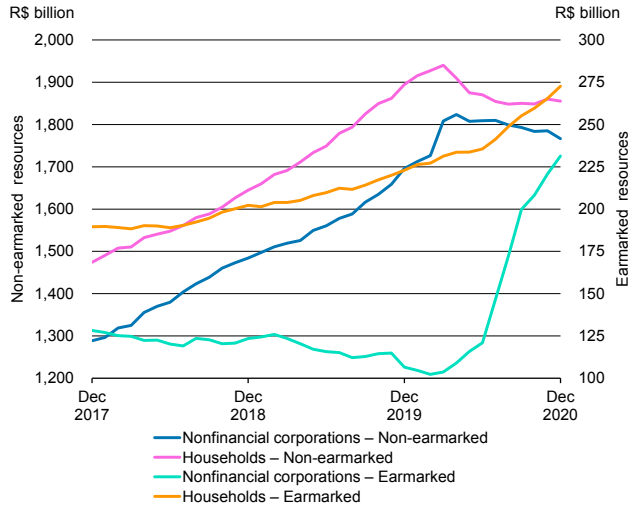


Figure 1.2 – Loan rates – Non-earmarked

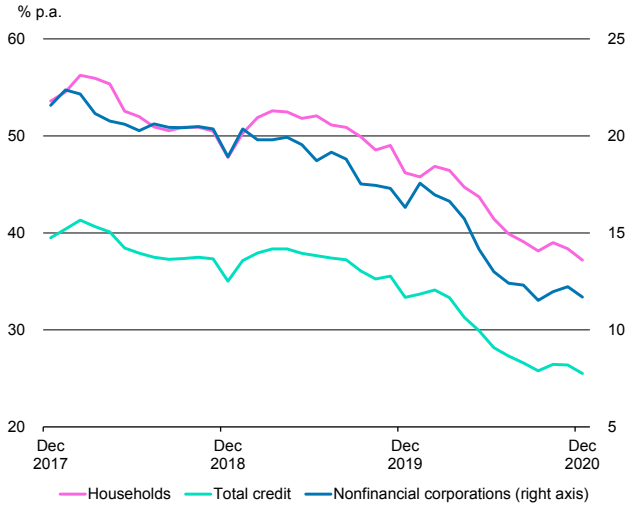


Table 1.3 – Average cost of outstanding loans (ICC)[1/]

Credit component	% p.a.			p.p. change		
	2018	2019	2020	2018	2019	2020
Total	20.4	20.3	16.8	-0.8	-0.1	-3.5
Non-earmarked resources	31.1	29.5	23.4	-2.9	-1.6	-6.1
Non-financial corporations	19.1	16.9	12.7	-3.0	-2.2	-4.1
Households	42.2	40.5	33.5	-3.0	-1.7	-7.0
Earmarked resources	8.8	8.6	8.2	-0.1	-0.1	-0.4
Non-financial corporations	9.0	8.8	8.4	-0.0	-0.2	-0.4
Households	8.6	8.5	8.2	-0.2	-0.1	-0.4
Non-financial corporations	14.5	13.7	11.0	-1.0	-0.7	-2.7
Households	25.4	25.2	21.5	-1.0	-0.1	-3.7

Note: 1/ Values referring to December of each year.

SFN credit granting rose 5.3% in 2020 to BRL 4.1 trillion, driven by an expansion of 10.9% in the corporate segment, whereas the household segment kept relatively stable (0.4%). Peac and Pronampe registered strong demand with a volume of borrowing that fueled the expansion in the earmarked corporate segment in the second half of 2020 (Figure 1.1). Working capital operations increased 63.9%, contributing to raise non-earmarked operations by 4.2% in the period. The volume of new household non-earmarked operations dropped 1.9% in 2020, impacted by the reduction in overdraft facility,[7] whereas earmarked operations rose 22.3%, mainly driven by real estate and rural financing.

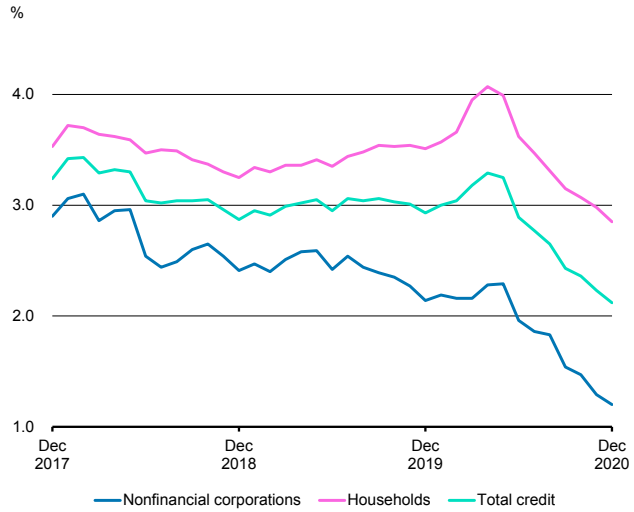
The average interest rate of new credit operations declined throughout 2020, reflecting the reduction in the basic interest rate and anti-cyclical measures for credit support, which provided banks with liquidity and allowed delinquency to remain at low levels. In September, the average rate reached 18.1% p.a, the lowest value of the time series since 2011, closing the year at 18.4% p.a., dropping 4.1 p.p. against December 2019. In the non-earmarked segment, the average interest rate reached 25.5% p.a., falling 7.8 p.p. in the year, reaching the lowest value of the series (Figure 1.2). The average rate in the household non-earmarked segment reached 37.2% p.a. in December, also reaching the lowest value of the series, dropping 9.0 p.p. against December 2019. The average rate in the corporate non-earmarked segment reached 11.6% p.a. in December, dropping 4.7 p.p. in the year.

The Average Cost of Outstanding Loans (ICC), that reflects the average cost of the overall financial portfolio, fell 3.5 p.p. in 2020, closing at 16.8% p.a. in December, the lowest value of the series begun in 2013 (Table 1.3). The ICC of non-earmarked operations reached the minimum historical value in December, 23.4% p.a., falling 6.1 p.p. against the end of 2019. The ICC of non-earmarked corporate operations declined 4.1 p.p. to 12.7% p.a. in December, whereas household non-earmarked operations reached 33.5% p.a., dropping 7.0 p.p. in 12 months, both reaching the lowest values of their respective series.

In 2020, the National Monetary Council (CMN) allowed the reclassification of credit operations renegotiated between March and December to the level they were classified in February, providing stimuli for financial institutions to actively operate in the restructuring of

7 A significant share of debts of clients with the overdraft facility was restructured and agreed as personal loans with longer terms.

Figure 1.3 – Deliquency rates



Fugure 1.4 – Change of household credit balance by region

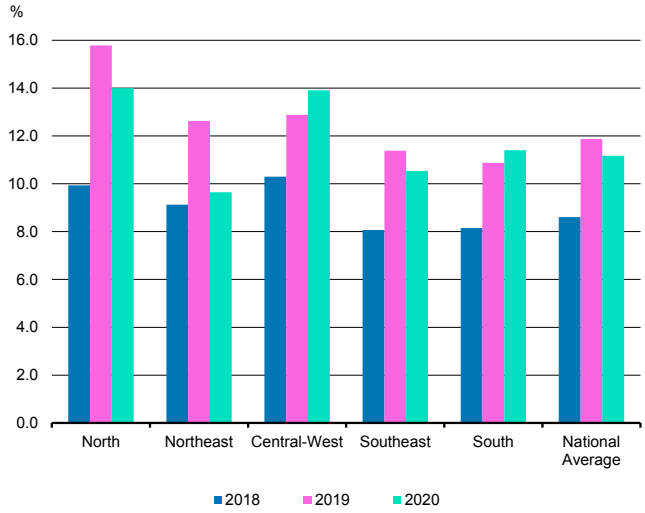
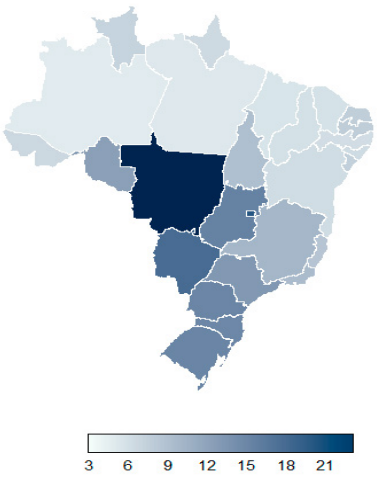


Figure 1.1 – Household credit density by state
Year 2020 – Figures in R$ thousands *per capita*



household and corporate debts within the pandemic environment. Thus, the delinquency rate associated with banking credit in operations overdue for more than 90 days dropped 0.8 p.p. throughout 2020, reaching 2.1% p.a. in December, the lowest value of the series (Figure 1.3). The delinquency rate fell 0.9 p.p., to 1.2% p.a., in the corporate portfolio in December, and 0.7 p.p., to 2.9% p.a., in the household portfolio.

1.2 Characteristics of operations and borrowers

Household credit by state[8]

The growth of household credit, compared with 2019, was quite heterogeneous across regions. The growth rate was like that of 2019 in the South and Southeast, declined in the North and Northeast, and accelerated in the Central-West (Figure 1.4 and Table A of Annex B).[9]

The states of the Central-West presented the highest credit densities per capita, largely reflecting the role of rural credit, followed by the states of the South region (Figure 1.1 and Table B of Annex B). The lowest credit densities were still observed in the North region.

Delinquency rates declined in all regions between 2019 and 2020 (Figure 1.5) because of renegotiations.[10] In terms of delinquency levels, in general a parallelism is observed for the evolution of delinquency across regions, with the largest household delinquency rates being systematically observed in the Northeast and the lowest in the South and Central-West (Figure 1.2 and Table C of Annex B).

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

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

10 From the beginning of the pandemic until June 2020, 25.8% of the outstanding credit was renegotiated and the proportion of troublesome assets relative to the portfolios of credit card and real estate financing were the largest of the time series, according to the October 2020 Financial Stability Report, available at https://www.bcb.gov.br/en/publications/financialstabilityreport/202010.

Figure 1.5 – Household credit delinquency by region

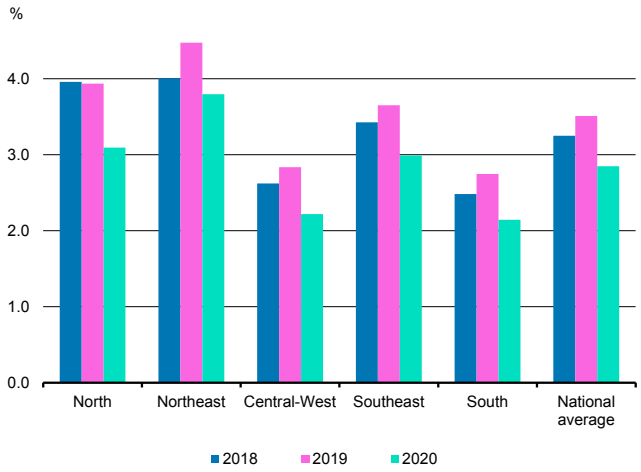


Figure 1.2 – Household credit delinquency by state
Year 2020

Table 1.4 – Household credit balance by gender[1/]

Gender	R$ billion			% change		
	2018	2019	2020	2018	2019	2020
Total	1,803	2,017	2,242	8.6	11.9	7.8
Men	1,120	1,242	1,388	8.1	11.0	8.6
Women	683	775	854	9.5	13.3	7.1

Note: 1/ Values refer to December of each year and do not account for unidentified cases.

Table 1.5 – Household credit deliquency by gender[1/]

%

Gender	2018	2019	2020
Total	3.3	3.5	2.9
Men	3.2	3.5	2.8
Women	3.3	3.5	2.9

Note: 1/ Values refer to December of each year.

Household credit by gender

Unlike in previous years, the growth rate of credit granted to women was lower than that granted to men (Table 1.4). As a result, the participation of women's credit in the total credit balance dropped from 38.4% in 2019 to 38.1% in 2020. As for delinquency rates, no material difference between genders was observed (Table 1.5).

Household credit by age groups

Regarding the age group of borrowers, one observes that the youngsters were the worst affected in 2020. The credit growth rate in the age groups of 25 years or more remained stable against 2019, but the growth rate in the age group of 24 years or less declined sharply (Table 1.6).

Delinquency rates declined in all age groups, especially in the age group of 24 years or less, with a reduction of 2.5 p.p. from 2019 to 2020 (Table 1.7).

Corporate credit by federated state

The sharp credit expansion in the corporate segment in 2020 was widespread across regions, with growth rates from 16.1% to 26.1% (Figure 1.6). The delinquency rate in the corporate segment fell in all regions to values around 1.2% (Figure 1.7), with a sharp reduction of regional differences.[11]

Corporate credit by corporation age

Firms with ten years or more hold the largest share of corporate credit (80.2% in December 2020) and, therefore, they are the group that mostly influenced the trajectory of the aggregate credit balance and delinquency rate of the segment. Therefore, the expansion of 21.9% in corporate credit in 2020 largely reflected the growth of 25.5% in the balance of this group of firms (Table 1.8) which, at the beginning of the pandemic, borrowed significant volumes of export financing, discount of receivables, and working capital (non-earmarked credit) in a precautionary behavior. It is also noteworthy the sharp increase of credit borrowed by firms operating

11 In 2020, despite the lower corporate delinquency rates, the pre-Troublesome assets deteriorated, mainly due to the reclassification of credit operations to large firms to risk "D", according to the October 2020 Financial Stability Report.

Table 1.6 – Household credit balance by age[1/]

Age group	R$ billion			% change		
	2018	2019	2020	2018	2019	2020
Total	1,803	2,017	2,242	8.6	11.9	11.2
Twenty-four years old or less	43	49	51	8.8	11.8	4.4
From twenty-five to thirty-nine years old	584	642	700	7.1	9.8	9.0
From forty to fifty-nine years old	787	885	994	8.4	12.4	12.3
Sixty years old or more	388	442	498	11.5	13.9	12.7

Note: 1/ Values refer to December of each year.

Table 1.7 – Household credit deliquency by age group[1/]

%

Age group	2018	2019	2020
Total	3.2	3.5	2.9
Twenty-four years old or less	7.2	8.4	5.9
From twenty-five to thirty-nine years old	3.3	3.9	3.0
From forty to fifty-nine years old	3.0	3.2	2.6
Sixty years old or more	3.1	3.1	2.9

Note: 1/ Values refer to December of each year.

Figure 1.6 – Change of corporate credit balance by region

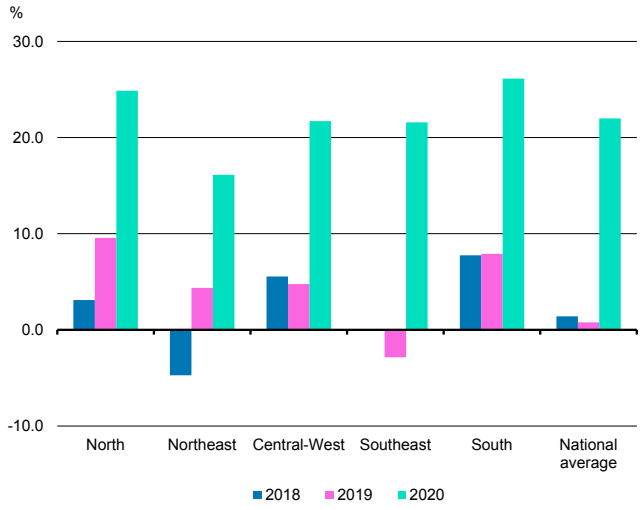
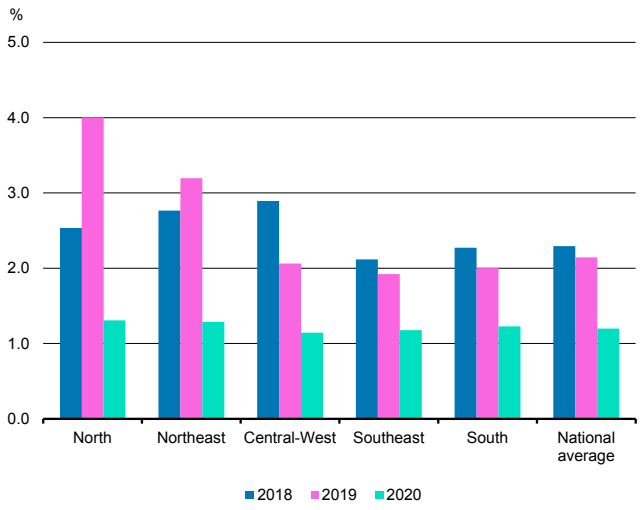


Figure 1.7 – Delinquency rate of corporate credit operations by region



for less than three years. The delinquency rate in the corporate segment declined in 2020 regardless of the corporation age (Table 1.9), which may be partially explained by additional credit operations and deferred payments under credit support programs.

Corporate credit by economic sector

In 2020, the credit balance increased in all economic sectors, with the sharpest growth rates in Trade, Other Services, Agriculture and Livestock, Transportation, and Manufacturing (Table 1.10). It should be highlighted that four of those industrial segments reverted the downward trend observed in previous years. Therefore, credit stimuli programs implemented after the outbreak of the Covid-19 pandemic spread out across several economic activities. Also reflecting these programs, the delinquency rate fell in all economic sectors but in Industrial Public Utility Services (Table 1.11).

Corporate credit by size

This subsection analyzes the corporate credit balance and granting in 2020[12] according to their size:[13] (a) micro enterprise; (b) small enterprise; (c) medium enterprise; and (d) large enterprise.

Credit expanded sharply in all categories in 2020 but in micro enterprises, which registered a more moderate growth (Table 1.12). Overall, the credit portfolio of MSMEs rose 43%, mostly for small enterprises (59.4%). The balance of the credit portfolio of large and medium enterprises rose 15.7% and 24.8%, respectively.

12 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 generated abroad.

13 The size of the enterprises are 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 FIs, mode is used): 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, as long as 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 BRL 240,000,000.00, as established in Article 3, sole paragraph, of Law 11,638, of December 28, 2007.

Table 1.8 – Corporate credit balances by company age[1/]

Age group	R$ billion			Change %		
	2018	2019	2020	2018	2019	2020
Total	1,462	1,460	1,779	1.2	-0.1	21.9
Up to one year	12	16	23	14.8	41.5	40.0
Two or three years	37	41	65	-17.4	8.4	59.5
Four or five years	72	73	75	-1.5	0.6	3.1
Six or seven years	79	81	95	-35.2	2.0	18.3
Eight or nine years	107	113	94	12.9	5.6	-17.0
Ten years or more	1,155	1,137	1,427	5.0	-1.5	25.5
Unidentified	0	0	0	55.6	-18.4	18.1

Note: 1/ Values referring to December of each year.

Tabela 1.9 – Corporate deliquency rate by company age[1/]

%

Age group	2018	2019	2020	Change p.p.		
				2018	2019	2020
Total	2.4	2.1	1.2	-0.5	-0.3	-0.9
Up to one year	1.8	3.4	1.9	0.4	1.5	-1.4
Two or three years	2.4	3.2	2.0	-0.4	0.9	-1.2
Four or five years	2.9	2.4	1.8	-2.2	-0.5	-0.6
Six or seven years	4.3	2.4	1.9	0.2	-1.9	-0.5
Eight or nine years	3.2	3.3	2.1	0.1	0.2	-1.2
Ten years or more	2.2	1.9	1.0	-0.4	-0.3	-0.9
Unidentified	0.0	0.0	0.0	0.0	0.0	0.0

Note: 1/ Values referring to December of each year.

Table 1.10 – Corporate credit balances by sector[1/]

Itemization	R$ billion			Change %		
	2018	2019	2020	2018	2019	2020
Total	1,462	1,460	1,779	1.2	-0.1	21.9
Agriculture, livestock, forestry, fisheries and aquaculture	27	27	33	4.6	-1.2	23.3
Extractive	18	15	17	-16.2	-13.8	9.0
Manufacturing	386	352	428	5.6	-8.9	21.6
Construction	75	67	77	-18.4	-10.8	15.4
Public utility industrial services	187	182	206	-4.6	-2.7	13.0
Trade and repair of motor vehicles and motorcycles	265	291	381	6.3	10.0	30.9
Transport, storage and mail	125	136	167	8.1	8.7	22.6
Public administration, defense and social security	138	141	163	3.9	1.8	15.6
Other services	219	237	308	6.4	8.2	29.9
Corporations headquartered abroad	22	12	0	-46.8	-42.3	-96.3

Note: 1/ Values referring to December of each year.

Table 1.11 – Corporate deliquency rate by sector [1/]

%

Itemization	2018	2019	2020	Change p.p.		
				2018	2019	2020
Total	2.4	2.1	1.2	-0.5	-0.3	-0.9
Agriculture, livestock, forestry, fisheries and aquaculture	2.5	3.6	1.3	0.2	1.1	-2.3
Extractive	1.1	0.7	0.2	0.6	-0.4	-0.5
Manufacturing	2.1	2.4	0.8	-0.4	0.3	-1.6
Construction	7.0	6.6	3.7	-0.2	-0.4	-2.9
Public utility industrial services	0.2	0.1	0.5	-0.7	-0.2	0.4
Trade and repair of motor vehicles and motorcycles	3.0	2.5	1.6	-1.6	-0.6	-0.9
Transport, storage and mail	1.5	1.5	0.9	-0.3	0.0	-0.6
Public administration, defense and social security	0.1	0.3	0.0	0.1	0.2	-0.3
Other services	3.5	2.4	1.5	-1.0	-1.1	-0.9
Corporations headquartered abroad	1.4	3.7	1.0	0.3	2.4	-2.8

Note: 1/ Values referring to December of each year.

Table 1.12 – Corporate credit by size[1/]

R$ billion

	2018	2019	2020	Change %		
				2018	2019	2020
Large	947.2	905.3	1,047.4	2.6	-4.4	15.7
Medium	336.5	342.7	427.7	-3.0	1.8	24.8
Small	132.4	150.5	239.9	0.5	13.7	59.4
Micro	45.8	62.0	64.2	5.7	35.2	3.7
Total	**1,461.9**	**1,460.5**	**1,779.2**	**1.2**	**-0.1**	**21.8**

Note: 1/ Values referring to December of each year.

Figure 1.8 – Percentage of SFN corporate credit portfolio balance by size

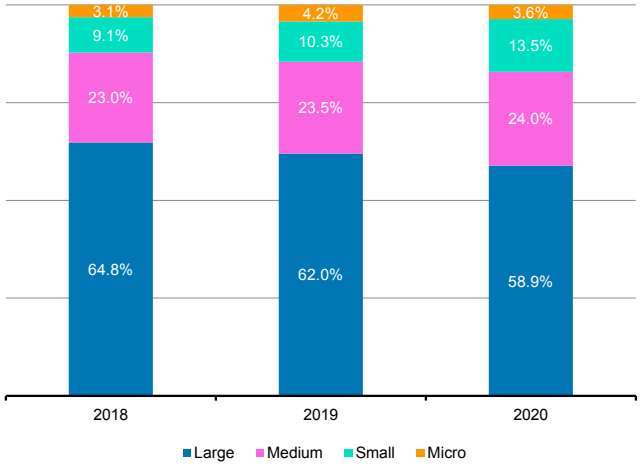


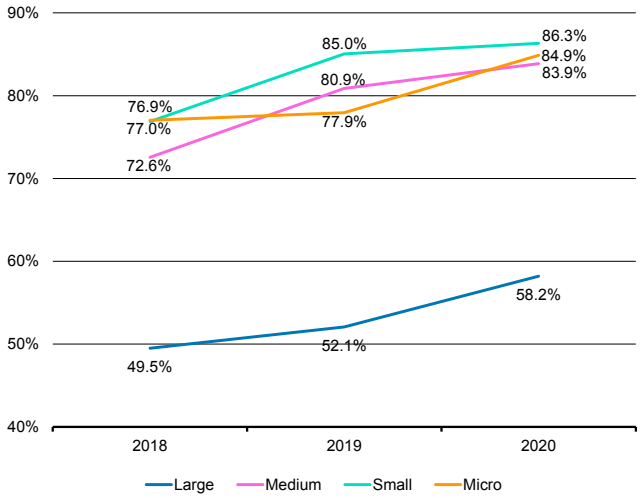
Table 1.13 – Corporate credit granting by size[1/]

R$ billion

	2018	2019	2020	Change %		
				2018	2019	2020
Large	773.6	843.8	951.0	21.0	9.4	12.5
Medium	548.7	605.0	635.5	5.4	10.6	4.8
Small	56.9	77.9	79.9	10.8	37.4	2.2
Micro	228.9	270.7	330.4	11.5	18.6	21.8
Total	**1608.1**	**1797.5**	**1996.8**	**13.5**	**12.1**	**10.9**

Note: 1/ Values referring to December of each year.

Figure 1.9 – Corporate share in non-eamarked resources by size



Credit expansion to small enterprises was partially due to credit support programs[14] to micro and small firms during the pandemic, as the Pronampe and the Support Fund for Micro and Small Enterprises (Fampe), in addition to the Emergency Employment Support Program (Pese).

In terms of the participation in the outstanding credit portfolio, large enterprises maintained downward trend in 2020, reaching 58.9%. The participation of MSMEs increased from 14.5% of the total portfolio in 2019 to 17.1% in 2020 (Figure 1.8).

Credit granting expanded in all corporate size segments (Table 1.13).[15] The sharpest credit growth occurred for micro enterprises (21.8%). The growth rate of credit granted to small enterprises did not follow that observed in 2019.

The participation of non-earmarked resources in the corporate credit balance continued to expand in all segments (Figure 1.9). Regarding large enterprises, traditionally more dependent on earmarked credit, the balance of non-earmarked operations reached 58.2% of the total balance. For the other corporate sizes, the source of more than 80% of the balance of the outstanding portfolio is not related to earmarked resources. The sharp expansion of non-earmarked operations in all segments may be explained by the expansion of funds to working capital, required for fighting against the economic crisis due to the Covid-19 pandemic. In the segment of small enterprises, the most benefited by credit support programs, the participation of non-earmarked credit registered lower growth.

Regarding the terms of operations, the share of longer-term credit (maturing over twelve months) in the total balance portfolio increased for both micro and small enterprises (Table 1.14).

In 2020, the delinquency rate fell in all segments: in the micro (from 6.3% to 4.8%), small (from 5.1% to 2.1%), medium (from 3.6% to 2.5%), and large (from 1.1% to 0.5%) enterprises (Figure 1.10).

Thus, based on the increased volume of credit granting, measures implemented to fight against the Covid-19 pandemic are supposed to have facilitated credit

14 The box "Microcredit", in this Report, shows credit support programs in detail.

15 It is worth noting that in the case of large enterprises, the growth in credit granting is compatible with the reduction in the balance of the credit portfolio in the same period, since the balance of concluded credit operations may exceed the amount of credit granted.

Table 1.14 – Credit operations terms[1/]

%

	2018	2019	2020	Δ
Micro enterprises				
Long term	80	82	87	
Short term	20	18	13	
Small enterprises				
Long term	83	84	91	
Short term	17	16	9	

Note: 1/ Values referring to December of each year.

Figure 1.10 – Corporate deliquency by size

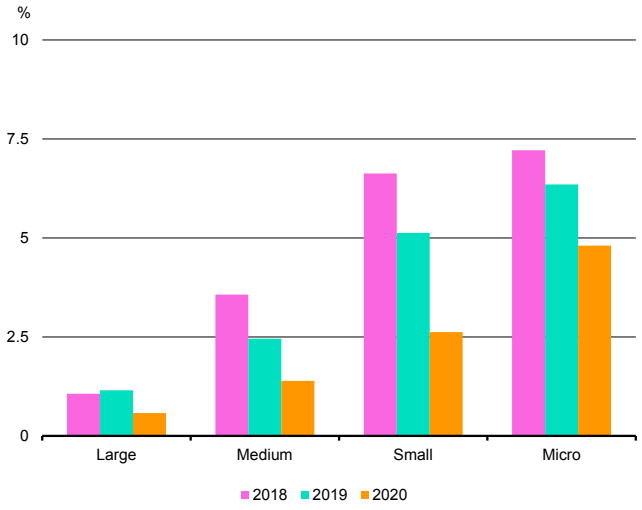
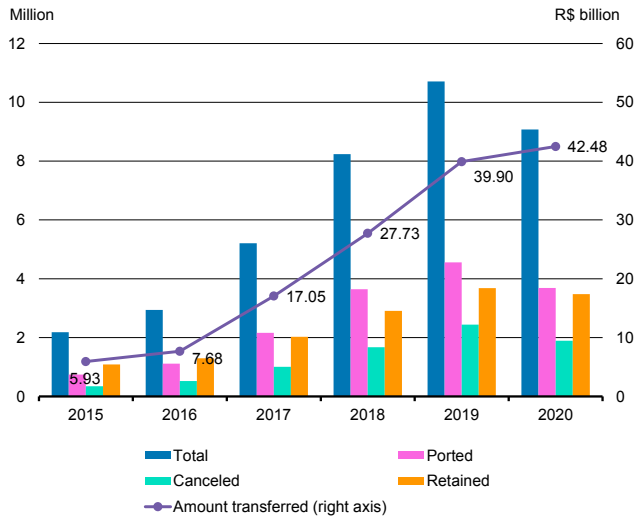


Figure 1.11 – Portability requests
Grouped by situation (accumulated per annum)



expansion to MSMEs, the lengthening of the average portfolio term, and the reduction of delinquency in 2020. The large number of renegotiations, however, possibly explains the reduction of delinquency. The proportion of troublesome assets in the credit portfolio of MSMEs, as shown in the Financial Stability Report,[16] did not reduce in the same proportion.

1.3 Credit portability

For the first time since the start of the series, credit portability registered lower requests than in the previous year (Figure 1.11).[17] In 2020, a total of 3.7 million requests were made (dropping 19.1% over 2019), corresponding to BRL 42.5 billion in ported balance (up 6.5% over 2019). The joint rate of effected and renegotiated transactions with the original lender remained stable at 59.9% in 2020 (Figure 1.12).[18]

Regarding the payroll-deducted credit line, the sharp increase in the average value of ported contracts (17.4%) smoothed the decline in the ported value (-5.6%), against a sharp decrease in the number of effected contracts (-19.5%). The portability of payroll-deducted loans continued quite relevant, reaching BRL 36 billion in 2020, accounting for 84.8% of total ported credit (Table 1.15) and 15.3% of the value of payroll-deducted loans in the same period.[19]

Although registering a slight increase in volatility, the average rates for new credit operations by the National Social Security Institute (INSS) continued on a downward trend in 2020 (Figure 1.13). The reduction

16 https://www.bcb.gov.br/en/publications/financialstabilityreport/202010

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

18 The portability market involves, in addition to the customer, two actors: the original lender –the institution that grant the credit–; and the proposer –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 proposer); canceled (at the request of the customer or, usually, at the proposer 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 register institution). Since the retention due to renegotiation implies better contract conditions for the customer, the overall effectiveness of this instrument is considered as the total of ported and renegotiated requests.

19 According to the Time Series 20671 – Credit grants with non-earmarked resources – Households – Total payroll-deductible personal credit –, the value granted in 2020 in this credit facility totaled BRL 234.8 billion.

Figure 1.12 – Portability
Evolution by situation

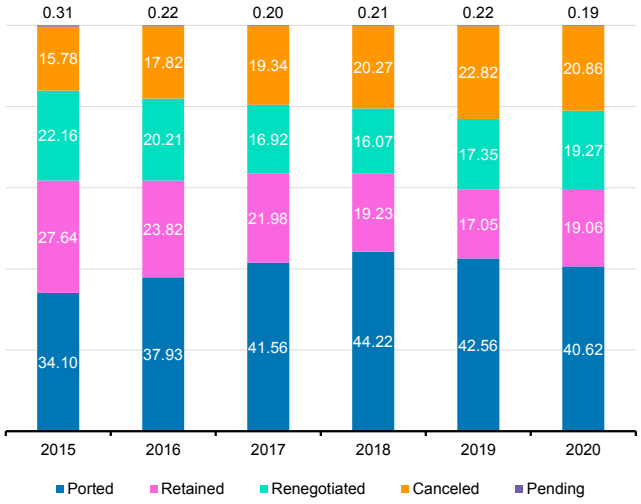


Figure 1.13 – Payroll-deducted loan rates – INSS
Loan rates x legal limit

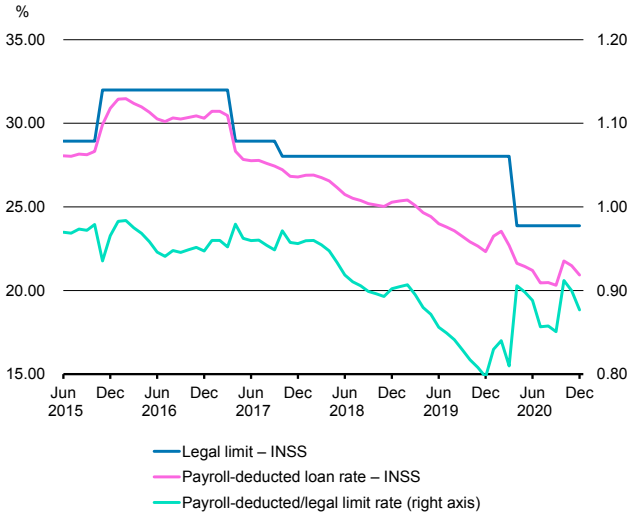
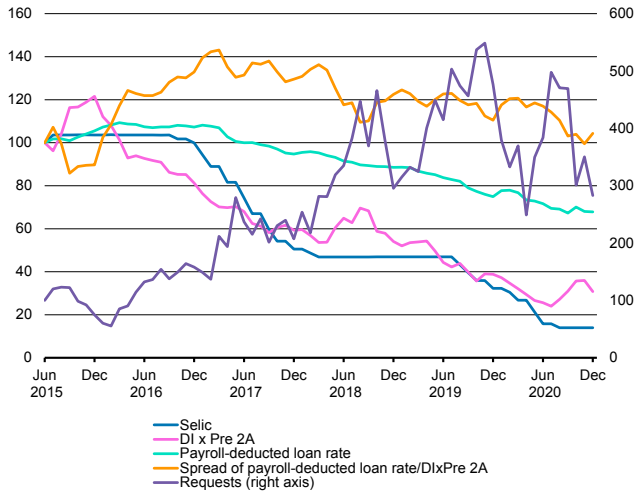


Figure 1.14 – Selic rate and portability
Jun 2015 = 100



of interest rates, however, was not enough to stimulate additional portability requests for payroll-deducted loans (Figure 1.14).

A relevant issue concerning the portability of payroll-deducted loans was the strong decline in the participation of bank correspondents (Figure 1.15). In the first months of the series, these agents accounted for nearly 75% of requested and conveyed contracts. As of January 2020, these percentages fell and remained at levels around 50% until 2020Q4, when a new decline was observed. In December 2020, correspondents accounted for 35.8% of requests and 28% of effected contracts. This movement is associated with the increasing participation of institutions that have historically been operating without intermediaries or that started to rely upon direct business platforms with their clients.

Unlike payroll-deducted loans, the portability of real estate financing grew sharply in 2020. Total requests exceeded 67 thousand (up 356% from 2019). Effected contracts totaled more than 19 thousand (up 322%) and ported value reached BRL 6.21 billion (up 269%).

Along with the slowdown of requests and effected contracts of payroll-deducted loans, the sharp growth of real estate financing credit portability more than tripled the participation on credit portability in 2020, reaching 14.7% of the total value of ported contracts (Table 1.15).

The expansion of real estate financing credit portability took place in a scenario of moderate reduction in the interest rates of this credit facility, despite the steady decline in the Selic rate until August 2020 (Figure 1.16).

Considering a total of less than one thousand portability requests in 2017, the use of this real estate financing instrument registered a quite relevant expansion. However, there is still room for portability expansion, given the potential benefit provided by the usage of this mechanism in a context of historically low interest rates. This subject, among others, is analyzed in the box "Evolution of credit portability in Brazil: behavior and profile", in this Report.

Figure 1.15 – Participation of correspondents
Payroll-deducted loans

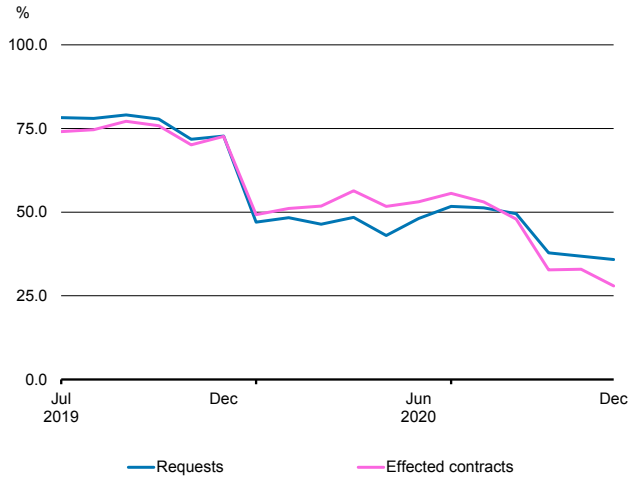
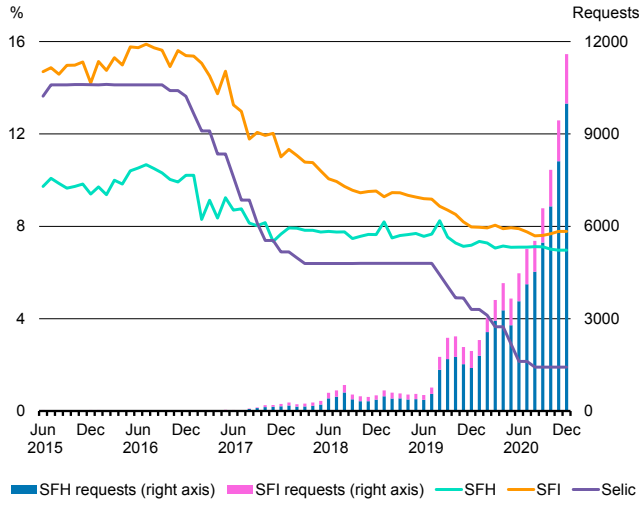


Table 1.15 – Portability by credit type[1/]

Itemization	R$ million		Participation %	
	2019	2020	2019	2020
Payroll-deducted	38,156.4	36,038.0	95.6	84.8
Real Estate	1,698.7	6,261.8	4.3	14.7
Home equity	15.3	45.1	0.0	0.1
Real Estate Development	1.9	0.4	0.0	0.0
Real Estate Financing System (SFI)	813.1	1,990.0	2.0	4.7
Housing Financing System (SFH)	868.5	4,226.3	2.2	9.9
Non-payroll-deducted	13.6	74.0	0.0	0.2
Vehicles	33.0	106.2	0.1	0.2
Total	39,901.7	42,482.6	100.0	100.0

Note: 1/ Values referring to December of each year.

Figure 1.16 – Real state loans portability
Requests x rates



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 the segments of credit to large enterprises and to MSMEs. Household credit is classified into consumption and housing financing segments.

For each segment, respondents assess the changes observed in the last three months and the outlook for the next three months in the patterns of supply of and demand for credit lines. The assessment is made by indicating, on a five-level scale, the direction and intensity of the observed change.[20] The respondents also assess a set of factors that affect supply and demand conditions. For each factor they give a score for its importance and indicate, on a five-level scale, the positive or negative effect on credit supply and demand conditions, considering the last three months and the outlook for the following three months.[21] Assessments are converted into values between -2 and 2, and the figures in this section show the evolution of the average assessment values of financial institutions observed in the last three months, from 2018 to 2020.

Determining factors for the credit supply behavior

The assessments of quarterly changes in credit supply conditions from 2018 to 2020 in the four analyzed segments are shown in Figure 1.17. The positive values correspond to more flexible approval patterns, and the negative values to more restrictive ones. Concerns about the economic consequences of pandemic shaped the trajectory of credit supply in 2020. In general, the four segments followed a similar path. The credit scenario started to deteriorate in 2020Q1 and worsened in Q2, when the worst credit evaluations were registered.

20 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 demand for credit lines, the alternatives are "substantially stronger", "moderately stronger", "same level", "moderately weaker", "substantially weaker".

21 For the evaluation of supply factors, the possible answers are "significantly induced more restrictive conditions", "moderately induced more restrictive conditions", "did not affect", "moderately induced more flexible conditions" and "significantly induced more flexible conditions". For the evaluation of demand factors, "significantly induced a reduction in demand", "moderately induced a reduction in demand", "did not affect", "moderately induced an increase in demand" and "significantly induced an increased demand".

Figure 1.17 – Approval of lines of credit

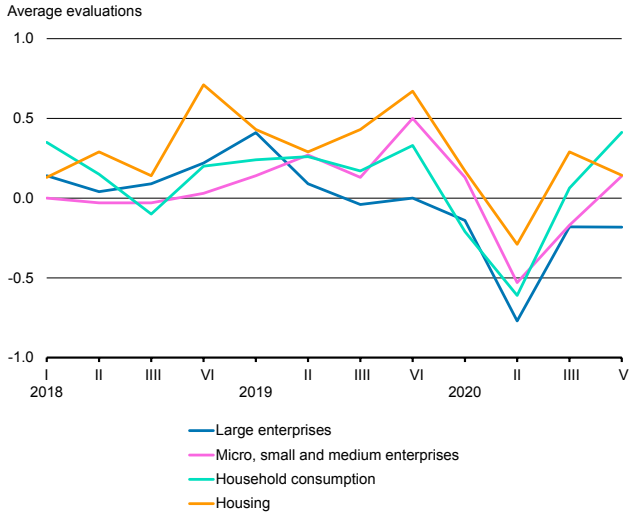


Figure 1.18a – Contributing factors
Credit supply - Large enterprises

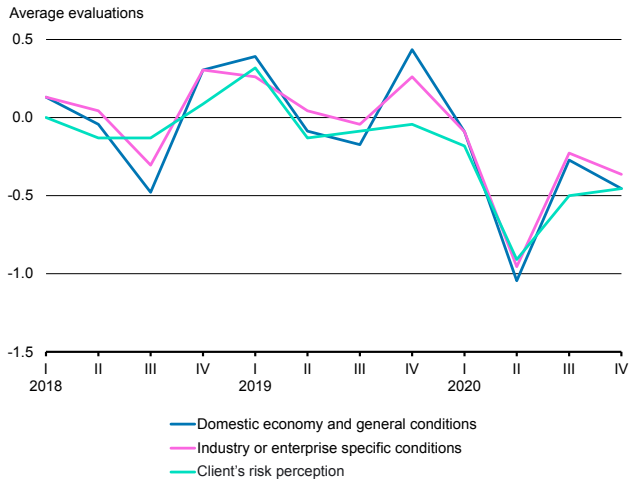
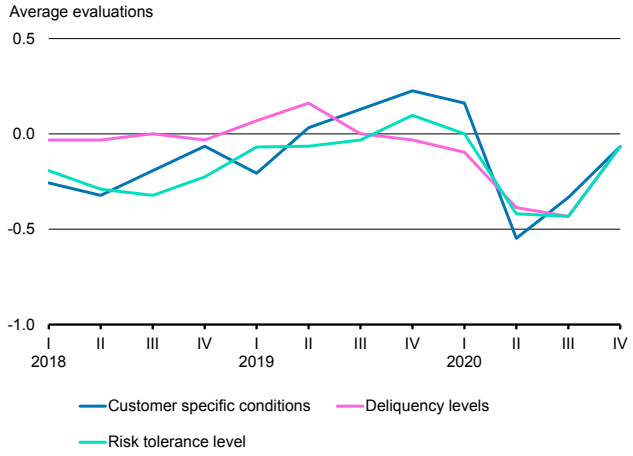


Figure 1.18b – Contributing factors
Credit supply – Micro, small and medium enterprises



The fall in supply conditions was sharper for large enterprises and lower in household housing financing. As of 2020Q3, supply conditions improved in all segments. In Q4, restrictive conditions were observed only for large enterprises. In the other segments, credit supply closed the year with growing approval flexibility, especially consumption credit.

Figures 1.18a to 1.18d describe, for each segment, how the assessments of the main factors that influence the credit supply evolved. The positive values indicate which factors contributed to more flexible conditions; the negative values, to more restrictive conditions. In the segment of credit to large enterprises, the general economic and sector specific circumstances that closed 2019 contributing for greater supply flexibility, became neutral in 2020Q1 and, together with the client's risk perception, strongly contributed to more restrictive supply conditions in Q2. In the second half of 2020, assessments recovered partially, but kept negative until the end of the year. In the case of MSMEs, clients' specific conditions and delinquency and risk tolerance levels registered a movement similar of that of large enterprises, although with lower decline and assessments close to neutrality in Q4.

In the household consumption credit segment, the key factors indicated more restrictive conditions in 2020Q1 that further intensified in Q2. The risk tolerance level returned to neutrality already in Q3 and the assessment of the portfolio delinquency became positive in Q4, whereas the employment level and wage perspectives as well as the income commitment level continued restrictive, although at lower intensity. In the segment of housing financing, factors related with employment, income, and risk tolerance, which were favorable to credit expansion at the end of 2019, started to be assessed as restrictive in 2020, reaching the worst assessment in 2020Q3, partially recovering in Q4. On the other hand, the cost or availability of funding was a positive factor for credit supply in this segment in 2020.

Determining factors for the credit demand behavior

The assessments of changes in quarterly demand from 2018 to 2020 are shown in Figure 1.19. Positive values correspond to the perception of stronger demand and negative values, to weaker. It is noteworthy the difference between corporate and household credit demand. The credit demand in both corporate segments continued on

Figure 1.18c – Contributing factors
Credit supply – Household consumption

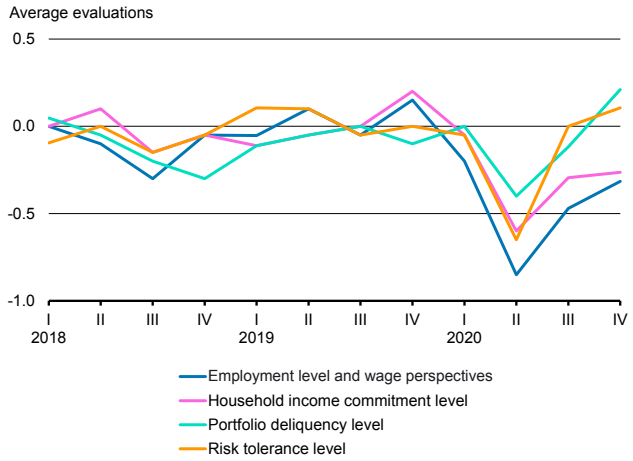


Figure 1.18d – Contributing factors
Credit supply – Housing

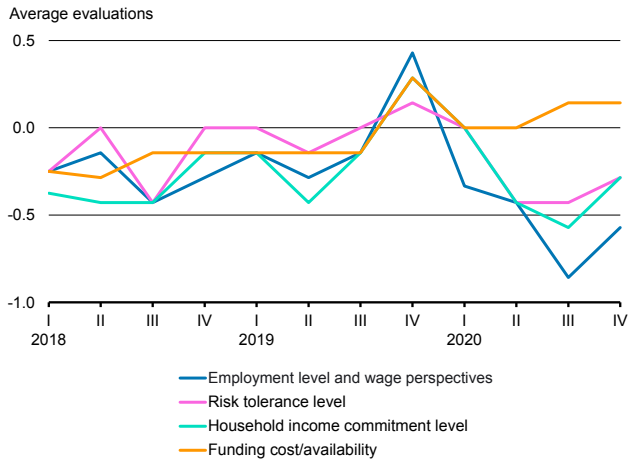
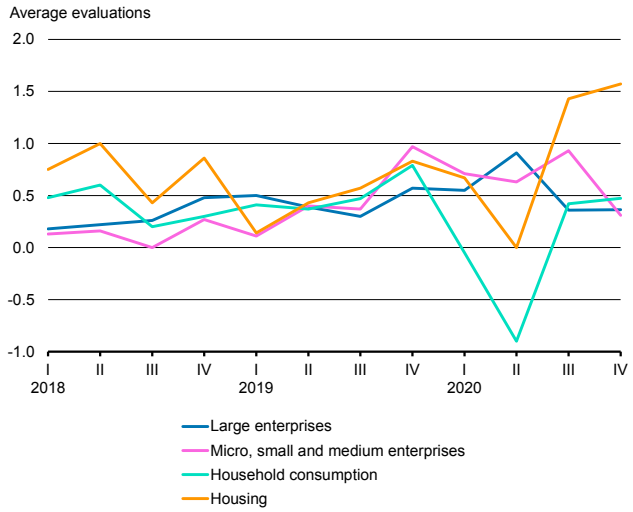


Figure 1.19 – Demand for lines of credit



an upward trend in 2020 but closed the year weaker than in 2019. The pandemic led to an increase of corporate credit demand for offsetting lower revenues and, at the start of the pandemic, as a precaution against the possibility of more restrictive credit supply ahead. In the household consumption segment, demand dropped sharply in the first half of the year, reaching the lowest assessment in 2020Q2 and recovering in the second half, when returned to levels similar to that of 2019. This movement reflected the consumption behavior associated with the pandemic, because of increased uncertainty and restrictions to mobility and business operation. The demand for housing financing stabilized in 2020Q2 and grew sharply in the second half, with the greatest assessments of demand increase ever registered in any segment since the start of the survey in March 2011.

Figures 1.20a to 1.20d describe, according to the survey, how the factors that affect demand evolved. In the corporate credit segments, working capital requirement, which had been mentioned in previous years as the main determinant for increased credit demand, expanded in 2020Q2 for large enterprises and in Q3 for MSMEs, returning to 2019 levels in 2020Q4. This trajectory is in line with the precautionary demand observed in the beginning of the Covid-19 pandemic for large enterprises and, subsequently, for MSMEs, due to financial restrictions faced by these firms in view of the measures adopted to fight against the virus. On the other hand, given the uncertain macroeconomic outlook, the need for investing in fixed assets contributed to reduce demand throughout 2020, mainly in Q2. Specifically for the credit segment to MSMEs, the change in interest rates was a relevant factor for increasing credit demand over the entire year.

Regarding consumption credit, the factors are quite aligned with the strong consumption variation observed during 2020. Except the change in interest rates, the factors that contributed to increased credit demand at the end of 2019 weakened in 2020Q1 and contributed to reduce credit demand in Q2, especially consumer confidence and the factor employment level and wage perspectives. Negative assessments lost intensity in 2020Q3 and, in Q4, consumer confidence contributed again to increase credit demand. In housing financing, factors related to employment, income, and consumer confidence contributed strongly to reduce demand in 2020Q2 but closed the year with contributions close to the neutrality. On the other hand, changes in interest rates were considered a strong factor for demand increase, which has been observed since the second half of 2019.

Figure 1.20a – Contributing factors
Credit demand – Large enterprises

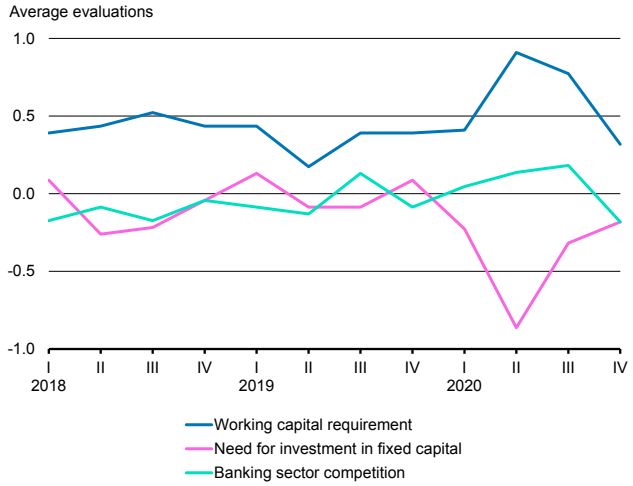


Figure 1.20b – Contributing factors
Credit demand – Micro, small and medium enterprises

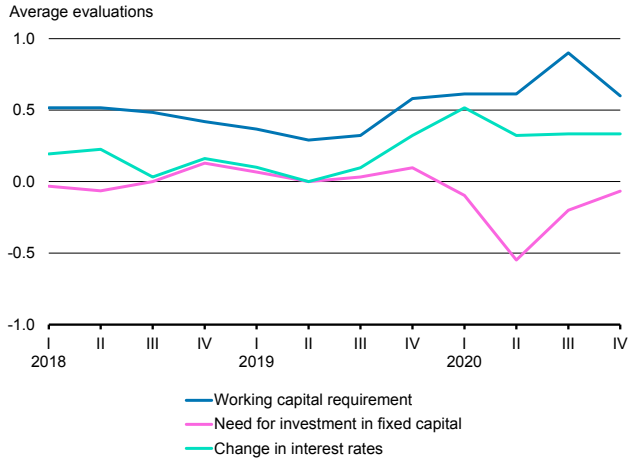
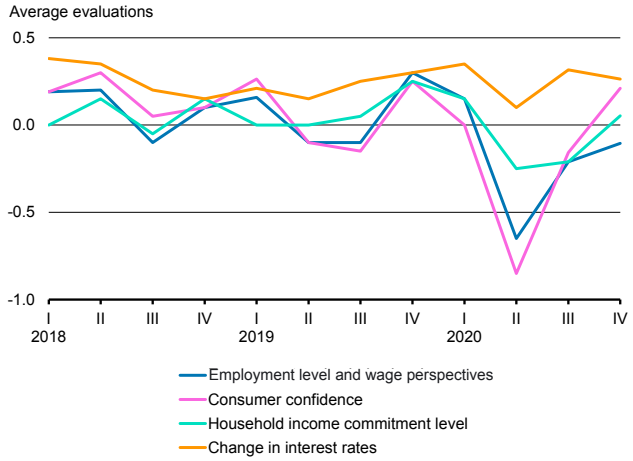


Figure 1.20c – Contributing factors
Credit demand – Household consumption



1.5 Credit prospects

Institutions' expectations regarding the variation of the SFN credit balance and delinquency level for the end of each year are collected in the first survey of the year. In the second PTC collection, held from April 27 to May 5, 2020, questions about expectations were exceptionally included for capturing the effects of the Covid-19 pandemic. Expectations for 2021 were captured between January 29 and February 10 of the same year. Figures 1.21 to 1.28 show the actual value and expectations informed for 2020, including both surveys, and for 2021.[22] In all segments, the values observed in 2020 for the variation of the credit balance and delinquency rates remained closer to expectations of the first 2020 survey than to the second survey, indicating that, in the first months of the pandemic, institutions reacted with an excessive pessimism or did not anticipate the effectiveness of measures for fighting against the crisis that started to be announced or were about to be announced.

Expectations for the variation of the credit balance in the corporate segments underestimated the expansion observed in 2020. The median expectation of 5% growth in the credit balance for large enterprises fell to 2.8% in the second survey, both below the observed in 2020, 12.9%. The difference is even greater in the credit balance for MSMEs, in which the expected growth of 6.5% in the first survey fell to 5% in the second, both much lower than the actual value observed in this segment, 27.0%, which was strongly fueled by emergency credit programs. In the household consumption credit segment, the actual growth of 10.4% was below the median expectation of 12% in the first survey and above the 6.2% of the second survey. The housing financing, which remained robust during the pandemic, grew 11.7%, close to the expectation of 9% of

22 The blue markers in the figures refer to the percentiles of forecasts informed by financial institutions for each year. The median of expectations is represented by pink circles and the values observed in 2020 are represented by green circles. Financial institutions follow quite heterogeneous criteria for classifying the corporate segments by size, which are not necessarily coincident with the criteria utilized in this Report for the purpose of presenting the results. As a result, expectations for corporations show a greater level of dispersion than those for households, whose segmentation criteria are more homogeneous.

Figure 1.20d – Contributing factors
Credit demand – Housing

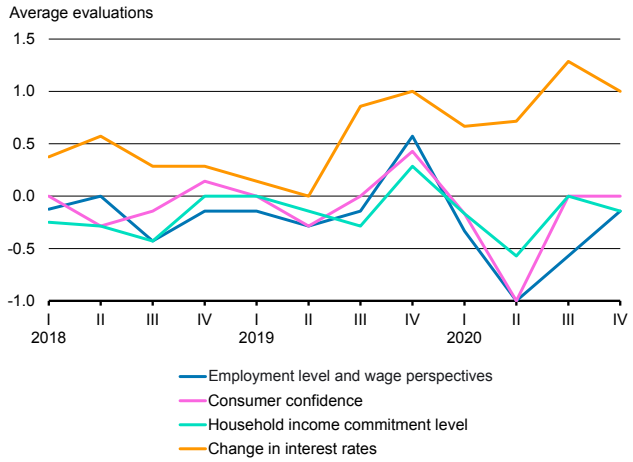


Figure 1.21 – Balance change
Large enterprises

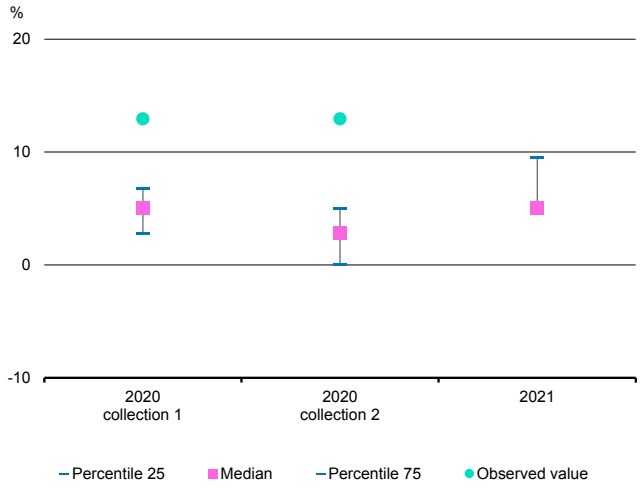
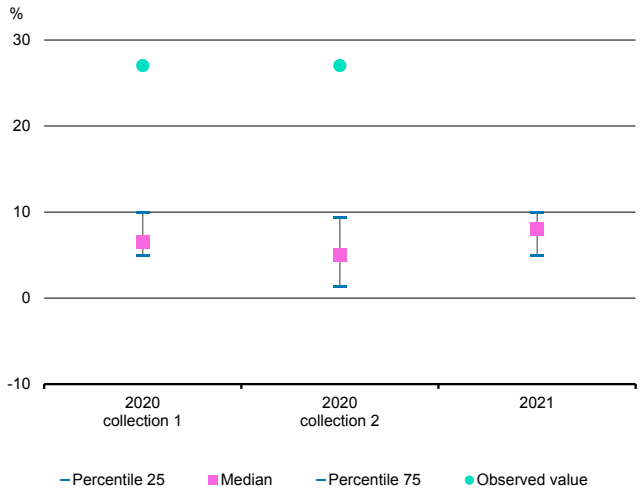


Figure 1.22 – Balance change
Micro, small and medium enterprises



the first survey, but did not confirm the balance stability expected in the second survey.[23]

The expectations for delinquency rates reveal a behavior like that of the credit balance, with increased pessimism detected in the second survey but not confirmed at the end of the year. In all segments, the actual delinquency rate remained below expectations in both 2020 surveys. The greatest difference between expected and actual figures occurred in the credit segment for MSMEs, for which the expected delinquency rate for 2020 rose from 3.5% to 4.9% between both surveys but closed at 1.4%. Most of this behavior reflected debts renegotiation and deferred payments implemented by financial institutions for mitigating the economic effects of the Covid-19 pandemic.

For 2021, the credit balance is expected to expand in all segments. Regarding corporate loans, a growth of 5% is expected for large enterprises and 8% to MSMEs. These figures are below that observed in 2020, but at the same magnitude of expectations of previous years, indicating that institutions expect the return to normality in these segments. For household segments, credit is expected to grow more strongly. The variation of 10% for consumption credit is similar to that observed in 2020, whereas the 15% expansion for housing financing represents an acceleration for this segment. The expectation for delinquency rates is higher than that observed in 2020 (2.0% to large enterprises, 3.6% to MSMEs, 5.0% tor consumption, and 2.1% to housing financing).

BCB's bank credit projections[24] for 2021 indicate growth of 8.0% in the total credit balance, with an increase of 11.1% in the balance of operations with non-earmarked resources and 3.7% with earmarked resources (Table 1.16).

23 Unlike the results for corporations, those for households may be compared with time series published by the BCB. The reference for the balance of consumption segment is the 20,570 series, named "Saldo da carteira de crédito com recursos livres – Pessoas físicas – Total" (Non-earmarked credit operations outstanding – Households – Total) and the reference for the delinquency of the segment is the 21,112 series, named "Inadimplência da carteira de crédito com recursos livres – Pessoas físicas – Total" (Delinquency on non-earmarked credit operations - Households – Total). The reference for the housing financing balance is the 20,612 series, named "Saldo da carteira de crédito com recursos direcionados – Pessoas físicas – Financiamento imobiliário total" (Earmarked credit operations outstanding – Households – Real Estate Financing Total Balance). The reference for the delinquency rate is the 21,151 series, named "Inadimplência da carteira de crédito com recursos direcionados – Pessoas físicas – Financiamento imobiliário total" (Delinquency on earmarked credit operations – Households – Real Estate Financing Total Balance).

24 Projections presented in the March 2021 Inflation Report, using information available until March 17, 2021.

Figure 1.23 – Balance change
Household consumption

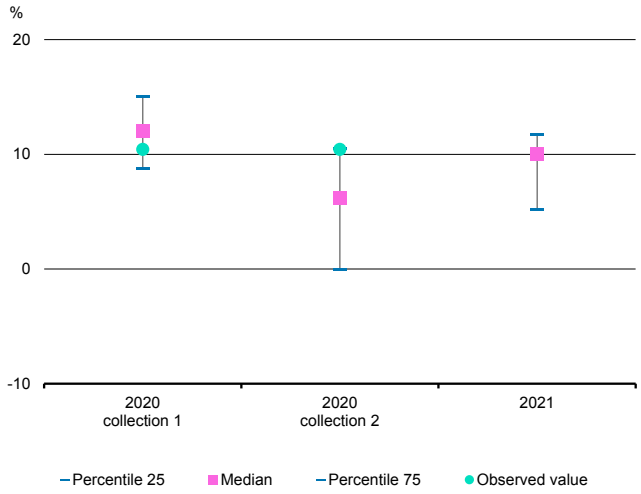


Figure 1.24 – Balance change
Housing

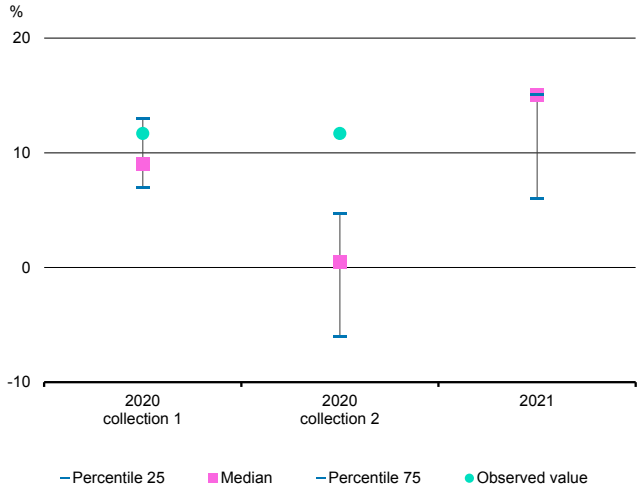
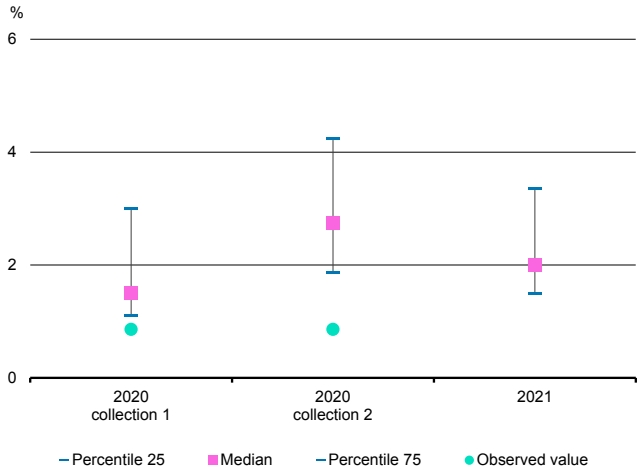
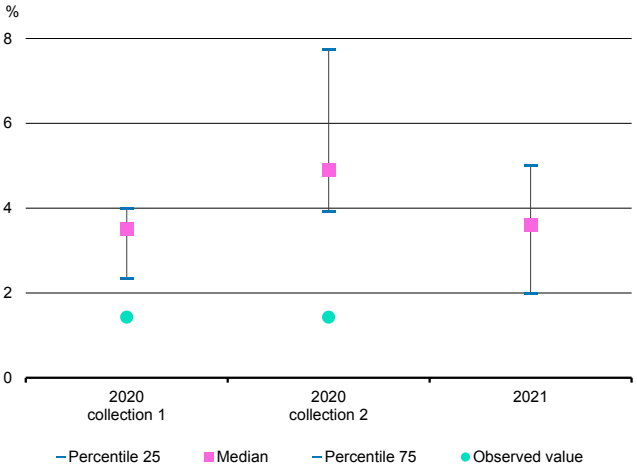


Figure 1.25 – Deliquency rate[1/]
Large enterprises



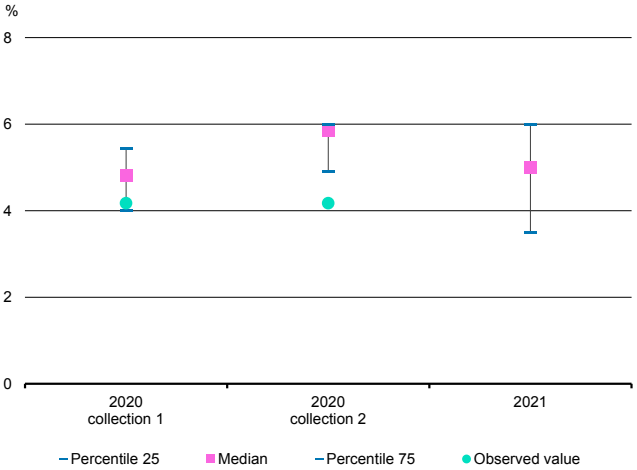
1/ Expectations of 0% in the delinquency rate were disregarded in the calculation of the medians and quartiles.

Figure 1.26 – Deliquency rate[1/]
Micro, small and medium enterprises



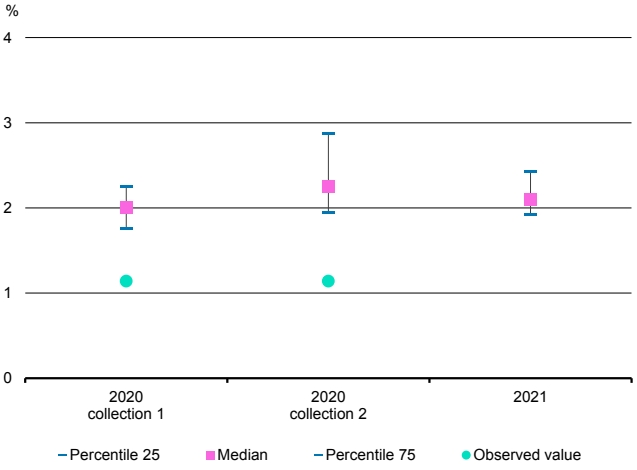
1/ Expectations of 0% in the delinquency rate were disregarded in the calculation of the medians and quartiles.

Figure 1.27 – Deliquency rate[1/]
Household consumption



1/ Expectations of 0% in the delinquency rate were disregarded in the calculation of the medians and quartiles.

Figure 1.28 – Deliquency rate[1/]
Housing



1/ Expectations of 0% in the delinquency rate were disregarded in the calculation of the medians and quartiles.

Table 1.16 – Credit growth projection for 2021 (%)

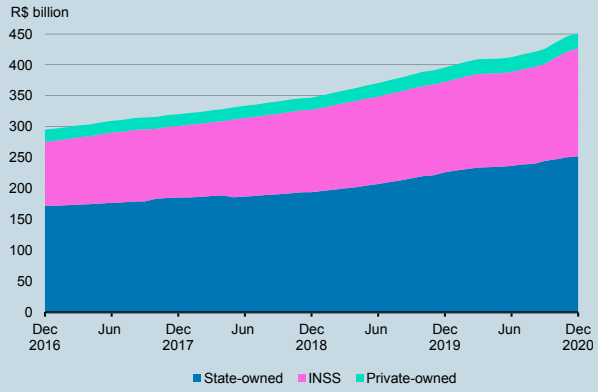
Itemization	Ocurred	Projection
	Dec 2020	Dec 2021
Total	15.7	8.0
Non-earmarked	15.5	11.1
Earmarked	15.9	3.7

For household loans, the perspective of an annual credit expansion of 11.5% is based on the persistence of favorable conditions in the real estate market and improvement in the labor market. For corporate loans, the expected expansion of 3.4% is lower than in 2020, influenced by the fact that credit expansion in 2020 was strongly impacted by the pandemic.

Payroll-deducted portfolio outlook

Payroll-deducted credit is one of the main credit facilities for households, being more relevant for retirees and pensioners (accounting for nearly 60%). At the end of 2020, the balance of this credit line reached BRL 439 billion, accounting for 19.6% of the total household portfolio, with BRL 235 billion granted in 2020. Although its participation in the household portfolio has kept relatively stable over the last years, the volume of payroll-deducted operations has increased consistently, especially the portfolio of retirees and pensioners of the National Social Security Institute (INSS). Between 2016 and 2020, the average growth was 14.0% p.a., above the respective growth rates of 10.0% and 5.6% for public and private sector employees. When the portfolio of payroll-deducted credit card is included, the total of both types reaches BRL 451.7 billion, of which 56.0% related to public sector employees and 38.7% to the INSS (Figure 1).

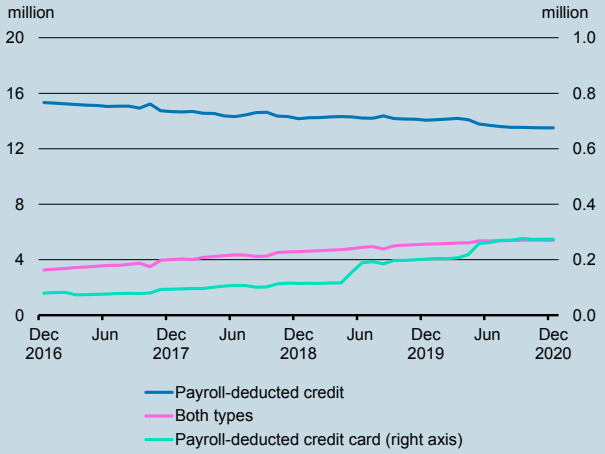
Figure 1 – Credit outstanding of payroll-deducted credit and credit card



The number of payroll-deducted credit borrowers[1] reached 19.2 million at the end of December 2020 (Figure 2) and, even with no great changes in the period under analysis, the proportion of clients holding only payroll-deducted card or both types of credit is increasing.

1 From now on, the term "payroll-deducted credit" will include both the personal payroll-deducted credit and the payroll-deducted credit card.

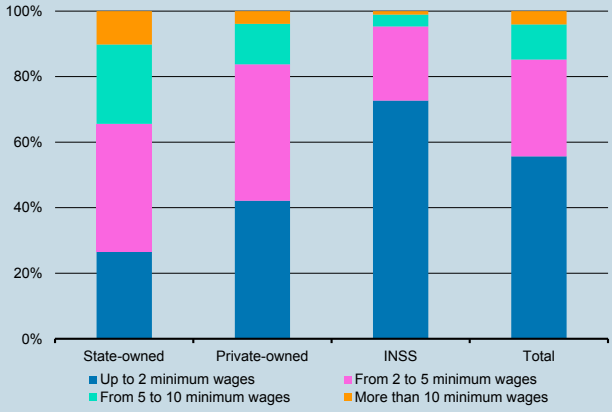
Figure 2 – Number of payroll-deducted credit borrowers
By type of credit



Regarding the distribution of the profile of clients, the income of 73% of INSS retirees and pensioners (57% of the active portfolio) is up to two minimum wages (Figures 3 and 4), reflecting the income profile of this population.

Figure 3 – Credit ousstanding of payroll-deducted credit by income
Granting institution – Dec/2020

Figure 4 – Number of payroll-deducted credit borrowers by income
Granting institution – Dec/2020



Another difference among payroll-deducted borrowers refers to the level of debt service-to-income (DSTI) ratio with this credit facility. Among borrowers from public and private sectors, a greater share of both the credit outstanding and the number of clients is below the DSTI level of 30%. Even though these metrics are different and DSTI represents only an estimate,[2] it might be a signal that they also lie below the borrowing upper bound (Figure 5).[3] Concerning payroll-deducted operations for INSS retirees and pensioners, the concentration of the credit outstanding and the number of clients is comparatively higher at around 30% and 35%, signaling that these borrowers may be close to the personal credit and payroll-deducted credit card borrowing upper bounds.[4] Since the borrowing upper bound increased to 40% in October 2020, of which 5% for the payroll-deducted credit card only (effective from October to December 2020[5]) a new concentration of credit outstanding appeared around a level of 40% of DSTI in 2020 (Figure 6). However, this new concentration is sharply lower than the concentration around DSTI levels of 30% and 35%.

Figure 5 – Credit outstanding and number of clients of payroll-deducted credit
Private and state-owned – Dec/2020

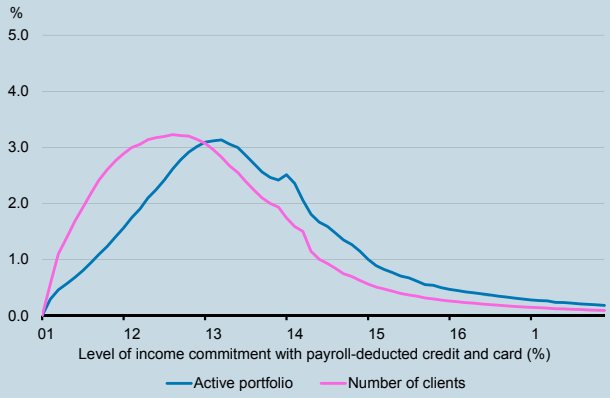
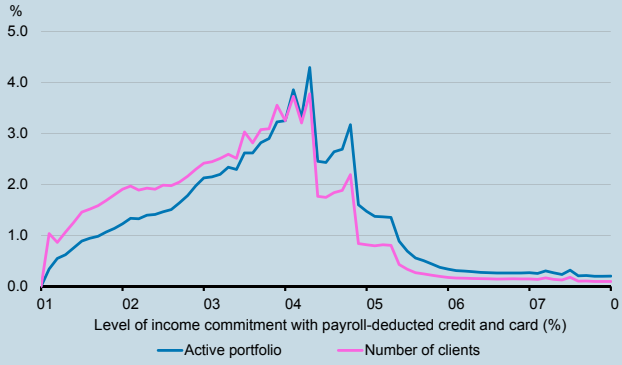


Figure 6 – Credit outstanding and number of clients of payroll-deducted credit
INSS – Dec/2020



Summing up, payroll-deducted represents a quite relevant credit facility in the household portfolio that is growing steadily over the years. It has a great relevance especially for INSS beneficiaries, which account for 60% of clients and 38% of the credit outstanding.

For these beneficiaries, one may observe a greater concentration of the portfolio and number of borrowers with DSTI at similar levels to that of the borrowing upper bound, thus representing an important cash availability, reinforced by the fact that more than 70% of borrowers lie in the income range of up to two minimum wages. However, if, on the one hand, this credit facility initially accounts for a relevant amount of resources for retirees and pensioners, on the other hand, it may lead to a quite significant reduction of available income over time.

Thus, payroll-deducted loans may provide to part of retirees and pensioners an access to the financial system due to the possibility of proving a formal income to be used as a credit guarantee. However, the fact that the prevalent borrowers' income is low, with an DSTI level in many cases close to the borrowing upper bound, indicates the need to consider the risk factor that high indebtedness may represent to an individual, as well as the not yet satisfied potential demand for financial resources.

2 Debt service-to-income (DSTI) of credit borrowers is calculated at the individual level, for each SFN borrower. The definition of this metric may be found in the annex Concepts and Methodology, item *g*, of the October 2020 Financial Stability Report. The analyses in this section are only estimates and do not represent effective values of DSTI with payroll-deducted loans. In addition, other factors may determine different individual bounds for payroll-deducted credit – and these factors are not considered here.

3 Figures concerning DSTI levels did not consider portfolio values in which the DSTI income commitment is equal to zero in that segment, since they may indicate operations in grace period or renegotiated and, therefore, with no debt service in the month under analysis.

4 According to Law 10,820, of December 17, 2003 (employers regulated by the Consolidated Labor Laws – CLT), Law 8,112, of December 11, 1990 (Federal Government civil servants) and Normative Directive INSS/PRES 28/2008 (retirees and pensioners), the discounts cannot exceed: (i) 30% (thirty percent) for personal loans; and (ii) 5% (five percent) for credit card operations.

5 Provisional Measure 1,006, of October 1, 2020.

Evolution of credit portability in Brazil: behavior and profile

The anticipated settlement of credit transactions and leasing contracts, through the receipt of funds transferred by another institution, was regulated by Resolution 3,401, of September 6, 2006. This procedure, although not explicitly defined, has become known as credit portability.[1]

In general, the objective of credit portability is to allow the borrower to seek more advantageous conditions for an outstanding credit transaction. This concept places portability as an important stimulus to competition among financial institutions, providing better conditions to a client due to competitive advantages. Factors that may encourage consumer demand for credit portability include lower interest rates, additional credit, longer term, among other conveniences.[2]

The objective of this study is to evaluate the impact of the mechanism on indicators such as interest rates, terms, and borrowers' balances, by comparing credit conditions before and after portability.[3] Based on information from the Interbank Chamber of Payments (CIP), the Credit Information System (SCR), and complaints filed with the Banco Central do Brasil (BCB),[4] the study also seeks to identify the main challenges to the expansion of its use.

Portability potential

The significant drop in interest rates, resulting from the reduction of the Selic rate, favors the demand for "credit portability". However, analysis conducted in the Banking Report 2019[5] on mortgage lending indicated that the benefits of portability still reach a small fraction of their potential.[6]

The results found in 2019 are still valid. Despite the significant drop in rates and the sharp growth in portability transactions, in December 2020 there were still 493 thousand borrowers (balance of BRL 63 billion) in operations

1 Until the effectiveness of Resolution 4,292, of December 20, 2013, the migration of credit transactions between institutions occurred, in general, with the early settlement of the original operation by the granting of a new transaction (the so-called "debt purchase"). With the new regulation, it started to be done at the Credit Transfer Center (CTC), a system of the Interbank Chamber of Payments (CIP).

2 Article 3 of Resolution 4,292 of 2013, states that the value and term of the transaction at the proposing institution cannot be greater than the outstanding balance and the remaining term of the credit transaction object of the portability on the date of the transfer of resources. The increase in the balance and the extension of the terms generally occur due to renegotiation after portability.

3 General information about portability is presented in Chapter 1.

4 The BCB receives complaints filed by clients/users of financial institutions authorized to operate (including credit unions, payment institutions, and consortium management). The monitoring of these complaints constitutes a first inspection of the institutions, supporting actions of supervision, regulation, and formulation of financial education policies. Finally, the complaints feed the Complaints Ranking, an instrument that discloses the financial institutions and consortia that receive most complaints, as well as the frequently asked issues.

5 2019 Banking Report. Available at: https://www.bcb.gov.br/content/publicacoes/relatorioeconomiabancaria/REB_2019.pdf.

6 The study concludes that the 36,000 contracts that had benefited from interest rate reductions in 2019 represented only 6.4 percent of that potential.

with interest rates above 10% p.a., higher than the average rate of approximately 7% p.a. practiced by the market in 2020.[7]

The unrealized portability potential is even more relevant for credit facilities such as payroll-deducted loans and vehicle purchases. In these credit facilities, 47% and 28% of borrowers (25% and 12% of the balance), respectively, active in December 2020, refer to transactions with interest rates above 25% p.a., while the average rates in 2020[8] were 19.7% and 19.3% p.a. (Figures 1.A to 1.C). As presented in Chapter 1, real estate, payroll-deducted, and vehicle loans are the most representative credit facilities, reaching almost the entire balance of ported transactions.

Figure 1.A – Balance and borrowers by interest rates
December 2020 – Payroll-deducted loans

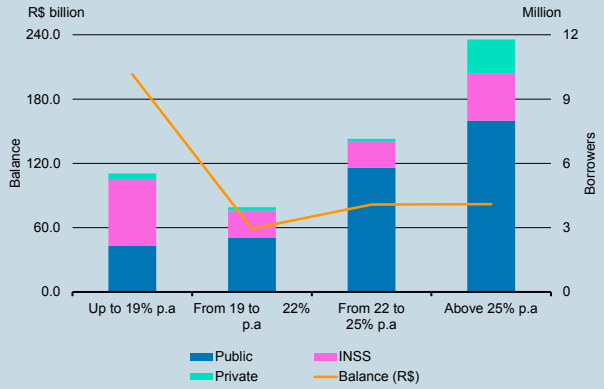


Figure 1.B – Balance and borrowers by interest rates
December 2020 – Vehicle purchases

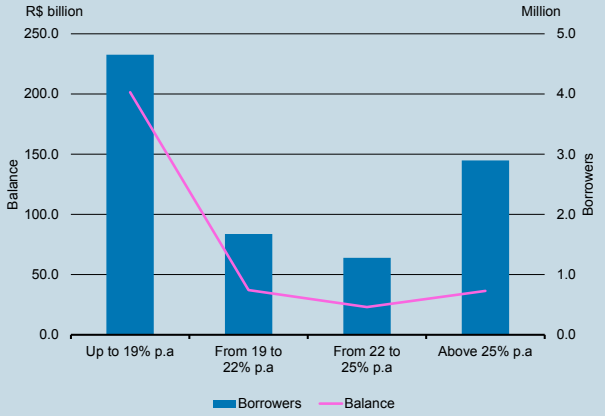
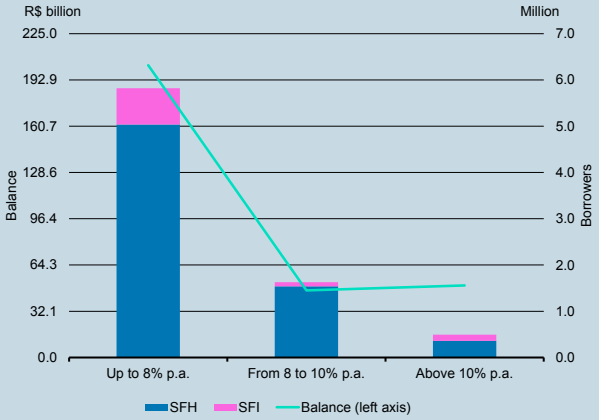


Figure 1.C – Balance and borrowers by interest rates
December 2020 – Real state



7 Part of the variation in interest rates can be explained by differences in the borrower's risk profile. However, estimating the impact of risk, among other factors, in determining interest rates would involve more in-depth identification techniques, which were not the subject of the present study. It is known, however, that the impact of risk on interest pricing tends to be lower in guaranteed transactions, favoring the hypothesis that credit portability can be an important instrument in the search for more advantageous conditions by borrowers in the credit facilities analyzed here.

8 Average interest rate calculated from the BCB Time Series 20774, 20747, and 20749. Available at: https://www3.bcb.gov.br/sgspub/localizarseries/localizarSeries.do?method=prepararTelaLocalizarSeries.

Analysis of the graph suggests that there is still a large fraction of borrowers with interest rates at high levels, considering the guarantees involved. This group could benefit from portability.[9] However, the number of portabilities actually requested still corresponds to a relatively low percentage of these potential transactions (Table 1).

Table 1 – Portability requests compared to the potential interest rate reduction

Description	Potential active operations[1]			Portabilities requested in 2020			Percentage of requests		
	Transactions	Borrowers	Balance (BRL billion)	Transactions	Borrowers	Balance (BRL billion)	Transactions	Borrowers	Balance
Payroll-deducted	37,746,785	18,929,508	163.5	3,623,371	1,661,158	35,565	10%	9%	22%
Real estate financing – SFI	138,498	134,103	13.0	3,064	3,039	1,855	2%	2%	14%
Real state financing – SFH	362,715	359,210	50.1	15,071	14,957	3,947	4%	4%	8%
Vehicles	4,392,812	4,176,186	59.4	2,404	2,351	105	0.1%	0.1%	0.2%

1/ Data base Dezembro de 2020. Considerou-se operações potenciais aquelas com taxas acima de 22%a.a. para veículos e consignado e 10%a.a. para crédito imobiliário.

Effectiveness of portability in improving credit conditions

Understanding the main motivations for portability is important to evaluate its results and to develop actions so that the instrument can effectively promote competition and improve credit conditions. This study compares the characteristics of the transactions –interest rate, term, and outstanding balance– before and after portability[10], using as a case study of payroll-deducted credit and real estate loans portability[11] requested via CIP in November 2020 and classified as effective until December 2020. Nearly 324 thousand transactions from almost 185 thousand borrowers (respectively 50% and 56% of the total requests made on the base date) represented more than BRL 4 billion in ported balance.[12] Payroll-deducted credit portability corresponds to 99% of the requests made and 81% of the ported balance in the sample analyzed. Among the ported transactions, the vast majority can be identified in the SCR, making up the sample analyzed here (Table 2).

Table 2 – Percentage of the ported transactions analyzed

Description	Portability effected[1/]			Transactions identified in the SCR			Percentage of identification	
	Transactions	Borrowers	Balance (BRL billion)	Transactions	Borrowers	Balance (BRL million)[2/]	Borrowers	Balance
Payroll-deducted	321,161	181,623	3,438.5	164,659	126,278	2,326.1	70%	68%
Real estate financing	2,603	2,599	760.8	1,938	1,935	539.6	74%	71%

1/ Portabilities requested in November 2020 and effective until December of the same year.

2/ Considering the balances reported in the CIP.

9 According to Resolution 4,292 of 2013, costs related to the exchange of information and the transfer of funds between the proposing institution and the original lender cannot be passed on to the borrower. There is, however, the possibility of charges such as a registration fee, costs for the appraisal of the asset given as guarantee, and notarial costs for the substitution of the chattel mortgage. On the financial institutions' side, there is the Reimbursement of Loan Origination Fees (RCO), a compensation paid by the proposer to the original creditor when portability is granted. It is also worth mentioning non-financial costs, such as the client's effort/time in searching for information and documents of the current transaction, in researching and comparing new proposals, and in the general follow-up of the process.

10 For the analysis of the post-portability conditions, all the borrower's transactions in the proponent financial institution in the same type of the ported transaction were considered, as long as they were contracted between the date of the portability request and up to one month after the transaction became effective. Thus, the post-portability balance corresponds to the sum of the transactions' balances, the interest rate to the average rate, and the term to the number of installments of the longest transaction. Similar aggregation is done for the cases where different transactions of the same type are combined into a single post-portability transaction.

11 These types have been chosen for being the most representative among the portability requests, both in terms of balance and number of transactions.

12 Series numbers 28650, 28651, 28652 provided by the Time Series Management System of BCB.

As a result, the analysis reveals that ported transactions of real estate loans tend to keep the outstanding portfolio's values close to those of the original transaction (variations of less than 2%).[13] Likewise, although with greater dispersion, there is no significant variation in the balance for most payroll-deducted portability. For this credit facility, however, there is a concentration of transactions in which the percentage increase is more significant (between 2% and 4%). The balance increase in payroll-deducted credit occurs, in general, due to the opening of new transactions after the portability (Figure 2.A).

The reduction in the number of installments is significant in real estate credit portability. Savings in interest payments are likely used in the amortization of the operation, thus contributing to reduce the total financing cost. Payroll-deducted credit, on the other hand, presents a bimodal distribution. Although many transactions do not show either no variation or a small reduction in maturity, refinancing via the lengthening of transactions seems to be relevant for the portability in this credit facility (Figure 2.B).[14]

Regarding the rate change for ported transactions, the behavior is similar on the two credit facilities analyzed, with a significant reduction in charged interest rates –an average of 2.9 p.p. for real estate loans and 5.7 p.p. for payroll-deducted loans (Figure 2.C).

Figure 2.A – Percentage difference in the balance of ported operations

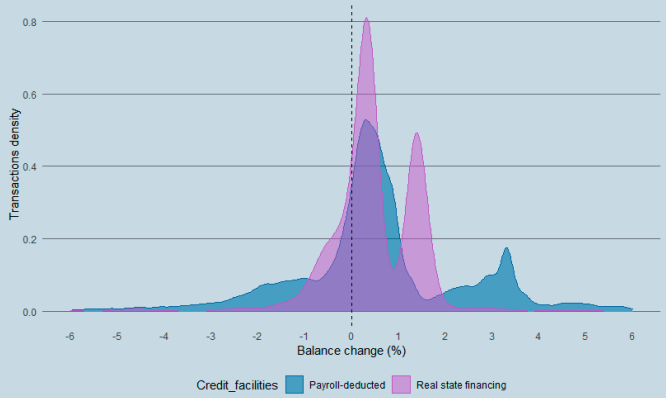


Figure 2.B – Variation in the number of installments

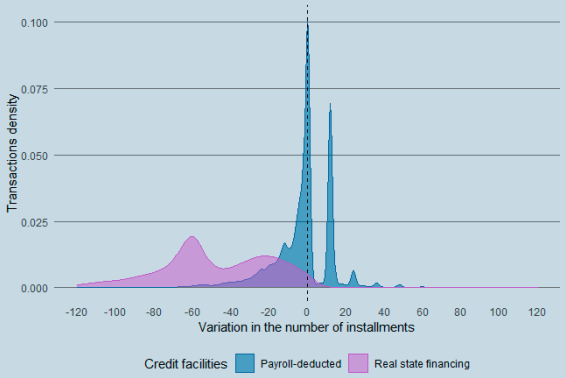
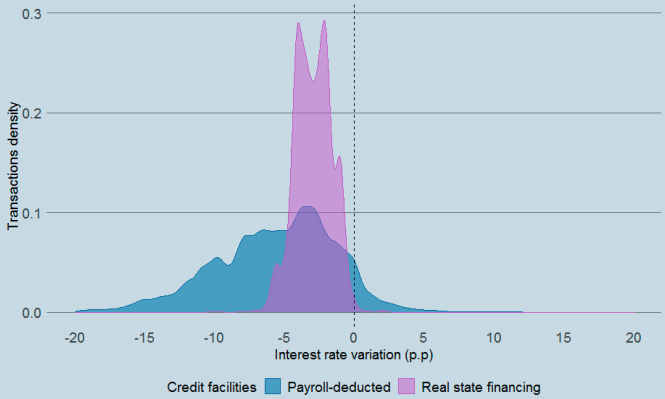


Figure 2.C – Difference in annual interest rates on ported transactions



13 The increase in balances may be the result of transaction costs (e.g., property appraisal fee), often recorded in the first installment of the financing (post-portability) and captured in the analysis.

14 The INSS Resolution 1,338, of March 17, 2020, reduced the maximum interest ceiling per month and raised the maximum maturity in transactions, from 72 to the limit of 84 monthly and successive installments. This change may have influenced the demand for portability in the analyzed period.

The role of banking correspondents[15]

Especially for payroll-deducted loans, the participation of correspondents in portability is quite representative, both in terms of ported balances and the number of borrowers. Of the 231 thousand payroll-deducted credit portability transactions analyzed in this study, 81 thousand (36%) were carried out through correspondents.

Using the same methodology as in the previous analyses and disaggregating the payroll-deducted credit data according to the channel used[16] – correspondent or directly at the financial institution – one sees that transactions intermediated by correspondents present a higher frequency of maturity lengthening. Regarding the balance variation and interest rates change, the distributions of correspondents and financial institutions have similar dynamics (Figures 3.A to 3.C).

Figure 3.A – Percentage difference in the balance of ported operations
Operations with and without correspondents

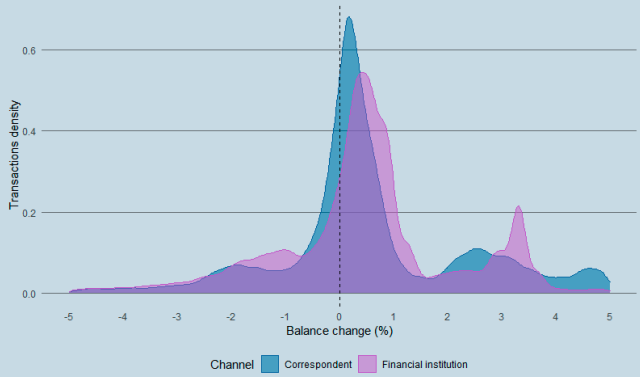


Figure 3.B – Variation in the number of installments
Operations with and without correspondents

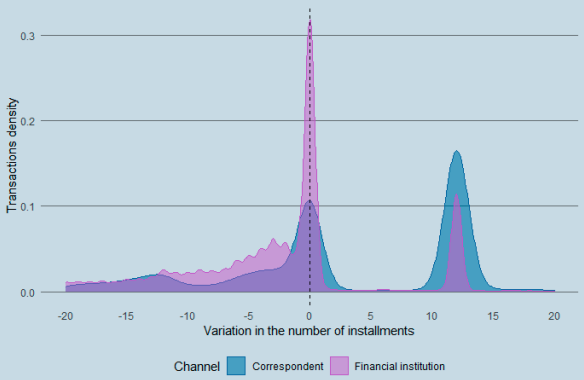


Figure 3.C – Difference in annual interest rates on ported transactions
Operations with and without correspondents

Operational challenges for portability expansion

In 2020, nearly 6.3 million credit portability requests were registered. Of this total, 62% were concluded and 13% were retained after negotiation with the customer. Retention after negotiation can also be understood as

15 Resolution 3,954 of February 24, 2011, later amended by Resolution 4,294 of 2013, establishes the rules for contracting correspondents in the country, to provide services to customers and users of the contracting institution. It is noteworthy the regulation contents in Article 2: the "correspondent operates on behalf of and under the guidelines of the contracting institution, which assumes full responsibility for the services provided to customers and users through the contracted party".

16 Checks performed have shown good consistency between the information on correspondents in the CIP table and in the data reported in the SCR. In this study, we opted to use the correspondent data reported in the CIP table.

a successful outcome of the portability process, since, in principle, the original lender was able to provide the borrower with better or equal conditions to those of the proposing institution.

Thus, the average success rate of 75% in portability requests allows us to conclude that, from an operational point of view, credit portability is an instrument that presents a satisfactory result, once requested by the borrowers. Among the reasons for not effecting portability, 15% of the registered requests are canceled, either by mistake of the original institution in locating the contract number or by failure of the borrower/proposing institution in properly filling the fields in the CIP. It should be noted that these data refer to requests registered in the system, which generally occur at an advanced stage of the portability process.

From the point of view of the complaints registered at the BCB in 2020 against the supervised institutions, 21,731 (4.59%) were related to credit portability, either because of problems in obtaining information/documents necessary for the transaction or because of operationalization problems, especially disagreement concerning cancellations and retentions of requests. Among the records duly filled out by the complaint[17] and forwarded to the financial institutions, less than 20% were considered well-founded, *i.e.,* with evidence of non-compliance by the original institution with BCB regulations.[18] This result is reflected in a discrete position in the Complaints Ranking,[19] as the 19th most complained issue in the last quarter of 2020, and reinforces the perception that operational difficulties do not seem to limit the realization of portability, considering the requests registered in the CIP.

It is worth noting that the financial institutions' administrative procedures prior to registering portability vary according to specific requirements and are especially burdensome in real estate credit. For this credit facility, it is important to emphasize the limitations related to the process of formalizing the real guarantee and its associated costs.

Besides operational issues, regulatory aspects can play an important role in expanding the use of portability. In real estate credit, for example, the expansion seen as of the second half of 2019 may be related to regulatory enhancements to increase competition, such as more flexible indexes for updating contracts.[20] Another important change, which came into effect from March 2021, is the permission for real estate credits originally contracted in the Real Estate Financing System (SFI) to be transferred to operations within the Housing Financing System (SFH).[21]

Conclusion

This study shows that there is an unrealized potential for credit portability, illustrated by the significant number of borrowers with transactions with interest rates above the market average: 18.9 million in payroll-deducted loans, 4.2 million in vehicle financing, and 493 thousand in real estate loans. The demand for portability represents a small percentage of this potential.

17 A minimum number of fields must be filled out to forward complaints to financial institutions. As disclosed in the Portability FAQ, BCB requests, for opening a complaint, the following information available at the proposing institution: (i) name of the proposing institution; (ii) portability number in the CIP; (iii) date of the portability request made electronically in the CIP; (iv) credit transaction contract number; and (v) refusal reasons alleged by the original creditor institution (http://www.bcb.gov.br/?PORTABILIDADEFAQ)

18 Resolution 4,292, of 2013; Resolution 3,401, of September 6, 2006; and Resolution 4,762, of November 27, 2019.

19 Available at: https://www.bcb.gov.br/ranking/index.asp?rel=outbound&frame=1.

20 Resolution 4,754, of September 26, 2019, extends to the SFH the possibility of contracting real estate financing that contains clauses for updating the outstanding balance based on price indexes, notably the Extended National Consumer Price Index (IPCA). This possibility had already been made available to financial institutions by Resolution 4,676, of July 31, 2018, but it did not reach operations contracted under the SFH. Besides the impact on interest rates, the approval of the normative provoked a widespread public discussion about the implications of this change, which may have contributed to an increasing number of borrowers being informed about the possibilities of improved credit conditions of their transactions to seek renegotiations and portability.

21 Resolution 4,762 of 2019. Among other advantages, the change for the SFH allows borrowers to use their accounts' resources from the Employment Compensation Fund (FGTS) to pay the installments and amortize the outstanding financing balance.

The comparison between the results before and after portability showed the positive impact of this instrument in significantly reducing interest rates of the two credit facilities: average of 2.9 p.p. per year for real estate loans and 5.7 p.p. for payroll-deducted loans. This indicates the ability of portability to improve borrowers' credit conditions.

Particularly regarding real estate financing, the trend signals a reduction in the number of installments and a modest variation in transaction values. As for payroll-deducted loans, the results were divergent in relation to the variation in the balance and in the number of installments, highlighting a bimodal distribution, with a concentration of both transactions with lengthened terms and increased outstanding balance and with lower or equal balances and number of installments. For a significant part of the ported transactions of this credit facility, the main motivation seems to be obtaining additional credit and/or extending the term. While payroll-deducted credit is characterized by having one of the lowest interest rates in the market and changed credit condition possibly favoring the borrower, the increased debt contributes to raise indebtedness and to compromise the citizens' income. It is important that borrowers properly plan the change and that financial institutions adopt the necessary controls and assessments, including compliance with the suitability requirement[22], to ensure that credit is used in a sustainable way.

From an operational point of view, the analysis of requests made in 2020 points to a satisfactory functioning of this instrument, with a 75% success rate in the outcome of the portability requests registered at the CIP and less than 5% of the total complaints filed with the BCB in the same period. The understanding that the processes have successfully developed cannot be extended to the pre-registration portability processes, which vary according to the credit facility and the requirements of the financial institutions involved.

By favoring competitiveness among institutions and reducing information asymmetry in the financial system, the implementation of Open Banking[23] tends to have a positive impact on credit portability on two fronts: by reducing the informational advantages of the original institutions and by making it easier for the borrower to find the best credit conditions. Accordingly, Open Banking is seen as an instrument for the promotion of portability, significantly impacting the universe of borrowers with credit operations under disadvantageous conditions.

22 Concept related to the adequacy of products/services to the needs, interests, and objectives of customers/users. See Resolution 3,694 of March 26, 2009.
23 Joint Resolution 1, of May 4, 2020. Defined as "standardized sharing of data and services through system openness and integration," Open Banking will allow customers to share their data for better products and services. Its full implementation is scheduled for December 2021.

Household debt and economic recession in Brazil[i]

The economic cycle alternates expansion and contraction periods. When characterized by more significant increases in aggregate household debt, periods of expansion tend to be followed by periods of relatively stronger economic crisis. The economic literature has recorded this pattern at the national and regional levels,[1] but sheds little light on the behavior of economic agents that produces this phenomenon. Studying this behavior, using information at the individual level, is the subject of the research "Government Banks, Household Debt, and Economic Downturns: the case of Brazil",[2] whose main results are reproduced in this box.

Brazil is an ideal laboratory for investigating the relationship between increased debt and the subsequent consumption behavior of individuals. First, Brazil has experienced a long period of rising household debt since the beginning of the century, followed by a recession in 2015 and 2016. In addition, large administrative databases in the country contain individual employment and income information, as well as detailed indebtedness, which even allows the estimation of consumption variations based on credit card purchases[3]. The research shows that a sharper increase in the individual debt-to-income ratio during the credit boom in Brazil preceded lower consumption during the subsequent crisis. Moreover, this effect is stronger when debt is concentrated in credit facilities that typically have higher interest rates and shorter terms.

Closer investigation of this relationship reveals that state-owned financial institutions (SOFIs) led the household credit expansion between 2011 and 2014, the last stage of the long period of uninterrupted growth in household debt in Brazil. Robust evidence of this comes from a comparison between the credit offered by SOFIs with the credit offered by privately-owned financial institutions (POFIs) to individuals who borrowed from both types of institutions. Additionally, there is evidence that borrower groups with greater exposure to this expansion had greater subsequent reductions in consumption. Comparing government sector employees, who were more exposed to this source of credit, with those in the private sector (less exposed), the increase in the debt-to-income ratio caused by the credit supply expansion shock is isolated, revealing that it resulted in a relative reduction in consumption.

1 For instance, Mian, Rao, and Sufi (2013) use aggregate data at the zip code level to study the Great Recession period. They found that areas with individuals with lower average incomes or higher leverage in home loans had a higher marginal propensity to consume out of wealth, amplifying the effect of the fall in property values on consumption.

2 Research conducted by Gabriel Garber (Banco Central do Brasil), Atif Mian (*Princeton University*), Jacopo Ponticelli (*Northwestern University Kellogg School of Management*) and Amir Sufi (*University of Chicago Booth School of Business*). Further details available at WPS538 (*link*): https://www.bcb.gov.br/pec/wps/ingl/wps538.pdf.

3 The study uses a base of 15 million individuals who went through the Credit Risk System (SCR) between 2003 and 2016. Information on labor income and the legal nature of the employing company are taken from the Annual Report on Social Information (Rais), managed by the Ministry of Economy.

The correlation

The first conclusion is that there is a clear, negative correlation between the increase in debt[4] between 2011 and 2014 and the change in consumption, as measured by credit card purchases by the same person, in the 2015-2016 recession years.

The relationship between these variables is studied using the estimation of a linear regression, following the equation:

$$\Delta \log(credit\ card\ expenditure)_{i,2014-2016} = \alpha + \beta\Delta\left(\frac{debt}{income}\right)_{i,2011-2014} + \varepsilon_i, \quad (1)$$

where *i* indicates the individual. *Debt* is measured as the average individual's monthly debt balance with the National Financial System (SFN) as a whole, *income* is defined as the sum of the individual's wages in the year, and *credit card expenditure* is an aggregation of purchases made throughout the year. The equation is augmented with an exhaustive set of fixed effects that aim to eliminate the effects of the individual's micro-region of residence, employee's initial income quintile, education level, gender, activity sector, and occupation. Standard deviations are clustered by micro-region.

The estimated coefficient, as shown in column (1) of Table 1, is negative, statistically significant, and robust to the inclusion of the fixed effects mentioned, as shown by its proximity to the estimated value in column (2). Using this coefficient, it is possible to calculate that individuals with a debt-to-income ratio change of one additional standard deviation (73 p.p.) between 2011 and 2014 experienced a 9.5 p.p. smaller change in their credit card spending between 2014 and 2016 (which is equivalent to 8.8% of one standard deviation of changes in credit card spending during the recession).

Table 1 – Estimate of Equation (1)
Relationship between credit card expenditure and debt-to-income ratio

Dependent variable:	Δlog(credit card purchases)$_{2014-2015}$	
	(1)	(2)
Δ(debt/income)$_{2011-2014}$	-0.12802	-0.12995
	[0,00246]***	[0,00239]***
Fixed effects:		
Micro-region	X	X
Income quintile	X	X
Age quintile		X
Educational level		X
Gender		X
Activity sector		X
Occupation		X
Events	981,615	981,615
R^2	0.01	0.02
N clusters	558	558

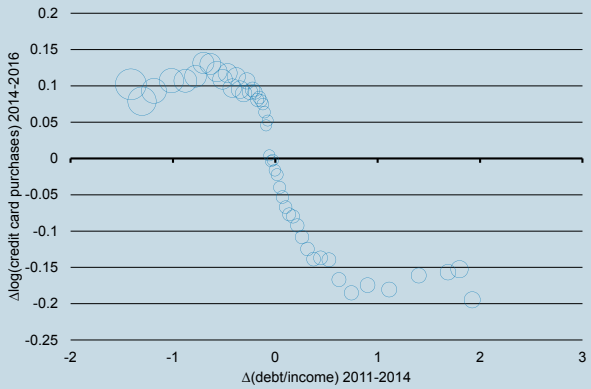
*** p<0,01, ** p<0,05, * p<0,10

Another simple way to see this correlation is to observe how indebtedness and subsequent consumption variation are jointly distributed, after controlling the influence of the characteristics used as fixed effects in the estimation of equation (1). Grouping individuals according to this "controlled" version of the variation in debt between

4 Measured as the amount of debt as a proportion of the annual formal labor income.

2011 and 2014 and, for each group, comparing it to the average variation in "controlled" consumption observed between 2014 and 2016, a negative relationship between these variables is clearly seen, without the imposition of much structure.[5]

Figure 1 – Debt-to-income ratio and purchases on credit card[1/]



1/ Includes observations of individuals with debt and income in 2011 and 2014 and purchases on credit cards in 2014 and 2016.

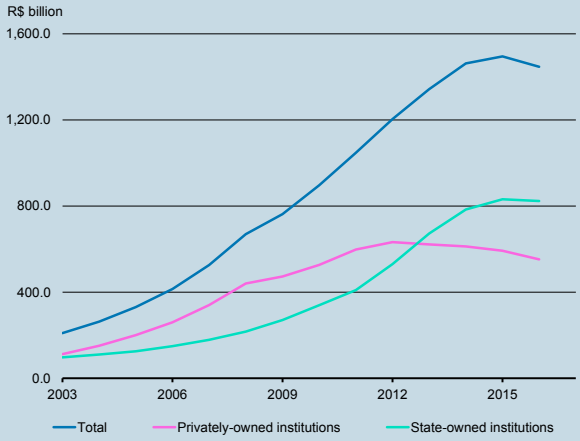
The study also explores how this correlation varies by credit category. Briefly, equations such as (1) are estimated separately for outstanding balances in: (i) mortgages; (ii) auto-loans; (iii) payroll-deducted credit; (iv) non-payroll-deducted credit; and (v) credit card debt.[6] The estimated coefficients[7] were all negative and statistically significant, increasing in absolute value along the order listed. In particular, categories that usually present lower interest rates and longer terms exert less pressure to reduce consumption after the increase of indebtedness. The coefficient found for credit card debt was equivalent to 112 times that found for mortgages.

Supply shock identification

Figure 2 shows the increase in household credit in Brazil offered by SOFIs and POFIs. It was produced from the aggregation of individual sample data, and the values were brought to the scale of the population of borrowers in the country. One observes a strong upward trend in household credit since the beginning of the SCR in 2003, until the crisis of 2015 and 2016. However, the series of credit provided by SOFIs and POFIs diverged as of 2011, with the state-owned segment maintaining the pace of growth while the privately-owned segment showed stability or a reduction in credit.

5 The area of the circles is proportional to the total debt of each grouping in 2011.
6 Includes revolving and installment with interest credit card
7 See footnote 2 for availability. Not fully replicated in the box for the sake of brevity.

Figure 2 – Household credit[1/]



1/ Estimated from sample totals. Adjusted for changes in SCR coverage, keeping the R$5,000 reporting limit in effect at the beginning of the period fixed. Values brought into reais from December 2016 by the IPCA.

Nevertheless, the diagnosis that SOFIs drove a credit supply shock starting in 2011 requires a more refined analysis. At all times, existing credit values reflect conditions on both the supply side (the SFN) and the demand side (its clients). In fact, it is possible that a demand shock could have generated these results. For example, changes in living conditions (such as the occurrence of unforeseen events) or in expectations (such as the belief in future income increases) could have made the clients of SOFIs demand more credit than the clients of POFIs, forcing the movement observed in the series. Thus, it is necessary to develop and apply some strategy to identify the nature of the shock, i.e., supply or demand.

One way that the banking literature addresses this difficulty of separating supply and demand, with great precision, is to construct a database consisting only of customers who take credit from more than one bank, eliminating the effect of each customer (i.e., the demand effect) from the observations related to each customer. In this study, this was done using customers who took credit simultaneously from both SOFIs and POFIs between 2011 and 2014. Since the customer is the same, changes on the demand side would affect the outstanding balances accordingly. Therefore, the credit supply impulse provided by SOFIs can be measured by comparing their balance with the balance provided by POFIs for the same person.

The econometrics is done with the following estimation equation:

$$\Delta\left(\frac{debt_{bi}}{income_i}\right)_{2011-2014} = \alpha_i + \lambda \cdot \mathbf{1}(govbank)_b + u_{bi}, \qquad (2)$$

where the dependent variable is the change, between 2011 and 2014, of individual *i* debt from institution *b*, divided by individual *i* labor income. The indicator function $\mathbf{1}(\text{govbank})_b$ takes value 1 when institution *b* is state-owned, and zero otherwise. The borrower's individual fixed effect is α, which absorbs the effect of any variable concerning him and does not change across the banks of which he is a customer. Standard deviations are grouped by micro-region.

Columns (1) and (2) in Table 2 refer to specifications estimated with all individuals in the sample, but without individual fixed effects. Column (1) is also estimated without individual characteristics fixed effects, while column (2) includes them. The coefficient of interest changes little. In column (3), only borrowers who have credit from more than one institution in the period are included, which represents 91% of the initial sample. This is a subsample of individuals with credit balance and labor income information between 2011 and 2014. In column (4), only the information of individuals with credit from both SOFIs and POFIs is used, which reduces the sample to 56% of the individuals considered. Finally, column (5) contains the estimation done by aggregating the information, for each individual, of debts within SOFIs and POFIs. The results indicate that the expansion of the supply provided by SOFIs relative to the supply provided by POFIs allowed an average increase in debt, as a fraction of annual income, 12.5 p.p. higher for this group of clients.

Table 2 – Estimatio of Equation (2)

Relationship between change in the debt-to-income ratio and the type of control of the creditor institution

Dependent variable:	Δ(debt/income)$_{2011\text{-}2014}$				
Individuals subsample	All	Multi-creditor		Multi-creditor (SOB and POB)	
	(1)	(2)	(3)	(4)	(5)
I(government institution)	0.10698	0.10991	0.114	0.12804	0.1252
	[0,00237]***	[0,00259]***	[0,00269]***	[0,00290]***	[0,00411]***
Fixed effects:					
Micro-region		X	X		
Income quintile		X	X		
Age quintile		X	X		
Educational level		X	X		
Gender		X	X		
Occupation		X	X		
Individual				X	X
Events	3,674,722	3,674,722	3,584,018	2,437,862	1,108,044
R^2	0.02183	0.02767	0.02895	0.26369	0.51321
N individuals	981,713	981,713	891,009	554,022	554,022
N clusters	558	558	558	558	558

*** p<0,01, ** p<0,05, * p<0,10

Identifying the impact on consumption

In turn, to measure the consequences of additional indebtedness on future consumption, it is necessary to use the individual's data in a consolidated form (unlike the previous section, which used individual information separated by type of creditor institution).

Even so, there are difficulties in determining the cause-effect relationship, since other variables – which do not appear in the databases – could be leading to a stronger drop in consumption in 2015 and 2016 precisely for individuals who showed the greatest debt increase from 2011 to 2014, without a causal relationship between these facts. The creation of two groups of borrowers in an experimental setting would be the ideal, thus providing a greater supply of credit for just one of them, to observe the consequences in a randomized manner. Unfortunately, conducting such an experiment would not have been feasible. Moreover, the study of a historical period does not admit this type of exercise. The economics literature adopts as empirical approach in such cases a quasi-experiment, that is, a division between groups with different exposure to the treatment in question, and in which the difference in effect can be compared.

In Brazil, government sector employees traditionally have greater exposure to SOFIs than private sector employees. This exposure is intensified by the performance of SOFIs in payroll-deducted loans, offered to a greater extent to government sector employees, given that the higher job stability results in a substantial reduction in the default risk.

The study recognizes statistically significant differences in profile between government and private sector workers. For example, government sector workers are 21% more likely to be female, have an average of 0.89 years more schooling, an average age five years higher, and an initial fraction of SOFIs credit grants relative to the total, on average, 19.3 p.p. higher. These differences are addressed by including a large set of controls in

the equations:[8] micro-region, labor income quintile, age quintile, educational level, gender, and occupation. In addition, controls measured in the initial period (2011) are included, namely, proportion of credit provided by SOFIs to the total and debt-to-income ratio.

The following equation compares the debt evolution of employees in the public sector with those in the private sector:

$$\Delta\left(\frac{debt}{income}\right)_{i,2011-2014} = \alpha + \lambda \cdot \mathbf{1}(public)_{i,2011} + u_i, \qquad (3)$$

where the indicator function $\mathbf{1}(public)_{i,2011}$ takes the value of 1 when the borrower is a public sector employee in 2011, and zero otherwise. Fixed effects and controls listed above are included when estimating the equation. Table 3 reports the results. Column (1) contains the result for the individual's total debt. Public sector workers had an increase in the debt-to-income ratio 1.6 p.p. higher than those in the private sector over the period from 2011 to 2014. This corresponds to 13.6% of the average increase in this ratio, calculated for all individuals in the sample (11.8 p.p.). Columns (2) and (3) show that this result occurred as credit from SOFIs increased, partially mitigated by the credit reduction among POFIs. In addition, Table 4 shows the analysis of the main credit categories, indicating that the phenomenon was concentrated in payroll-deducted credit. The article also investigates the distribution of this effect along the income quintiles, finding that the supply impulse was more concentrated in the lowest income quintile.

In turn, the equation that compares the variation in credit card purchases by public sector workers with those in the private sector is:

$$\Delta \log(credit\ card\ expenditure)_{i,2014-2016} = \alpha + \theta \cdot \mathbf{1}(public)_{i,2011} + \eta_i. \qquad (4)$$

The interpretation of the explanatory variable and the set of controls and fixed effects used are the same as in equation (3). Public sector workers had a change in this consumption measure between 2014 and 2016 that was, on average, 2 p.p. lower than those in the private sector (Table 4). The paper also investigated the variation of this estimate across income quintiles, finding that for the lowest income quintile, the variation in consumption was on average 4 p.p. lower for public sector workers.

Combining the results of equations (3) and (4), it is possible to find an elasticity of the variation in consumption with respect to the previous variation in the debt-to-income ratio of -1.24 p.p. Thus, individuals with a 1 p.p. increase in the debt-to-income ratio between 2011 and 2014 had, on average, a 1.24 p.p. smaller variation in consumption between 2014 and 2016.

8 Still, other systematic differences between the groups could affect the result. Job stability of government sector employees is the most important of these controls. However, this factor would tend to work against the identification of lower consumption during the recession period.

Table 3 – Estimatio of Equation (3)

Relationship between change in the debt-to-income ratio and the borrower's sector of employment

Dependent variable:	Δ(debt/income)$_{2011-2014}$						
	Total	State-owned institutions	Privately-owned institutions	State-owned institutions			
				Real state	Payroll-deducted	Personal non-payroll-deducted	Credit card[2/]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I(civil servant)	0.01637	0.07252	-0.05610	0.00638	0.04858	0.00140	0.00081
	[0,00291]***	[0,00657]***	[0,00591]***	[0,00330]*	[0,00284]***	[0,00022]***	[0,00009]***
Initial controls[1/]	X	X	X	X	X	X	X
Fixed effects:							
Micro-region	X	X	X	X	X	X	X
Income quintile	X	X	X	X	X	X	X
Age quintile	X	X	X	X	X	X	X
Educational level	X	X	X	X	X	X	X
Gender	X	X	X	X	X	X	X
Occupation	X	X	X	X	X	X	X
Events	981,615	981,615	981,615	981,615	981,615	981,615	981,615
R^2	0.19	0.06	0.24	0.06	0.10	0.02	0.06
N clusters	558	558	558	558	558	558	558

*** p<0,01, ** p<0,05, * p<0,10

1/ Fraction of credit from government-controlled financial institutions in 2011 and debt-to-income ratio in 2011.

2/ Includes revolving credit and installment credit with interest.

Table 4 – Estimation of Equation (4)

Relationship between credit card spending and borrower's sector of employment

Dependent variable:	Δlog(credit card purchases)$_{2014-2015}$	
	(1)	(2)
I(civil servant)	-0.01659	-0.02027
	[0,00707]**	[0,00733]***
Initial controls[1/]		X
Fixed effects:		
Micro-region	X	X
Income quintile	X	X
Age quintile	X	X
Educational level	X	X
Gender	X	X
Occupation	X	X
Events	981,615	981,615
R^2	0.01	0.01
N clusters	558	558

*** p<0,01, ** p<0,05, * p<0,10

1/ Fraction of credit from government-controlled financial institutions in 2011 and debt-to-income ratio in 2011.

Conclusion

The relationship between increased household debt in periods of economic expansion and the severity of subsequent recessions is a robust and well-known stylized fact. This box shows this mechanism operation at the individual level, as individuals who borrowed more heavily between 2011 and 2014 showed greater cuts in consumption in the recession years that followed. The interpretation that households cut consumption to service their debt is consistent with the results found. The fact that these individual movements act to deepen the bad phase of the economic cycle points to the relevance of this mechanism for economic policy in terms of regulating credit.

The key participation of state-owned financial institutions (SOFIs) in the expansion-recession episode under analysis was demonstrated. The preferred credit categories were those of lower risk, given the presence of collateral, particularly in payroll-deducted credit for government sector employees, reaching mainly those in the lowest portion of income distribution within this group.

Currently, research in this area continues seeking to understand the individual borrower's economic behavior. Traditional models in economics point to the individuals' preference to smooth their consumption. Thus, credit plays a fundamental role by allowing smaller swings in consumption when income receives negative shocks, or by anticipating consumption when income increases are expected. However, the phenomenon studied could not be justified based on differential expectations of income increase between workers of public and private sector. Simultaneously, there is evidence that the group with the largest credit expansion presented the largest variation in consumption on the entire period under analysis, which points against the argument of shock smoothing. Thus, there seems to be evidence that traditional economic models are not sufficient for the explanation. For a more complete understanding of the individuals' behavior in the credit market, models of bounded rationality or behavioral economics are required.

Reference

MIAN, A.; RAO, K.;SUFI, A. (2013). Household balance sheets, consumption, and the economic slump. *The Quarterly Journal of Economics*, *128*(4), 1687-1726.

i In this box, the expression "state-owned" means that the government is the controlling shareholder. Some of these institutions have a portion of their shares held by the private sector. By the same token, "privately-owned" means that the control is held by the private sector.

The evolution of bank switching costs in the Brazilian credit market

Introduction

There is a consensus in the economic literature that one of the banking sector characteristics is that clients are subject to switching costs when they change from one financial institution to another. These costs include, for example, fees related to the redemption of financial assets before the agreed term or expenses related to asymmetric information, among others.

Regarding costs associated with asymmetric information, on the one hand, the relationship of the bank with their clients increases the knowledge about clients over time, thus allowing an improved accuracy in the assessment of the risk profile, leading to lower borrowing interest rates to suitable clients. On the other hand, this relationship generates asymmetric information when compared with other banks with which the client has any connection. This asymmetry generates costs for suitable clients since other banks have a less accurate assessment of client profiles and this can result in higher risk rates when compared with that offered by the bank with which they already have a relationship, thus providing less favorable borrowing conditions. In turn, informational costs may also include better information by the client about its current bank when compared with other banks. Thus, the information asymmetry may lead the client to underestimate the advantages of switching to another institution due to the uncertainty about the quality of the relationship with other banks. As the possibility of change would reduce the expected utility, the client might decide to maintain the relationship with the current bank in view of the uncertainties involved.

From an institutional point of view, several measures have been adopted over the last years to reduce asymmetric information between financial institutions and their clients, to make it easier to the client to switch institutions, thus benefiting the borrower. Among these measures are: (i) the improvement of credit portability rules aimed to facilitate the migration to a financial institution that offers better credit conditions; (ii) approval of new legislation for the Positive Credit Record,[1] which improved the constitution of credit history; and (iii) the Open Banking System, which, since 2021, allows the sharing of clients' information (upon their approval) among financial institutions.

In this box, we will estimate the evolution of bank switching costs in the credit market and thus evaluate whether the adoption of several institutional measures is contributing to reduce these costs. To achieve this, the methodology proposed by Shy (2002)[2] for firms in general, which are presented below in the context of banks,[3] will be used.

1 Complementary Law 166, of April 8, 2019.
2 SHY, O. (2002). A quick-and-easy method for estimating switching costs, *International Journal of Industrial Organization*, v. 20, pp. 71-87.
3 The Shy methodology (2002) was also applied to the banking sector in Egarius, D. and Weill, L. (2016). Switching costs and market power in the banking industry: the case of cooperative banks. *Journal of International Financial Markets, Institutions & Money*, v. 42, pp. 155-165.

Methodology

Considerer a market in which bank A and B are competitors, bank A offering a credit line A and B a credit line B, at interest rates p_A and p_B respectively. N_A and N_B are the clients that used credit lines A (client type α) and B (client type β). S>0 represents the switching cost for a client deciding to change bank. U_α and U_β are the utilities of clients opting for credit line A or B. Hence, credit utility in the following period is given by:

$$U_\alpha \stackrel{\text{def}}{=} \begin{cases} -p_A & if\ the\ client\ stays\ with\ credit\ line\ A \\ -p_B - S & if\ the\ client\ switches\ to\ credit\ line\ B \end{cases}$$
$$U_\beta \stackrel{\text{def}}{=} \begin{cases} -p_B & if\ the\ client\ stays\ with\ credit\ line\ B \\ -p_A - S & if\ the\ client\ switches\ to\ credit\ line\ A \end{cases} \quad (1)$$

Let n_A and n_B be the number of clients (endogenously determined) of credit line A and credit line B in the following period, then (1) implies:

$$n_A = \begin{cases} 0 & se \quad p_A > p_B + S \\ N_A & se \quad p_B - S \le p_A \le p_B + S \\ N_A + N_B & se \quad p_A < p_B - S \end{cases}$$

(2)

$$n_B = \begin{cases} 0 & se \quad p_B > p_A + S \\ N_B & se \quad p_A - S \le p_B \le p_A + S \\ N_A + N_B & se \quad p_B < p_A - S \end{cases}$$

Assuming that marginal costs for both banks are equal to zero, then the profits of each bank are given by:

$$\pi_A(p_A, p_B) = p_A n_A$$

(3)

$$\pi_B(p_A, p_B) = p_B n_B$$

A pair of non-negative interest rates (p_A^N, p_B^N) would represent a Nash-Bertrand equilibrium if, given the interest rate p_B^N of bank B, the bank A chooses the price p_A^N to maximize π_A and, given the interest rate p_A^N of bank A, bank B chooses p_B^N to maximize π_B. However, a Nash-Bertrand equilibrium does not exist as a pure strategy because banks would choose to reduce interest rates to capture all clients.

Shy (2002) presents the concept of undercut-proof equilibrium to overcome this problem. This equilibrium implies that a bank cannot reduce interest rates to capture the client of its rival bank and increase profits, at the same time that it is not possible for any bank to increase its interest rate without the rival adopting more competitive interest rates for increasing profits.

As in Shy (2002), we may assume that bank *i* undercuts bank *j* when it prices in such a way that $p_i < p_j - S$, $i = A, B$ and $i \neq j$. In this case, bank *i* is subsidizing the switching costs of the rival bank *j*, which permits bank *i* to attract all clients, *i.e.*, $n_i = N_i + N_j$ and $n_j = 0$.

Also according to Shy (2002), the pair of interest rates (p_A^U, p_B^U) satisfies the undercut-proof property if, for p_B^U and n_B^U, bank A chooses the highest interest rate p_A^U subject to $\pi_B^U = p_B^U n_B^U \geq (p_A - S)(N_A + N_B)$, and when for p_A^U and n_A^U, bank B chooses the highest interest rate p_B^U subject to $\pi_A^U = p_A^U n_A^U \geq (p_B - S)(N_A + N_B)$. Both inequalities hold as equalities thus permitting to reach the solution:

$$p_A^U = \frac{(N_A + N_B)(N_A + 2N_B)S}{(N_A)^2 + N_A N_B + (N_B)^2}$$

$$p_B^U = \frac{(N_A + N_B)(2N_A + N_B)S}{(N_A)^2 + N_A N_B + (N_B)^2} \quad (4)$$

By setting $p_j - S \leq p_i \leq p_j + S$, a strictly positive market percentage is guaranteed, so the competing bank will not reduce its interest rate for attracting the whole market.

With the purpose of generalizing this result, Shy (2002) presents additional cases including more banks and different bank switching costs for clients. Under the undercut-proof equilibrium, the most (least) profitable bank is considered to be the one with the greatest (lowest) market participation. As a result, the bank with the least number of clients is encouraged to undercut more profitable banks, aiming to increase its market share.

Suppose that there are $I \geq 2$ banks in a market with $i = 1, \ldots, I$ institutions and let N_i be the market participation of bank *i*, such that $N_1 > N_2 > \cdots > N_I$. Shy (2002) then assumes that banks behave so as each bank $i \neq I$ fears to be undercut by bank *I*, and then sets its rate p_i in reference to the interest rate charged by bank *I*; and bank *I,* in turn, fears the competition of bank 1 and then sets its interest rate p_I in reference to p_1.

Let S_i represent the switching cost for the client of bank *i* and assume that $S_i (i = 1, \ldots, I)$ is known by all banks and clients. Then, each bank $i \neq I$ considers p_I as given and chooses the maximal p_i to satisfy:

$$\pi_I = p_I N_I \geq (p_i - S_i)(N_i + N_I) \quad (5)$$

where π_I is the profit of bank I. Solving (5) for the case of equality, we obtain:

$$S_i = p_i - \frac{N_I p_I}{N_i + N_I}, i \in \{1, \ldots, I-1\} \quad (6)$$

Bank *I*, in turn, with the lowest market participation, assumes that it is the "prey target" of bank 1. Then, bank *I* chooses interest rate p_I which would make interest rate reduction by bank 1 unprofitable. That is:

$$\pi_1 = p_1 N_1 \geq (p_I - S_I)(N_1 + N_I) \quad (7)$$

As p_I is observed, we may find the switching cost for clients of bank *I*:

$$S_I = p_I - \frac{N_1 p_1}{N_1 + N_I} \quad (8)$$

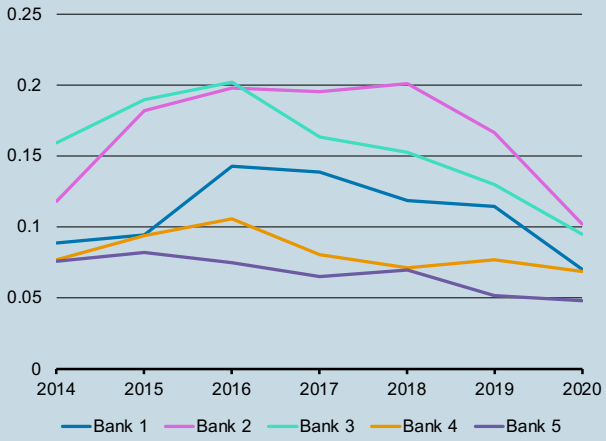
Data and results

In this box, bank switching costs are obtained through equation (6) for all banks in reference to the bank with the lowest market participation, and through equation (8) for clients of bank *I* in reference to bank 1, with the highest market participation.

For evaluating the evolution of switching costs, we use the Credit Information System (SCR) of the five banks holding the largest outstanding credit portfolios in Brazil. We chose this sample because the Shy method (2002) is more suitable for banks with similar size. Estimations considered the average interest rates weighted by the outstanding portfolio (household and corporate operations) and the market participation calculated by means of the aggregate value of this portfolio. The sample does not include household or corporate credit abroad or for which the bank did not inform to the SCR the borrower's CPF or CNPJ, which represented, in 2020, 4.3% of the outstanding portfolio.

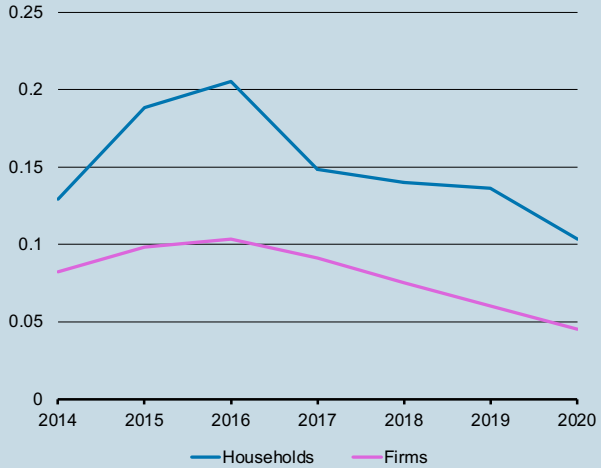
Estimated switching costs are shown in Figure 1, where a reduction is observed for the clients of the five banks examined over the last years. If we compare the 2020 average switching cost of these five banks with the 2019 average, we find a t-statistic of 2.287 (p-value = 0.051); if we compare the 2020 and 2018 averages, the t-statistic is 2.320 (p-value = 0.049); and for the comparison between 2020 and 2017, the t-statistic is 2.602 (p-value = 0.032), indicating that the reduction of switching costs is statistically significant.

Figure 1 – Switching costs



In Figure 2 are shown the average switching costs of the five previous financial institutions broken down into the household and corporate segments. We may observe a reduction in the switching costs for both segments and larger average costs for households than for firms over the last years. If we compare the average switching cost for households and firms in 2020, we obtain a t-statistic of 2.013 (p-value = 0.079), indicating that the average switching cost for households is statistically higher than the average cost for firms, considering the usual significance levels.

Figure 2 – Average switching costs[1/]



1/ Average switching costs of the five banks holding the largest active credit portfolios in

We conclude that these results indicate, over the recent years, a reduction of the so-called lock-in effect, *i.e.*, the reduction in the ability of "capturing and extracting rents" due to asymmetric information by banks relative to their clients, thus improving the clients' position. Furthermore, results also indicate that bank switching costs concerning credit borrowing are larger for households than for firms.

Microcredit

Fostering the microcredit market is one of the Agenda BC# programs in the Inclusion dimension. According to this guideline, several activities have been implemented with the goal of broadening the access and reducing costs in this credit segment, with relevant economic and social impacts.

This box presents an overview of this market in 2020, describing its regulatory and institutional framework and leading quantitative performance indicators.

Regulatory and institutional framework

The year of 2020 was remarkable and atypical for the microcredit market in several aspects. On the one hand, normative changes aimed at modernizing the institutional environment of this market progressed, especially concerning the Production-Oriented Microcredit National Program (PNMPO). These changes[1] allowed, among others, the following improvements: (a) broaden the target public of the program, harmonizing it with the legal concept of micro-enterprise; (b) increase the use of digital technologies and remote access in the process of credit granting, similarly to what happens with other credit types; and (c) the inclusion of new agents in the list of microcredit participants or operators. Among the new participants in the microcredit system, it is remarkable the entering of companies with expertise in fostering and guiding micro-entrepreneurs and micro-enterprises and non-financial institutions authorized to offer credit assignment, which became an alternative for reducing costs and rationalizing operational structures serving this market segment.

In addition to normative and regulatory incentives, the government continued to promote direct actions towards the improvement of the microcredit market operational infrastructure. Among these actions, it stands out Credimei, a program aimed at simplifying the access to financial products and services for individual micro-entrepreneurs (MEI), promoted by the Ministry of Finance with the support of the Banco Central do Brasil (BCB). Credmei, as part of the Entrepreneur Portal, has the objective to be perceived as the main electronic platform for financial services targeted to individual entrepreneurs and micro-enterprises, gathering in a friendly electronic environment, easily accessible, nearly 17 million potential borrowers and 100 institutions offering credit and additional financial services. In its early implementation stage in 2020, Credmei addressed approximately 450 thousand credit operation requests or payment solutions all around the country. With an increasing number of participant institutions and the expected incorporation of new functionalities, such as a tool for comparing interest rates and a negotiation platform, the perspective for 2021 is a significant expansion of operations towards an increasingly transparent, competitive, and accessible market, both for entrepreneurs, micro-enterprises, and credit institutions.

1 Changes in Law 13,636, of March 20, 2018, were firstly introduced by Provisional Measure 905, of November 5, 2019, and converted into consolidated legislation by Law 13,999, of May 18, 2020.'

The crisis associated with the outbreak of the Covid-19 pandemic and social distancing measures, which impacted economic activity as never before, hit particularly small and micro-enterprises and entrepreneurs. Businesses of these segments mostly target products and services rendered or delivered on-site, for which the demand is more dependent on the circulation of people. As a result, several emergency programs aimed at income and credit transferring were implemented to smooth the shock on household income and support companies during the period of reduced demand and economic activity. Some of these programs benefited the microcredit market, especially the National Program for Supporting the Micro and Small Enterprises (Pronampe). Between June and December 2020, this program channeled, by means of the provision of guaranties, 517,053 operations worth BRL 37.5 billion, benefiting 468,769 companies, of which micro-enterprises accounted for 44.6% of total operations and 23.3% of the credit granted.[23] Following we describe the microcredit evolution in 2020.

Microcredit in a broad sense[4]

Microcredit includes 71 operations out of 92 credit types informed in the BCB's Credit Information System (SCR). This category comprises two large groups: (i) earmarked credit operations;[5] and (ii) non-earmarked credit operations. Earmarked credit operations are granted by means of two official credit programs: (i) rural credit, mostly granted by means of the National Program for Strengthening Family Farming (Pronaf);[6] and (ii) PNMPO.[7] Non-earmarked credit operations encompass the remaining 64 credit types whose specific features allow us to classify them as production-oriented credit.

In December 2020, microcredit, in a broad sense, totaled BRL 142.7 billion, of which most borrowers were represented by households, accounting for 60% of borrowers and 72% of the credit outstanding volume.[8] The most representative credit types were rural credit operations for investments (47.3%), rural credit operations for production costs (16.0%) and working capital operations with maturity greater than 365 days (12.1%). When it comes to the number of clients, rural credit operations for investments were the most frequent type (20.4%), followed by production-oriented microcredit for working capital (16.5%), and working capital operations with maturity greater than 365 days (7.4%).

From December 2019 to December 2020, microcredit outstanding volume, in a broad sense, increased by BRL 17 billion (13.5%), whereas the number of operations increased 5.1% (Table 1). The expansion in microcredit outstanding volume was close to the 15.8% growth rate observed in National Financial System (SFN), although below the growth rate of credit granted to large companies[9] (16.0%).

2 Further details at https://bb.com.br/fgo, accessed on March 31, 2021.

3 The other emergency credit program that benefited the same target borrowers was the Emergency Credit Access Program − Credit Card Machines (Peac-*Maquininhas*), managed by the Brazilian Development Bank (BNDES), but with a lower volume of operations worth nearly BRL 3.2 billion. In addition to Pronampe and Peac-*Maquininhas*, other emergency credit programs were implemented, such as the Emergency Employment Support Program (Pese), the Peac-FGI, with guaranties provided by the Investment Guarantor Fund (FGI), and the Working Capital Program for Preserving Companies (CGPE).

4 Broad microcredit operations are deemed to be, also for classification purposes in the Credit Information System (SCR), those carried out to finance productive activities of households or companies, organized individually or collectively, with annual gross income or revenue up to BRL 360,000.00.

5 Earmarked credit comprises credit operations whose lending institutions, source of funds, borrowers, costs or terms are defined by Law or regulation, with the purpose of fostering economic sectors with insufficient access to the non-earmarked credit market. Earmarked credit differs from the emergency credit programs implemented in 2020, by which the government granted special conditions relative to the source of funds, guaranties, and target public, while allowing the free participation by financial institutions.

6 Rural credit is represented by the following five SCR credit types: (i) costing; (ii) investment; (iii) trade; (iv) industrialization; e (v) project.

7 PNMPO is represented by the following two SCR credit types: (i) loans; and (ii) financing.

8 The concept of microcredit requires it to be production-oriented and restricted to borrowers whose income does not surpass a fixed ceiling, in accordance with the SCR credit type regulations. The classification in this category does not consider whether the borrower is a household or a corporation. Therefore, operations channeled to the so-called informal entrepreneurs may also be compiled as production-oriented, given the absence of a formal enterprise or the option made by the borrower or by the financial institution to link these credit operations to his natural person.

9 According to the criterion adopted by the BCB for recording and releasing monetary and credit statistics, large enterprises are those with declared gross annual revenue higher than BRL 300 million or total assets above BRL 240 million.

Table 1 – Credit outstanding volume and the number of operations by groups

	Microcredit outstanding volume(R$ billion)			Operations (million)		
	dec/19	dec/20	Variation %	dec/19	dec/20	Variation %
Broad microcredit	125.7	142.7	13.5	9.8	10.3	5.1
- Non-earmarked	30.9	43.1	39.5	4.8	4.7	-2.7
- Rural credit	87.9	90.5	3.0	3.6	4.1	14.1
- MPO	6.9	9.0	31.5	1.4	1.5	8.7

The growth of the microcredit outstanding volume is explained by a significant increase in two of its three components. Non-earmarked credit and production-oriented microcredit (MPO) grew, respectively, BRL 12.2 billion (39.5%) and BRL 2.1 billion (31.5%), offsetting the almost stable balance of microcredit operations granted as rural credit (+3.0%). From this perspective, microcredit targeted to urban activities, more affected by the crisis, increased twice as fast as the SFN credit outstanding volume. The expansion of non-earmarked operations, then, may be mostly explained by the effect of the emergency credit programs, especially Pronampe, as mentioned above.

By credit types, the largest contributions for the increase in the microcredit outstanding volume came from working capital operations with maturity greater than 365 days (BRL 9.8 billion), followed by infrastructure and development (BRL 2.2 billion), and rural credit for production costs (BRL 2.1 billion).

Concerning the relative participation by income or revenue[10] in the microcredit outstanding volume, the share of segments with income or revenue up to five minimum wages rose from 29.0% to 32.9% (+3.9 p.p.) in the same period (Table 2). As for the number of clients, the share of these segments increased from 52.6% in 2019 to 59.0% (+6.4 p.p.) in 2020.

Table 2 – Participation of income/monthly revenue segments in microcredit outstanding volume

	Month	Participation (%)									Total
		A - Up to 1 mininum wage	B - From 1 to 2 Sminimum wages	C - From 2 to 3 minimum wages	D - From 3 to 5 minimum wages	E - From 5 to 10 minimum wages	F - From 10 to 15 minimum wages	G - From 15 to 20 minimum wages	H - From 20 to 25 minimum wages	I - From 25 minimum wages to legal limit	
Microcredit outstanding volume (billion)	dec/19	7.6	6.3	5.2	9.9	21.0	18.1	13.7	11.9	6.5	125.7
	dec/20	9.4	7.3	5.8	10.4	20.9	17.0	13.7	11.7	3.9	142.7
Clients (million)	dec/19	11.7	16.4	10.0	14.5	19.4	11.4	7.3	6.3	3.0	9.9
	dec/20	9.4	20.4	11.2	18.0	20.7	8.6	5.5	4.5	1.8	9.9

Regarding delinquency rates, the significant dispersion pattern of this indicator observed in 2019, by borrower's income, continued in 2020, of which the higher rates were noticed in low-income borrowers. From 2019 to 2020, however, a slight increase of the delinquency rate was observed, especially in the lower income or revenue segments, an expected behavior due to the asymmetric effect of the economic crisis in relation to the firms' size (Table 3).

10 In this Report were employed the income ranges expressed in minimum wages used in the SCR for households, as well as the limit established by law for household income of BRL 360,000.00, with thirteen annual wages. The limits established for the analysis of the microcredit granting to households were maintained for companies.

Table 3 – Average deliquency rate – Broad microcredit

%

	Year	A - Up to 1 mininum wage	B - From 1 to 2 Sminimum wages	C - From 2 to 3 minimum wages	D - From 3 to 5 minimum wages	E - From 5 to 10 minimum wages	F - From 10 to 15 minimum wages	G - From 15 to 20 minimum wages	H - From 20 to 25 minimum wages	I - From 25 minimum wages to legal limit	Average
Deliquency rate	2019	8.6	9.2	6.8	5.4	3.9	3.6	3.5	3.5	2.9	5.3
	2020	10.4	12.7	8.8	6.8	4.5	3.6	3.4	3.2	2.7	6.2

When it comes to credit flows, Table 4 presents, for 2019 and 2020, the total amount of credit granted in the microcredit segment, in a broad sense, considering each group of operations that make up this segment credit type, as well as the number of operations and the average value. The total amount of microcredit, in a broad sense, rose from BRL 78.7 billion to BRL 89.6 billion (+13.8%) and the number of operations dropped from 23.2 million to 17.9 million (-22.8%).

Analyzing credit flows by groups, the value of credit granted in the non-earmarked segment grew from BRL 43.5 billion to BRL 50.3 billion (+15.5%), whereas the number of operations decreased from 20.7 million to 15.4 million (-25.6%).

The amount of credit granted also increased in rural financing, from BRL 20.8 billion to BRL 23.4 billion (+12.5%), whereas the number of operations, nearly 560 thousand, remained practically stable from 2019 to 2020. Regarding specifically the production-oriented microcredit, the same behavior was observed for the number of operations, nearly 1.9 million, and a slight increase in the amount of credit granted, the lowest of the three groups, of 10.3%, from BRL 14.5 billion to BRL 15.9 billion.

As shown in Table 4, the decrease in the number of operations and the increase in the amount of credit granted implies a significant expansion, of about 50%, in the average value of microcredit operations, from BRL 18 thousand in 2019 to BRL 27.2 thousand in 2020. This expansion occurred mostly in the non-earmarked segment (59.1%), since both earmarked segments (rural credit and MPO), subject to their own dynamics, increased much less. It is worth mentioning that the expansion of credit flows was not observed to the detriment of lower income borrowers, since, as shown in Table 2, the distribution of credit outstanding volume by income or revenue remained quite stable, presenting just a reduction in the share of higher income borrowers, those with income or revenues up to 10 minimum wages. This particularity of increasing credit flow spreading over all borrowers' income ranges may be partially explained by the effect of emergency credit programs, which allowed financial institutions to expand, in general, their credit limits for the low income or low revenue borrowers.

Table 4 – Amount granted, number of operations granted and average ticket of microcredit groups

	Microcredit outstanding volume (R$ billion)			Operations (million)			Average ticket (R$ thousand)		
	2019	2020	Variation %	2019	2020	Variation %	2019	2020	Variation %
Broad microcredit	78.7	89.6	13.8	23.2	17.9	-22.8	18.0	27.2	50.8
- Non-earmarked	43.5	50.3	15.5	20.7	15.4	-25.6	15.1	24.0	59.1
- Rural credit	20.8	23.4	12.5	0.6	0.6	0.2	46.5	57.1	22.9
- MPO	14.5	15.9	10.3	1.9	1.9	0.5	8.1	9.1	12.1

Production-oriented Microcredit

Production-oriented microcredit (MPO)[11] comprises microcredit operations that use a specific methodology for granting and controlling credit operations, which try to take into account specific characteristics of micro-entrepreneurs in terms of their greater need of technical assistance, expert monitoring, and differentiated conditions of credit supply.[12] One specific characteristic of MPO operations is the absolute predominance of credit granted to households, which, in December 2020, accounted for 96.2% of clients, 95.4% of credit outstanding volume, and 98.7% of operations.

In December 2020, total MPO operations reached BRL 9 billion, corresponding to approximately 6.3% of the total microcredit, in a broad sense. This value represents an expansion of BRL 2.2 billion (31.3%) over the amount observed in December 2019.

Table 5 shows the share of MPO by income segments in December 2019 and in 2020. The highest frequency of production-oriented microcredit clients was concentrated on the income range of 1 to 2 minimum wages, while the main income segment in terms of share in the MPO outstanding volume was the income segment of 3 to 5 minimum wages.

Table 5 – Share of MPO by monthly income segments

		Participation (%)									
	Month	A - Up to 1 mininum wage	B - From 1 to 2 Sminimum wages	C - From 2 to 3 minimum wages	D - From 3 to 5 minimum wages	E - From 5 to 10 minimum wages	F - From 10 to 15 minimum wages	G - From 15 to 20 minimum wages	H - From 20 to 25 minimum wages	I - From 25 minimum wages to legal limit	Total
Microcredit outstanding volume (billion)	dec/19	6.0	19.1	16.8	27.5	22.2	5.4	1.8	0.9	0.3	6.9
	dec/20	5.0	19.0	16.9	27.9	22.6	5.6	1.9	0.9	0.2	9.0
Clients (million)	dec/19	14.2	32.5	18.8	19.6	11.1	2.5	0.8	0.4	0.1	1.9
	dec/20	13.7	32.5	18.7	19.8	11.6	2.4	0.8	0.4	0.1	2.1

The share of the lower income borrowers (up to 1 minimum wage) declined both in terms of volume (-1 p.p.) and the number of clients (-0.5 p.p.). The percentage share of the intermediate income range (5 to 10 minimum wages) increased in both volume (+0.4 p.p.) and in the number of clients (+0.5 p.p.). The other income ranges kept relatively stable in both perspectives.

Unlike other microcredit segments, MPO registered a significant delinquency rate reduction in almost all income segments (Table 6). The average delinquency rate of this group reached 2.4% at the end of 2020, which was similar to the SFN average rate (2.1%). Such figure suggests a better selection of borrowers by financial institutions granting MPO and may indicate the effectiveness of the specific methodology required for this financial client. Although this methodology may increase the loan origination and monitoring costs, these expenses can be greatly reduced thanks to technological advances and the increasing digitalization in the relationship with clients, which may lead to a positive final effect on the financial results of these institutions.

11 MPO consists of an earmarked credit line: commercial banks, multiple banks with a commercial portfolio and *Caixa Econômica Federal* must channel part of the demand deposit funds in credit operations oriented to lower income ranges and micro entrepreneurs. It corresponds to 2% of the average demand deposit balances raised by banking institutions. However, this limit was modified by Law 13,999, of May 18, 2020, which equalized it to the legal limit established by Complementary Law 123, of December 14, 2006, for the classification of companies in the category of micro enterprises, currently set at BRL 360,000.00.

12 To avoid over-indebtedness or abusive conditions, the operational limits are more restrictive: the terms of operations cannot be lower than 120 days, and the sum of the outstanding balances of production-oriented microcredit operations cannot exceed BRL 21,000.00 in the same financial institution and BRL 80,000.00 in the entire SFN – except for real estate financing. In addition, the interest rate cannot exceed the ceiling of 4% p.m. and the credit opening fee is limited to 3% of the granted credit value.

Table 6 – Deliquency rate – MPO

%

	Year	A - Up to 1 mininum wage	B - From 1 to 2 Sminimum wages	C - From 2 to 3 minimum wages	D - From 3 to 5 minimum wages	E - From 5 to 10 minimum wages	F - From 10 to 15 minimum wages	G - From 15 to 20 minimum wages	H - From 20 to 25 minimum wages	I - From 25 minimum wages to legal limit	Average
Average deliquency	2019	5.0	3.9	2.9	2.4	1.7	1.8	2.2	2.2	2.6	2.7
	2020	5.0	3.4	2.4	2.0	1.7	1.5	1.8	2.2	2.1	2.4

Conclusion

Although not successful in supplying the total credit demand by micro-enterprises and micro entrepreneurs, microcredit played an important role in 2020 in softening the effects of the economic activity decline due to the Covid-19 pandemic, which were stronger in this credit segment. In a period that we could expect a decline in credit flows in line with the generalized risk aversion, especially for the most vulnerable economic segments, non-earmarked microcredit, and even part of earmarked microcredit, oriented to urban entrepreneurs, increased sharply and surprisingly, twice as fast as the SFN outstanding volume growth for large companies, which also registered an above-the-average growth.

Even though part of this expansion might be explained by the emergency credit programs, especially Pronampe, the importance of government measures for institutional and operational adjustment implemented before the outbreak of the crisis cannot be discarded. Despite the crisis, these measures contributed to permanently foster the microcredit market. The effects of these measures, due to their structural and longer maturity nature, should continue over the next years, exacerbated by the accelerated economic activity recovery that is expected after the sanitary crisis is overcome.

Credit unions growth

Credit unions are financial institutions that offer their members financial products and services, in a similar way to a commercial bank, but with a different corporate nature. While banks are corporations, credit unions are partnerships governed specifically by Complementary Law 130, of April 17, 2009, and additionally by Law 5,764, of December 16, 1971. Accordingly, the following characteristics stand out:

- each member of a credit union is entitled to one vote, which is not proportional to his or her share in the capital stock;

- the surplus of a credit union is reverted to its members as a proportion of how much they use the services, not of their capital share (art. 24, § 3, Law 5.764/1971).[1] The return on the capital of credit unions is limited by Complementary Law 130/2009, as their social function is not to generate profits, but to provide services its members. Therefore, the net effect of the split of the surplus to members can be considered as a cost reduction of the products offered (as credit, for instance);[2]

- The primary services provided by credit unions – fundraising and the granting of credits and guarantees– must be restricted to members.[3]

In December 2020, the National Cooperative Credit System (SNCC)[4] was composed of 847 **individual** credit unions, i.e., institutions that directly provide services to their members. Among them, 222 are **independent** –that is, they are not linked to central credit unions. The other 625 are affiliated to one of the five independent central credit unions (Ailos, Cecoop, Credisis, Uniprime and Cecrers) or to one of the 29 central credit unions linked to one of the four existing central confederations (Sicredi, Sicoob, Fintech and Cresol). The latter correspond to the four **organized cooperative systems**, composed of three levels: individual and central credit unions and confederation. Two of these systems also include **cooperative banks** – i.e., multiple banks under the shareholding control of central credit unions, according to CMN Resolution 2,788 of November 30, 2000.

In the last five-year period, SNCC growth[5] stood out above the rest of the SFN.[6] SNCC's adjusted total assets (ATA) rose to BRL 371.8 billion in December 2020 from BRL 174.3 billion in December 2016 (Table 1), and its share of total SFN assets rose to 3.71% from 2.5% over the same period. The SNCC's credit portfolio, meanwhile,

1 The distribution of surplus varies from one credit union to the other, according to what is defined in their bylaws –according to art. 21, IV, of Law 5.764/1971.

2 Credit unions have a differentiated stance on credit interest rates relative to banks. This is apparent in their post-new-member-capture strategies, as evidenced in the box "Credit Unions versus Private Banks: behavior after the capture of new clients" published in the 2019 Banking Report (REB), p. 177.

3 Exceptions are: (i) fundraising from municipalities, their bodies or entities and companies controlled by them; (ii) operations carried out with other financial institutions; and (iii) funds from legal entities, on an occasional basis, at favored rates or exempt from remuneration, pursuant to Complementary Law 130, of 2019.

4 For further information on the composition of the SNCC, see box "Credit Union Business Model", published in the 2019 REB.

5 In terms of adjusted total assets (ATA) and, mainly, of the credit portfolio. Despite this growth, the recession that started in 2015 affected the performance and profitability of these institutions (as shown by Cordeiro *et al.*, 2018), as a result of the increase in credit risk (and monitoring costs) (Santos et *al.*, 2020, p. 967).

6 Further details can also be found in the box on "Cooperatives' Participation in the Credit Market," published in the 2017 REB (p. 102).

went to BRL 228.7 billion (5.1% of the SFN) from BRL 95 billion (2.74% of the SFN) –an accumulated increase of 134.6%.[7] Comparing the annual growth of the SNCC credit portfolio (in December of each year) in the credit types in which it has a relevant participation with the growth of credit in the other SFN institutions (i.e. SFN excluding the SNCC) in the same types,[8] it can be seen that the growth rate was systematically higher –albeit with a similar acceleration (Figure 1).

Table 1 – SNCC and SFN

Adjusted total assets, credits and deposits

BRL billions

Variable	Dec 16	Dec 17	Dec 18	Dec 19	Dec 20
Total asset	174.3	204.9	235.7	273.9	371.8
% in SFN assets	2.50%	2.90%	3.10%	3.40%	3.80%
Classified credit portfolio	95	109.7	135	169.1	228,7
% portfolio	2.70%	3.20%	3.70%	4.40%	5.10%
Deposits	110.1	128.7	151	175.8	253.4
% SFN deposits	5.10%	5.50%	5.60%	6.10%	6.21%

Figure 1 – Growth of credit operations

SNCC x SFN

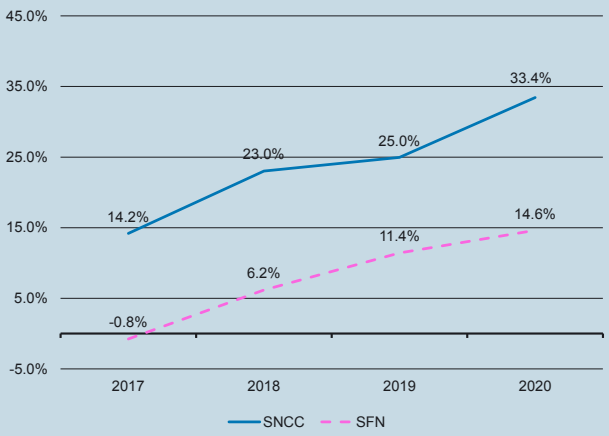
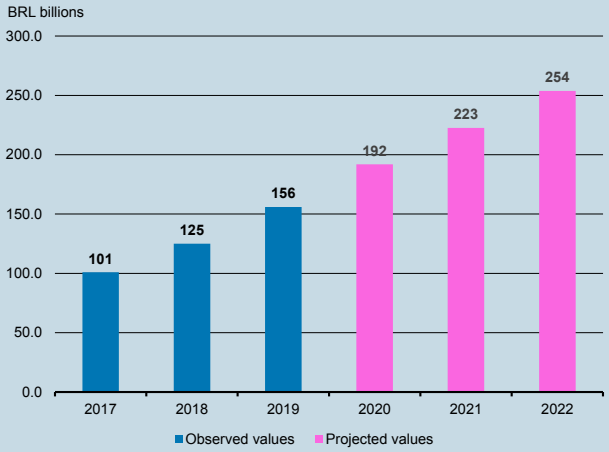


Figure 2 shows the growth projection for credit operations presented by the credit unions themselves to the BCB. It shows that the credit unions expect the growth of the credit portfolio to continue throughout the triennium, although at a lower level than that projected for 2020.

7 Throughout the text, to maintain comparability, values are presented are current prices, except when expressly pointed out. Reference date for current time is December 31, 2020. SNCC's total assets were calculated based on the combined balances of the cooperative banks, the credit confederations and the central offices of the two-tier systems and based on the individual trial balances of the independent individual banks. In the combined balances, operations performed between institutions of the same cooperative system are eliminated, which allows a glimpse of the real situation of the segment by considering only transactions performed with third parties, avoiding duplications. The information on credit operations, except when expressly stated otherwise, does not include for loan-loss provisions.

8 The credit operations considered relevant to the credit unions exclude real estate financing, export and import financing operations, as well as operations with clients with exposure above BRL 100 million, i.e., considered *corporate*.

Figure 2 – Credit projection of the credit unions affiliated to the central



This box presents a set of hypotheses on the subject, and possible explanations for this growth, which was higher than the rest of the SFN and despite the economic crisis. It also presents exploratory analyses and a literature review on the performance of credit unions during the 2008 Crisis, articles on credit unions published in the last decade in theses, journals, conferences and BCB Working Papers.[9]

In the following section, we will present descriptive data, for the five-year period considered, on the expansion of the SNCC credit portfolio, distributed by different types of operations, by types of persons (households or companies), by new and old members, and by municipalities.

1 Background and hypotheses

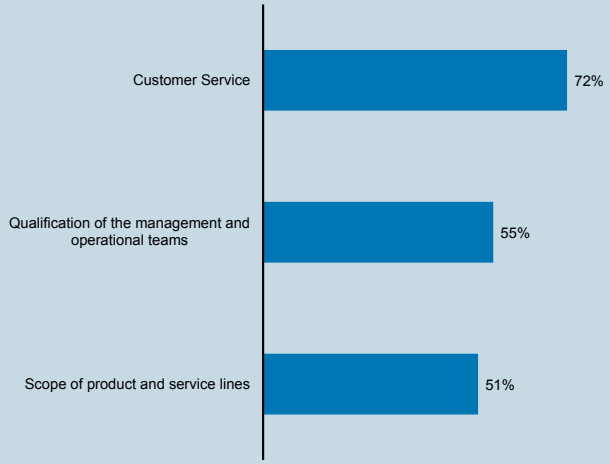
Especially after the 2008 crisis, the literature points out that credit unions tend to respond to crises differently from other institutions, such as banks (Lu & Swisher, 2020), being less sensitive to financial market volatility and business cycles and smoothing out contractionary effects during recessions (McKillop *et al.*, 2020). Analyzing data from the SNCC in the context of the 2008 crisis, Aghabarari *et al.* (2020) conclude that credit unions tend to establish fewer restrictions on credit to their members – what is called "insurance effect" – mitigating liquidity shocks, with positive effects on small and medium-sized enterprises and on the level of employment in the respective regions. Likewise, according to research by Sebrae (2020) on the impact of the Covid-19 pandemic, small businesses seeking credit had higher success rates in the cooperative systems (30% in Sicredi and 28% in Sicoob) than in the banking sector (from 12% to 26%).

Given the capital and governance structure of credit unions, where clients are also members, the organization would work to maximize not the result (by maximizing the spread – the difference between the cost of raising funds and the remuneration for credit), but the benefit delivered to its members by providing financial services, intermediating the relationship between savers and borrowers. In addition, historically, credit unions usually favor a closer relationship with members, emphasizing the common bond between them and the presence in the social life of the community, especially in cities with smaller populations (Meneghini, 2019). Figure 3 shows

9 Aggregated information from the Accounting Plan of the National Financial System (Cosif), Credit Information System (SCR), Information System on Institutions of Interest of the Central Bank (Unicad), Information on Credit Unions Relationships (Document 5300 – Census of Credit Unions Members), information collected during inspections from the Automation of Supervisory Processes System (APS), and other databases available at BCB were used for the preparation of this text. This information is the responsibility of the respective financial institutions. Open data available on the page of the Credit Cooperative Guarantee Fund (FGCoop) – fgcoop.coop.br/relatorio-timeline/relatorio-sncc was also used. The data contained in this document may differ from other publications, as well as from the information available on the BCB website, for reasons such as: delays in the delivery or substitution of documents, form of individual data aggregation, gaps or errors in filling out the information, etc.

that 72% of the credit unions consulted list service to members among their critical success factors –a much higher percentage than of the other factors.

Figure 3 – Critical success factors
According to credit unions



Thus, studies on credit cooperativism often highlight the role of the relationship with the member, sometimes linked to social relationships with emotional value (Vilanova, 2020), as well as the use of soft information (which would not be adequately captured in credit risk analysis models) by the credit union to reduce the asymmetry of information between the institution and the client and the conflict of interest between savers and borrowers.[10] In this way, the credit union could select borrowers that are less likely to default, reducing the effects of adverse selection and hence the costs of the credit transaction (Mckillop *et al.*, 2020, pp. 2 and 4). In fact, the SNCC has generally offered lower rates than the SFN average (Annibal & Koyama, 2011) and, according to the responses given to the BCB by the individual credit unions affiliated to central credit unions, the offer of lower rates (91% of the responses) and the expectation of the distribution of surpluses (85% of the responses) would be their main competitive advantages[11] – derived from the privileged relationship between credit unions and members.

Another factor that has contributed to the growth of the credit cooperativism in Brazil is its special relationship with the agricultural sector. Due to exports, this sector tends to be favored by currency devaluation and the appreciation of commodity prices (Fernandez, 2020). In this sense, GDP of agribusiness (measured by Cepea, 2020) and GDP of the Agriculture and Livestock sector (measured by Ipea, 2020) at constant prices had a sustainable growth, despite the economic crisis, being less impacted than other sectors by the 2020 crisis. Credit unions tend to be concentrated in the country's interior and in rural areas (Annibal & Koyama, 2011), having a positive effect on the economy of municipalities in these areas (Jacques & Gonçalves, 2016). The SNCC accounts today (Dec/2020) for 20.26% of rural financing in the SFN (against 9.5% in Dec/2016), remaining the main credit type for individuals (in volume) in credit unions – in contrast with a downward trend, in real values and in the number of contracts, among the commercial banks (Assunção, Costa & Souza, 2020), which indicates that the SNCC has replaced the banking sector in the supply of this product.

Furthermore, the constant improvement of the regulatory framework has driven the maturation of the sector in recent years. As discussed in section 4, a reduction in the number of individual institutions occurred, driven

10 Whether a credit union is "neutral," or favors savers or borrowers, may vary by institution and context (McKillop, 2020, p. 5). In Brazil, Mercer, Póvoa, and Piccoli (2020) infer that 78.3% of the credit unions favor borrowers, particularly when interest rates are high; although Bressan *et al*. (2013) conclude along the same lines, they calculate that the amount of deviation from "neutrality" would be much smaller.

11 The distribution of the surplus (which, as highlighted in the introduction, is distinct from the concept of *profit* –since credit unions are not-for-profit companies) to the member is a cooperative act– i.e., a legal transaction between the credit union and its member for the achievement of its social objectives, as defined in article 79 of Law 5.764/1971. As such, it enjoys differentiated tax treatment, pursuant to article 146, paragraph III, line "c" of the Federal Constitution –including exemption from Corporate Income Tax (IRPJ) and Social Contribution on Net Income (CSLL).

by mergers and acquisitions (M&A) in the sector, leading to scale gains and the absorption of less efficient institutions in the market (Dos Santos & Costa, 2020; Prolo Jr., 2019) – with no direct loss to members. Some regulatory changes that occurred in the last decade (as already mentioned in REB 2019) are worth mentioning, such as the creation of FGCoop, created by CMN Resolution 4,150, of October 30, 2012,[12] the creation of the Cooperative Audit (CMN Resolution 4,454, of December 17, 2015) and a new regulatory basis for the SNCC (CMN Resolution 4,434, of August 5, 2015) – giving rise to fewer restrictions regarding the area of operation and the criteria for free admission membership. Today, 51% of the total number of individual credit unions offer free admissions and concentrate 86.4% of the segment's ATA.

In addition, the sector has invested in digital insertion (following a trend already present in the rest of the financial sector). Digital service channels already concentrate most transactions, and investment in technological infrastructure is a prominent item in the combined financial statements of the two main three-tier systems, Sicredi and Sicoob – which account for 85% of the SNCC's ATA. This insertion allows for the expansion of the products and services offered to members, as we mentioned in section 3 of the box. In addition, it allows the reduction of transaction costs (Caraffini, 2020) and the application of analytical tools for credit analysis and granting. This is in line with experiences reported in the literature regarding credit union systems in other countries, where credit unions with web applications tend to offer more convenient services, without negative impact on the customer (Pana, Vitzthum & Willis, 2015) and with reduced spreads (Quinn, 2015). Moreover, digitalization expands the possibilities of communication with members (Poitevin, 2017) and makes it possible for them to participate remotely (Viana, 2018) – which spread due to social distancing measures in 2020, when general meetings could be held on-line, with explicit authorization from Law 14.030 of July 28, 2020. While these changes allow for further expansion of credit unionism, it is still an open question how this will impact the notion of common bonds in the future – which, as we mentioned above, is at the basis of cooperativism (Mckillop, 2020).

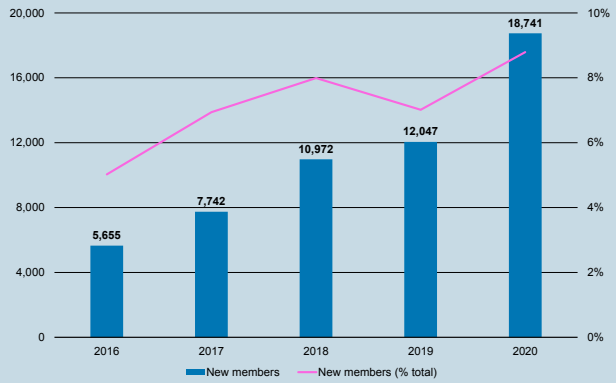
2 Credit growth by member and credit type

New members

As of December 2020, SNCC had 11.9 million members (an increase of 9.4% over 2019 and 42.1% over 2016) -of which 10.2 million are households and 1.7 million are companies. Figure 4 shows that the share of new members (considered those with less than one year of membership) in SNCC's Outstanding Credit Portfolio increased proportionally until 2018, reaching a peak of 8% (BRL 11 billion). After this peak, the expansion of credit among long-time members was greater than among new members. Today, the latter account for 8.8% of the portfolio (BRL 18.7 billion). Therefore, the growth of the credit portfolio is not only due to short-term expansions in the member base (i.e. lending to new members). This is consistent with the emphasis on member relations referred to in the cooperativism literature.

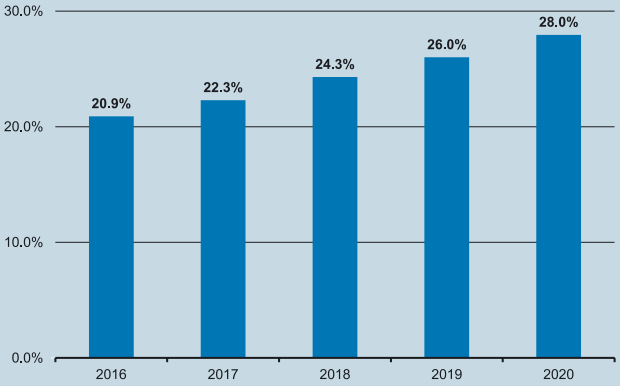
12 Depositors in credit unions and cooperative banks are guaranteed by FGCoop up to BRL 250 thousand in case of intervention or extra judicial liquidation –that is, with rules similar to the SFN's Credit Guarantor Fund (FGC).

Figure 4 – Share of new members in the balance of credit operations
BRL millions



Similarly, the expansion of the participation of cooperative credit remains when the total credit taken by member in the whole SFN is considered. When we consider the types in which the SNCC has a relevant share and competes with other segments, the participation of the cooperative credit in the total credit taken by its members jumped from 20.9% to 28% in the period (Graph 5).

Figure 5 – Share of SNCC in total credit taken by members



The data presented in the last two graphs are in line with one of the goals set for credit cooperativism in the BC# Agenda. In 2019, when the BC# Agenda was launched, the sector committed to expand the supply of credit to its associates, to reach 40% of their total volume of operations in the credit types considered relevant. There is still room to advance in the supply of credit to members, since, in December 2020, most members had no outstanding credit in the relevant credit types in the SNCC (although they had social capital and enjoyed other services) and, of 24.9% of them (3 million members) took credit only in other institutions.

Growth by credit type

A changing trend in the profile of the SNCC credit portfolio can be observed. In the five-year period, although the household portfolio has increased 108.2% (from BRL 64.37 billion to BRL 134 billion), credit granted to companies grew 142.7% (from BRL 35.51 billion to BRL 83.64 billion), representing 39% of the credit portfolio by the end of 2020. In December 2020, the main household credit type was still rural credit, whose balance represented 36.9% of the household credit granting, followed by personal loans (with and without consignment), with a 30.3% share.

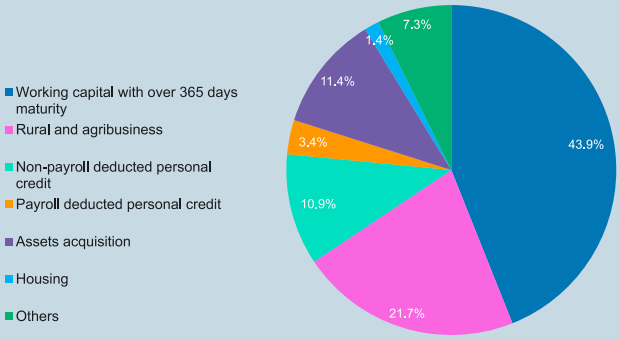
Small and medium-sized companies account for 93.5% of the credit granted to companies (PJs). The long-term working capital type continues to account for most of the PJ portfolio, growing from BRL 15.58 billion to BRL 55.2 billion. Working capital with a maturity of more than one year is one of the types that grew more in the period (Table 2), accounting for 43.9% of the SNCC portfolio growth in the last year (Figure 6).

Table 2 – Main types

Balance and growth in the period — BRL millions

Types	Dec 20	5-yr change	2020 change
Housing loans – Except SFH	574.59	782%	182%
Home Equity	1,202.65	1081%	59%
Assets acquisition – other assets	11,832.48	187%	49%
Payroll-deducted personal credit	14,110.90	129%	17%
Non-payroll-deducted personal credit	27,862.64	104%	28%
Assets acquisition – motor vehicles	11,832.48	187%	31%
Rural and agribusiness	60,520.25	198%	26%
Working capital with over 365 days maturity	55,247.10	297%	87%

Figure 6 – Credit growth of individual credit unions
Proportional to each modality - in 2020



Furthermore, as mentioned in section 1, the expansion trend of rural credit in the SNCC is confirmed, as shown in Table 3, in which we compare the change in the Rural Financing balances (Cosif account 1.6.3.00.00-0[13]) in the Banking sector (B1 and B2[14]) and in the SNCC over the last five years.

Table 3 – Rural loans: SNCC and banks

Balance at Cosif account 1.6.3

BRL millions

Date	Banks	Annual change	SNCC	Annual change
Dec 16	288,315.08		30,295.78	
Dec 17	252,212.55	-12.50%	34,584.73	14.20%
Dec 18	266,268.86	5.60%	41,171.22	19.00%
Dec 19	267,370.91	0.40%	48,622.37	18.10%
Dec 20	299,079.18	11.86%	60,591.17	24.62%

13 This account covers credit unions with resources of specific destination, according to the Rural Credit Manual (MCR). Rural producers, however, may decide to finance the investment and the funding of production in other ways -including outside the banking sector and the SNCC. Furthermore, this item refers to information different from that used in the table above on growth by types, which uses SCR data corresponding to sub-types of rural credit to households granted by individual credit unions.

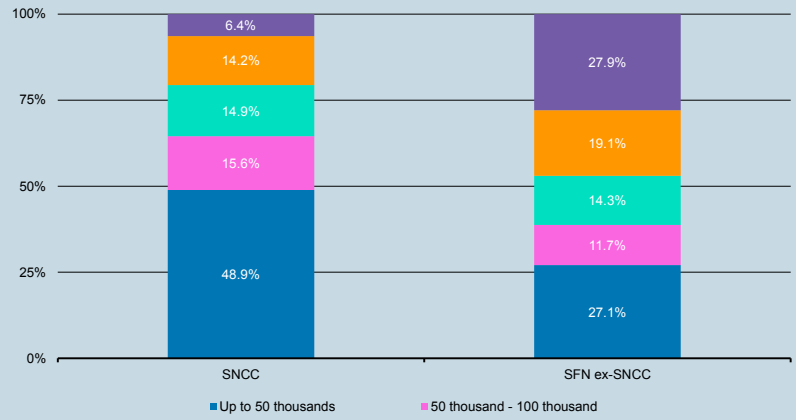
14 The segment (b1) includes commercial banks, multiple banks with commercial portfolio and savings banks; (b2) multiple banks without commercial portfolio and investment banks; (b3) credit unions; (b4) development banks; and (n1) non-banking credit institutions.

SNCC geographic distribution

Historically and geographically, the credit union movement has expanded from small municipalities of the South region to more densely populated areas, also spreading to the Southeast and Central-West regions. More recently, it reached the North and Northeast regions. Currently, 94% of the municipalities in the South are served by individual credit unions, compared to 27.6% in the North, 11.5% in the Northeast, and a national average of 49.7%. Also, 3.8% of the national municipalities are served exclusively by credit unions, i.e., they do not have bank branches (although banking services provided by correspondents maybe available).

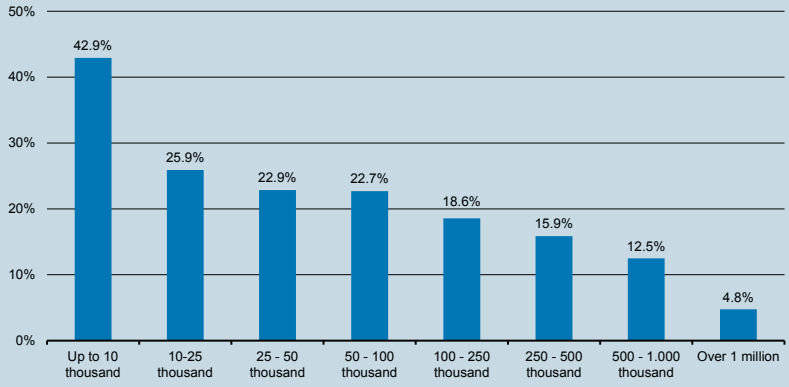
Another important characteristic that differentiates the SNCC is its concentration according to the size of the municipality. While the SNCC, in December 2020, concentrated its portfolio in municipalities with up to 50 thousand inhabitants (48.8% of the relevant portfolio), the rest of the SFN presents a greater representativeness in metropolitan regions with more than 1 million inhabitants (28% of the relevant portfolio) (Figure 7).

Figure 7 – Distribution of the credit portfolio
By municipality population range



According to Bustos, Garber, and Ponticelli (2016), the banking system in general, aiming to maximize return, reallocates capital from sectors and regions with productive surplus – such as the agricultural sector of the interior of Brazil – to investments in other areas. The SNCC, on the other hand, according to its peculiar mutualist philosophy and its geographical distribution (Mckillop *et al.*, 2020), keeps the surplus relevantly in the same region, thus having a much greater impact on the economy of smaller municipalities. As Figure 8 shows, 42% of credit in municipalities with up to 10,000 inhabitants is provided by credit unions – compared to 4.7% of credit in municipalities with more than 1 million inhabitants (considered the relevant portfolio).

Figure 8 – Market share of credit unions
By municipality population range

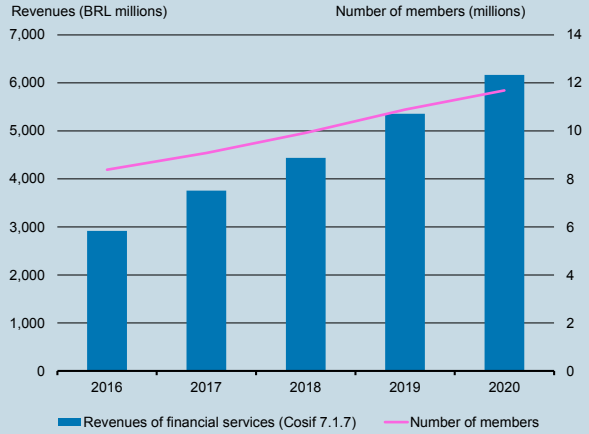


3 Trends in the expansion of the credit union sector

As presented above, the growth of the cooperative sector does not stem only from specific macroeconomic conditions (such as the 2020 crisis) or effects such as those of recent digital insertion (in the wake of the banking sector), showing a long-term trend: from December 2011 to December 2015, its total credit balance increased from BRL 47.04 billion (2.43% of the SFN) to BRL 102.37 billion (3.23% of the SFN).

Moreover, the observed growth occurs not only in the credit portfolio, but also in other services offered to members – provided directly by individual credit unions (banking and financial intermediation services, such as checking account, payment services, deposits, etc.) or provided by entities belonging to the same system or agreements (such as the distribution of securities, consortiums, insurance, investment funds, credit card issuance, etc.). The literature indicates that diversification of products and services positively impacts the efficiency of these institutions (Santos *et al*., 2020, p. 967). Credit unions increase their chances of retaining their old members and attracting new ones by offering a range of financial services (including credit types in which SNCC participation is still insignificant, such as real estate financing and home equity). Figure 9 illustrates this trend, showing the evolution of service revenues, which generally accompany the growth in the number of members.

Figure 9 – Evolution of revenue by services provided



Deposits

At the end of 2020, deposits accounted for 87.3% of SNCC's funding, and were the main source of funds to finance the credit portfolio. The research of Carvalho *et al.* (2013) indicates that an increase in deposits has a negative correlation with the probability of a credit union exiting the market (either through liquidation or M&A). As seen in Table 1, cooperative deposits increased 130% over the past five years (from BRL 110.1 billion to BRL 253.4 billion) – and their share of total SFN deposits went from 5.1% to 6.28%. As a response to the pandemic crisis, balance of deposits over 2020 increased sharply (also observed in the banking sector) – when members exchanged positions in variable income (such as stocks or stock mutual funds) for time deposits and savings.

Cooperative deposits became a safer investment with the creation of FGCoop (which started operating in 2014), since they began to be guaranteed up to a limit of BRL 250,000 per member.

Table 4 – FGCoop covered deposits

Year	Number of depositors (thousands)		Guaranteed value (BRL millions)	Depositors fully covered	(%) guaranteed deposits
	ı to BRL 250 thousand	Over BRL 250 thousand			
2016	8,161.00	54.6	65,188.30	99.30%	67.80%
2017	9,634.10	71.5	80,354.00	99.30%	67.20%
2018	11,270.40	87.9	98,242.40	99.20%	66.20%
2019	12,177.80	101.3	111,880.90	99.20%	64.90%

Source: FGCoop

4 Gains in scale: mergers and acquisitions and expansion of the scope of operations

The reduction in the total number of institutions (mainly due to M&A) and the increase in the number of institutions that choose to expand their scope of action (becoming full credit unions, for example[15]) or their membership criteria (becoming, for example, free admission credit unions[16]) are other trend related to the expansion of the SNCC. Table 5 shows that in the last five years the total number of individual credit unions decreased from 1,019 to 847 (-16.9%) – without prejudice, however, to the capillarity of the SNCC, which increased the number of Service Points (PAC) from 4,681 to 6,280 (+34.2%). In the same period, free admission credit unions went from 328 to 438 (+33.5%), representing today 51.7% of the individual institutions.

Table 5 – Credit unions by membership criteria and category

Compared to the total PACs

Criteria / Category	Dec 16	Dec 17	Dec 18	Dec 19	Nov 20	5-yr change
Free admission	328	343	372	413	438	33.50%
Rural producer	181	114	88	48	36	-80.10%
Mutual credit	510	512	467	414	373	-26.90%
Full	38	38	36	36	70	84.20%
Classic	791	739	704	658	613	-22.50%
Capital and loans	190	192	187	181	173	-8.90%
Total number of individuals	1019	969	927	875	847	-16.90%
Total number of PACs	4681	4929	5385	6045	6280	34.20%

Although, as to the category, classic institutions remain the majority, with 613 institutions (72.4% of the total), the tendency is for their number to decrease as they choose to become full credit unions. Institutions in this category tend to be larger and currently account for 38.8% of the volume of credit granted by singular credit unions (of BRL 181.2 billion), against 60.3% for classic credit unions.

The reduction in the number of individual credit unions, with no decrease in the number of service points, is a consequence of the fact that, instead of closing activities, most of these institutions were merged with larger ones (Table 6). In most cases, although there is no continuity risk for the merged company, the merger

15 Full credit unions can perform all operations available to credit unions, while traditional credit unions cannot deal foreign currency, nor operate with foreign exchange variation or with derivatives. In turn, capital and loan credit unions cannot take deposits from members, and their funding comes only from share capital or loans and onlendings from other entities.

16 CMN Resolution 4,434/2015 (which fully revoked CMN Resolution 3,859, of May 27, 2010) did not distinguish the types of credit unions by membership criteria. Their types are determined by each entity bylaws (according to art. 16 of the resolution). Thus, we adopted the classification contained in REB 2019 and *Panorama of Cooperativas* (Credit Unions Panorama - BCB, 2020): rural credit unions (whose household and company members focused on agricultural or extractive activities), free admission credit unions (for members of any economic activity), and mutual credit unions (for professionals from specific sectors or a particular economic category, such as entrepreneurs or workers from the same sector, civil servants, liberal professionals, etc.).

enables scale gains and, consequently, benefits for the membership. In cases where the merged company has a deteriorated economic-financial situation (such as being out of compliance with the operational limits defined by regulation), the merger allows the less efficient institution to be absorbed by larger credit unions, avoiding the interruption of service provision (as would occur with the dissolution of the company) and the risk to its creditors (including depositors).

Table 6 – Closed credit unions

Annual data

Cause	2016	2017	2018	2019	2020
Incorporation	40	47	36	46	30
Normal liquidation	4	2	4	6	1
BCB's initiative	2	1	0	0	0
Other	1	3	2	1	2
Total	47	53	42	53	20

Central credit unions play a fundamental role in merger processes, either by cost-benefit analysis in cases where the corporate alteration is aimed at gains of scale, or by acting as Auxiliary Supervision (under Complementary Law 130/2009) in cases of risk to the continuity of the business – thus avoiding a risk to the image of the respective system and the SNCC. In these cases, the FGCoop also stands out, which, besides providing guaranty to the deposits and monitoring the economic and financial situation of the individual credit unions, can also perform reorganization operations, financing the recovery (or M&A) of credit unions at risk of discontinuity.

This shows how credit unions "mutually cooperate" -an example of what has been called "*coopetition*" in the financial system, also observed in the cooperation between smaller institutions, such as Fintechs, and larger banks (Fonseca & Meneses, 2020). In the case of credit unions, the corresponding gains in scale and specialization resulting from this cooperation allow for greater competition among the different systems and in relation to the rest of the SFN. However, as mentioned earlier, in addition to competition, the prices charged by credit unions for their main services (credit and deposits) are also influenced by their governance and their membership structure –since members have incentives to minimize the spread.

5 Conclusion

Although the credit union movement still constitutes a relatively small part of the SFN, whose assets are concentrated in a small number of banking institutions, the continuous growth of the SNCC suggests that, in the future, credit unions may have a prominent place, as in countries like France, Canada and Portugal. In this box, we present the evolution of credit cooperativism in Brazil in recent years and analyze possible hypotheses for the phenomenon. It shows how capital structure and business models characteristic of credit unions may explain a different performance from the rest of the financial system during recessions, reinforcing the thesis that these institutions provide to members a form of "insurance effect" (Aghabarari et al., 2020). Furthermore, as for Brazil, the internalization of the cooperative movement, its regional character and its connection with agribusiness are factors to be considered in any model that seeks to explain this phenomenon.

The analysis indicates that there is still room for credit growth in the sector –either by expanding the relative share of credit taken among its members in the SFN, or by maintaining the expansion geographically. This expansion, in turn, will offer other challenges, such as adapting the idea of "common link" to social realities different from those where cooperativism has historically developed (i.e., the interior of the South and Southeast regions of the country), obtaining expertise in new areas and services outside the traditional scope of the business (such as real estate credit and corporate credit), and competing with institutions other than the traditional banking

system (such as Fintechs and correspondent banking). Some innovations in the industry, such as Open Banking and positive credit registries, tend to generally decrease the asymmetry of information between borrowers and institutions, and thus may reduce the comparative advantage that member relations and soft information provide to credit unions.

Finally, just as the expansion of the SNCC is due, in part, to increased digital insertion, the continuity of this growth depends on keeping up with technological changes in the SFN. For credit unions this will depend on consistent strategic planning and significant investments – and, given the associative nature of cooperative capital (and the equal division of power among members), these decisions will have to be pondered and deliberated upon by the members themselves.

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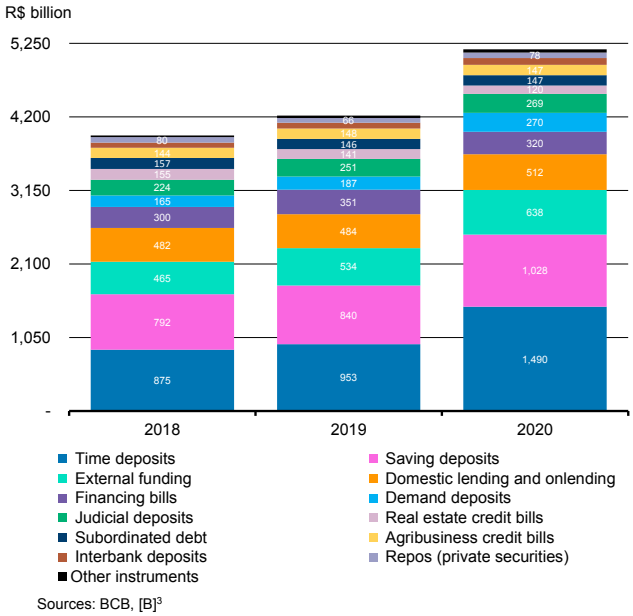
Funding

2

Figure 2.1 – Funding profile by instrument
Banking system



Sources: BCB, [B][3]

Time deposits: bank deposit certificates, bank deposit receipts, time deposits with special guarantee from the Credit Guarantor Fund (FGC). Subordinated debt: subordinated certificates of deposit , subordinated financial notes and other capital instruments. Other instruments: structured notes , bills of exchange, financial notes, mortgage notes, box spread strategies with options, secured real estate notes. Repurchase agreements: refers only to repo collateralized by private-issued securities.

2.1 Funding profile by instrument types

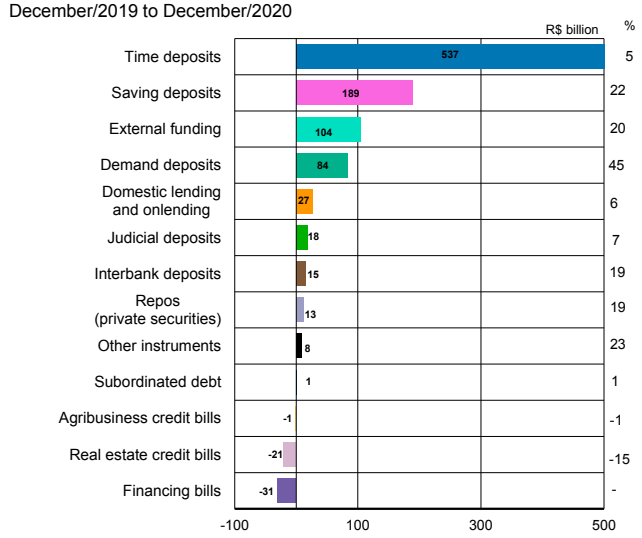
The outstanding amount of funding of the banking system grew 22% in 2020 (Figure 2.1). Funding accelerated as of mid-March when the World Health Organization (WHO) declared that the outbreak of the Covid-19 was a pandemic. Some corporate customers reacted by depositing resources withdrawn from available credit lines, a defensive behavior for strengthening cash flow amid uncertainties involving the sanitary crisis. Resources from investment funds were also withdrawn to be converted into deposits into the financial system. At the same time, the National Monetary Council (CMN) re-established the Time Deposit with Special Guaranties (DPGEs) of the Credit Guarantor Fund (FGC) without guarantees to that fund[25] and introduced the Guaranteed Financial Bill (LFG)[26] with the goal of operating the Temporary Special Liquidity Line (LTEL-LFG)[27].

In addition, other government measures contributed to increase the number of resources held by the public, such as the payment of the emergency aid, emergency withdrawals from the Employment Compensation Fund (FGTS) and the deferred schedule for the payment of taxes. Even though these circumstances impacted funding in the yearly comparison, in the last two months of the year, the pace of funding expansion was lower than in 2019.

Thus, the portfolio of time deposits rose 56% (BRL 537 billion)[28] in the year, whereas the balances of savings accounts and demand deposits grew 22% (BRL 187 billion)

25 Resolution 4,785 of March 23, 2020.
26 LFGs are incorporated in the series of financial bills in Figure 2.1.
27 Resolution 4,795 of April 2, 2020.
28 Of which BRL 516 billion corresponding to the increase of the portfolio of the Bank Deposit Certificates (CDBs).

Figure 2.2 – Funding instruments – Outstanding amount variation
December/2019 to December/2020



Sources: BCB, [B][3]

Time deposits: bank deposit certificates, bank deposit receipts, time deposits with special guarantee from the Credit Guarantor Fund (FGC). Subordinated debts: subordinated certificates of deposit , subordinated financial notes and other capital instruments. Other instruments: structured notes , bills of exchange, financial notes, mortgage notes, box spread strategies with options, secured real estate notes. Repurchase agreements: refers only to repo collateralized by private-issued securities.

Figure 2.3 – Saving deposits
Outstanding amount variation breakdown

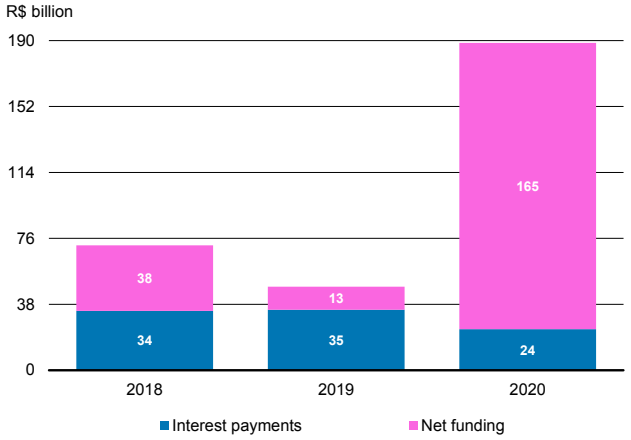
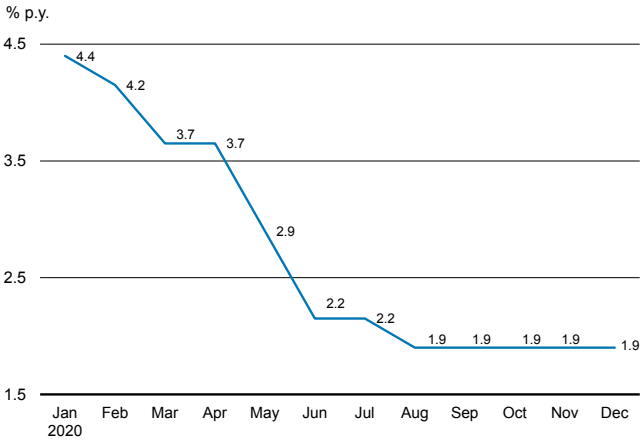


Figure 2.4 – Evolution of average pre-fixed rate (overnight) of the DI



Source: [B][3]

and 45% (BRL 84 billion), respectively (Figure 2.2). Repo operations backed by private securities, domestic borrowing and onlending, judicial and interbank deposits also followed a positive trajectory. The expansion of 20% in the portfolio of external funding remained below the variation of the exchange rate BRL/USD (29%) in the year, indicating that the stock increase did not represent inflows of new resources. The stock of Real Estate Credit Bills (LCIs) fell 15%, the worst performance among funding instruments, whereas the portfolio of financial bills decreased 9% because of the reduced demand from investment funds. The introduction of the guaranteed type, for which the stock reached BRL 68 billion in December 2020, contributed to smooth the decline in the portfolio of financial bills in 2020.

Savings accounts registered positive net inflows for the fourth consecutive year. The breakdown of the aggregate balance variation for 2020 reveals a decline of earnings in the year, but a sharp increase of annual net funding, the peak of the time series (Figure 2.3).

2.2 Funding rates

Reflecting the monetary policy operation, the Interbank Deposit (DI) dropped sharply in 2020, reaching new historical lows (Figure 2.4). On the other hand, funding rates as a proportion of the interbank rate rose in the first half of the year and stabilized at higher levels afterwards, except for the rates of the S4 segment, for which the upward trend persisted throughout the year (Figure 2.5).[29, 30] Since part of the funding amount is maintained in high liquidity assets for meeting the financial system cash requirements, one consequence of the increased rates expressed as a percentage of the interbank rate is a rise in the carrying costs of this funding type, for which the remuneration is close to the Selic rate.[31]

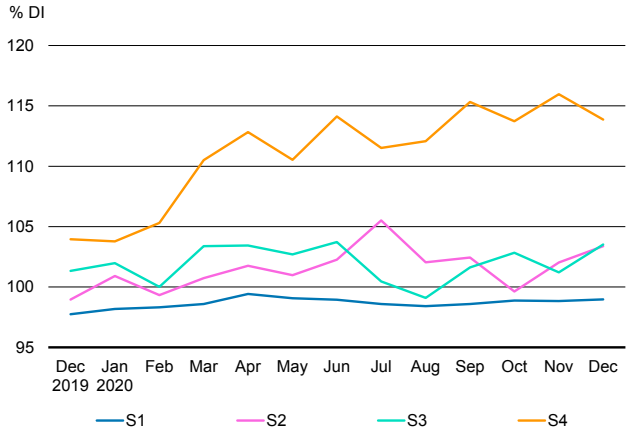
The stabilizing trend of rates is clearer in the case of CDB, except, again, in the S4 segment, for which the upward trend persisted throughout the year (Figure 2.6). For all segments, the average funding rates of CDBs,

29 Unlike in the previous Banking Report, repo operations backed by private securities are not included in the series of Figure 2.5, given the increase in its usage. LFGs are not included in the series of Figure 2.5.

30 S1 to S4 refer to the segments of the set of financial institutions and other institutions authorized to operate by the BCB, in compliance with the proportional application of the prudential rule, pursuant to Resolution 4,553, of January 30, 2017.

31 Occasional divergences between the paths of the series in Figure 2.4 and the paths in Figures 2.5, 2.7 and 2.8 are explained, as a rule, by the somewhat significant participation of data from other instruments in the composition of rates.

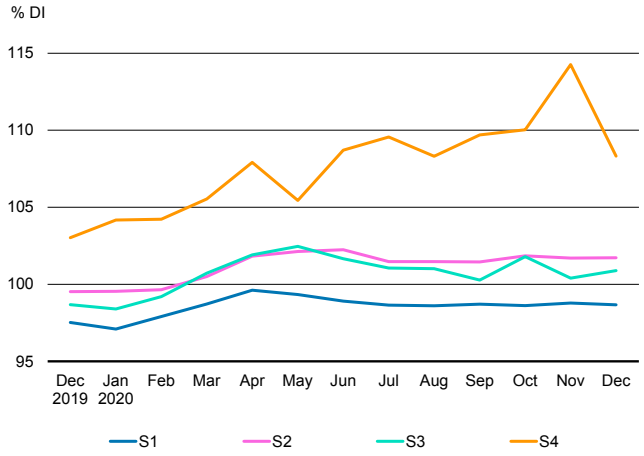
Figure 2.5 – Average funding rates in percentage terms of the DI by segment (*)



Sources: BCB, [B]3

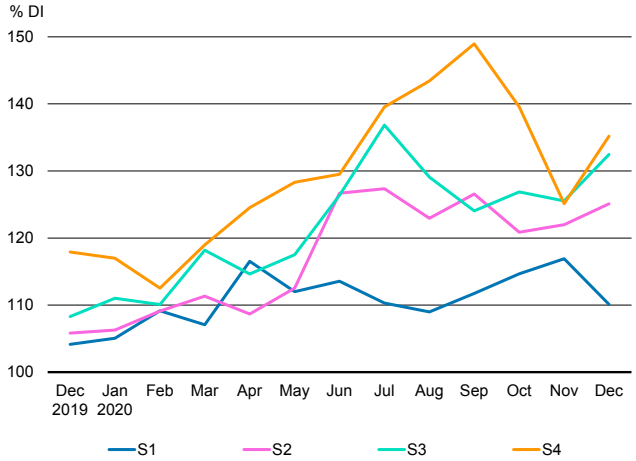
(*) Weighted average rate of the following instruments: bank deposit certificates, bank deposit receipts, time deposits with special guarantee from the Credit Guarantor Fund (FGC), interbank deposits, agribusiness credit bill, real state credit bills, financing bills (includes subordinated financial notes), secured real estate notes and repo collaterized by private-issued securities.

Figure 2.6 – Average funding rates in percentage terms of the DI by segment
Certificates of Deposit – CDBs



Sources: BCB, [B]3

Figure 2.7 – Average funding rates in percentage terms of the DI by segment
Financial bills



Sources: BCB, [B]3

as a proportion of the interbank rate, closed 2020 at higher levels than in the beginning of the year. Although the average funding rates of financial bills with no subordination clause increased in 2020, they closed the year with average rates lower than the maximum rates registered in the year for all segments, thus suggesting improved funding conditions for this instrument at the end of the year (Figure 2.7). In the case of Agribusiness Credit Bills (LCAs) and LCIs (Figure 2.8), the upward paths are more homogeneous among segments and persisted throughout the year as a longer growth trend. The series of segments S3 and 4 present higher volatility because the funding frequency of these segments is lower and, mainly, because global financial institutions or those linked to global economic conglomerates are classified within these segments and their funding rates are compatible with the risk profile of their headquarters abroad. These rates are generally lower than those practiced by other financial institutions composing the respective segments. Specifically for 2020, volatility was also observed in the S2 segment.

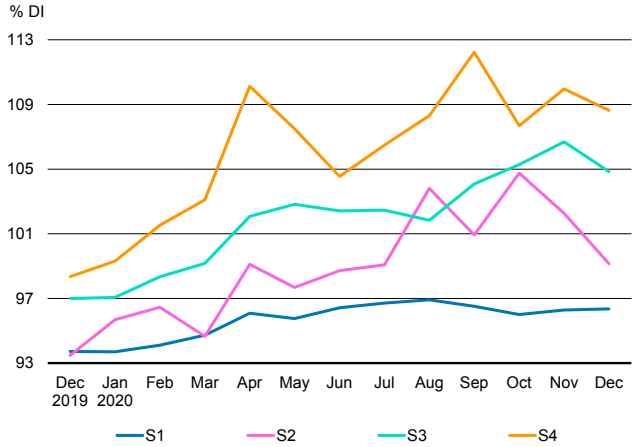
2.3 Investor type

Households and corporations not classified as institutional or non-resident investors remain as the main source of funding for the banking system. Their participation expanded from 64% of the total funding, in December 2019, to 68% in December 2020. Non-resident and public[32] sector complete the relevant funding sources for the banking system, with a combined participation of nearly 12% in December 2020. In the year, the increase in the corporate portfolio was mostly due to the corporate strategy of keeping resources available, as described above (Figure2.9).[33]

32 Mostly corresponding to the intermediation of financing from governmental programs or credit lines (Housing, Rural Credit, Machinery and Equipment, Urbanization, Innovation etc.). As of the base-date of June 2020, also includes the LFGs held by the BCB.

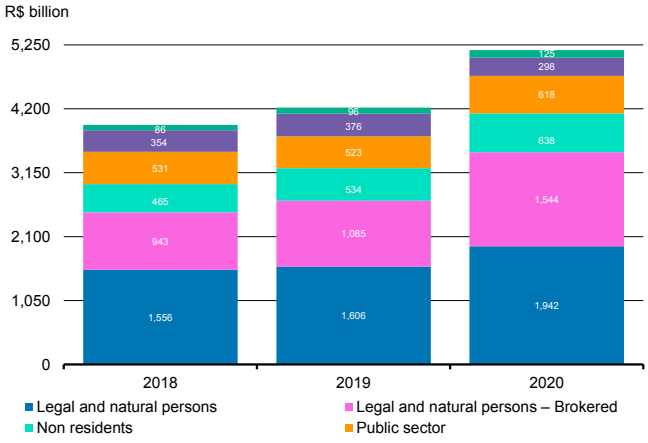
33 The distribution of judicial deposits between households and corporations was estimated by applying to cash deposits the same percentage obtained for the aggregate portfolio of instruments for which the BCB has available information.

Figure 2.8 – Average funding rates in percentage terms of the DI by segment
Agribusiness credit bills (LCAs) and real estate credit bills (LCIs)



Sources: BCB, [B]³

Figure 2.9 – Banking funding profile
By investor type

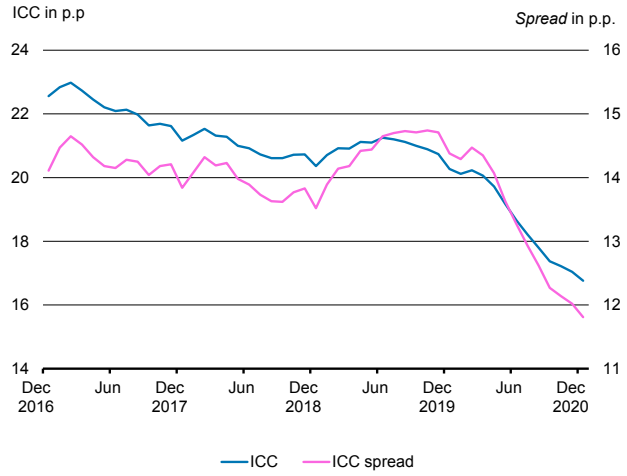


Sources: BCB, [B]³

Credit Cost and Spread Decomposition

3

Figure 3.1 – ICC and its spread



This chapter presents the decomposition of credit cost in Brazil, as measured by the Average Cost of Outstanding Loans (ICC), published by the Banco Central do Brasil (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.[34] Therefore, the ICC includes information from recent contracts and previous contracts still in force.

In line with several measures aimed at monetary easing and credit stimulus adopted in the context of fighting against the effects of the Covid-19 pandemic, the ICC dropped sharply in 2020, closing the year at 16.8%, compared with 20.3% at the end of 2019 (Figure 3.1).

The ICC spread is obtained by excluding from the ICC the share corresponding to the funding cost. In 2020, the ICC spread also declined significantly, from 14.4 p.p., at the end of 2019, to 11.8 p.p. at the end of 2020. This trajectory mostly reflected the sharp decreased in the ICC in the period, in face of a more moderate decline of financial institutions' funding cost.

3.1 ICC decomposition

The ICC decomposition aims to identify and measure the main determinant factors of borrowers' credit cost.[35] Table 3.1 presents the items used in the decomposition[36],

34 For methodological details on the ICC estimation, please see BCB Technical Note 45, "*Indicador de Custo de Crédito*", June 2018.

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

36 In 2020's decomposition some improvements were made to calculations, aim at (i) reflecting the increase from 15% to 20% of the Social Contribution on Net Income (CSLL) for financial institutions, as of March 1, 2020; and ii) the substitution of the account 8.1.9.55.00-2 by the account 9.0.9.72.20-3 in calculations involving interest on equity.

Table 3.1 – ICC decomposition

p.p.

Item	2018	2019	2020
A.1 – Average ICC	20.92	20.93	18.47
A.2 – Adjustment by capitalization method	1.77	1.77	1.40
A – Adjusted average ICC (A.1 - A.2)	19.15	19.16	17.07
B.1 – Funding costs	7.03	6.46	5.36
B.2 – Adjustment by capitalization method	0.21	0.18	0.12
B – Adjusted funding cost (B.1 - B.2)	6.82	6.28	5.24
C – *Spread* (A - B)	12.33	12.88	11.83
D – FGC expenses	0.05	0.04	0.05
E – IOF	0.42	0.40	0.23
F – PIS and Cofins	0.51	0.53	0.50
G – Administrative Expenses	3.69	3.81	3.46
H – Estimated loss	3.15	3.00	2.75
I – Interest not received in operations overdue for 6 or more days	0.79	0.73	0.56
J – Discounts granted	0.25	0.28	0.31
K.1 – Interest paid to equity owners received by equity holders	0.36	0.58	0.39
K.2 – IRRF levied on interest paid to equity owners	0.06	0.10	0.07
K – Expenses with interest paid to equity owners (K.1 + K.2)	0.42	0.68	0.46
L – ICC margin before IR and CSLL (C - D - E - F - G - H - I - J - K)	3.06	3.41	3.50
M – IR and CSLL	1.38	1.36	1.55
N – ICC Financial Margin (L - M + K.1)	2.05	2.62	2.35

which is carried out for average adjusted ICC, calculated by using a capitalization method adjustment. These items are grouped into five components, as follows (between brackets, the corresponding lines in the table).

1) Funding Cost (B): estimates the interest paid by financial institutions on their funding, as in the case of time deposits;

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

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)[37] and withhold the

37 It should be mentioned that the CSLL rate of 20% effective in 2017 and 2018 was reduced to 15% for the entire 2019 and January and February 2020. As of March 2020, the CSLL rate returned to 20%.

Table 3.2 – Adjusted average ICC decomposition

p.p.

Item	2018	2019	2020	Average
1 – Funding costs	6.82	6.28	5.24	6.11
2 – Deliquency	4.19	4.01	3.62	3.94
3 – Administrative Expenses	3.69	3.81	3.46	3.65
4 – Taxes and FGC	2.42	2.43	2.40	2.42
5 – ICC Financial Margin	2.05	2.62	2.35	2.34
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	19.17	19.16	17.07	18.47

Table 3.3 – Adjusted average ICC decomposition

as share % of the adjusted average ICC

Item	2018	2019	2020	Average
1 – Funding costs	35.58	32.78	30.70	33.02
2 – Deliquency	21.86	20.93	21.21	21.33
3 – Administrative Expenses	19.25	19.89	20.27	19.80
4 – Taxes and FGC	12.62	12.68	14.06	13.12
5 – ICC Financial Margin	10.69	13.67	13.77	12.71
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	100.00	100.00	100.00	100.00

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;[38] and

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

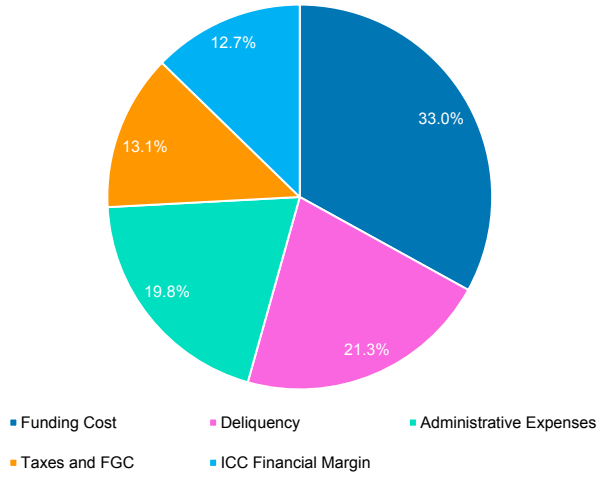
In 2020, all ICC components contributed to a sharp decline of nearly 2.1 p.p. in comparison with 2019 (Table 3.2). The main factor underlying the ICC decline was the funding cost (-1.04 p.p.), followed by delinquency (-0.39 p.p.), administrate expenses (-0.35 p.p.), financial margin (-0.27 p.p.), and, finally, taxes (-0.03 p.p.). The decline of the funding cost was due to the monetary easing. The Selic target rate, after remaining stable at 6.50% p.a. from March 2018 to July 2019, started to follow a downward trajectory, further intensified by the outbreak of e Covid-19 pandemic, reaching 2.00% p.a. in August 2020.[39] Delinquency, despite a 4.1% decline in the Gross Domestic Product (GDP) in 2020, followed a quite stable trajectory in view of several measures adopted with the purpose of mitigating the effects of the pandemic, including renegotiations of credit contracts. The contribution of Administrative Expenses in percentage points also declined, as well as of the Financial Margin. The contribution of the component Taxes and FGC remained practically stable. If, on the one hand, the reduction of the IOF rate in the context of measures for fighting against the pandemic effects contributed to the decline of this component, on the other, the increase in the CSLL rate from 15% to 20% as of March 2020 had the opposite effect.

When the percentage participation of different ICC components is considered, it is notable the decline in the participation of the item Funding Cost, although it still represents the main component (Table 3.3). Considering

38 For further details on the institutions associated to the Credit Guarantor Fund (FGC), collaterals offered, value, please visit https://www.fgc.org.br/.

39 The Funding Cost declines more slowly than the Selic rate for two reasons: i) the measure captures the funding costs valid at the credit granting; and ii) a significant amount of the funding is paid interest based on rates that have low sensitivity to the Selic rate (for instance, the return on savings when the Selic rate is greater than 8.5%, which, does not occur since September 8, 2017) or is not paid (cash deposits). Box 5 of Banking Report 2017 shows details on the procedures adopted to perform the funding costs calculations.

Figure 3.2 – ICC decomposition
Average from 2018 to 2020



the average for the period 2018-2020, a more stable and less subject to cyclical components, Funding Cost contributed with 33.0% of the ICC decomposition (Figure 3.2). It was followed by Delinquency (an average of 21.3%), Administrative Expenses (an average of 19.8%), Taxes and FGC (an average of 13.1%) and, finally, ICC Financial Margin (an average of 12.7%). In addition, one may observe that, except in 2019, when the component ICC Financial Margin was nearly 1 p.p. above the component Taxes and FGC, the order of components remained practically stable in the three years under analysis.

The ICC decomposition for the non-earmarked and earmarked portfolios reveals that the average ICC continues significantly lower for the earmarked credit,[40] reflecting the ceiling imposed on rates due to specific regulations, as well as all its components (Table 3.4 and Figure 3.3). Similarly to previous years, the financial margin of the earmarked credit remain around zero.

Table 3.4 – ICC decomposition by type

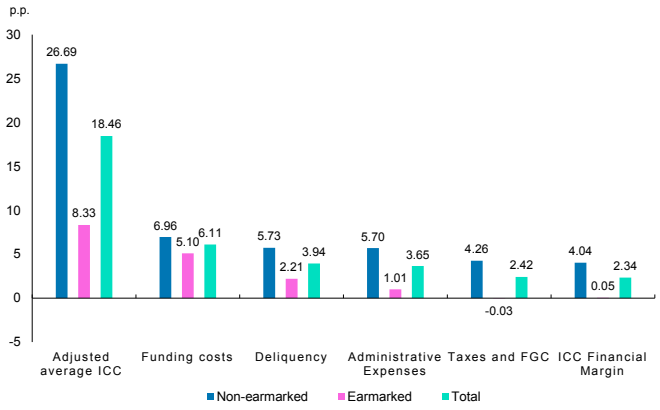
Average from 2018 to 2020 in p.p.

Item	Non-earmarked	Earmarked	Total
A.1 – Average ICC	30.25	8.66	20.11
A.2 – Adjustment by capitalization method	3.56	0.33	1.65
A – Adjusted average ICC (A.1 - A.2)	26.69	8.33	18.46
B.1 – Funding costs	7.19	5.22	6.28
B.2 – Adjustment by capitalization method	0.23	0.12	0.17
B – Adjusted funding costs (B.1 - B.2)	6.96	5.10	6.11
C – Spread (A - B)	19.74	3.23	12.35
D – FGC expenses	0.05	0.02	0.05
E – IOF	0.61	0.03	0.35
F – PIS and Cofins	0.81	0.13	0.51
G – Administrative Expenses	5.70	1.01	3.65
H – Estimated loss	3.93	1.78	2.97
I – Interest nor received in operations overdue for 6 or more days	1.39	0.22	0.69
J – Discounts granted	0.40	0.20	0.28
K.1 – Interest paid to equity owners received by equity holders	0.44	0.44	0.44
K.2 – IRRF levied on interest paid to equity owners	0.08	0.08	0.08
K – Expenses with interest paid to equity owners (K.1 + K.2)	0.52	0.52	0.52
L – ICC margin before IR and CSLL (C - D - E - F - G - H - I - J - K)	6.31	-0.68	3.32
M – IR annd CSLL	2.72	-0.29	1.43
N – ICC Financial Margin (L - M + K.1)	4.04	0.05	2.34

Thus, in order that FIs capital allocated to credit obtain risk-adjusted returns that make it a viable financial product, the return on the non-earmarked loan portfolio must be higher than it could be in the event of the absence

40 It should be noticed, however, that the larger the disaggregation 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.

Figure 3.3 – ICC components: non-earmarked, earmarked and total – average 2018 to 2020



of close-to-zero profitability in the earmarked credit segment.[41]

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. This dynamic is clearly observed in 2020. Whereas the ICC variation in the earmarked segment was only -0.26 p.p. compared with 2019, the variation in the non-earmarked segment was -4.15 p.p., thus leading to an overall ICC variation of -2.08 p.p.

Table 3.5 – ICC decomposition by type

p.p.

	Non-earmarked			Earmarked			Total		
	2018	2019	2020	2018	2019	2020	2018	2019	2020
Funding costs	8.17	7.15	5.55	5.32	5.17	4.81	6.82	6.28	5.24
Deliquency	6.24	5.78	5.17	2.17	2.35	2.10	4.19	4.01	3.62
Administrative Expenses	6.04	5.90	5.17	0.97	1.05	1.00	3.69	3.81	3.46
Taxes and FGC	4.55	4.32	3.91	-0.01	-0.14	0.06	2.42	2.43	2.40
ICC Financial Margin	3.83	4.55	3.75	0.05	-0.05	0.15	2.05	2.62	2.35
Adjusted average ICC (1 + 2 + 3 + 4 + 5)	28.83	27.70	23.55	8.50	8.38	8.12	19.17	19.15	17.07

Table 3.6 – Decomposition of the ICC spread

p.p.

Item	2018	2019	2020	Average
1 – Deliquency	4.19	4.01	3.62	3.94
2 – Administrative Expenses	3.69	3.81	3.46	3.65
3 – Taxes and FGC	2.42	2.43	2.40	2.42
4 – ICC Financial Margin	2.05	2.62	2.35	2.34
ICC spread (1 + 2 + 3 + 4)	12.35	12.87	11.83	12.35

3.2 ICC spread decomposition

The decomposition of the ICC spread – found 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.

The comparison between 2019 and 2020 reveals that all components contributed to the ICC spread reduction, especially Delinquency (Table 3.6).[42] 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. Throughout 2020, the balances of financial institutions registered large provisions for credit losses. However, since these provisions are estimates only, they may underestimate or overestimate the effective

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

42 The contributions in percentage points are the same as those reported for the ICC decomposition, but the percentage shares of all components (Table 3.7) increase due to the exclusion of the funding cost.

Table 3.7 – Decomposition of the ICC spread

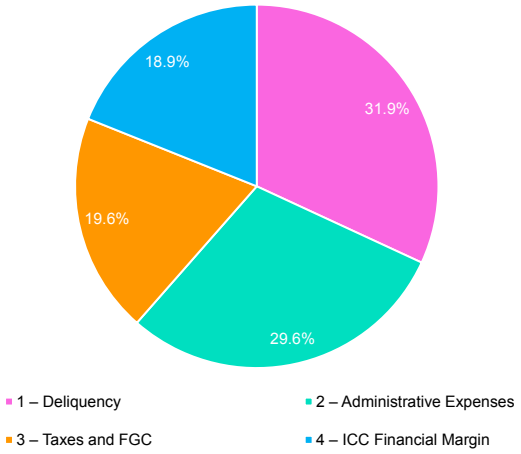
as share % of the spread

Item	2018	2019	2020	Average
1 – Deliquency	33.93	31.16	30.60	31.90
2 – Administrative Expenses	29.88	29.60	29.25	29.58
3 – Taxes and FGC	19.60	18.88	20.29	19.59
4 – ICC Financial Margin	16.60	20.36	19.86	18.94
ICC spread (1 + 2 + 3 + 4)	100.00	100.00	100.00	100.00

losses with credit assets, regardless of their accounting records. Therefore, the delinquency rate in 2020 should be carefully analyzed, since non-observed losses in the year, due to the public and private sector measures for mitigating the pandemic effects, may occur in the following years, depending on the evolution of the economic outlook.

When considering average values between 2018 and 2020, Delinquency accounts for 31.9% of the ICC spread, followed by Administrative Expenses (29.6%), Taxes and FGC (19.6%) and, lastly, ICC Financial Margin (18.9%) – Table 3.7 and Figure 3.4.

Figure 3.4 – Decomposition of the ICC spread
Average from 2018 to 2020



3.3 Simulations on the effect of components on the ICC

In this section are presented simulations of the effects of zeroing ICC components. The impact of hypothetical changes on some ICC components may be inferred by considering the effects on the other components. In other words, one may not infer the impact directly from the figures presented in Section 3.1. For example, a reduction in any component reduces the ICC, but in doing so, also leads to a decrease in taxes and FGC contributions. In another example, reductions in different components of delinquency indirectly affect the Delinquency component because, by reducing the ICC value, potential expenditures with the granting of discounts are also reduced.

These simulations seek to capture the direct impacts of zeroing a specific component, but, for the sake of simplicity, the indirect effects were not considered. For example, the spread reduction due to the zeroing of the administrative expense could, indirectly, reduce delinquency.

Table 3.8 presents simulations of the impact on the ICC spread using 2020 data, setting its financial margin at the value resulted from the decomposition presented in Section 3.1 (except for the last simulation, which sets the financial margin at zero) and, for the sake of simplicity, also setting to zero the contribution of the component undergoing analysis.

Table 3.8 – Spread simulation – Year 2020

p.p

Item	Original value	Zero deliquency	Zero administrative expenses	Zero financial margin
1 – Deliquency	3.62	0.00	3.62	3.62
2 – Administrative Expenses	3.46	3.46	0.00	3.46
3 – Taxes and FGC	2.40	2.22	2.18	0.48
4 – ICC Financial Margin	2.35	2.35	2.35	0.00
ICC spread (1 + 2 + 3 + 4)	11.83	8.03	8.15	7.56

According to simulations, the impact of Delinquency in the ICC spread is 3.8 p.p., *i.e*., if delinquency in 2020 had been zero (third column of Table 3.8), the ICC spread would have fallen 3.8 p.p. In the case of Administrative Expenses, the impact would be a reduction of 3.7 p.p. Finally, if there were no financial margin, the ICC spread would be 4.3 p.p. lower.[43]

43 Although the participation of Financial Margin in the ICC is lower than that of Administrative Expenses, the zeroing of Financial Margin has a similar impact on the ICC spread due to the secondary effect on components Taxes and FGC resulting from the incidence of IRPJ and CSLL.

Foreign exchange products

4

Figure 4.1 – Exchange market
Price of currencies against USD
Index 100 in January 1, 2020

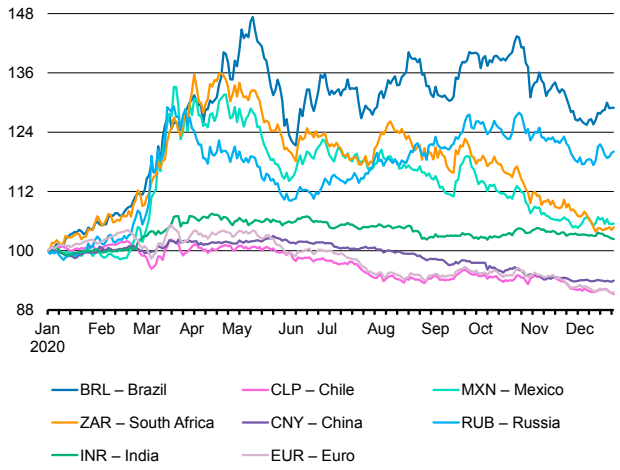
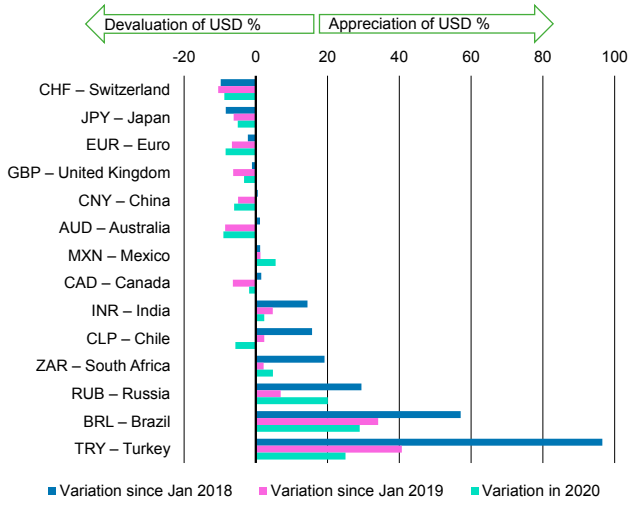


Figure 4.2 – Foreign exchange rates
Against USD



4.1 Introduction[44]

The parity USD/BRL varied by 28.9% in 2020 (Figures 4.1 and 4.2). When compared with a set of emerging countries' currencies, the Brazilian *real* (BRL) had the largest variation, with a peak in the first quarter of the pandemic and high volatility in the rest of the year.

Spot buying and selling operations,[45] with settlement terms of up to two business days, accounted for 92.5% of the total value of the primary market and for 98.7% of number of operations in 2020, showing an increase over the previous year's values, 91.0% and 97.7%, respectively. The predominance of this type of settlement arises from the characteristics of the underlying transactions related to the foreign exchange operations and their associated cash flow.

The transactions with future settlement[46] represented 7.5% of the total value of the primary market in 2020 (the lowest percentage in the last six years). The granting of advances on exports foreign exchange contracts (Advances on Foreign Exchange Contracts – ACC and Advances on

44 The analyses were carried out based on the operations registered in the Foreign Exchange System ("Sistema Câmbio") of the Banco Central do Brasil (BCB). Institutions authorized to operate in the foreign exchange market carry out registrations in the day of occurrence, but the exchange contract can be retroactively changed at any time. The amounts reported in this chapter were calculated on February 11, 2021, including operations with symbolic (*i.e.,* not effective) delivery of currencies. Values may differ from the foreign exchange rate series released every Wednesday by the BCB, which do not encompass retroactive registrations.

45 In these cases, institutions authorized to operate in the foreign exchange market negotiate with their customers the final price of the foreign currency, and there are no adjustments at the time of settlement.

46 Operations for settlement over two business days are considered as future contracts. The foreign 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.

Delivered Export Shipment Documents – ACE),[47] in the amount of USD 23.7 billion in 2020, corresponded to 12.3% of the total of USD 192.0 billion of export exchange contracts (-4.0 p.p. over 2019) and 11.3% of physical exports of USD 209.9 billion (-3.1 p.p. over the previous year) registered by the Ministry of Economy – Industry, Foreign Trade, and Services (ME-MDIC).

The volume of outstanding ACCs and ACEs was reduced by 19.3%, from USD 16.6 billion in December 2019 to USD 13.4 billion in December 2020. The value of new operations also fell during the year (27%), because of both the decrease in the volume of export-related foreign exchange contracts (3%) and in the exporters' demand for this type of financing. The average term of ACCs and ACEs was 154 business days in 2019, against 165 in 2019. The interest rates of these operations increased in relation to the previous year, going from 3.28% p.a. in December 2019 to 3.41% p.a. in December 2020, with a relevant oscillation during the year, reaching 4.82% p.a. in April, due to a lower availability of credit lines in the international market in the initial phase of the Covid-19 pandemic (Figure 4.3). The reduction in the volume of outstanding ACC was partially due to the availability of domestic financing lines, which were cheaper due to the reduction of the Selic rate, the exemption of the Tax on Financial Operations (IOF) for credit operations and policies for increasing liquidity. The main funding source used by financial institutions when celebrating export related ACC/ACE contracts with their customers are specific credit lines raised with banks abroad. Considering all Brazilian exports, the nominal cost at the end of 2020 was 0.8% p.a., compared to 2.2% p.a. at the end of 2019 (Figure 4.4)[48]. This decrease is mainly explained by the reduction in international reference rates.

The foreign exchange operations with future settlement, without the granting of advances, reached USD 23.5 billion in export-related contracts (-8.3% over 2019) and another USD 56.2 billion in other classifications (-31.6% over 2019). The reduction in other classifications is mainly associated with a decrease in the value of contracts related to investment by non-residents in domestic bonds and shares.

Figure 4.3 – ACC/ACE
Average cost

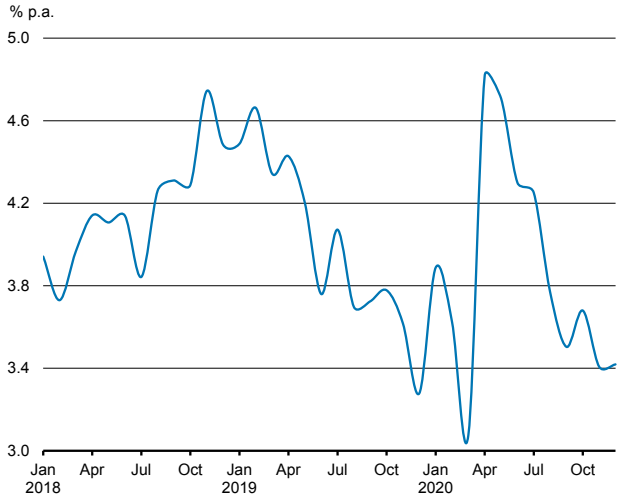
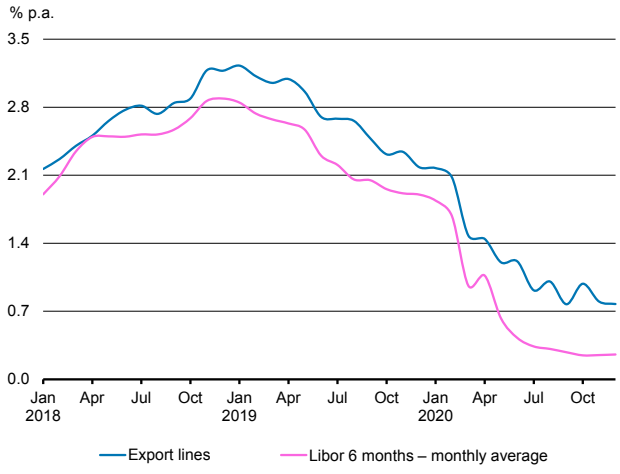


Figure 4.4 – Foreign export credit lines
Cost



47 Export-related foreign exchange operations may be traded previously or after the shipment of goods, with the anticipation 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 anticipation of the domestic currency is intended to provide the exporter with the capital necessary to finance its 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.

48 Figure 4.4 considers all external funding aimed at promoting Brazilian exports, not only the resources used in ACC and ACE operations.

Table 4.1 – Export and import
Advances

	2018		2019		2020	
	US$ billion	%	US$ billion	%	US$ billion	%
Export	**227.7**	**100.0**	**198.0**	**100.0**	**192.0**	**100.0**
Advance receipts	77.5	34.0	59.2	29.9	69.6	36.2
Short-term	30.9	13.6	25.4	12.8	30.3	15.8
Long-term	46.6	20.5	33.9	17.1	39.3	20.5
Other modalities	150.3	66.0	138.8	70.1	122.4	63.8
Import	**178.3**	**100.0**	**175.1**	**100.0**	**164.9**	**100.0**
Advance payments	17.8	10.0	16.3	9.3	16.5	10.0
Other modalities	160.6	90.0	158.8	90.7	148.4	90.0

Figure 4.5 – Cash exchange operations
Customers' purchases and sales

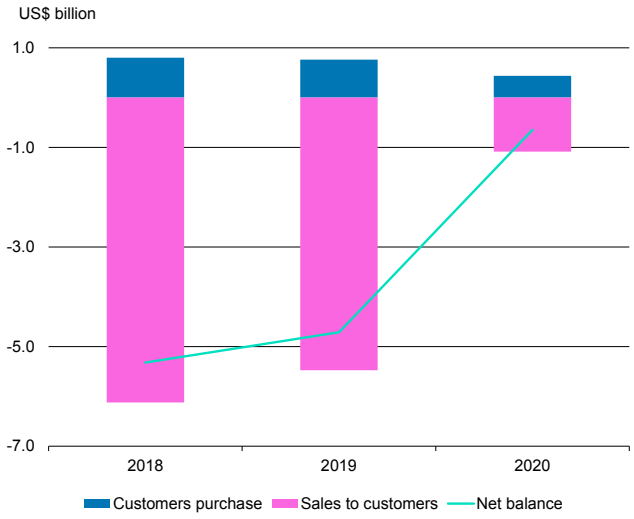
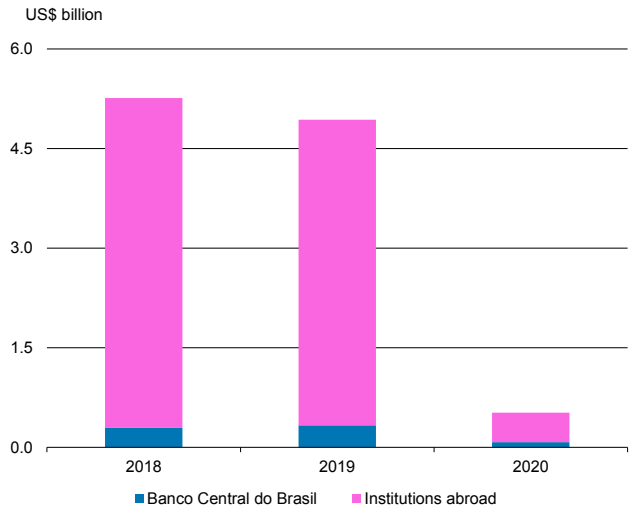


Figure 4.6 – Foreign currency reserves in cash
Supply source



Operations regarding anticipated receipt of exports totaled USD 69.6 billion in 2020, reaching the highest percentage share in total exports in the last three years (Table 4.1). This financing modality is mostly used by multinational exporting companies which receive resources from their affiliated companies abroad against a future shipment of goods. In 2020, USD 5.6 billion were sent abroad referring to interest on export operations.

Prepayment of imports represented 10.0% of the total of these operations (Table 4.1). This type of operation shows large concentration: 1.1% of total clients accounted for half of the operated value. The major clients are oil and energy companies. On the other hand, long-term financed imports[49] were minimal (1.9% of total imports in 2020).

The trade of foreign currency in cash and traveler's check amounted to USD 1.1 billion in sales to clients and USD 433.2 million in purchases from clients. 2020 was an atypical year in terms of volumes traded. Cash transactions dropped dramatically from the second half of March on, as the international tourism and events segment was one of the hardest affected by the Covid-19 pandemic (Figure 4.5). In the country, the volume of foreign currency purchased in cash by Brazilian travelers is usually far higher than that volume sold by foreign tourists. The difference is covered by the import of foreign currency in cash by banks[50] and, complementarily, by the BCB, which also imports foreign currencies in cash to supply the market (Figure 4.6).

49 This is a type of financing that has a payment term over 360 days after shipment. It can be obtained from the foreign exporter or from other financing agencies abroad.

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

Table 4.2 – Primary market

Value and number of operations by region and type of client

Region	2018		2019		2020	
	US$ billion	Operations (in 1,000)	US$ billion	Operations (in 1,000)	US$ billion	Operations (in 1,000)
North	**20.4**	**1,245**	**20.1**	**1,253**	**18.0**	**1,031**
Individuals	0.7	1,161	0.8	1,165	0.6	942
Corporate	19.7	84	19.3	89	17.4	90
Northeast	**49.5**	**2,523**	**42.8**	**2,495**	**35.8**	**1,644**
Individuals	2.9	2,340	2.5	2,300	1.8	1,460
Corporate	46.6	183	40.2	195	34.0	184
Central-West	**44.4**	**1,788**	**54.2**	**1,512**	**50.1**	**1,095**
Individuals	2.9	1,534	2.6	1,385	1.6	979
Corporate	41.5	253	51.6	127	48.4	116
Southeast	**1,293.6**	**13,445**	**1,344.7**	**13,015**	**1,189.4**	**9,057**
Individuals	23.4	10,560	21.7	10,142	16.1	6,380
Corporate	1,270.2	2,884	1,322.9	2,873	1,173.3	2,677
South	**88.8**	**3,667**	**90.0**	**3,827**	**86.6**	**2,799**
Individuals	4.2	2,934	4.1	3,036	3.0	2,037
Corporate	84.6	733	85.9	791	83.6	762
Foreign	**8.8**	**1,733**	**9.1**	**1,736**	**5.9**	**1,057**
Individuals	1.7	1,726	1.5	1,732	1.3	1,054
Corporate	7.1	7	7.7	4	4.5	3
Total	**1,505.6**	**24,401**	**1,560.9**	**23,839**	**1,385.8**	**16,684**
Individuals	35.7	20,256	33.2	19,759	24.4	12,852
Corporate	1,469.8	4,145	1,527.7	4,079	1,361.3	3,831

4.2 Characteristics of clients and foreign exchange operations

Transactions carried out by households are characterized by their low average value and are concentrated in the Southeast region,[51] involving a combination of population and *per capita* income above the average of the other regions (Table 4.2). Households continued to account for the largest number of foreign exchange operations in the spot market, despite dropping 35% compared with 2019, due to the reduction in international travel. Unilateral transfers showed a net inflow in 2020, which is atypical for this modality. On the other hand, funds abroad (usually resources kept in foreign checking, savings, or money market accounts), – traditionally a deficit for Brazilian households – showed an almost neutral flow, both due to the reduction in its constitution and to the increase in the return of amounts previously sent.

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

Table 4.3 – Primary market

Accumulated value by range

Range	2018		2019		2020	
	US$ billion	Operations (in 1,000)	US$ billion	Operations (in 1,000)	US$ billion	Operations (in 1,000)
Up to US$3,000	12.4	21,074	11.7	20,378	7.3	13,454
Up to US$100,000	72.2	23,783	72.1	23,230	64.6	16,098
Up US$1 million	215.7	24,251	216.0	23,698	203.3	16,550
Up to US$10 million	561.1	24,362	566.1	23,812	526.6	16,655
Up to US$100 million	1,169.9	24,385	1,191.1	23,836	1,075.9	16,676
Up to US$1 billion	1,450.5	24,386	1,507.9	23,837	1,333.2	16,677
Total	1,505.6	24,386	1,560.9	23,837	1,385.7	16,677

Table 4.4 – Primary market

Values by operation type

Operation type	2018		2019		2020	
	US$ billion	%	US$ billion	%	US$ billion	%
Exports	227.7	15.1	198.0	12.7	192.0	13.9
Imports	178.3	11.8	175.1	11.2	164.9	11.9
Financial						
Portfolio investments						
Non-residents	530.1	35.2	633.7	40.6	527.9	38.1
Residents	39.6	2.6	36.6	2.3	61.2	4.4
Other	529.8	35.2	517.5	33.2	439.7	31.7
Total	1,505.6	100.0	1,560.9	100.0	1,385.8	100.0

Firms have an average value of operations well above those of households. Foreign exchange operations carried out by companies represented 98.2% of the value transacted in the primary market (Table 4.2), despite accounting for only 23.0% of the number of operations. The total volume transacted in the primary market dropped 26.5% for households and 11.2% for companies compared with 2019.

Although low-value operations account for most contracts, in terms of volume, there is a concentration of high-value operations. Nearly 85% of the volume transacted in the year corresponded to operations above USD 1 million (Table 4.3).

Foreign exchange operations related to foreign trade corresponded to nearly 25.8% of the total volume of operations in the primary market (Table 4.4), whereas operations linked to the non-residents' portfolio investment[52] corresponded to 38.1%.

52 These are operations regulated by Resolution 4,373, of September 29, 2014, predominantly investments in stocks, federal government bonds, funds and depositary receipts. Before carrying out operations, the non-resident investor must constitute a representative and a custodian in the country and be registered in the Securities and Exchange Commission (CVM).

Table 4.5 – Foreign exchange market
Number of institutions by segment

Institutions that carried out operations	2018	2019	2020
Authorized institutions – Banking sector	**91**	**92**	**92**
Multiple banks	63	63	63
Commercial banks	13	13	14
Investment banks	6	6	5
Foreign Exchange banks	5	5	5
Development banks	2	2	2
Cooperative banks	1	2	2
Caixa Econômica	1	1	1
Authorized institutions – Non-banking sector	**86**	**81**	**71**
Foreign exchange brokerage companies	56	55	48
Brokerage firms	16	13	11
Securities distribution companies	14	13	12
Total	**177**	**173**	**163**

Table 4.6 – Foreign exchange market
Volume

US$ billion

Authorized institutions by segment	2018	2019	2020
Banking sector	**2,204.1**	**2,443.4**	**2,063.4**
Multiple banks	2,052.2	2,311.4	1,961.5
Commercial banks	33.9	34.5	36.0
Investment banks	76.8	45.9	29.0
Foreign Exchange banks	22.9	27.5	27.2
Development banks	8.6	11.6	4.8
Caixa econômica	8.5	11.1	3.7
Cooperative banks	1.3	1.4	1.3
Non-banking sector	**27.8**	**23.6**	**15.4**
Foreign exchange brokerage companies	20.7	18.3	12.9
Securities distribution companies	4.7	3.8	1.5
Brokerage firms	2.4	1.5	1.0
Total	**2,231.9**	**2,467.0**	**2,078.8**

Table 4.7 – Evolution of correspondents

	2018	2019	2020
Number of correspondents	1,463	1,403	1,143
Number of operations (million)	5.7	5.6	1.1
Unilateral transfers (US$ million)	1,082.1	983.8	604.3
Purchase	201.9	181.1	132.6
Sale	880.2	802.7	471.7
International travel	2,273.9	1,988.5	455.4
Purchase	231.5	252.7	147.9
Sale	2,042.4	1,735.8	307.4

Table 4.8 – Evolution of intermediation
Value of operations in foreign exchange market

	2018	2019	2020
Number of intermediates	49	49	43
Number of operations (thousand)	690.6	652.1	557.3
Purchase	172.2	152.8	133.8
Sale	518.4	499.3	423.5
Value of operations (US$ billion)	268.0	235.3	193.4
Purchase	125.4	103.6	85.2
Sale	142.7	131.7	108.2

4.3 Institutions authorized to operate in the foreign exchange market

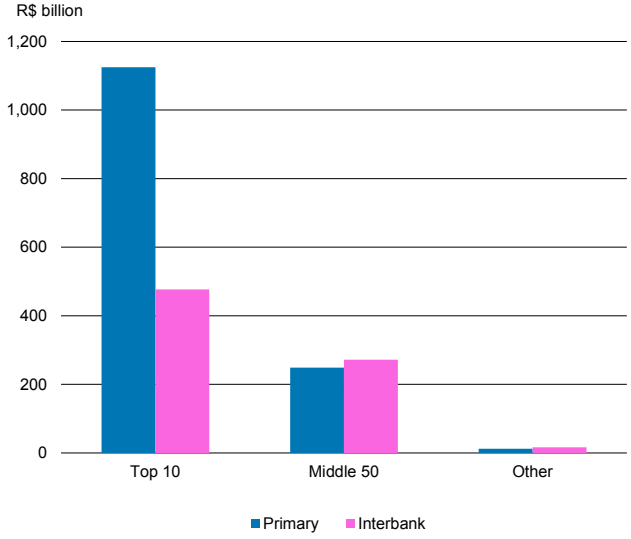
Banking institutions may carry out all kinds of foreign exchange transactions provided for in the foreign exchange regulations, of any value, including sending or receiving foreign currency in cash to/from abroad. Development banks, on the other hand, may only carry out specific operations authorized by the BCB. In the non-banking segment, foreign exchange transactions with clients (primary market) are limited to spot operations (with a settlement term of up to two business days) and a maximum value per transaction of USD 300,000.00 or its equivalent in other currencies.

In 2020, 163 institutions carried out operations in the exchange market: 92 banking and 71 non-banking (Table 4.5), the former concentrating most of the traded volume (Table 4.6). As of December 31, 2020, there were 179 institutions authorized to operate in the foreign exchange market, of which 101 were from the banking segment and 78 from the non-banking segment.

Institutions authorized to operate in the foreign exchange market 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. Correspondents may also receive and forward proposals for foreign exchange operations. As of December 31, 2020, 4,587 foreign exchange correspondents were registered in the Information System on Institutions of Interest of the Central Bank (Unicad). However, only 1,143 active correspondents carried out operations in 2020 (Table 4.7).

Of the total of transactions carried out in the primary market, about 14.0% were intermediated by non-banking institutions. Table 4.8 shows the annual evolution of intermediated values and the number of institutions that acted as intermediaries.

Figure 4.7 – Exchange market
Market share in 2020



4.4 Market concentration

The ten largest financial institutions in terms of transacted volume are from the banking segment.[53] In the primary market, the top ten operators concentrated 81.2% of the value. In the interbank market,[54] this percentage was 70.1% (Figure 4.7).

Almost the total volume transacted in the primary market (99.4%) is concentrated in the banking segment, and this participation has risen 0.3 p.p. over the last two years. Within the banking segment, the top ten institutions concentrated 81.7% of the volume transacted in 2020, slightly lower share than in 2018 and 2019 (83.6% and 82.9%, respectively). The non-banking segment is less concentrated, as the top ten institutions were responsible for 68.8% of the transacted volume in 2020. However, the concentration has increased over the last two years[55] (Table 4.9).

In the interbank market, the banking segment accounted for 99.0% of the volume transacted in 2020, slightly above the participation of the previous two years. The intrasegmental analysis indicates that the relative concentration of the ten main institutions had a small rise in the years 2019 and 2020, in both the banking and non-banking segments, reaching 70.9% and 62.9% in 2020, respectively (Table 4.10).

4.5 Forms of foreign currency delivery

Wire transfer is the most common form of currency delivery. Cash transactions hold the second place in terms of number of operations, but, as they are mostly carried out by households, 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, there is no effective delivery of foreign currency; records are made to comply with regulatory provisions, as well as for statistical purposes.

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

54 Although carried out in the interbank market, arbitrage operations and the exchange between bank money and cash were not included in this 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).

55 The reason for the increased concentration in 2020 was the 80% reduction in the volume of cash, traveler's checks, and prepaid card operations (modalities most associated with international travel), while the reduction in the other forms of foreign currency delivery was 10%. Operations in cash, traveler's checks and prepaid card represented only 22% of the total operated by the ten largest institutions between 2018 and 2020, against 50% of the total operated by the other institutions.

Table 4.9 – Primary market

Participation in the volume transacted

Rank	2018		2019		2020	
	Banking segment	**99.1%**	**Banking segment**	**99.3%**	**Banking segment**	**99.4%**
1	BANCO BRADESCO S.A.	15.9%	BANCO CITIBANK S.A.	15.8%	BANCO CITIBANK S.A.	15.8%
2	BANCO CITIBANK S.A.	15.1%	BANCO BRADESCO S.A.	13.7%	BANCO SANTANDER (BRASIL) S.A.	14.3%
3	BANCO SANTANDER (BRASIL) S.A.	13.7%	BANCO SANTANDER (BRASIL) S.A.	12.0%	BANCO BRADESCO S.A.	11.4%
4	ITAÚ UNIBANCO S.A.	9.5%	BANCO J.P. MORGAN S.A.	10.4%	ITAÚ UNIBANCO S.A.	10.8%
5	BANCO J.P. MORGAN S.A.	8.8%	ITAÚ UNIBANCO S.A.	10.0%	BANCO J.P. MORGAN S.A.	9.8%
6	BANCO DO BRASIL S.A.	8.0%	BANCO DO BRASIL S.A.	7.3%	BANCO DO BRASIL S.A.	6.9%
7	BANK OF AMERICA MERRILL LYNCH BANCO MÚLTIPLO S.A.	3.8%	BANCO SOCIETE GENERALE BRASIL S.A.	3.9%	BANK OF AMERICA MERRILL LYNCH BANCO MÚLTIPLO S.A.	4.0%
8	BANCO SOCIETE GENERALE BRASIL S.A.	3.6%	BANK OF AMERICA MERRILL LYNCH BANCO MÚLTIPLO S.A.	3.9%	BANCO ABN AMRO S.A.	3.7%
9	BANCO BNP PARIBAS BRASIL S.A.	3.1%	BANCO BNP PARIBAS BRASIL S.A.	2.9%	BANCO SOCIETE GENERALE BRASIL S.A.	2.5%
10	GOLDMAN SACHS DO BRASIL BANCO MÚLTIPLO S.A.	2.2%	GOLDMAN SACHS DO BRASIL BANCO MÚLTIPLO S.A.	2.9%	BANCO BNP PARIBAS BRASIL S.A.	2.4%
	Other	16.4%	Other	17.1%	Other	18.3%
	Non-banking segment	**0.9%**	**Non-banking segment**	**0.7%**	**Non-banking segment**	**0.6%**
1	WESTERN UNION CORRETORA DE CÂMBIO S.A.	10.3%	WESTERN UNION CORRETORA DE CÂMBIO S.A.	11.1%	ADVANCED CORRETORA DE CÂMBIO LTDA	11.9%
2	B&T CORRETORA DE CÂMBIO LTDA.	8.1%	B&T CORRETORA DE CÂMBIO LTDA.	9.8%	B&T CORRETORA DE CÂMBIO LTDA.	11.9%
3	ADVANCED CORRETORA DE CÂMBIO LTDA	7.7%	ADVANCED CORRETORA DE CÂMBIO LTDA	8.1%	WESTERN UNION CORRETORA DE CÂMBIO S.A.	10.4%
4	COTAÇÃO DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS S.A	6.6%	COTAÇÃO DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS S.A	6.9%	FAIR CORRETORA DE CÂMBIO S.A.	6.9%
5	CONFIDENCE CORRETORA DE CÂMBIO S.A.	6.1%	CONFIDENCE CORRETORA DE CÂMBIO S.A.	6.6%	GUITTA CORRETORA DE CÂMBIO LTDA.	6.1%
6	FAIR CORRETORA DE CÂMBIO S.A.	5.7%	FAIR CORRETORA DE CÂMBIO S.A.	5.9%	AGK CORRETORA DE CÂMBIO S.A.	6.1%
7	AGK CORRETORA DE CÂMBIO S.A.	4.3%	AGK CORRETORA DE CÂMBIO S.A.	4.3%	COTAÇÃO DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS S.A	4.5%
8	GUITTA CORRETORA DE CÂMBIO LTDA.	3.6%	GUITTA CORRETORA DE CÂMBIO LTDA.	4.0%	DOURADA CORRETORA DE CÂMBIO LTDA.	3.7%
9	BROKER BRASIL CORRETORA DE CÂMBIO LTDA.	3.1%	BROKER BRASIL CORRETORA DE CÂMBIO LTDA.	2.6%	TREVISO CORRETORA DE CÂMBIO S.A.	3.6%
10	TREVISO CORRETORA DE CÂMBIO S.A.	3.0%	LEVYCAM – CORRETORA DE CÂMBIO E VALORES LTDA.	2.5%	BROKER BRASIL CORRETORA DE CÂMBIO LTDA.	3.6%
	Other	41.5%	Other	38.2%	Other	31.2%

Note: the percentages by segment refer to the total of the primary market; the percentages by institution refer to the total of the segment.

Table 4.10 – Interbanking market

Participation in volume transacted

Rank	2018		2019		2020	
	Banking segment	**98.0%**	**Banking segment**	**98.7%**	**Banking segment**	**99.0%**
1	BANCO SANTANDER (BRASIL) S.A.	16.7%	BANCO SANTANDER (BRASIL) S.A.	20.0%	BANCO SANTANDER (BRASIL) S.A.	20.7%
2	BANCO J.P. MORGAN S.A.	11.1%	BANCO BTG PACTUAL S.A.	10.7%	BANCO BTG PACTUAL S.A.	11.1%
3	BANCO BTG PACTUAL S.A.	10.6%	BANCO J.P. MORGAN S.A.	9.6%	BANCO J.P. MORGAN S.A.	9.7%
4	BANCO BRADESCO S.A.	7.4%	BANCO CITIBANK S.A.	5.7%	ITAÚ UNIBANCO S.A.	6.9%
5	ITAÚ UNIBANCO S.A.	5.6%	ITAÚ UNIBANCO S.A.	5.7%	BANCO BRADESCO S.A.	5.5%
6	BANCO CITIBANK S.A.	4.2%	BANCO BRADESCO S.A.	5.5%	BANCO CITIBANK S.A.	4.6%
7	BANCO DO BRASIL S.A.	3.3%	GOLDMAN SACHS DO BRASIL BANCO MÚLTIPLO S.A.	3.8%	BANCO DO BRASIL S.A.	3.6%
8	BANK OF AMERICA MERRILL LYNCH BANCO MÚLTIPLO S.A.	3.2%	BANK OF AMERICA MERRILL LYNCH BANCO MÚLTIPLO S.A.	3.4%	BANK OF AMERICA MERRILL LYNCH BANCO MÚLTIPLO S.A.	3.4%
9	BANCO DE INVESTIMENTOS CREDIT SUISSE (BRASIL) S.A.	2.9%	BANCO DO BRASIL S.A.	3.1%	BANCO MORGAN STANLEY S.A.	2.8%
10	STANDARD CHARTERED BANK (BRASIL) S.A. - BANCO DE INVESTIMENTO	2.6%	BANCO MORGAN STANLEY S.A.	3.1%	BANCO VOTORANTIM S.A.	2.5%
	Demais	32.3%	Demais	29.4%	Demais	29.1%
	Non-banking segment	**2.0%**	**Non-banking segment**	**1.3%**	**Non-banking segment**	**1.0%**
1	B&T CORRETORA DE CÂMBIO LTDA.	12.1%	B&T CORRETORA DE CÂMBIO LTDA.	14.4%	B&T CORRETORA DE CÂMBIO LTDA.	16.7%
2	COLUNA S/A DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS	10.5%	ADVANCED CORRETORA DE CÂMBIO LTDA	9.2%	ADVANCED CORRETORA DE CÂMBIO LTDA	13.8%
3	ADVANCED CORRETORA DE CÂMBIO LTDA	6.0%	COLUNA S/A DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS	7.4%	FAIR CORRETORA DE CÂMBIO S.A.	5.9%
4	TREVISO CORRETORA DE CÂMBIO S.A.	4.8%	WESTERN UNION CORRETORA DE CÂMBIO S.A.	5.0%	GUITTA CORRETORA DE CÂMBIO LTDA.	4.9%
5	WESTERN UNION CORRETORA DE CÂMBIO S.A.	4.6%	FAIR CORRETORA DE CÂMBIO S.A.	4.7%	AGK CORRETORA DE CÂMBIO S.A.	4.5%
6	COTAÇÃO DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS S.A	4.3%	CONFIDENCE CORRETORA DE CÂMBIO S.A.	4.5%	OM DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS LTDA	4.5%
7	CONFIDENCE CORRETORA DE CÂMBIO S.A.	4.1%	COTAÇÃO DISTRIBUIDORA DE TÍTULOS E VALORES MOBILIÁRIOS S.A	4.4%	BROKER BRASIL CORRETORA DE CÂMBIO LTDA.	3.6%
8	FAIR CORRETORA DE CÂMBIO S.A.	4.0%	UNIÃO ALTERNATIVA CORRETORA DE CÂMBIO LTDA.	3.5%	LEVYCAM – CORRETORA DE CÂMBIO E VALORES LTDA.	3.1%
9	MMY INVESTIMENTOS E PARTICIPAÇÕES LTDA.	2.7%	GUITTA CORRETORA DE CÂMBIO LTDA.	2.7%	TREVISO CORRETORA DE CÂMBIO S.A.	3.1%
10	UNIÃO ALTERNATIVA CORRETORA DE CÂMBIO LTDA.	2.6%	AGK CORRETORA DE CÂMBIO S.A.	2.6%	DOURADA CORRETORA DE CÂMBIO LTDA.	2.7%
	Demais	44.2%	Demais	41.7%	Demais	37.1%

Note: i) arbitrage operations, as well of operations regarding the exchange between bank money and cash were not considered; ii) the percentages by segment refer to the total of the primary market; the percentages per institution refer to the total of the segment

Table 4.11 – Foreign exchange spot market

By form of foreign currency delivery – 2020

	Volume – US$ million		
	Segment		
Delivery	Banking	Non-banking	Total
Teletransmission	1,028,867	6,510	1,035,378
Deposit account	208,246	264	208,510
Symbolic	119,056	271	119,328
Exporter's deposit account held in foreign banks	18,868	13	18,881
In cash or traveler's check	548	971	1,519
Deferred letter of credit	1,123	0	1,123
Sight letter of credit	701	0	702
Prepaid currency card	67	82	149
Agreement on Reciprocal Payments and Credits (CCR)	85	-	85
Check	35	14	49
Securities	37	0	37
Total	**1,377,635**	**8,125**	**1,385,759**

	Number of operations		
	Segment		
Delivery	Banking	Non-banking	Total
Teletransmission	9,282,583	4,123,308	13,405,891
In cash or traveler's check	674,903	1,612,768	2,287,671
Deposit account	534,463	30,290	564,753
Prepaid currency card	138,102	168,571	306,673
Symbolic	52,891	14,983	67,874
Check	7,957	11,350	19,307
Exporter's deposit account held in foreign banks	9,078	175	9,253
Deferred letter of credit	7,069	2	7,071
Sight letter of credit	1,995	16	2,011
Securities	1,230	28	1,258
Agreement on Reciprocal Payments and Credits (CCR)	75	-	75
Total	**10,710,346**	**5,961,491**	**16,671,837**

When analyzing the participation of the banking and non-banking segments in the primary market, it is clear that the relevance of the non-banking sector in the total market value is low (0.59% in 2020). However, when analyzing only operations where the foreign currency is delivered in the forms of cash/traveler's checks and prepaid currency cards, this segment becomes relevant regarding the number of transactions, representing 70% and 55% of the market, respectively. These are operations in which small values prevail, traded with households, and classified as "International Travel".

In terms of participation in the total value, in the last two years the increase of "Deposit account" and "Exporter deposit account held in a bank abroad" forms of delivery stands out. While in the former the increase was due almost exclusively to foreign investment operations in portfolio-shares, the increase in the latter was mainly due to exports in the oil/natural gas, agribusiness and mining/steel sectors. In this same period, "Wire transfer" and "Symbolic" forms also decreased. It is noteworthy the reduction that occurred in 2020 in "cash and/or traveler's checks", due to the impacts of the Covid-19 pandemic (Table 4.12).

4.6 Traded currencies

The traded currency is the currency defined between the parties involved in the transaction. In the foreign exchange position of each authorized institution, the balances resulting from all foreign exchange transactions carried out in the interbank and primary markets are recorded.

Operations with the US dollar (USD) prevailed in foreign exchange contracts registered in the primary market in 2020, with a 91.3% participation in the total value, followed by the Euro (EUR), with 7.2% (Table 4.13). In the last two years, the British pound sterling (GBP) and the Canadian dollar (CAD) have had their shares reduced, losing their positions in the ranking to the Japanese yen (JBY) and the Australian dollar (AUD), respectively.

The concentration was lower when the distribution was analyzed in relation to the number of operations in the primary market. This was mainly due to the higher number of low-value transactions related to international travel and to the maintenance of residents abroad in currencies other than the USD. However, an increase in the concentration of the number of USD operations in 2020 related to the reduction in international travel operations was observed (Table 4.13). The biggest

Table 4.12 – Foreign exchange spot market

By form of foreign currency delivery

Volume – US$ billion	2018	2019	2020
Teletransmission	1,157.2	1,185.9	1,035.4
Deposit account	172.2	209.0	208.5
Symbolic	165.8	149.3	119.3
Exporter's deposit account held in foreign banks	0.7	7.9	18.9
In cash or traveler's check	6.9	6.2	1.5
Deferred letter of credit	1.4	1.3	1.1
Sight letter of credit	0.5	0.5	0.7
Prepaid currency card	0.7	0.5	0.1
Agreement on Reciprocal Payments and Credits (CCR)	0.0	0.1	0.1
Check	0.1	0.1	0.0
Securities	0.1	0.1	0.0
Total	1,505.6	1,560.9	1,385.8

Table 4.13 – Foreign exchange spot market

Operations per currency

	2018		2019		2020	
	US$ billion	%	US$ billion	%	US$ billion	%
Value of operations	1,505.56	100.00	1,560.87	100.00	1,385.69	100.00
USD – US dollar	1,372.44	91.16	1,426.29	91.38	1,265.14	91.30
EUR – Euro	108.46	7.20	109.12	6.99	99.11	7.15
CHF – Swiss franc	6.65	0.44	8.04	0.51	7.45	0.54
JPY – Yen	5.52	0.37	6.42	0.41	5.29	0.38
GBP – Sterling pound	8.77	0.58	6.68	0.43	4.24	0.31
AUD – Australian peso	0.89	0.06	0.77	0.05	1.33	0.10
CAD – Canadian dollar	1.65	0.11	1.22	0.08	0.91	0.07
MXN – Mexican peso	0.21	0.01	0.36	0.02	0.72	0.05
CNY – Yuan renminbi	0.19	0.01	0.35	0.02	0.58	0.04
SEK – Sweden krona	0.31	0.02	0.29	0.02	0.31	0.02
Other	0.47	0.03	1.33	0.09	0.60	0.04
	No.	%	No.	%	No.	%
Number of operations	24,401,404	100.00	23,853,578	100.00	16,690,918	100.00
USD – US dollar	18,481,602	75.74	17,772,738	74.51	13,974,667	83.73
EUR – Euro	4,080,812	16.72	4,301,646	18.03	2,016,756	12.08
GBP – Sterling pound	338,823	1.39	359,004	1.51	156,539	0.94
CAD – Canadian dollar	350,068	1.43	297,247	1.25	124,824	0.75
ARS – Argentinian peso	386,295	1.58	381,463	1.60	102,492	0.61
CHF – Swiss franc	77,960	0.32	84,252	0.35	58,316	0.35
PYG – Paraguayan guarani	146,470	0.60	135,599	0.57	56,595	0.34
AUD – Australian peso	88,301	0.36	85,832	0.36	40,234	0.24
JPY – Yen	93,436	0.38	72,094	0.30	40,082	0.24
CLP – Chilean peso	128,421	0.53	123,780	0.52	24,709	0.15
Other	229,216	0.94	239,923	1.01	95,704	0.57

reduction occurred with the EUR, whose share in the number of operations fell from 18.03% to 12.08%.

In the interbank market, the share of the USD was even higher (98.99%),[56] while the EUR represented 0.87% (Table 4.14). Regarding the number of operations, the concentration is lower than in the primary market, since operations with the USD accounted for only 60.49% of the total, while the EUR was the currency of nearly one fifth of the operations.

Table 4.14 – Interbank foreign exchange market
Operations per currency

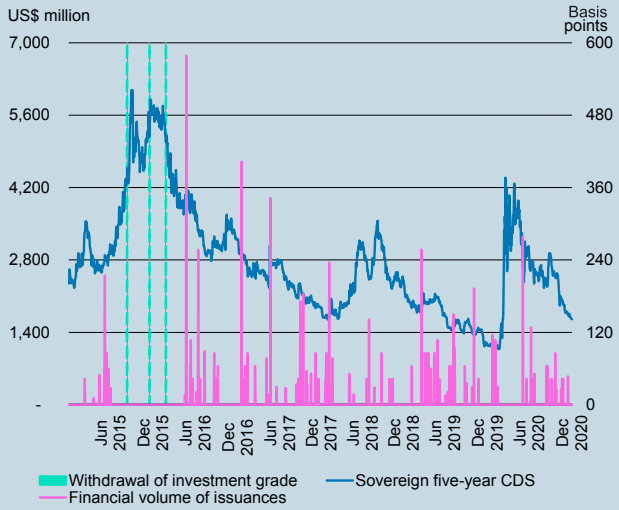
	2018		2019		2020	
	US$ billion	%	US$ billion	%	US$ billion	%
Value of operations	726.60	100.00	906.31	100.00	693.13	100.00
USD – US dollar	710.98	97.85	887.54	97.93	686.12	98.99
EUR – Euro	13.57	1.87	16.78	1.85	6.01	0.87
GBP – Sterling pound	0.67	0.09	0.83	0.09	0.41	0.06
ARS – Argentinian peso	0.20	0.03	0.18	0.02	0.15	0.02
CAD – Canadian dollar	0.53	0.07	0.47	0.05	0.12	0.02
JPY – Yen	0.11	0.02	0.08	0.01	0.12	0.02
CHF – Swiss franc	0.10	0.01	0.15	0.02	0.09	0.01
AUD – Australian dollar	0.16	0.02	0.14	0.02	0.04	0.01
NZD – New Zeland dollar	0.06	0.01	0.03	0.00	0.01	0.00
CNY – Yuan renminbi	0.01	0.00	0.01	0.00	0.01	0.00
Other	0.20	0.03	0.09	0.01	0.04	0.01
	No.	%	No.	%	No.	%
Number of operations	1,175,608	100.00	1,050,203	100.00	490,077	100.00
USD – US dollar	542,870	46.18	474,235	45.16	296,451	60.49
EUR – Euro	295,480	25.13	261,514	24.90	99,948	20.39
GBP – Sterling pound	77,772	6.62	74,020	7.05	22,908	4.67
CAD – Canadian dollar	88,034	7.49	74,534	7.10	21,470	4.38
AUD – Australian dollar	30,856	2.62	28,530	2.72	9,106	1.86
CHF – Swiss franc	14,910	1.27	15,894	1.51	6,040	1.23
JPY – Yen	17,258	1.47	16,214	1.54	5,408	1.10
MXN – Mexican peso	14,938	1.27	13,510	1.29	5,338	1.09
CLP – Chilean peso	24,382	2.07	21,652	2.06	3,180	0.65
COP – Colombian peso	7,576	0.64	8,174	0.78	2,878	0.59
Other	61,532	5.23	61,926	5.90	17,350	3.54

56 Considering all types of interbank market operations in the calculation, the participation of the USD in this market in 2020 would be 77.3%. However, the data presented in this document only consider types with a high participation of the USD, such as operations with the BCB (where the participation is 100%) and purchases/sales among institutions (participation of 98.8%). Arbitrage operations, where the USD is usually exchanged for another currency and, therefore, its participation is 50%, and operations where bank money is exchanged with cash, or vice versa, where the average participation of the USD in 2020 was 89.2%, are not considered in this work.

Financing of Brazilian companies and their overseas subsidiaries in the international capital market by bond issuance[1]

Between 2015 and 2020, Brazilian non-financial companies with access to the international bond market faced two major challenges, which resulted in temporary interruption of this type of financing: (i) the withdrawal of the sovereign issuer's investment grade by the major rating agencies; and (ii) the outbreak of the Covid-19 pandemic (Figure 1).

Figure 1 - Bond issuances abroad



The impacts of these two events on the length of the disruption and on the financing conditions after the resumption of issuances were distinct. After the loss of the investment grade, the absence of issuances lasted ten months. In addition, issuance in the year following the downgrade had the least favorable costs and average terms of the time series. In 2020, issuance was interrupted for three months due to the sanitary crisis. However, in the resumption, they maintained the same conditions as before the pandemic, that is, at a lower cost and with longer terms compared to the previous five years.

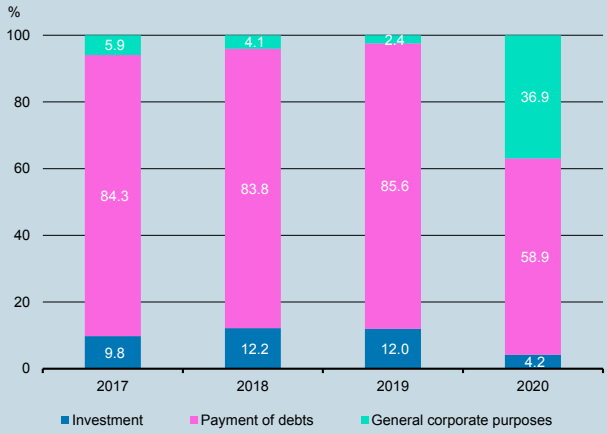
In 2015, access to the international debt market by Brazilian companies was impacted by the assignment of a speculative grade to Brazilian sovereign issues by two of the major rating agencies. With the downgrade, the sovereign risk (5-year Credit Default Swap – CDS BR 5yr) exceeded 500 points in the second half of that year.

1 The data in this study use the concept of nationality, as distinct from the scope of international statistics (BPM6, IIP and External Debt), which adopt the concept of residence. The difference between these two approaches in the analysis of foreign issues is addressed in the March 2015 Inflation Report, in the Box "Issues of subsidiaries of companies headquartered in Brazil in the international market." The information about companies' issuances (headquarters in Brazil and overseas subsidiaries) is sourced from the Refinitiv/Reuters information system and the websites of the issuing companies. Debt issues in the domestic market were gathered from the Capital Market Bulletin of the National Association of Financial Market Institutions (Anbima).

Despite the absence of investment grade for the sovereign issuer since 2015/2016 and the predominance of issuances by speculative grade companies, the international private corporate debt market remained accessible for Brazilian issuers.

Between 2015 and 2019, in a context of loss of investment grade by the sovereign issuer and a high liquidity international outlook, Brazilian companies and overseas subsidiaries issued USD 82.7 billion in the international market, with an average coupon of 6.6% p.a. and an average term of approximately ten years.[2] The main allocation of the resources was the refinancing and enlargement of debts' maturities,[3, 4] (Figure 2). Thus, the issues of the last six years contributed to the inversion in the maturity curve observed in the last 15 years, which shifted from short-term to long-term maturities.

Figure 2 – Allocation of resources of bond issuances in the international market



The greater expressiveness of the "general corporate purposes" allocation in 2020 may be associated with the formation of safety reserves, in line with a recent study by the Bank for International Settlements (BIS),[5] which identified for the global securities market an increase in issuances not associated with specific objectives, which give companies greater flexibility in allocating resources. The lack of need to settle or refinance debts in the short term and the existence of comfortable liquidity metrics, added to the allocation of funds not associated with investments, corroborates, for the Brazilian case, the hypothesis of liquidity cushion formation.

In 2020, still with no investment grade by the sovereign issuer, with an outlook marked by the Covid-19 pandemic and high liquidity resulting from expansionist policies adopted by central banks to mitigate the effects of the sanitary crisis on the economies, international issues totaled USD 16.8 billion, with more favorable cost and term conditions than in the previous five years.

Between 2015 and 2020, the issuance of securities in the international market by overseas subsidiaries of domestic companies predominated in relation to the issuance by subsidiaries domiciled in Brazil (Figure 3). The issuance cost – coupons paid – for overseas subsidiaries was lower between 2016 and 2018 (Figure 4). Although companies domiciled in the country have shorter issuance terms,[6] this has only been reflected in lower cost in 3 of the 6 years (2015, 2019, and 2020).

2 The average term does not include Petrobras' 2015 issue with a 100-year term.
3 The main sources of information on the allocation of funds are the companies' websites, in the "Investor Relations" session.
4 The issue by an overseas subsidiary and the use of the resources to refinance/extend foreign debt imply no inflow in the domestic foreign exchange market.
5 Bank for International Settlements (BIS). Bonds and syndicated loans during the Covid-19 crisis: decoupled again? BIS Bulletin n. 29. 14 Aug 2020. Available at: https://www.bis.org/publ/bisbull29.pdf.
6 Issues by BRF, with a longer term (30 years; 31% of the financial volume), and Eletrobras, with a shorter term (5 and 10 years; 49% of the financial volume), contributed, respectively, to the longest term and lowest cost for companies domiciled in the country in 2020.

Figure 3 – Bond issuances in the international market by domicile of the issuer

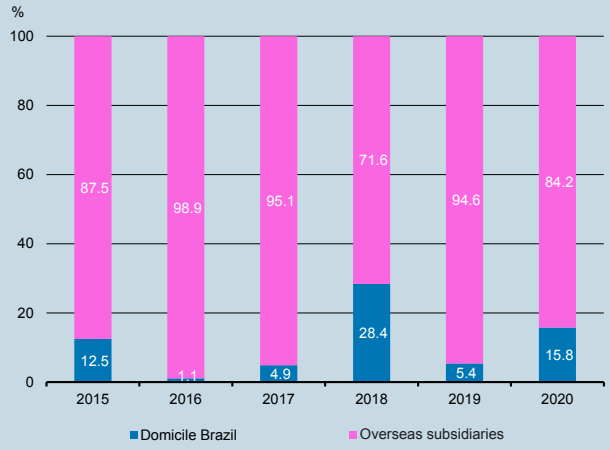
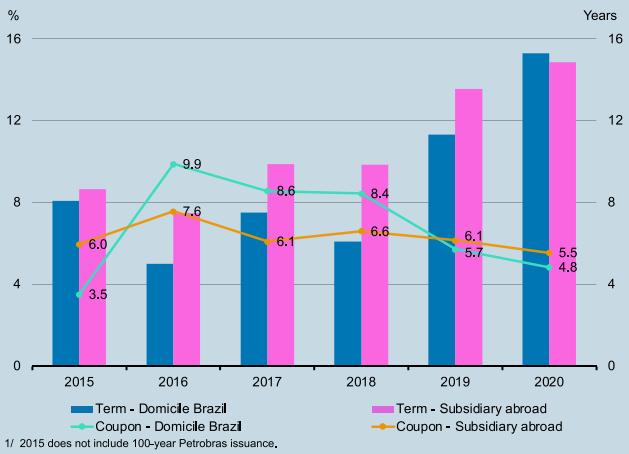


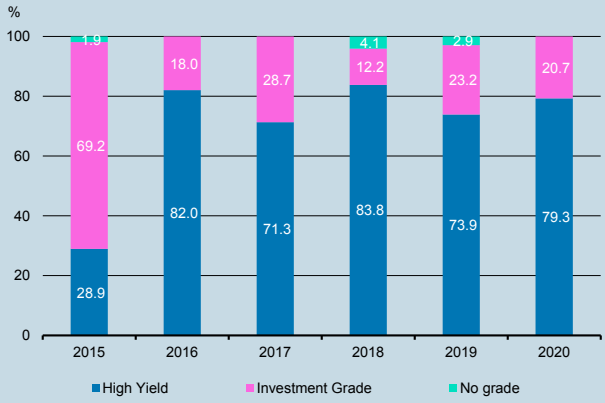
Figure 4 – Coupons (% p.a.) of bonds issued in the international market by domicile of the issuer[1/]



1/ 2015 does not include 100-year Petrobras issuance.

Apart from 2015, when issuances were concentrated in the first half of the year, prior to the withdrawal of the investment grade from the sovereign debt, issuances by non-investment grade companies predominated in the other years (Figure 5).

Figure 5 – Rating of bond issuances in the international market
Percentage distribution according to the amount issued



The stock of international issues by Brazilian companies and overseas subsidiaries was USD 126 billion in 2020 (USD 157 billion in 2015), 24% belonging to Petrobras. Compared to 2015, most of the variation is explained by Petrobras' stock reduction, with the other companies hovering around USD 100 billion over the last five years. Petrobras' share of the issues' stock varied from 35% in 2015 to 24% in 2020 (Figure 6).

The maturities' distribution is concentrated in the long term, with 71% of the stock having a maturity of more than five years (Figure 7). In retrospect, the maturity profile of the stock has virtually undergone a reversal in 15 years. In a study conducted by the Brazilian Development Bank (BNDES),[7] the 2004 stock had maturities concentrated in up to five years.

7 Brazilian Development Bank (BNDES). Market funding Report. 2004 outlook.

Figure 6 – Stock of bonds issued in the international market

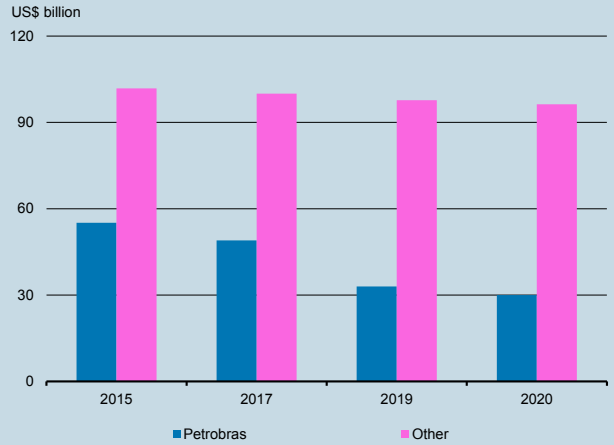
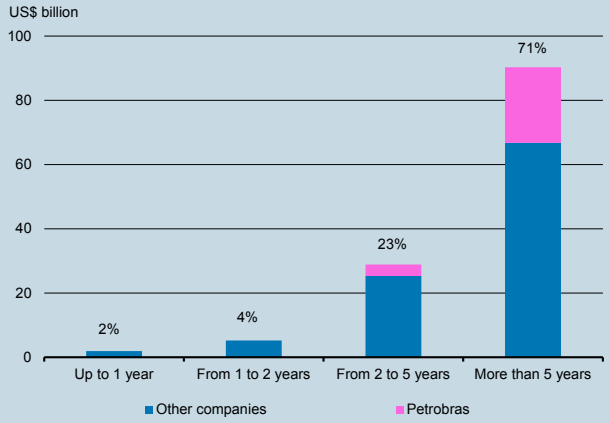


Figure 7 – Maturity of the stock of bonds issued in the international market
Maturity by residual term



The lengthening of maturities corroborates the analysis of the stock of issues between 1991 and 2004 (BNDES, 2004), which showed that the larger volumes and maturities were associated with periods of greater liquidity. In this way, the international liquidity resulting from the expansionist monetary policy adopted by the main central banks as of 2008 contributes to explaining the reversal in the maturity profile of corporate debt.

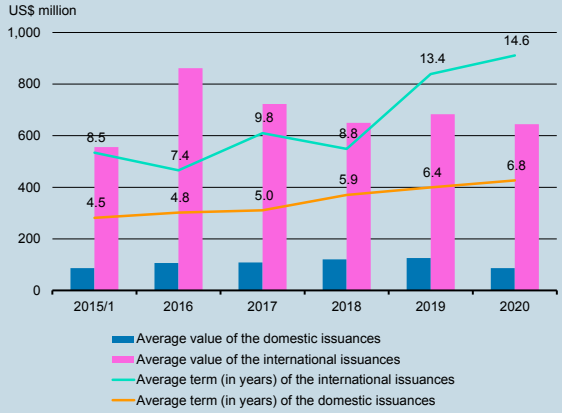
Comparing the volume of debentures issued in the domestic capital market with foreign market issues between 2015 and 2020, domestic issues prevail in both financial volume and quantity (Table 1).

Table 1 – Bond issuance on international and domestic markets
Brazilian companies and overseas subsidiaries

	Financial volume (US$ billions)		Quantity	
	International market	Domestic market	International market	Domestic market
2015	7.2	18.5	13	213
2016	18.1	18.4	21	174
2017	24.6	28.0	34	259
2018	12.3	41.4	18	343
2019	20.5	46.8	30	372
2020	16.8	23.7	25	274

The higher volume and quantity issued are evidence that the domestic market is accessible to a larger number of issuers compared to the international market. However, the characteristics of the issues (average ticket and maturity) indicate that the international market has a greater capacity of granting credit with better conditions – larger volume and longer terms. Between 2015 and 2020, the average volume of an issuance abroad was approximately six times higher than a domestic one, and the average maturity, almost double (Figure 8).

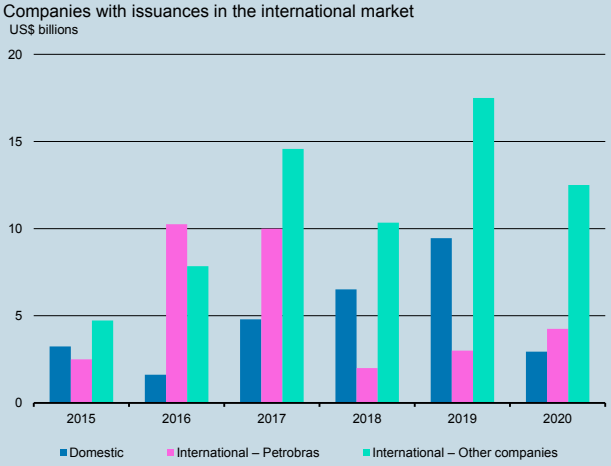
Figure 8 – Average value and maturity of bonds issued in the domestic and international markets[1/]



1/ 2015 does not include 100-year Petrobras issuance.

The predominance of domestic over international capital markets as a source of funding for Brazilian companies is consistent with the result found by the International Organization of Securities Commissions (IOSCO)[8] for emerging countries. Nevertheless, when considering only companies that have already issued abroad, international issues are predominant (Figure 9), a result corroborated for the 25 largest domestic public companies, according to a study by the Securities and Exchange Commission (CVM).[9]

Figure 9 – Bond issuances in the domestic and international countries
Companies with issuances in the international market



Concentration is a common characteristic of both markets. Between 2015 and 2019, the ten largest issues were about a third of the financial volume issued in the domestic market.

In emerging countries, corporate debt issuance, down since 2014, showed growth in 2016 and 2017, and a decline in 2018.[10] Despite the lack of sovereign investment grade status since 2015/2016, Brazilian companies continued to have access to the international corporate private bond market, with predominance of issues by companies also without investment grade.[11]

8 International Organization of Securities Commissions (IOSCO). *Corporate bond markets: an emerging markets perspective*. 2015.

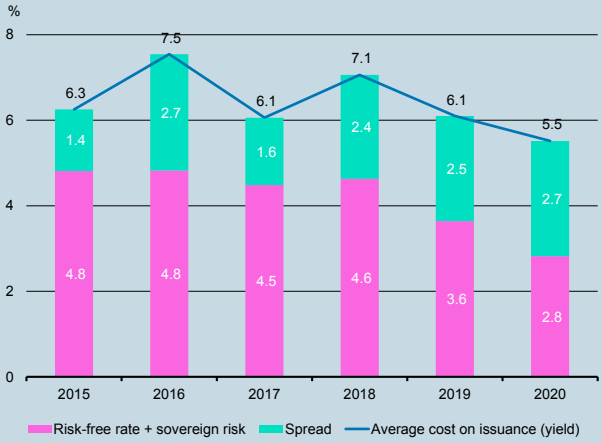
9 Securities and Exchange Commission (CVM). *O mercado de dívida corporativa no Brasil*. 2019.

10 Emerging Issues: Çelik, S., G. Demirtaş and M. Isaksson (2019), Corporate Bond Markets in a Time of Unconventional Monetary Policy, *OECD Capital Market Series*, Paris. Issuances by Brazilian companies and overseas subsidiaries: survey with the Refinitiv/Reuters information system. The statement does not cover issuances by China, with growth in 2015 and 2016, a drop in 2017, and a resumption in 2018.

11 South Korea, Mexico, and Brazil are the largest emerging economies with issues outside their domestic market (IOSCO, 2015, p. 4). OECD data (2019) shows approximately 20% share for Brazil in emerging markets' (w/o China) issuances between 2008 and 2018.

In 2019, ex-Petrobras issues exceeded the previous four years,[12] consisting of a five-year record. Sovereign risk, a determinant for the return required from private securities, favored issues during the year, i.e., the average effective cost was lower than that of two of the previous three years (Figure 10) and the average maturity, onger than that in the previous four years (Figure 8).

Figure 10 – Effective cost on issuance (yields)
Bonds issued in the international market



In 2020, the outlook marked by uncertainty about the Covid-19 pandemic effects on the global economy presented a new scenario for Brazilian issuers. Sovereign risk, at mid-March, reached a level where issues become scarce or cease. Figure 1 shows the near absence of issuances forv above 250 bps.

In the year, issues behaved at a stop-and-go pace, in line with CDS levels,[13] that is, four months of the year with no issues[14] since February and a resumption in June, following sovereign issues.[15] The financial volume in 2020 exceeded that of 2015, when the sovereign risk reached a higher level, and that of 2018,[16] also with higher levels in the series, but was lower than that of 2017 and 2019, years with lower perceived risk (Table 1 and Figure 1).

Issues ended the year with an average coupon and an average initial yield lower than that of the previous five years, a longer maturity, and a higher spread over the risk-free rate plus sovereign risk[17] (Figures 8 and 10). The resources continued to be used to pay or refinance debts (Figure 2). Five of the 26 issues in the year had investment grade status.

Companies had been lengthening the term of their securities liabilities since the resumption of issuance in 2016 (Figure 2); thus, the interruption of funding at the beginning of the pandemic had no impact on the need for refinancing securities, which was concentrated in the medium term (Figure 7). The allocation of issuances' resources after the resumption in July corroborates the absence of the need for refinancing, that is, the issuance for general purposes presented the highest percentage of the previous five years (Figure 2).

12 In 2019, Petrobras accounted for 25% of the total corporate debt stock. Between 2015 and 2017, its average share of issues was 40%; in 2018 and 2019, the average was 15%.
13 The Brazilian sovereign risk (CDS BR 5yr), at 99.5 points on February 24, reached a maximum of 376.5 on March 18. The rise associated with the Covid-19 pandemic's effects approached 300 points. The effects of the pandemic began to be reflected in the international financial and capital markets at the end of February. On February 24, US stock markets recorded the largest daily drop since February 2018; on March 3, at an extraordinary meeting, the Federal Reserve (Fed) announced a cut in the fed funds rate range.
14 Interruption for three consecutive months, between March and May; and absence in August.
15 Sovereign issues are a benchmark for private issues and anticipate foreign currency funding. The annual effective cost for corporate issues over the last five years was on average +1.5 p.p. over sovereign issues.
16 In 2015, due to the loss of sovereign investment grade, and in 2018, to truckers' strike and announcement of US surcharges on Brazilian steel and aluminum.
17 Sovereign risk: CDS 5yr BR. Risk-free interest rate: 10Y US Treasuries.

Final considerations

This study covered the funding of Brazilian companies domiciled in the country and their overseas subsidiaries by the issuance of securities in the foreign market. Financing through the domestic securities market was studied for comparison of funding conditions – volume, cost, and maturity – without distinguishing between purchases of debt issued in the country by residents and non-residents.

The most recent event with negative repercussions on access to the international securities market – the outbreak of the Covid-19 pandemic – had a shorter-lasting impact than the loss of the investment grade in 2015 by the sovereign issuer, which resulted in a prolonged issuance disruption. In 2020, companies resumed issuing securities a few months after the disruption, with funding conditions similar to those that had been practiced, which were better than in previous years, with lower costs and longer terms.

The absence of investment grade for most of the issuing companies since the sovereign's loss of investment grade status has not proved to be an impediment to access to the international securities market on a regular basis and at favorable conditions. The high global liquidity benefited the resumption of international issues, without representing an increase in corporate vulnerability associated with the increase in foreign currency funding – companies continued to issue securities with the main objectives of refinancing and lengthening debt maturity, as they had been doing at least since 2015, keeping their stock stable.

Portfolio investments of non-resident investors

Portfolio investments have a relevant participation in financial exchanges with other countries, being the most significant flow in the Balance of Payments' financial account and the second largest stock of non-residents' claims in the International Investment Position. This study investigates foreign portfolio investments in the country from a historical perspective – since 2015, the year the first credit rating agency withdrew the Brazilian sovereign issuer's investment grade, until 2020 –, and the impacts of the Covid-19 sanitary crisis, when the portfolio accounted for almost half of total foreign exchange flows[1] and for the most negative balance of the series in the most acute month of the crisis.

This box highlights the contribution of portfolio investments to primary foreign exchange market flows and its relevance in the expansion of international reserves after the 2008 global financial crisis. The main characteristics of portfolio investments are described, including evolution and composition, stock concentration and its effects, participation of non-resident investors (NRIs) in the sovereign debt and stock markets, and portfolio maturities – in the case of investments in sovereign bonds.

Portfolio investments in external liabilities, foreign exchange flows, and the NRIs in the bond and equity markets

Portfolio investments accounted for 33.4% of external liabilities in December 2020, with non-resident investments in the domestic market accounting for approximately 2/3 of that percentage.[2] The average participation of portfolio investment flows in the foreign exchange primary market in the last three years reached 35.9% (purchases + sales) (Figure 1).[3] In 2020, the negative portfolio balance contributed with 19.4% of the total negative balance of all financial flows.

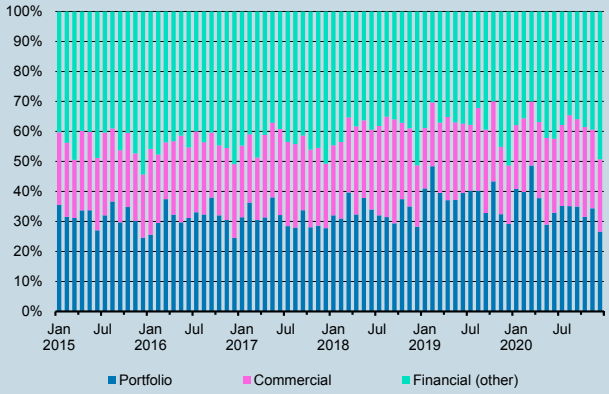
The stock of equities and sovereign bonds has accounted for nearly 80.0% of foreign portfolio investments in the country. Flows related to sovereign bonds are the main determinants of the negative foreign exchange balance of NRIs' portfolio investments since 2016. The remaining stock is composed of investments in funds of various types and other assets, including fixed-income securities issued by non-financial companies and institutions authorized by the Banco Central do Brasil (BCB). The exchange rate exposure is a risk for the NRI as portfolio investments occur in domestic currency.

1 Purchase + sale.

2 International Investment Position (IIP). The scope of this box is non-residents' investment in the domestic market, which represents a share of portfolio liabilities in the IIP. Data sources for portfolio investment flows are the Foreign Exchange System ("*Sistema Câmbio*"), the series of portfolio investments (SGS22924), of the trade balance (SGS11047) and the financial balance (SGS11050). Data sources for stock are the CBLC and Selic databases. Regarding the NRIs' purchases of assets in the Brazilian equity market, B3 data was used.

3 Derivative flows are included.

Figure 1 – Participation of portfolio, commercial and financial lows in the primary foreign exchange market
Purchases + sales

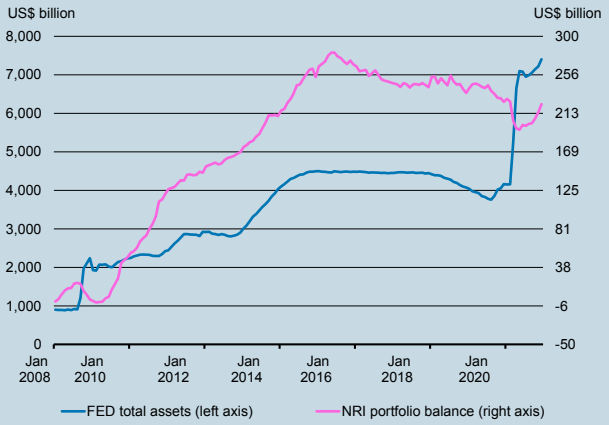


Portfolio investments and the expansion of international reserves

Since the 2008 financial crisis, the expansionary monetary policy of major central banks included, in addition to interest rate management, the use of unconventional tools, including the purchase of financial assets – sovereign and private securities –, with the corresponding injection of funds into the economies. One of the consequences of reducing interest rates to minimum levels was the phenomenon known as "search for yields" in which agents – notably banks and asset managers – searched for more profitable and, therefore, riskier assets. The use of unconventional monetary policy instruments has provided a significant increase to global liquidity.

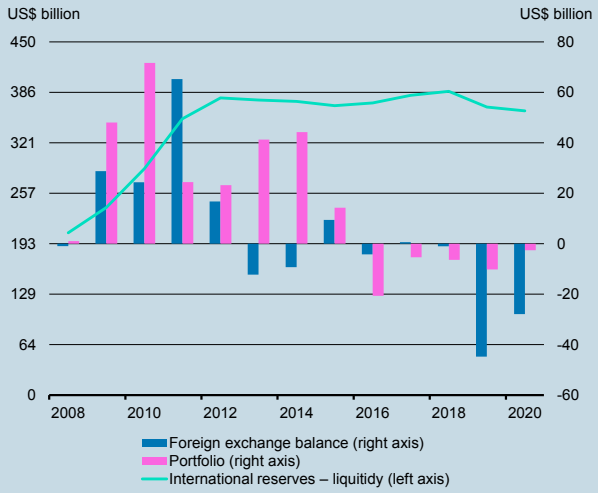
The combination of these two factors – "search for yields" and excess liquidity – benefited emerging countries, including Brazil, which absorbed part of the resources available from developed economies as capital inflows (Figure 2). The financial and capital markets – mainly investments in fixed and variable income securities– have been some of the channels for transmitting monetary policy from central banks of developed economies to emerging countries.

Figure 2 – Balance of NRI portfolio investments and FED total assets



The expansionary monetary policy of the central banks in developed countries had an important impact on the increase of Brazil's international reserves as of the second half of 2009[4] (Figure 3). The NRI portfolio flows contributed significantly to foreign exchange surpluses and the role of the BCB as buyer of foreign currency from the institutions authorized to operate in the foreign exchange market.[5] The achievement of the investment grade in 2008 also contributed to foreign capital inflows. The Tax on Financial Operations (IOF) rates policy stands out in regulating these flows.[6] As of 2016, the portfolio flow became predominantly negative, albeit at relatively moderate levels.

Figure 3 – Evolution of international reserves



The contribution of portfolio flows[7] during the period of reserves accumulation was greater than its contribution to the decrease of foreign currency in the BCB's portfolio in 2019 and 2020, when the BCB sold foreign currency to the market to balance the foreign exchange deficit in the primary market. In March 2020, the most critical month regarding the impact of the Covid-19 pandemic on the foreign exchange balance, portfolio flows (purchase + sale) accounted for half of total foreign exchange flows (commercial + financial) and were the main factor underlying the month's foreign exchange deficit and the decrease of reserves. However, this reduction was not comparable to the previous foreign currency accumulation.

4 The US monetary policy as a relevant factor in explaining portfolio flows to emerging economies is analyzed in the study "*Fluxos de portfólio para economias emergentes e o comportamento de não residentes*" of the April 2019 Financial Stability Report.

5 The BCB's foreign exchange policy provides for its acting in the domestic exchange market, if adverse conditions for its regular operation are identified. Positive or negative foreign exchange balances, in considerable amounts, may require BCB to act as buyer or seller of foreign currency. When the BCB acts by purchasing foreign currency from institutions authorized to operate in the foreign exchange market, it increases the level of international reserves.

6 The IOF rate on fixed income portfolio investment was zeroed since October 2008, increased to 2% in September 2009, and to 4% and 6% in October 2010, returning to 0% in June 2013. For investment in equities, a 2% tax rate was applied in September 2009 and 0% in December 2011. The adoption of the IOF as an instrument of macroprudential policy is analyzed in the study "*Marco legal do mercado de câmbio e de fluxos de capitais: há possibilidades de aprimoramento? Desregulamentação recente e perspectivas institucionais*", by Cesar van der Laan. Available at http://www2.senado.leg.br/bdsf/handle/id/508644

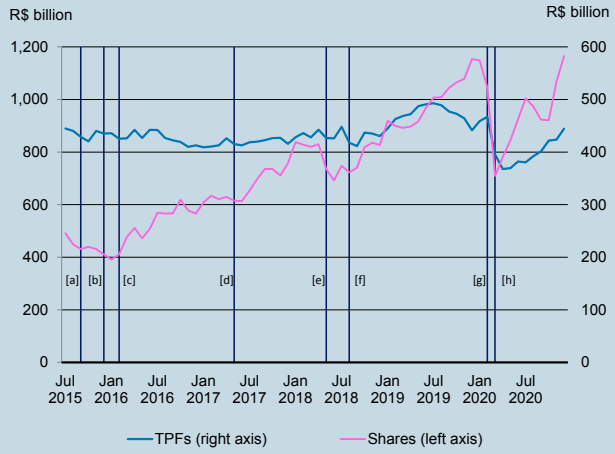
7 The NRI derivatives flow – with a balance of USD 9.6 billion between 2016 and 2020 – makes up the foreign exchange balance but is not computed in portfolio. In a period of currency volatility, this flow assumes greater relevance, with negative balances associated with the depreciation of the domestic currency.

Portfolio investments of NRIs in the country[8]

Around 80% of portfolio investment by non-residents in Brazil is concentrated in equity securities (shares) and sovereign bonds (TPF).[9]

The foreigner investors' portfolio of sovereign bonds remained stable[10] from July 2015 to December 2020 (Figure 4). However, due to the increase in the domestic Federal Government Securities Debt (DPMFi), its share in this debt declined from 18.7% to 8.8%[11] in that period. Almost all investments in securities are in fixed-rate debt securities. The drop of the basic interest rate from 14.25%, in July 2015, to 2.0%, until December 2020, did not change this profile.

Figure 4 – Balance of TPFs and shares
Portfolio of NRIs



Throughout the analyzed period, a concentration of investments in TPFs raised the participation of some NRIs. The operations of this group have a relevant impact on the monthly movement in the foreign exchange market flows, the stock variation, and the maturities distribution. In fact, major investors have been responsible for the most significant flows, the main stock variations, and changes in the distribution of portfolio maturities.

8 The data source of portfolio flows is the Foreign Exchange System ("*Sistema Câmbio*"). Stock data – equities and sovereign bonds – are based on the Brazilian Clearing and Depository Corporation (CBLC) and the Special Settlement and Custody System (Selic) databases.

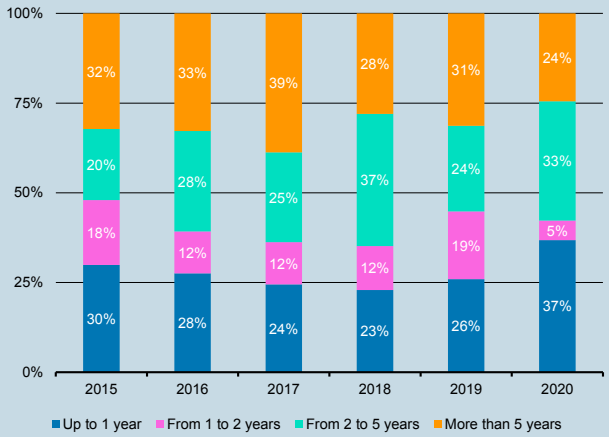
9 The main events impacting the asset stock of NRIs since July 2015 were: (a) withdrawal of the sovereign investment grade status by Standard & Poor's Ratings Services on September 9, 2015; (b) withdrawal of the sovereign investment grade status by Fitch Ratings on December 16, 2015; (c) withdrawal of the sovereign investment grade status by Moody's on February 24, 2016; (d) disclosure, in national media, of a dialog between Joesley Batista (JBS company) and the president of the Republic, Michel Temer, on May 17, 2017; (e) halt in the transportation sector against the diesel price hike, on May 21, 2018; (f) doubling of steel and aluminum tariffs on imports from Turkey, to 20% and 50%, respectively, authorized by US President Donald Trump, on August 10, 2019; (g) the largest daily drop in the US stock markets since February 2018, due to the impact of the expected reduction in global growth associated with Covid-19, on February 24, 2020; and (h) declaration by the World Health Organization (WHO) of the Covid-19 outbreak as a global pandemic, on March 11, 2020.

10 With the exception of the first three quarters of 2020, when the effects of the pandemic were felt on foreign investments in sovereign bonds, and the increase in the average stock in 2019, the NRIs portfolio hovered in the range of BRL 400 billion to BRL 450 billion between July 2015 and December 2020.

11 The International Monetary Fund (IMF) establishes reference levels for sovereign debt risk assessment. Among them is the lower risk-assessment benchmark of 15% for the foreign investors' participation. Considering only the domestic currency debt acquired by NRIs, the percentage in December 2020 was 8.8%. If the external debt is included, it reaches 13.7%. (IMF. Public debt sustainability analysis in market-access countries. https://www.imf.org/external/np/pp/eng/2013/050913.pdf).

Between 2015 and 2019, considering the portfolios on the last day of the year, nearly 26% of the stock maturity was up to 12 months (Figure 5). In 2020, this percentage was 36.8%. The portfolio average maturity in December reached 3.3 years, shorter than in the previous three years.[12] There are distinctions in investment profile and maturities among categories and even within categories for major investors: (i) non-resident banks with short-term concentration; (ii) sovereign investors with stocks above BRL 20 billion in the short-term, and other sovereign investors in the long-term; and (iii) asset managers with stocks above BRL 20 billion in the short-term, and other asset managers in the long-term.

Figure 5 – Maturity of the TPF portfolio of the INRs



The stock of equities[13] ranged from BRL 391 billion (January 2016) to BRL 1,165 billion (December 2020), considering portfolios between July 2015 and December 2020. The stock of equities shows some degree of concentration like the stock of sovereign debt securities. The average participation of investors with assets greater than BRL 20 billion in the portfolio of variable-income assets reached 36% in 2020 (35% in 2019). Participation of NRIs in public offerings in the domestic market (IPOs and follow-ons) averaged 56% between 2015 and 2019. In 2020, the participation reached 31.8%.

The NRIs' average participation in the market value of equities traded on B3 reached 23.2%. Trading volume participation ranged from 43.1% to 56.9% between July 2015 and December 2020. In December 2020, it stood at 45.5%. The equity portfolio of the NRIs follows the market value of the equities traded on B3 or an equity index (Ibovespa or MSCI); the main equity investment funds reproduce the index composition in their portfolio (country share in the index).

Portfolio investments in the Covid-19 pandemic[14]

The Covid-19 pandemic severely impacted portfolio flows and the NRIs' stock of assets in March 2020. In that month, the participation of portfolio-related transactions in the total volume (commercial + financial) operated in the foreign exchange market reached 48.7%, the highest percentage in the series since January 2015. Among portfolio assets, the capital outflows related to derivatives, equities and bonds reached the highest levels since July 2015 and the highest monthly negative balance in absolute value. March accounted for more than 70% of the portfolio's deficit in the first half of the year, highlighting the outflows related to debt securities and equities.

12 Portfolio average maturity in December/2017: 4.5 years; December 2018: 3.9 years; December 2019: 3.7 years.
13 Does not include Depositary Receipts (DRs).
14 The analysis of foreign exchange flows is based on t data from the Foreign Exchange System ("*Sistema Câmbio*"), while that of the sovereign debt stock is based, on the Selic database.

The reopening of the economies and the continuity of monetary and fiscal stimuli recalibrated the risk aversion of foreign investors in the second half of the year, and the portfolio accumulated a positive foreign exchange balance of USD 22 billion, compared with USD 34 billion in the first half of 2020. The foreign exchange balance of equity investments (not considering depositary receipts) in the second half of the year reverted the first half's performance, while that of securities showed a partial reversal.

Regarding the stock of assets, in March 2020, the number and financial volume of sovereign debt securities reached the lowest levels in the series since July 2015. More than 70% of the reduction of the NRIs' stock of sovereign debt securities observed in March was due to the negative variation in the portfolio of asset managers. Sovereign investors maintained a stable stock, while non-resident banks showed a little negative variation.

Average stock of domestic sovereign debt securities owned by NRIs in 2020 remained below the average of the last four years. The worsening in portfolio maturities compared with pre-pandemic years is explained by one-off increases in the portfolio of investors with predominantly short-term securities and by the shortening of the relevant investors' portfolio maturities.

The participation of NRIs in public offerings in the domestic capital market – Initial Public Offering (IPOs) and follow-ons – ceased in February and resumed in May, but at a lower level compared with the previous five years (32%, compared with an average of 56%).

Conclusion

This study addressed portfolio investments in Brazil by non-residents from a historical perspective, with emphasis on the characteristics of the portfolios of equities and sovereign debt securities. In the analyzed period, the relevance of the portfolio investment participation in financial transfers to and from abroad stood out. The high global liquidity was determinant for reserves accumulation in foreign currencies, with the increase in capital inflows in a context of investment grade achievement, and for the subsequent stability of the stock, even after the sovereign issuer's downgrade.

The characteristics of the NRIs' investments, notably the concentration of the sovereign debt securities' portfolio and the more active participation in the volume traded in the equity market, present relevant impacts on the primary foreign exchange market and financial indexes. In the foreign exchange market, the main recent variations in portfolio investment flows are associated with movements by major investors. As for the financial indexes, the volatility of indicators such as Ibovespa can be associated with the movement of foreign investors – inflows and outflows, due to their significant participation in the volume traded on B3.

The future behavior of capital inflows changes for different time horizons. Continued high global liquidity conditions indicates stable portfolio inflows expected in the short-term.

Modernization of Foreign Exchange and International Capital Legislation – Foreign Exchange Bill

The Chamber of Deputies approved, in December 2020, the text of the substitute of Bill 5,387/2019 (Foreign Exchange Bill – FX Bill) originated in the Executive Branch from studies prepared by the Banco Central do Brasil (BCB). This legislative proposal is in line with international best practices and it is a fundamental step in the process to Brazil become a full member of the Organization for Economic Cooperation and Development (OECD).

The FX Bill aims to modernize, simplify, and consolidate the legal framework of the foreign exchange market and international capitals. It makes legal requirements compatible with the demands of an economy inserted in global value chains, making it easier to develop foreign trade and an efficient flow of funds and investments, improving the business environment in Brazil. The proposal aligns the Brazilian regulatory framework on the subject to countries with similar levels of development. The FX Bill foresees that the BCB will continue to monitor the foreign exchange market and its transactions, starting with the identification of the parties and the values involved. The proposal has a chapter dedicated to information for the compilation of official macroeconomic statistics by the BCB. The bill does not deal with the execution of monetary or foreign exchange policies. This box describes the reasons for submitting the bill, its proposals, and the benefits available to foreign exchange market participants, to economic agents who receive international investment or credit, to those who make foreign investment or international credit transactions, and to the public in general.

Current legislation

The existing legal framework on foreign exchange operations and on international capital was structured when Brazil was experiencing severe restrictions on the balance of payments during most of the 20th century.

At that time, exporters were obliged to bring back to Brazil all their exports proceeds, which were of fundamental importance for the country's balance of payments over several decades of the last century. When the country's external vulnerability was reduced as of the 1990s, it was possible to adopt regulatory adjustments on the subject, such as Law 11,371, of November 28, 2006, which made it possible to make proceeds repatriation requirements more flexible, and the National Monetary Council (CMN) to be competent to establish the percentage of export resources that could be kept abroad. In 2008, the CMN allowed Brazilian exporters to keep all their exports proceeds abroad.

These regulatory adjustments highlighted the existence of a rigid and obsolete legal framework, permeated by rules that hamper foreign trade, investment, and capital movement and do not contemplate the current needs of the Brazilian economy.

The FX Bill will allow the adoption of requirements proportional to the values of the transactions and the risks involved, allowing innovative business models to be implemented, to increase competition and provide more efficient services.

Modernization

Although Law 11,371 of 2006 allows to keep exports earnings abroad, this permission is limited to investments or payment of their own obligations, being forbidden the granting of loans, even for its subsidiaries abroad. The FX Bill removes these restrictions, eliminating the existing asymmetry in relation to resources from exports held abroad, increasing exporters' ability to manage and better allocate their exports proceeds held abroad. Thus, the Brazilian exporters will be able, in this regard, to compete on equal terms with its foreign competitors.

The definition of foreign capital is another topic in the bill. Law 4,131, of September 3, 1962, characterizes international capital as

> assets, machinery, and equipment, received from abroad without initial currency expenditures, intended to production of goods and services, as well as financial or monetary resources brought to the country earmarked to economic activities, if, on both hypotheses, they belong to resident households or companies, domiciled or headquartered abroad.

This concept is incompatible with current global value chains and prevents, for example, the payment of principal and interest on financed imports where part of the final good to be imported and produced in a third country will not be received in Brazil. In these cases, the restriction generates unnecessary costs to the business. In the FX Bill, the definition of international capital is in line with the country's needs.

Another example of modernization in the Bill is the possibility of Brazilian companies, willing to pay obligations abroad in Brazilian currency (BRL), to use an international bank correspondence service from accounts in BRL held in the country by banks not established in Brazil. Art. 8 of Law 11,803, of November 5, 2008, foresees the use of this international bank correspondence service for receiving BRL from abroad. The bill will also allow the remittance of funds in BRL abroad from resources kept in these accounts. This new command will contribute to the increase the international use of the BRL.

The acceptance of the BRL abroad reflects the confidence in the country's economy and in the conduct of economic policy, as well as the country's commercial and financial presence in the world. Having an internationally accepted currency helps to reduce funding costs in the domestic currency, facilitating public and private financing. When the domestic currency is used to define price denomination of commercial invoices, the exchange rate variation risk is transferred to other countries.

Still regarding modernization, the box "Public Consultation on the Regulation of Innovations in the Foreign Exchange Market", of this Report, presents an important initiative with the purpose of adapting the foreign exchange regulations to the current outlook of intensive use of technological solutions, within the current legal framework. The FX Bill will allow even greater advances in the future. As an example, currently, a FinTech with an innovative solution in foreign exchange needs to be structured with practically the same level of requirements as a financial institution. This raises costs and creates barriers to entry and makes it unfeasible to offer low-value transfer services. The bill will allow the adoption of new business models that increase market efficiency, competition, and financial inclusion.

Thus, the proposal modernizes the legal and regulatory framework, adapting it to an economy inserted in global value chains.

Simplification

Regarding simplification, the FX Bill allows the adoption of proportionality principles in bylaw regulation, creating requirements appropriate to businesses values and to participants' risks. It also allows for simplifying requirements so that households and companies can streamline their foreign operations.

The FX Bill refers to the registration at the BCB of foreign capital entering the country in an economic context of high and chronic unbalance in the balance of payments and shortage of foreign currency, according to Law 4,131, of 1962. Registration is required for international credit operations, for investments in companies established in Brazil, and for investments in financial and capital markets, regardless of the amount of the operation, thus encompassing even low-value operations between small companies and low-value loans between individuals within the household environment.

Table 1 presents values of international credit operations denominated in US dollars (USD) registered in the BCB, encompassing loans, financed imports and related operations. International credit operations above USD 10 million represent almost 88% of the value of operations, but only about 9% of the operations registered. The FX Bill establishes that the BCB may choose ways to obtain information about international capital, according to proportionality criteria. The business value, for example, could be considered, exempting from registration non-significant transactions, thus allowing reduction in compliance costs for recipients of international credit.

Table 1 - Distribution of international credit operations registered in the BCB
Records denominated in US dollars (2011-2019)

Value of Operations	Quantity of Operations	Participation in the total number of operations	Participation in the total value of operations
Up to US$100 thousand	26,690	26.9%	0.1%
From US$100 thousand to US$500 thousand	25,824	26.0%	0.7%
From US$500 thousand to US$1 million	11,643	11.7%	0.9%
From US$1 million to US$10 million	25,953	26.1%	9.4%
From US$10 million to US$100 million	7,699	7.8%	25.4%
From US$100 million to US$1 billion	1,400	1.4%	40.0%
More than US$1 billion	92	0.1%	23.5%

Source: BCB

The FX Bill should also facilitate the participation of foreign investors in the financial and capital markets. Currently, they must also register investment in the BCB. The FX Bill opens the possibility for simplified access by these investors, including for financial investments in public or private securities.

Consolidation and other characteristics of the proposal

The FX Bill consolidates more than 40 legal provisions issued since 1920 into a single legal instrument that contain disperse and possibly conflicting commands, increasing the legal security of international operations.

With its approval, a significant improvement will occur in relation to the scenario of restrictions that prevent Brazil from adhering to the OECD's Code of Liberalization of Capital Movements and Code of Liberalization of Current Invisible Operations. Adherence to the liberalization codes is a key step in the country's process to become a full member of the OECD

Finally, the FX Bill is in line with the best international practices, including those related to the recommendations to prevent money laundering and combat the financing of terrorism.

Public Consultation on the Regulation of Innovations in the Foreign Exchange Market

The Public Consultation Notice 79, of November 12, 2020, approved by the Banco Central do Brasil (BCB), on improvements in the current foreign exchange regulation, brought advancements related to technological innovations and new business models applied to international payments and transfers. This box aims to show the motivations and main measures presented by draft resolutions of the National Monetary Council (CMN) and the BCB under public consultation.

Considering the increasing digitalization in the financial system and the new business models, it is opportune to improve the foreign exchange regulation, seeking to consider innovations related to cross-border payments and transfers.

The improvements consider recent developments in cross-border payments and transfers, advancing towards competition, financial inclusion, and innovation in the segment within the operational possibilities allowed by the current legal framework. It should be noted that the implementation of structural innovations in the Brazilian foreign exchange market are subjected to the updating of the legal framework of this market (PL 5,387/2019).[1]

The measures proposed in the CMN and BCB resolutions under public consultation cover three major themes: (i) remittances, usually understood as resources sent, with no counterpart, by migrants to their families in their country of origin; (ii) payment institutions and payment accounts in the foreign exchange market; and (iii) modernization of the regulation of cross-border payment or transfer services in the foreign exchange market. These topics are detailed below.

Remittances

The current foreign exchange regulation brings some restrictions to personal transfers (remittances). For instance, it is not possible to use international cards for this purpose, and the customer must have a relationship with an institution authorized by the BCB to operate in the foreign exchange market. In this sense, the proposal creates a regulation framework (eFX, detailed below) that will enable institutions authorized to operate by the BCB − not only those authorized to operate in the foreign exchange market − to carry out remittances, as well as transfers of funds between accounts held in the country and abroad by the customer. The new possibilities for these transfers will increase competition in the segment, providing better services and lower costs to users.

Additionally, the regulation under public consultation will improve the rules related to the inflow of resources from remittances to individuals in Brazil whose payment order terms were agreed upon by the sender abroad. Besides the delivery of funds through credit in the recipient's deposit account in the country, it will be allowed the credit in a payment account held in a financial institution or in another institution authorized to operate by the BCB and the delivery of funds in cash. The amount in Brazilian *real* (BRL) to be received by the individual in this type of transaction will remain limited to BRL 10,000 per operation.

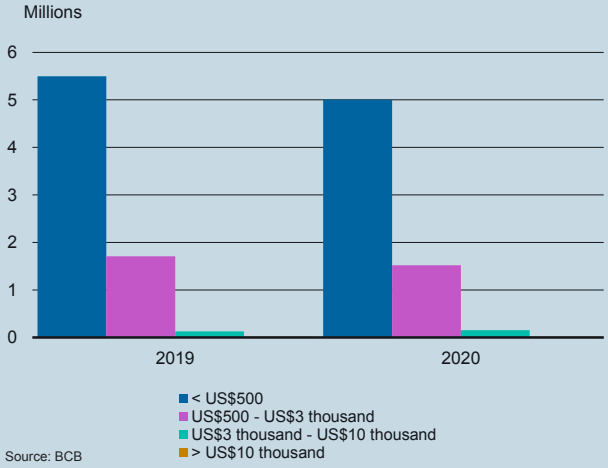
1 For further details on the Foreign Exchange Bill, see box "Modernization of Foreign Exchange and International Capital Legislation – Foreign Exchange Bill," of the 2020 REB.

These measures are aligned with the G20's efforts for the member-countries to propose initiatives aimed at continuously reducing such operations associated costs, as well as contributes to the fulfillment of United Nations' 2030 Agenda item, which calls for the reduction of migrant remittances transaction costs to less than 3% on average and that none of the remittance corridors remain with costs higher than 5%. Such initiatives for reducing remittances costs have been consolidated into national remittance plans[2], which involve initiatives in the following areas: (i) competition; (ii) infrastructure improvement and new technologies implementation encouragement; (iii) tariffs reduction; and (iv) transparency and consumer protection improvement in remittance services.

According to the December 2020 edition of the World Bank's Remittance Prices Worldwide survey − report that has been monitoring the remittance prices charged in the world's main transfer corridors since 2008 − the average cost of remittances to Brazil in 2020Q4 was 5.17%, higher than the average cost of 4.19% for the G20 countries in the same period. For remittances from Brazil, the average cost was 6.79%, also above the G20 countries average value (4.35%).

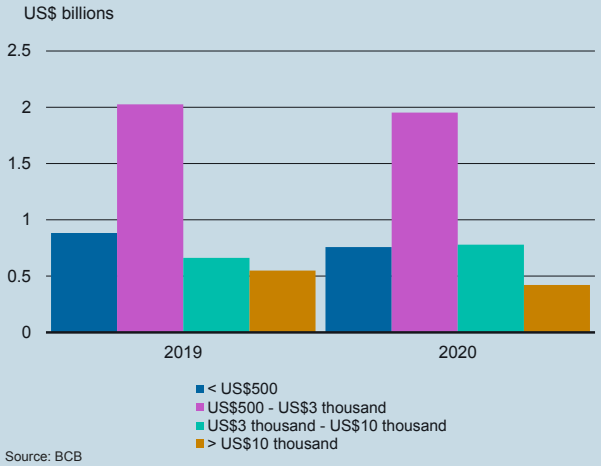
In 2020, transactions up to USD 10,000 accounted for 99.8% in terms of quantity (Figure 1) and 87.9% in terms of total remittance transactions values (Figure 2).

Figure 1 – Remittances – Quantity of transactions by value range



Source: BCB

Figure 2 – Remittances – Volume of transactions by value range



Source: BCB

Payment institutions and payment accounts in the foreign exchange market

The proposed regulation also considers the significant development of payment institutions[3] (PIs) and the popularization of payment accounts in BRL, bringing these alternatives for carrying out foreign exchange transactions. The proposals under public consultation focus on PIs authorized to operate by the BCB − on March 2021 there were 26 of these authorized institutions, some of them with millions of customers and relevant international operations. The main proposals aim at:

- allowing the use of payment accounts held in financial institution or in another institution authorized by the BCB, for the delivery of BRL in foreign exchange operations, without limit. A BRL 10,000 limit will be maintained for the use of payment methods not expressly foreseen in the foreign exchange regulation;

2 https://www.gpfi.org/g20-national-remittance-plans.

3 For further details on the current transformations of the business models of IPs authorized by BCB, see box "Transformation of Payment Service Providers into Financial Service Providers Conglomerates" of the 2020 REB.

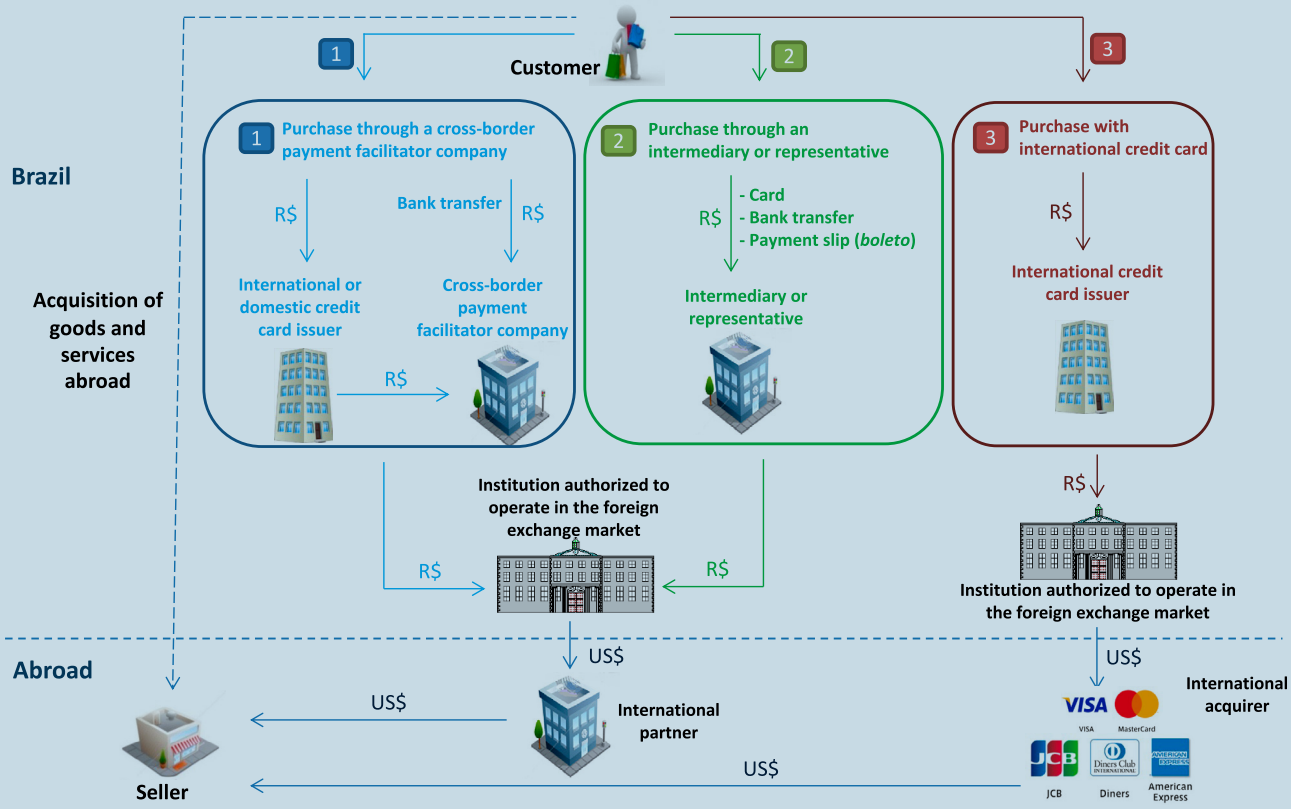
- allowing PIs authorized to operate by the BCB to be eligible to obtain authorization to operate in the foreign exchange market to carry out spot foreign exchange operations with customers up to the equivalent of USD 100,000, being prohibited from receiving and delivering national or foreign currency in cash. Currently, there are 181 institutions authorized to operate in the foreign exchange market, comprising banks, brokerage firms, securities distribution companies, and foreign exchange brokerage firms, among others;

- regulating the use of prepaid payment account in domestic currency held by resident, domiciled or headquartered abroad, which must be kept in a financial institution or in another institution authorized to operate in the foreign exchange market and whose transactions are limited to BRL 10,000, being forbidden the transit of third-party resources.

Modernization of the cross-border payment or transfer services regulation in the foreign exchange market

The proposal under public consultation will also give uniform treatment to operations currently carried out in the foreign exchange market with the participation of international credit card issuers, cross-border payment facilitators, and intermediaries and representatives in international packages. Such models are the simplest alternatives for a customer to acquire or sell goods and services abroad, and to make international withdrawals, in the case of international cards. In these cases, there is a company incorporated in the country that looks for an institution authorized to operate in the foreign exchange market to make the payment or receive funds from abroad from its customers' transactions. Figure 1 illustrates the operational flow of the three current models if a customer in Brazil buys a good abroad.

Figure 1 – Models provided by the current regulation



The activities performed in these three models, as well as the inherent risks, considering the main object of foreign exchange regulation – currency inflows and outflows – are quite similar. However, each of the models has its own rules in the regulation, resulting in asymmetric treatment, for example, regarding the activities allowed to each of these model's participants, underlying documentation required for foreign exchange operations, transactions reporting to the BCB, BRL delivery possibilities in the country, among others.

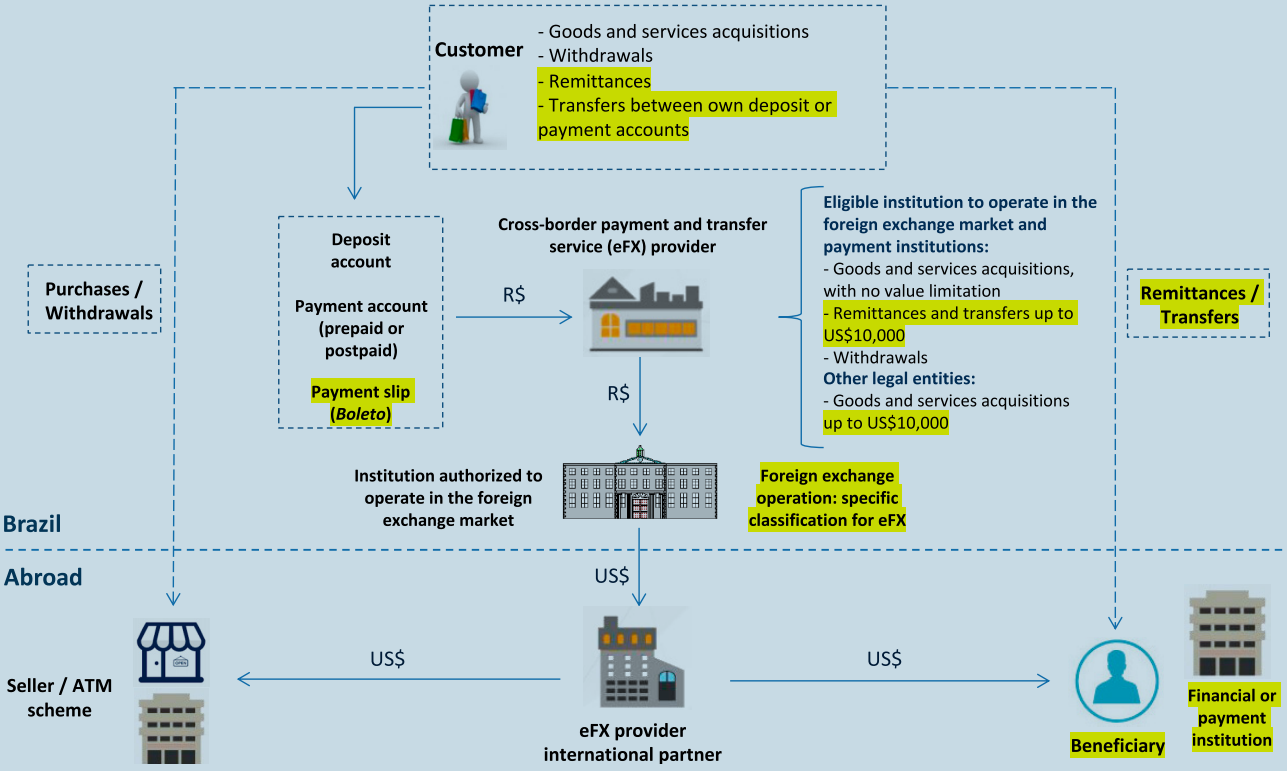
According to the proposal, the rules on existing models will be unified in the foreign exchange regulation and the provider of such services, be it an institution authorized to operate in the foreign exchange market, an institution authorized to operate by the BCB or another legal entity domiciled in the country that offers digital payment solutions, will be referred to in the foreign exchange regulation as an eFX.

The eFX may offer to customers international payment or transfer services relating to: (a) acquisition of goods and services, in the country or abroad, in person or through a digital payment solution offered by the eFX and integrated to an e-commerce platform; (b) unilateral transfer; (c) transfer between account in the country and account abroad held by the customer; and (d) withdrawal in the country or abroad.

Figure 2 represents the proposed models union in a transaction that involves sending money abroad, whether from an acquisition of goods or services, withdrawal or transfer, and highlights in yellow the main changes and the new operational possibilities if the proposal is implemented.

The figure details the types of services that can be provided by the eFX and highlights that it will continue to be mandatory to carry out foreign exchange operations through an institution authorized to operate in the foreign exchange market for the fulfillment of obligations arising from eFX customers' transactions, in line with current legislation, with the option to carry out a single foreign exchange operation encompassing several eFX customers' transactions.

Figure 2 – Cross-border payment and transfer service proposal



Regarding the new possibilities, in addition to purchases of goods and services and withdrawals, if the eFX is an institution authorized to operate by the BCB, it may also offer unilateral transfers and transfers of funds between accounts held by the customer in the country and abroad. As for the BRL delivery from the customer to the eFX, the proposal allows the acceptance of a payment slip *(boleto)* for these international payments and transfers, considering the recent changes in regulation that have brought more security to the use of this payment instrument.

Furthermore, the rules for being an eFX constitute an additional requirement layer to the specific regulations to which the entity is subject, such as, for example, those related to payment arrangements. Being under the supervision of the BCB will be a mitigation of the risk that the entity may offer to the foreign exchange market, allowing a proportionality approach with regard to allowed payment services modalities and transaction value limits that the eFX firm may provide. For example, an institution authorized to operate by the BCB may offer all cross-border payment and international transfer services. Conversely, legal entities not authorized to operate by the BCB may only offer cross-border payment services related to the acquisition of goods and services up to the equivalent of USD 10,000.

The proposal will also standardize the requirements applicable to foreign exchange transactions for the fulfillment of obligations resulting from the eFX customers' transactions, adjusting them according to the risk arising from the type of institution that acts as an eFX. If the eFX is not an institution authorized to operate by the BCB, the counterpart institution authorized to operate in the foreign exchange market must be able to prove to the BCB that it has certified that the eFX has the capacity to comply with the foreign exchange regulation and anti-money laundering and combating the financing of terrorism actions.

In short, the improvement measures detailed in this box will contribute to increase the efficiency in services provision to individuals and corporations that need to make cross-border payments and transfers, especially through digital solutions. These measures will allow these customers to be served in a more competitive, inclusive, and innovative environment.

Profitability

5

Figure 5.1 – Net income and return on equity (ROE)
12-month accumulated

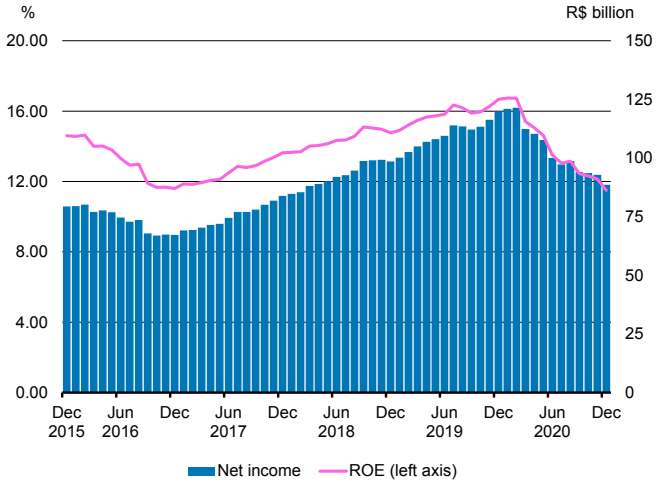
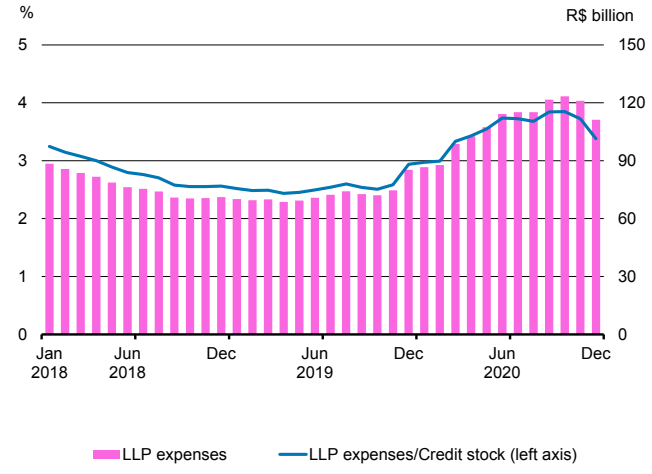


Figure 5.2 – LLP expenses
12-month accumulated



5.1 System Profitability

The pandemic interrupted the improvement in the banking system profitability that has been taking place since the end of the recessionary period of 2015-2016. In December 2020, the Return on Equity (ROE)[57] of the system was 11.5%, the lowest in the historical series (Figure 5.1).[58] The drop in profitability was widespread, affecting banks of different types of control, size, and activity segment. Loan loss provisions (LLP) expenses increased, margins were under pressure, and service revenues suffered from the fall in economic activity. Costs remained under control. The reduction in the number of branches and employees, along with the increased use of digital service channels, tends to bring operational efficiency gains for the system in the medium term.

Profitability is expected to improve in 2021, despite the increased uncertainty arising from the pandemic. The main pillars for the profitability recovery are the current stock of LLP and the resumption of economic activity. The reinforcement of provisions carried out in 2020 reduces the need for significant amounts of additional provisions, while the recovery of economic activity contributes to credit growth and quality, as well as to the demand for banking services. The pandemic remains as the main risk to the improvement in profitability in 2021, as it may delay the recovery of economic activity and require new provisions for credit losses.

In 2020, the main factor responsible for the drop in profitability was the increase in LLP expenses. These expenses totaled R$111.2 billion in the year, up 30% compared to 2019 (Figure 5.2). Relative to the credit

57 The indicator is calculated from the aggregated Net Income divided by the aggregated Net Equity of the banking system. It should be noted that the profit is adjusted so as to disregard relevant non-recurring results.

58 Refere-se ao menor ROE observado desde dezembro de 2010, quando o BCB começou a calcular o ROE ajustado do sistema bancário.

Figure 5.3 – Components of net interest margin on credit
12-month accumulated

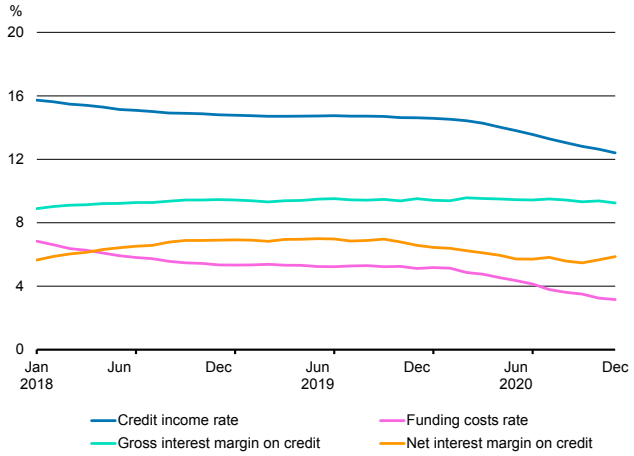


Table 5.1 – Composition of services revenues
Revenues in each year

R$ billion

Service itens	2018	2019	Var. (%)	2020	Var. (%)
Total	155.1	165.6	6.7	169.4	2.3
Total bank account fees	48.1	50.3	4.6	48.6	-3.5
Fees - households	36.4	38.0	4.3	36.4	-4.2
Fees - firms	11.7	12.3	5.5	12.2	-1.3
Investment funds(fees)	13.3	15.1	13.5	15.8	4.2
Constitutional funds and lotteries	10.5	10.6	1.4	8.0	-24.7
Bank bills collection	7.2	7.1	-1.2	6.9	-2.4
Bank guarantee	3.9	1.9	-50.1	1.9	-1.1
Capital market	6.2	10.5	70.1	14.4	36.4
Payment services	21.3	21.9	3.1	25.4	15.6
Other services revenues	44.6	48.0	7.5	48.5	1.0

Table 5.2 – Composition of administrative expenses
Expenses in each year

R$ billion

Expenses itens	2018	2019	Var. (%)	2020	Var. (%)
Total	231.4	247.9	7.1	260.2	5.0
Personnel	122.0	132.2	8.4	133.8	1.2
Data processing/ telecommunications	19.2	19.9	3.5	21.8	9.8
Facilities	15.3	15.6	2.1	15.8	1.1
Outsourced services	27.1	27.5	1.6	29.0	5.4
Advertising and promotion	5.7	6.2	9.2	6.3	1.6
Amortization and depreciation[1/]	15.8	16.3	3.4	19.8	21.3
Payment services	3.9	4.3	11.9	7.6	74.9
Other	22.6	25.8	14.5	26.2	1.4

1/ Amortization of goodwill on acquisitions is not included.

portfolio, LLP expenses reached levels close to those observed in the recessionary period of 2015-2016. In 2021, LLP expenses are expected to return to pre-pandemic levels, given the current stock of provisions and the improved outlook for economic activity. The reduction in provision expenses should be the primary determinant of the profitability improvement in 2021.

The net interest margin (NIM) from credit operations was under pressure and retreated slightly in 2020, with the return on credit (-2.2 p.p.) reducing faster than the cost of funding (-1.96 p.p.) (Figure 5.3). The faster fall in the return on credit resulted from the combined effect of a strong portfolio growth and lower interest income. Despite the advance of the credit portfolio, growth occurred in products with lower interest rates,[59] and lower returns. Besides suffering from the reduction in interest rates throughout the year, revenues were also impacted by the interest rate cap imposed on overdraft credit.[60] Funding costs fell but increased relative to the Selic rate. This increase is related to funding instruments with pre-fixed returns or fixed spreads relative to the DI rate. As an example, this is the case of savings deposits made before May 3, 2012, which earn 6.17% p.a. With the reduction in the degree of monetary stimulus started in March 2021, the cost of funding should increase and put pressure on the NIM in the short term.

Services revenues grew less in 2020 but responded positively to the resumption of economic activity in the second half of the year (Table 5.1). After a fall in the first half of the year due to social distancing measures, revenues recovered in response to the recovery of economic activity and improved flexibility on the mentioned measures. Growth stemmed primarily from rising capital markets earnings and payment services revenues, which more than offset lower revenues from bank fees and management of constitutional funds.[61]

59 The growth in credit to households was greater in the payroll-deducted and housing credit types. As for corporate credit, growth was greater in the working capital credit, influenced also by grants in the scope of emergency programs.

60 Resolution 4,765, of November 27, 2019, established, among others, a cap of 8% per month for the overdraft facility interest rate.

61 Capital markets earnings were favored by an increased issuing of variable income securities and by the record financial volume transacted on B3. In turn, payment service revenues benefited from the increase in revenues with card issuing and merchant acquirers. Revenues from management of constitutional funds declined due to the reduction in the management fee of the Brazilian Government Severance Indemnity Fund for Employees (FGTS). Revenues from bank fees were impacted by a drop in revenues from service packages and credit card annuities of individual cardholders.

Figure 5.4 – Services revenues to administrative expenses ratio

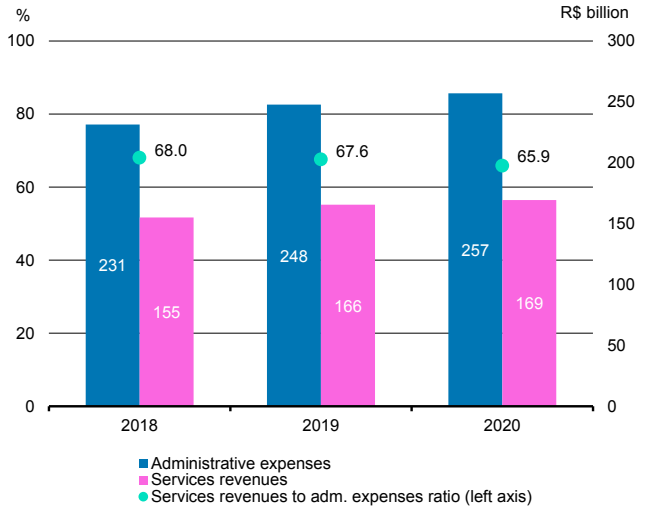
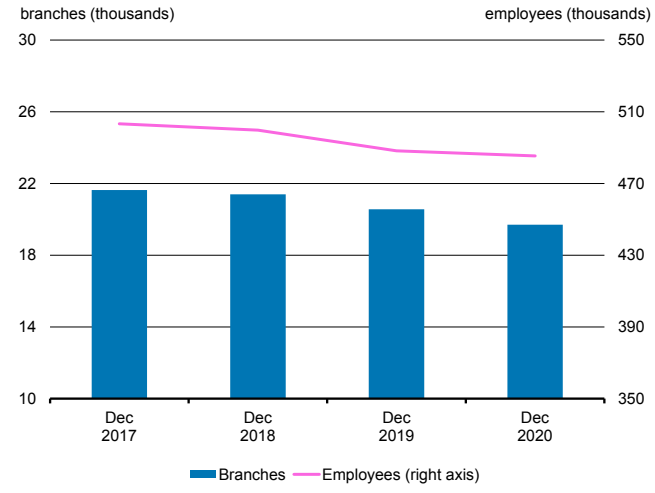
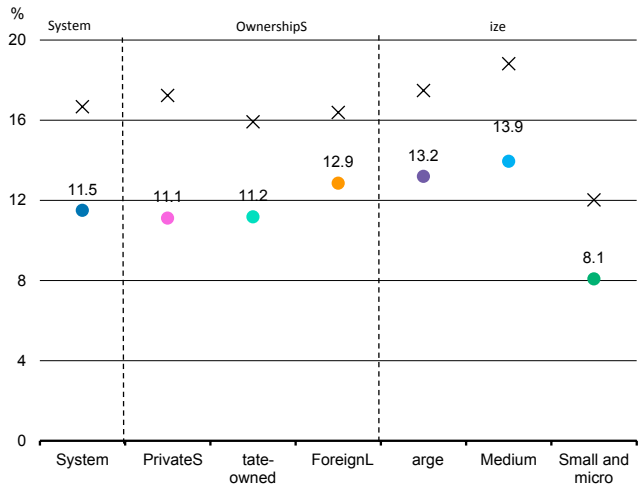


Figure 5.5 – Branch and employee evolution



Evolution in number of employees was estimated based on RAIS/Caged data. Number of branches are informed by the institutions to the BCB. The series present some adjustments.

Figure 5.6 –R OE by ownership and size
2020 (× ⇒ 2019)



In recent years, the growth of administrative expenses has followed the trend of the Extended National Consumer Price Index (IPCA), as shown in Table 5.2, which reflects the FIs' cost control. In 2020 it was not different: expenses grew 5%, while the IPCA rate was 4.5%. Expenses should remain under control with the continuation of cost reduction strategies carried out by FIs.

With the lower growth in service revenues, the Coverage Ratio of Administrative Expenses by Service Revenues reduced in 2020 (Figure 5.4). The continuation of the cost control strategies and the recovery in the pace of growth in service revenues should contribute to an improved coverage ratio going forward.

Digital service channels should generate operational efficiency gains in the medium term. The number of branches and employees in the banking system continued to decline in 2020 (Figure 5.5). This trend is expected to continue in the coming years with the increasing use of digital service channels by institutions and clients. The Covid-19 pandemic has been a catalyst in this process. The migration to digital channels should initially demand greater investments in technology to, in the future, reduce costs and increase the operational efficiency of FIs.

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

Privately-owned banks showed the largest drop in profitability in 2020, while foreign-controlled banks were the most profitable in the period (Figure 5.6). The ROE of state-owned banks also fell more than that of foreign banks, closing the period at a level close to that of privately-owned banks. The more dramatic increase in provision expenses by privately-owned banks is the primary factor for the sharper drop in ROE in this group of institutions. Compared to 2019, these expenses increased by 40%, 17% and 25% across privately-, public- and foreign-owned banks, respectively.

Regarding bank size, there is a clear distinction in profitability levels between large and medium-sized banks on the one hand, and small and micro banks on the other hand (Figure 5.6). The difference may be related to gains of scale and diversification, which allow large and medium-sized banks to access more profitable clients and raise funds at lower costs. Bank profitability dropped similarly across different size types, so that the ROE of small and micro banks remained the lowest in 2020. These smaller institutions may face greater challenges in regaining profitability ahead, given the greater competition

Figure 5.7 – ROE by segment
2020 (× ⇒ 2019)

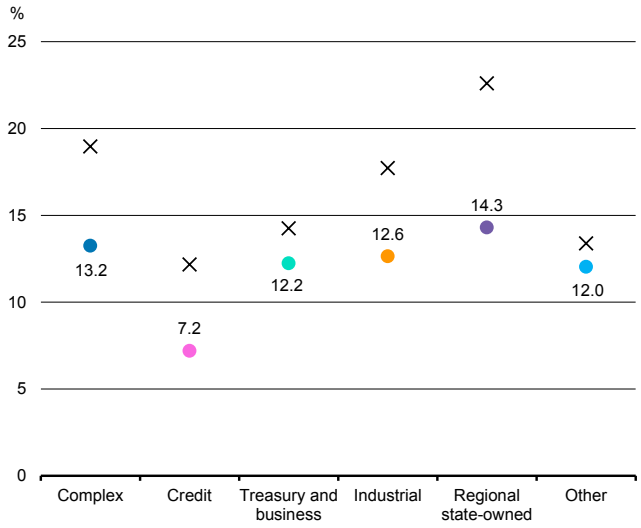
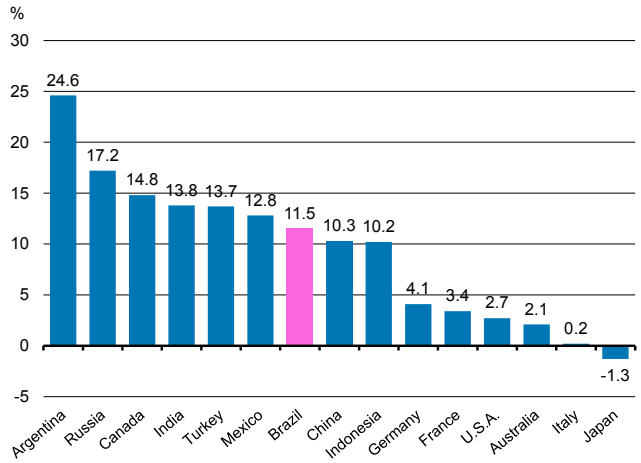
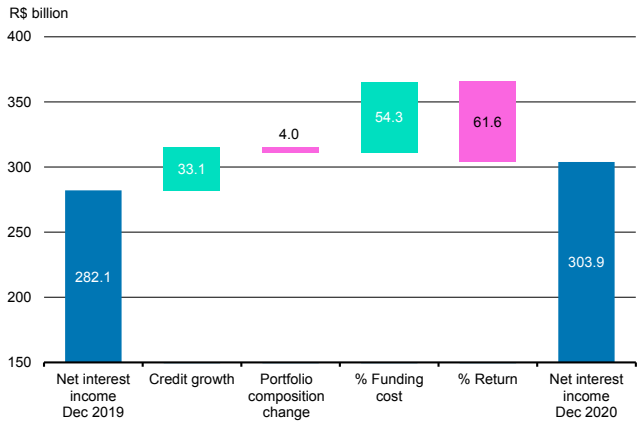


Figure 5.8 – Annual return on equity (ROE)
2020 Internacional comparision[1/]



Source: ROE (Financial Soundness Indicators)
1/ Latest available data
* Data referring to 2019

Figure 5.9 – Net interest income from credit operations
Contributions to change
Dec 2019 *vs.* Dec 2020 (12-month accumulated)



and the more fragile profile of their clients (mostly small and medium-sized as well).

Relative to bank activity segment,[62] there was a reduction in the dispersion of profitability among segments in 2020 (Figure 5.7). The ROE of all FI segments decreased but remained mostly within the range between 10% and 15%. The exception was the ROE of "Credit" banks, which fell to 7.2% (-5.0 p.p.). The profitability of this group of banks was already the lowest among segments in 2019. The pandemic shock has put further pressure on these banks, which may also face greater difficulties to recover their profitability in the coming periods.

Banks that operate in business models with lower exposure to credit risk showed a milder variation in profitability, as was the case with "Treasury and Business" and "Other" banks. The ROE of "Regional state-owned banks" showed the most relevant drop (-8.3 p.p) but remained the highest among the segments in 2020. The ROE of this group of banks had increased in 2019 due to some non-recurring events, which explains the larger reduction in 2020.

Compared with countries from different continents,[63] the profitability of the Brazilian banking system remained at an intermediate position (Figure 5.8). The ROE of the Brazilian banking system, for example, is lower than in countries like, Canada, India, Turkey and Mexico but higher than that of China, Indonesia, Germany and France.

5.3 Credit margin

The net interest income (NII) from credit operations[64] (in BRL billion) increased in 2020 because of the lending

62 The segmentation by 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 client profile; b) regional state-owned banks – under federal or state control that operate regionally and have a branch network and a relevant number of clients 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 guaranties 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.

63 Data available on the Financial Soundness Indicators (FSI) of the International Monetary Fund (IMF).

64 It refers to the difference between interest return on loans and interest expenses on funding.

Figure 5.10 – Net interest margin – Household versus corporate
12-month accumulated

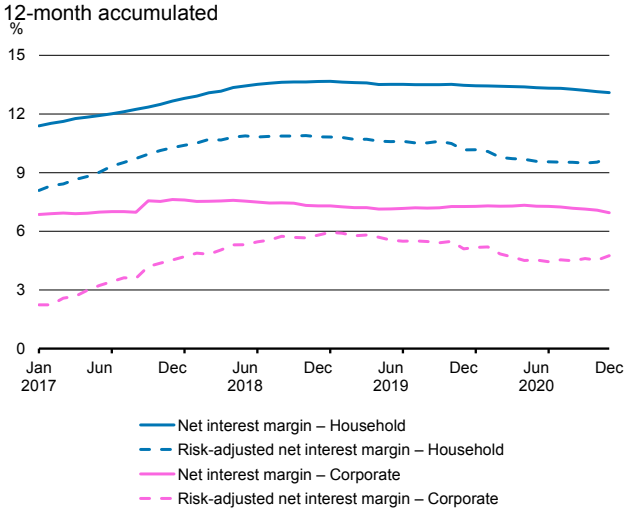


Figure 5.11 – Risk-adjusted NIM on credit profile
Household *versus* corporate

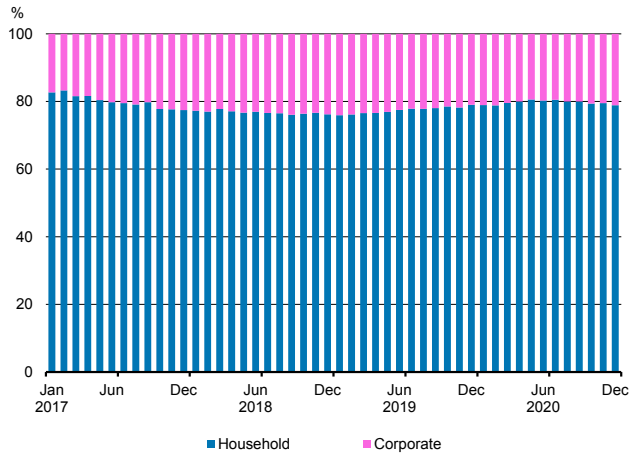
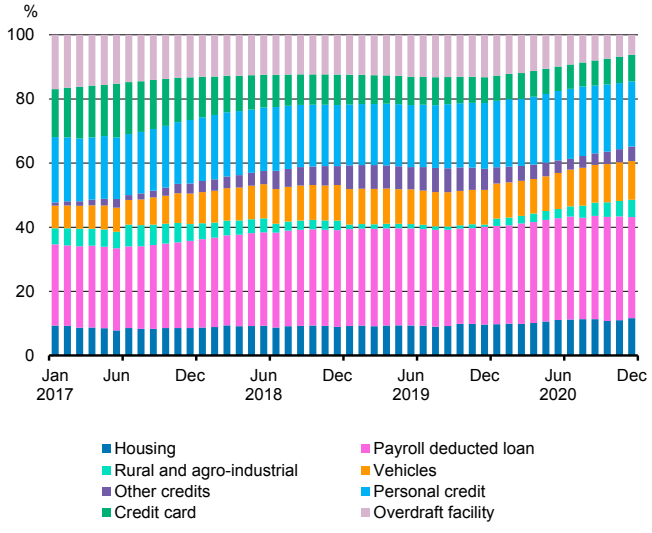


Figure 5.12 – Risk-adjusted NIM on credit performed by product
Household



growth in the period (Figure 5.9). The NII would have reduced if not for this growth. The reduction in the return on credit was greater than the fall in the cost of funding. The cost of funding reduced in line with the downward trend of the Selic rate, while the return on credit retreated due to the combined effect of the higher growth of the loan portfolio and the reduction in interest income, as mentioned in the previous section.

Following, the contribution of the different types of credit to the net interest margin (NIM) and risk-adjusted NIM from credit operations is analyzed. The NIM[65] by credit type reflects the difference between the gross return on credit that each credit type generated (estimated revenues) and the funding cost required to support the credit balance in the financial intermediation process (estimated expenses). The risk-adjusted NIM, in turn, considers expenses with LLP associated with each credit type.

Both household and corporate NIM from credit came under pressure in 2020, primarily because of the faster reduction in the return on credit than in the cost of funding (as mentioned in section 5.1 of this chapter). Changes in the risk-adjusted NIM from credit reflected the significant increase in LLP in the period. After a significant increase in the first half of the year, LLP expenses decreased during the second half. As a result, the risk-adjusted NIM from credit narrowed in the first half of the year but recovered throughout the second half.

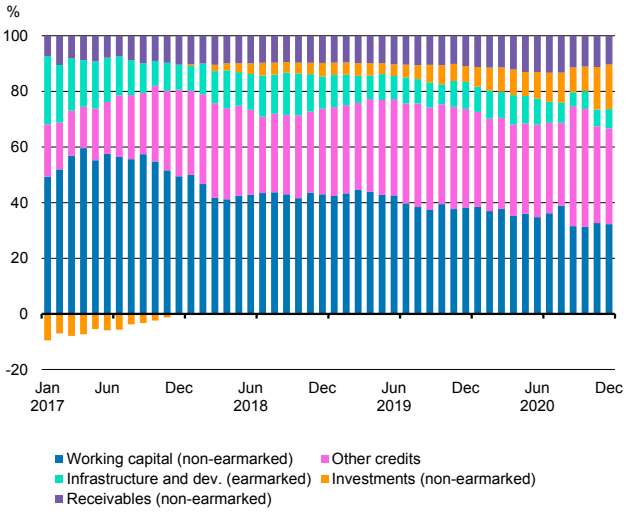
The ratio between household and corporate credit risk-adjusted NIM remained stable throughout 2020 (Figure 5.11). The household portfolio continued to be the most significant in the system (about 62% of total outstanding loans), and household clients continued to account for most of the risk-adjusted NIM from credit (about 76%).[66]

Overdraft facility, credit card, and non-payroll deducted credit continued to be relevant for the system result. Despite being less significant to the total outstanding loans, they make a relevant contribution to the system earnings. This occurs because of the higher interest

65 The box "Methodology for calculating the credit margin by subgroups of the portfolio", of the 2018 REB presents further details on methodology.

66 The contribution of each credit type to the margin of credit 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 expenses of 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.

Figure 5.13 – Risk adjusted NIM on credit performed by product
Corporate



rates charged in these credit types. In 2020, 35% of the risk-adjusted NIM from household credit resulted from these operations (Figure 5.12), despite representing only 10% of the total outstanding loans. "Credit card" and "installment credit card" [67] are not included in these calculations, as they are payment services and not credit granted by the institutions (these credit types do not bear interest for the FIs).

The share of "overdraft credit" in the risk-adjusted NIM showed a significant reduction in 2020. This product represented 13% of the risk-adjusted NIM from credit in 2019 and ended 2020 with a 6% share. The change was influenced by the new cap of 8% per month imposed on the interest rate of the product and a reduction in the average outstanding overdraft credit throughout 2020 amid lower demand during the pandemic. In turn, there was an increase in the share of "rural and agribusiness" credit in the risk-adjusted NIM, reflecting an improvement in the product's NIM and a more significant reduction in LLP expenses when compared to other credit types.

Non-earmarked credit continued to be relevant for the intermediation result of the banking system (Figures 5.12 and 5.13). In 2020, about 52% of the risk-adjusted NIM from household credit derived from payroll-deducted and non-payroll deducted personal credit. In turn, working capital operations contributed to approximately 32% of the risk-adjusted NIM from corporate credit.

67 Although they do not bear interest, the "credit card" and "installment credit card" operations bear the risk of default on the installments. For this reason, FIs need to set up a provision for credit losses related to these receivable balances.

Concentration, Competition and Innovation 6

6.1 Concentration indicators[67]

Since the 2017 Banking Report, to monitor concentration levels in different segments of the National Financial System (SFN), the BCB has been using the normalized Herfindahl-Hirschman Index (HHIn) and the Concentration Ratio of the Five Largest Financial Institutions (CR5) in the accounting aggregate total assets, credit operations and total deposits in Brazil.

Domestic and international competition defense authorities use the HHIn as an auxiliary instrument for the evaluation of economic concentration. In its normalized version – the HHIn is obtained by the sum of the square of each financial institution (FI) market share, in the decimal form, resulting in a number between 0 and 1. According to the guide *Análise de Atos de Concentração envolvendo Instituições Financeiras* (Analysis of Acts of Concentration involving Financial Institutions),[68] the BCB considers that markets that record HHIn values:

a) between 0 and 0.10 are of low concentration;

b) above 0.10 to 0.18 are of moderate concentration; and

c) above 0.18 to 1 are of high concentration.

However, it is important to note that, based on the 2010 Horizontal Merger Guidelines, the U.S. Department of Justice (USDOJ), the Federal Trade Commission (FTC), and the US antitrust agencies consider HHIn ranges to be between 0 and 0.15 (low concentration), above 0.15 to 0.25 (moderate concentration), and above 0.25 to 1 (high concentration).

67 Information regarding the evolution of the Brazilian Financial System is available at: https://www.bcb.gov.br/estabilidadefinanceira/evolucaosfnmes.

68 Annex I to Statement 22,366, of April 27, 2012.

In turn, CR5 illustrates the sum of the market shares of the five largest financial institutions in a given market. Table 6.1 shows the HHIn and CR5 for the balance of domestic operations on the dates of December 31, 2018, December 31, 2019, and December 31, 2020, considering three levels of aggregation: banking and non-banking segment (b1+b2+b3+b4+n1);[69] banking segment (b1+b2); and commercial banking segment (b1), for each of the accounting aggregates.

To compose these three series for each segment, the following adjustments were considered:

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

b) for the total deposits, total deposit minus interfinancial deposits plus Agribusiness Credit Bills (LCA) plus Real Estate Bills (LCI) plus Financial Bills and, in case of the non-banking segment, Exchange Bills; and

c) for the credit operations, the balances of the institutions active portfolio of all credit operations.

Table 6.1 also reports the "HHIn equivalent number" (η), which shows the number of financial institutions with equal participation in the market which would generate the same observed HHIn. The relationship between the two is given by HHIn=1/η, where an equivalent number of HHIn equal to 7, for instance, indicates that the observed HHIn would be equal to 1/7. Therefore, the higher the concentration, the higher the HHIn and the lower the equivalent HHIn.

Measured by the HHIn or its equivalent, the downward trend in the SFN concentration between 2017 and 2019, observed in the previous Banking Report, continued in 2020. The reduction in concentration involved the three sets of segments and the three accounting aggregates considered.

69 The segment (b1) comprises the commercial banks, multi-commercial banks, and savings banks; (b2), universal banks that do not have a commercial portfolio, investment banks, and FX banks; (b3), credit unions; (b4), development banks; and (n1), non-banking credit institutions.

Table 6.1 – Summary of time series concentration indicators

Indicators	Bank and non-bank segment			Bank segment			Commercial bank segment		
	Dec 2018	Dec 2019	Dec 2020	Dec 2018	Dec 2019	Dec 2020	Dec 2018	Dec 2019	Dec 2020
Total asset									
HHIn	0.1090	0.1071	0.0983	0.1334	0.1308	0.1207	0.1390	0.1367	0.1259
CR5 (%)	69.3	69.8	67.0	79.5	79.2	76.0	81.2	81.0	77.6
HHIn numbers equivalent	9.2	9.3	10.2	7.5	7.6	8.3	7.2	7.3	7.9
Total deposits									
HHIn	0.1297	0.1263	0.1103	0.1447	0.1419	0.1261	0.1479	0.1456	0.1306
CR5 (%)	78.4	77.6	72.7	82.8	82.3	77.7	83.8	83.4	79.1
HHIn numbers equivalent	7.7	7.9	9.1	6.9	7.0	7.9	6.8	6.9	7.7
Credit operations									
HHIn	0.1205	0.1124	0.1069	0.1530	0.1427	0.1367	0.1630	0.1532	0.1456
RC5 (%)	70.9	69.8	68.5	82.2	80.7	79.2	84.8	83.7	81.8
HHIn numbers equivalent	8.3	8.9	9.4	6.5	7.0	7.3	6.1	6.5	6.9

In the banking and non-banking segment, the equivalent figure, between 2018 and 2020, rose from 9.2 to 10.2 in total assets, from 7.7 to 9.1 in total deposits, and from 8.3 to 9.4 in credit operations, considering a universe of 1,136 active institutions. In the commercial banking segment, this same metric, between 2018 and 2020, rose from 7.2 to 7.9 in total assets, from 6.8 to 7.7 in total deposits, and from 6.1 to 6.9 in credit operations, considering a universe of 98 active institutions.

Considering the benchmarks against the metrics used, the HHIn still indicates moderate concentration according to the aforementioned guide. However, it should be noted that following the criteria set by the USDOJ and FTC, all segments and accounting aggregates would be considered as unconcentrated in 2020. This reduction occurred despite eleven concentration acts involving financial institutions that took place in the period, the most relevant being the acquisition of 49.9% of XP Investimentos by Itaú-Unibanco (BCB Vote 169, of August 8, 2018).

Furthermore, it is noteworthy the reduction in the participation of the main state-owned banks, *Banco do Brasil* (BB), *Caixa Econômica Federal* (CEF) and the Brazilian Development Bank (BNDES) in the period.

With regard to market shares, the participation of BB, CEF, and BNDES in the banking and non-banking segments' credit operations declined, between 2018 and 2020, from 41.3% to 37.5% in total assets, from 37.7% to 31.4% in total deposits (except BNDES) and from 48.9% to 42.8% in credit operations. On the other hand,

in the same segment, between 2018 and 2020, the CR5 reduced from 69.3% to 67.0% of total assets, from 78.4% to 72.7% of total deposits, and from 70.9% to 68.5% of credit operations. This fact shows that the reduction in the participation of the main state-owned banks occurred, in part, due to the increase in the participation of institutions not among the five largest institutions, which contributes to increase the competitiveness when considering concentration indexes alone.

6.2 Financial institutions share by type of borrower and credit

This section allows for a more disaggregate analysis of the evolution of the degree of bank concentration in the credit market over the past three years. An overview of the participation of the main FIs in the household and corporate segments is presented. The market share of the real estate and rural credit types are also detailed.[70]

Tables 6.2 to 6.5 present the market shares of FIs in their balance by credit types, accompanied by indicators of market concentration (HHIn and CR5). Data refer to credit operations granted with both non-earmarked and earmarked resources, for the banking and non-banking segments (b1+b2+b3+b4+n1+n2+n4). In all tables, the first five positions refer to the shares of individual FIs, while the sixth to the tenth positions indicate aggregate shares by SFN segment, all in descending order.

Tables 6.2 and 6.3 show a continuity in the downward movement in credit market concentration for both households and, more strongly, companies. In 2020, the total stock of credit to households reached BRL 2.26 trillion, up 10.8% compared to 2019. In this segment, the improvement in concentration indexes reflected the reduction in the market share of the two largest state-owned banks (CEF and BB), whose combined market shares dropped from 48.0% in 2018 to 44.5% in 2020. This loss of market share was absorbed in a dispersed manner by the largest institutions in the commercial and multiple with a commercial portfolio banking segments, as well as by credit unions.

70 Annex C shows supplementary tables A to H for a broader set of credit types.

Table 6.2 – Market share in outstanding credit – Households

%

Rank	2018		2019		2020	
1	Caixa Econômica Federal	29.4	Caixa Econômica Federal	27.3	Caixa Econômica Federal	27.0
2	Banco do Brasil S.A.	18.6	Banco do Brasil S.A.	18.0	Banco do Brasil S.A.	17.4
3	Itaú Unibanco S.A.	12.0	Itaú Unibanco S.A.	12.2	Itaú Unibanco S.A.	11.9
4	Banco Bradesco S.A.	10.5	Banco Bradesco S.A.	11.3	Banco Bradesco S.A.	11.2
5	Banco Santander (Brasil) S.A.	9.6	Banco Santander (Brasil) S.A.	10.0	Banco Santander (Brasil) S.A.	10.0
6	Other commercial / multiple banks with a commercial portfolio	11.5	Other commercial / multiple banks with a commercial portfolio	12.0	Other commercial / multiple banks with a commercial portfolio	12.7
7	Credit unions	4.1	Credit unions	4.5	Credit unions	5.2
8	Investment / multiple banks w/o commercial portfolio	2.3	Investment / multiple banks w/o commercial portfolio	2.4	Investment / multiple banks w/o commercial portfolio	2.3
9	Non-banking segment	1.7	Non-banking segment	2.1	Non-banking segment	2.1
10	Development banks	0.2	Development banks	0.2	Development banks	0.0
Total		100.0		100.0		100.0
HHIn		0.1579		0.1455		0.1414
Equiv. of HHIn		6.3		6.9		7.1
RC5 (%)		80.1		78.7		77.6

Table 6.3 – Market share in outstanding credit – Corporate

%

Rank	2018		2019		2020	
1	BNDES	20.6	BNDES	18.3	BNDES	15.7
2	Banco do Brasil S.A.	17.6	Banco do Brasil S.A.	15.2	Banco do Brasil S.A.	14.3
3	Banco Bradesco S.A.	12.6	Banco Bradesco S.A.	13.6	Banco Bradesco S.A.	12.8
4	Caixa Econômica Federal	11.1	Itaú Unibanco S.A.	9.9	Itaú Unibanco S.A.	11.6
5	Itaú Unibanco S.A.	9.0	Caixa Econômica Federal	9.7	Caixa Econômica Federal	9.9
6	Other commercial / multiple banks with a commercial portfolio	21.1	Other commercial / multiple banks with a commercial portfolio	23.6	Other commercial / multiple banks with a commercial portfolio	25.9
7	Investment / multiple banks w/o commercial portfolio	3.2	Credit unions	4.0	Credit unions	5.0
8	Credit unions	3.1	Investment / multiple banks w/o commercial portfolio	4.0	Investment / multiple banks w/o commercial portfolio	3.2
9	Development banks	1.1	Development banks	1.0	Development banks	0.9
10	Non-banking segment	0.7	Non-banking segment	0.7	Non-banking segment	0.6
Total		100.0		100.0		100.0
HHIn		0.1164		0.1022		0.0933
Equiv. of HHIn		8.6		9.8		10.7
RC5(%)		70.8		66.6		64.3

Corporate credit reached BRL 1.75 trillion in 2020, an increase of 22.6% compared to 2019. In this segment, the equivalent number of the HHIn increased by 2.1 institutions in the analyzed period, or, in other words, the equivalent of 10.7 FIs had an average share of 9.3% in 2020, while, in 2018, the equivalent of 8.6 FIs had an average share of 11.6% according to this same metric. CR5, in turn, fell from 70.8% in 2018 to 64.3% in 2020. The combined share of BNDES and BB declined from 38.2% to 30.0% in the same period, while that of Bradesco and Itaú-Unibanco increased from 21.5% in 2018 to 24.4% in 2020. It is also worth mentioning the sharp increase in the market shares of other commercial banks, multiple banks with commercial portfolios, and credit unions.

In 2020, the total credit stock in the real estate segment grew 10.4% in relation to the previous year, reaching BRL 744.7 billion. CEF's stable market share of 70% is worth noting. As a result, the equivalent number of the HHIn (2.0 in 2020) and CR5 (98.2% in 2020) did not change relevantly in the period (Table 6.4). Among the other institutions, BB dropped from the second to the fourth position, corresponding to a market share reduction from 8.2% in 2018 to 6.5% in 2020, while the market share of the three largest private banks rose 2.4 p.p. from 2018.

Table 6.4 – Market share in outstanding credit – Real estate

Households + corporations

%

Rank	2018		2019		2020	
1	Caixa Econômica Federal	70.0	Caixa Econômica Federal	69.8	Caixa Econômica Federal	69.2
2	Banco do Brasil S.A.	8.2	Banco Bradesco S.A.	8.0	Banco Bradesco S.A.	8.8
3	Banco Bradesco S.A.	7.9	Banco do Brasil S.A.	7.7	Itaú Unibanco S.A.	7.7
4	Itaú Unibanco S.A.	7.0	Itaú Unibanco S.A.	7.1	Banco do Brasil S.A.	6.5
5	Banco Santander (Brasil) S.A.	5.3	Banco Santander (Brasil) S.A.	5.8	Banco Santander (Brasil) S.A.	6.1
6	Other commercial / multiple banks with a commercial portfolio	1.3	Other commercial / multiple banks with a commercial portfolio	1.3	Other commercial / multiple banks with a commercial portfolio	1.4
7	Non-banking segment	0.3	Non-banking segment	0.3	Non-banking segment	0.3
8	Credit unions	0.0	Credit unions	0.0	Credit unions	0.1
9	Investment / multiple banks w/o commercial portfolio	0.0	Investment / multiple banks w/o commercial portfolio	0.0	Investment / multiple banks w/o commercial portfolio	0.0
10	Development banks	0.0	Development banks	0.0	Development banks	0.0
Total		100.0		100.0		100.0
HHIn		0.5107		0.5084		0.5001
Equiv. of HHIn		2.0		2.0		2.0
RC5(%)		98.4		98.4		98.2

The total stock of credit in the rural segment for both households and corporations reached BRL 342.1 billion in 2020, an expansion of 8.2% in relation to the previous year. As opposed to the real state credit, the market concentration in the stock of rural credit has been declining. The equivalent HHIn number grew from 3.2 in 2018 to 3.4 in 2020, while CR5 fell from 71.1% to 69.1% in the same period. Offsetting the reduction in BB's participation, the participation of the other commercial and multiple banks and credit unions increased.

Table 6.5 – Market share in outstanding credit – Rural[5/]

Households + corporations

%

Rank	2018		2019		2020	
1	Banco do Brasil S.A.	54.8	Banco do Brasil S.A.	53.7	Banco do Brasil S.A.	52.9
2	Banco Bradesco S.A.	6.7	Banco Bradesco S.A.	6.5	Banco Bradesco S.A.	5.9
3	Banco Santander (Brasil) S.A.	3.9	Banco Santander (Brasil) S.A.	4.1	Banco Santander (Brasil) S.A.	4.0
4	Itaú Unibanco S.A.	3.0	Itaú Unibanco S.A.	3.0	Banco Cooperativo Sicredi S.A.	3.2
5	Banco Cooperativo Sicredi S.A.	2.7	Banco Cooperativo Sicredi S.A.	3.0	Itaú Unibanco S.A.	3.1
6	Other commercial / multiple banks with a commercial portfolio	11.7	Credit unions	11.7	Credit unions	13.7
7	Credit unions	10.1	Other commercial / multiple banks with a commercial portfolio	11.1	Other commercial / multiple banks with a commercial portfolio	10.8
8	Other development banks	3.5	Development banks	3.3	Investment / multiple banks w/o commercial portfolio	3.4
9	Investment / multiple banks w/o commercial portfolio	3.1	Bancos de investimento/ múltiplos s/ cart comercial	3.2	Development banks	2.7
10	Non-banking segment	0.5	Non-banking segment	0.4	Non-banking segment	0.3
Total		100.0		100.0		100.0
HHIn		0.3113		0.2990		0.2900
Equiv. of HHIn		3.2		3.3		3.4
RC5(%)		71.1		70.4		69.1

5/ The costing, investment, commercialization, industrialization and project financing submodalities were considered.

Tables from A to H of Annex C bring information about the concentration in other credit types. In the period between 2018 and 2020, no significant change was observed in the level of concentration in the segments of earmarked credit with BNDES resources, working capital, personal credit, payroll-deducted loans, and vehicle purchase by households. It is noteworthy the reduction in credit card concentration, with an increase in the equivalent number from 5.9 in 2018 to 6.7 in 2020. In all these credit types, the HHIn was below 0.18 point in 2020, thus allowing their classification as moderately concentrated.

6.3 Competition

In this section, the Lerner and Boone indicators are used to analyze competition in the SFN markets of credit and financial services from 2002 to 2020.[71]

The Lerner indicator is defined as the relative mark-up, *i.e.*, the ratio between the mark-up and the price. For a monopolistic competitor optimizing profits, the Lerner indicator is inversely proportional to the price elasticity of demand. Therefore, in the case of the financial sector, the lower the sensitivity of demand to interest rate variations, the higher is the Lerner indicator and, therefore, the lower the degree of competition.

In turn, the Boone indicator measures the sensitivity of the FIs market share to changes in marginal cost. In less competitive segments, FIs would be more able to transfer marginal cost increases, via increased cost of credit, without significant loss in their market share. The more negative the Boone indicator, the greater the degree of competition prevailing in the financial market.

The figures of the credit and service Lerner indicators in this section show different percentiles of the FIs distribution.[72] The 50 percentile (median) is indicated by the pink line. The 45 to 55 percentiles are marked in dark blue; 35 to 65 in neutral blue; and 25 to 75 (1st and 3rd quartiles) in light blue. In both the Lerner and Boone figures, each year's position on the scale refers to December. For the credit market, indicators are calculated for the banking (b1+b2), credit unions (b3), and non-banking (n1) segments. For the services market, the calculation is done only for the banking segment.

Competition in the credit and financial services markets

In this Banking Report, the analysis focuses on the changes in 2020 in relation to 2019,[73] a period in which

71 The methodology used to estimate the competition indicators encompasses marginal cost estimation and pricing. It is described in the box "Estimation of competition indicators", of the 2018 REB. It considers the cost structure of financial intermediation activity in the Brazilian market, covering both the credit and financial services markets, allowing the evaluation of possible competitive relationships between them.

72 The inclusion of 2020 data and the change in the time interval for estimating the Lerner and Boone indicators to 2002 to 2020 may lead to changes in the values published in the REB 2019. This is because several coefficients of the cost function are not time-specific and, therefore, are estimated using all years.

73 The Banking Report 2018 presented an analysis of the historical evolution of Lerner and Boone indicators since 2000.

Figure 6.1.a – Credit Lerner (banking segment)

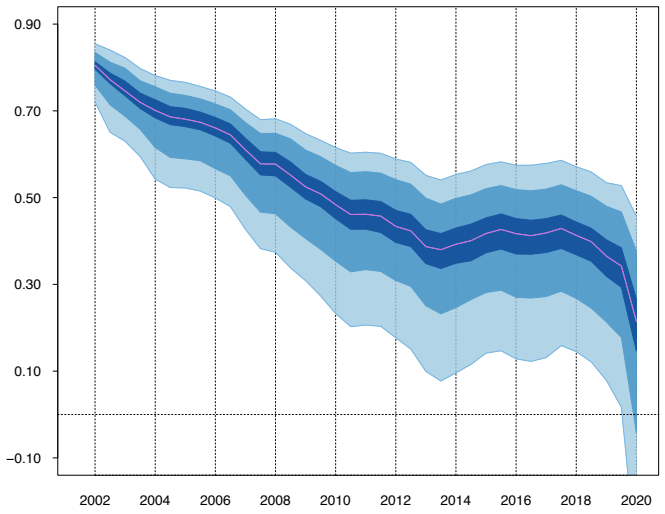


Figure 6.1.b – Credit Lerner (Credit Union)

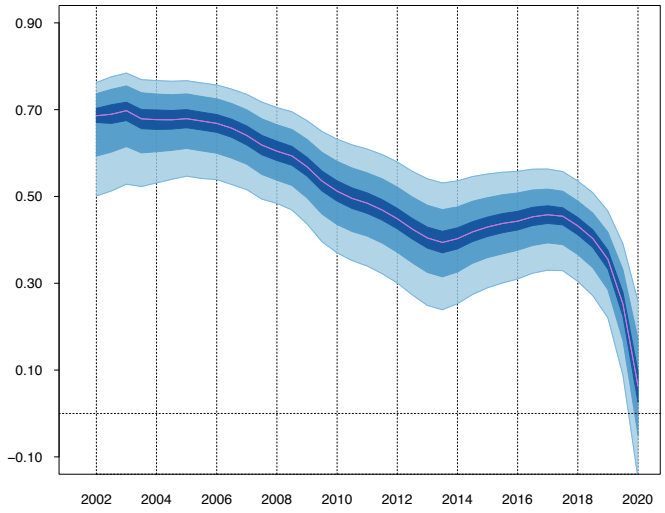
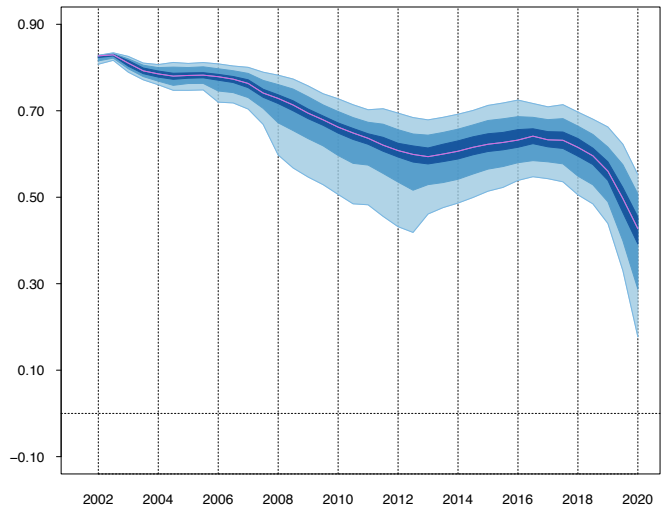


Figure 6.1.c – Credit Lerner (non–banking segment)



Lerner indicators reduced sharply. The Lerner indicator is affected by the marginal cost and the prices[74] charged by FIs when granting credit. The shock resulting from the Covid-19 pandemic crisis contributed to a reduction in bank's credit margin and income from financial intermediation, explaining the sharp drop in the Lerner indicator in 2020.[75]

The Lerner indicator for the banking credit market maintains the downward trajectory observed in 2019, reaching a median value of 0.22 in 2020. The first quartile reached a negative value at the end of 2020 (Figure 6.1.a). The negative values of the Lerner indicator do not imply that FIs are operating at a loss because it captures only a portion of the financial intermediation margin. Additionally, the indicator measures the mark-up on marginal cost and not on average cost. That is, even if the price is lower than marginal cost, if it is above the average price, the FI will not incur a loss.

The Lerner indicator for the credit market in the credit unions segment showed similar behavior to the banking segment, but with a sharper reduction. The median at the end of 2020 was around 0.10, which is about one-fifth of the median at the end of 2019 (Figure 6.1.b).

In the case of credit institutions in the non-banking segment, the Lerner indicator also dropped, but less sharply when compared to the banking and credit unions segments. The median decreased to 0.43 in 2020 from 0.56 in 2019 (Figure 6.1.c).

The Boone indicator is used as a complement to the Lerner indicator to assess bank competition. It is estimated from FIs panel data from 2002 to 2020, with a semiannual frequency. The Boone indicator calculation considers the participation of each financial institution and the overall composition of costs associated with the financial intermediation activity.

74 The term "price" has been adopted in this section to designate interest rates on credit operations similar to the terminology used in the Lerner indicator literature.

75 The average rate used is the ratio of the income from financial intermediation and credit volume. Income from financial intermediation comprises the revenue that the FI actually received from its credit operations. Renegotiation operations that occurred during 2020 decreased the flow of income from credit operations received by FIs (because of postponed payments) and therefore reduced the average rate in 2020. This concept of average rate excluding delinquency is recurrent in the bank competition literature, as in (i) Erler, A.; Gischer, H.; Herz, B. Regional Competition in US Banking - Trends and Determinants. Faculty of Economics and Management Magdeburg. Working Paper Series n. 8/2017 and (ii) Shaffer, S.; Spierdijk, L. Measuring multi-product banks' market power using the Lerner indicator. Journal of Banking & Finance. Vol. 17, August 2020.

Figure 6.2 – Credit Boone (banking segment)

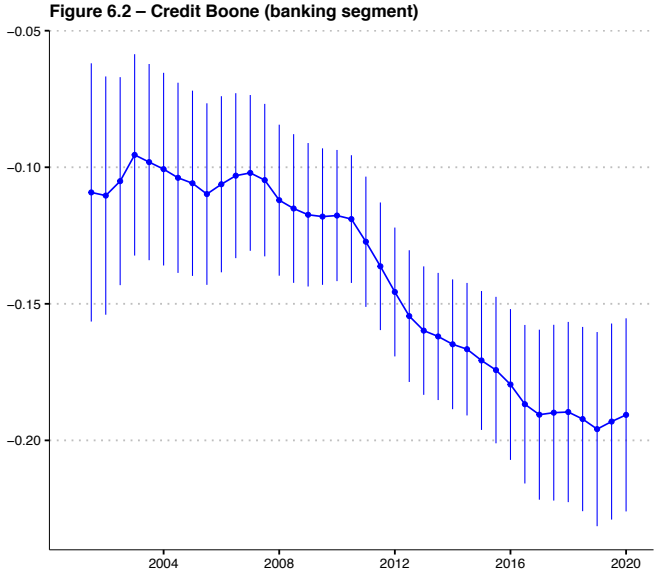
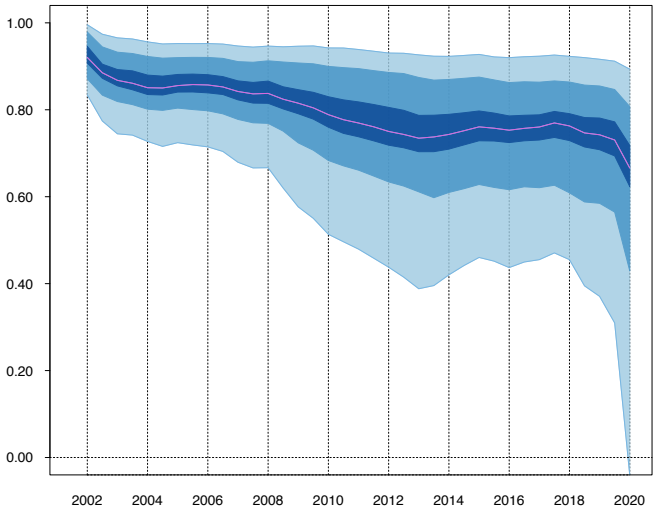


Figure 6.3 – Services Lerner (banking segment)



The credit Boone indicator (banking segment) showed moderate increase in 2020 relative to 2019 (Figure 6.2).[76] The measures taken to mitigate the economic effects of the pandemic have heavily impacted the price and costs of the banking system. In the Boone indicator, price is used indirectly via market share, which is a more persistent variable. The use of market share tends to reduce the estimated elasticity. Consequently, shocks that affect marginal costs and produce relevant changes in prices have a lower impact on balance-based market shares in the short run. This explains the difference in the behavior of the Boone indicator and the Lerner indicator in 2020.

As with the credit market, the Lerner indicator of the financial services market in the banking segment declined in 2020 compared to 2019, with the first quartile turning negative (Figure 6.3).

Final considerations

Lerner indicators for credit and services fell in 2020, reaching negative values in the first quartile for some segments, reflecting the reduced profitability[77] of the banking system in 2020 as a result of the Covid-19 crisis. On the other hand, the Boone indicator showed a slight increase, explained by rigidities in the market structure, which reacts more slowly to changes in the bank's cost structure.

6.4 Financial innovations and BCB's role

Open Banking

The Joint Resolution 1, of the BCB and the National Monetary Council (CMN), and the BCB Circular 4,015, both dated May 4, 2020, established the fundamental rules for the implementation of the Open Banking System in Brazil, which aims to increase competitiveness in the SFN and the development of new business models focused on offering products that are better suited to the clients' profiles.

This system is based on the sharing of data and services between institutions authorized by BCB, by means of specialized technological platforms (Application

76 The results were smoothed using a five-year window to mitigate variations resulting from the economic cycle. The vertical bars indicate the 95% confidence interval on each date.

77 As Chapter 5 of this Report shows, the SFN's net income and Return on Equity (ROE) fell in 2020 compared to 2019.

Programming Interfaces − APIs), upon consent by individuals and firms. With these normative acts, the main Open Banking requirements were defined, such as mandatory and voluntary participants, the minimum scope of data and services to be shared, the customer journey – the processes of consent, authentication and confirmation –, the participants' responsibilities, in addition to minimum security requirements, among others.

Complementing these provisions, the BCB, through Circular 4,032, of June 23, 2020, established the rules concerning the initial structure of governance for the Open Banking implementation: a private non-profit entity, formalized by class associations elected by the potential Open Banking participants to represent them on that entity's deliberative board. Besides representation, this entity has the function of proposing technical standards to the BCB and implementing the Open Banking support infrastructure. The technical standards will be gradually presented in four phases, according to the complexity of data and service to be shared. They will be evaluated and incorporated into the regulatory process by the BCB as appropriate.

In this context, still in 2020, the technical standards for the data sharing of the Open Banking initial phase have been established, including data on service channels and on products and services offered by participating institutions regarding demand, savings and prepaid accounts, as well as credit cards and credit operations, in addition to aspects related to the Open Banking basic infrastructure. These regulations are contained in BCB Resolution 32 and in BCB Normative Instructions 34, 35, 36, and 37, all of October 29, 2020.[78]

With the specification of the first technical standards, Open Banking participants became able to develop the necessary APIs for data sharing as of February 1, 2021. In turn, the entity that embodies the initial governance structure can start implementing the Open Banking support infrastructure, developing the participants directory, the service desk, and the Open Banking portal in Brazil. This portal consists of a website that aims to concentrate access to resources for the assistance of participating institutions, developers and citizens interested in the subject, while the technical standards for the implementation of subsequent phases are being developed.

78 These Normative Instructions have been revoked. Currently, these subjects are regulated by Normative Instructions 184, of November 12, 2021; 298, of August 8, 2022; 305, of September 9, 2022; 306, of September 19, 2022; 133, of July 22, 2021

The implementation of the four phases is expected to be accomplished by December 15, 2021.[79]

Regulatory Sandbox

The BCB is developing an innovative experience with the definition and application of the operating rules of the Regulatory Sandbox within the SFN.

The Sandbox concept, originally applied to computer science research, expresses the idea of a controlled environment in which tests can be performed without exposing computer system's functions and programs to risk. This procedure ensures that any damage resulting from the tests is restricted to the controlled environment, not compromising the operation of other system's components.

In 2015, the Financial Conduct Authority (FCA), the United Kingdom's financial market regulator, applied this concept to the area of financial regulation and created the Regulatory Sandbox, which came into operation in mid-2016. Similarly to the concept used in the computing field, this is a controlled environment in which institutions can test new products and services that are only subject to a specific set of regulatory requirements.

The primary goal of the Regulatory Sandbox is to foster the development of innovative products and services. In this environment, the regulatory authority can follow its development process from the beginning and, to ensure its compatibility with the country's regulatory framework, suggest changes in products and services that might be difficult to implement later.

In addition, the closer contact of Sandbox participants with the regulator can be very productive for institutions such as FinTechs that do not yet have much experience in operating within a regulated environment. The participants receive guidance from the regulator itself in relation to aspects such as the adequacy of products and services offered to the regulatory environment, as well as parameters that must be observed for their market performance, such as risk management, transparency, and meeting of consumer needs. This contact is also important for the regulatory authority because it allows to monitor how new technologies are being used, *i.e.* which new risks may arise, and to identify the need for improving current legislation and regulations.

79 Due to the complexity and broad scope of Open Finance, the implementation is still in progress.

Following the FCA's pioneering work in the United Kingdom, other jurisdictions have decided to implement similar structures, through initiatives from regulatory agencies in countries such as Hong Kong, Singapore, Australia, Denmark, the Netherlands, Abu Dhabi, Canada, the United States, Sierra Leone, and Kenya.

In October 2017, the FCA published the Regulatory Sandbox Lessons Learned Report[80], containing an evaluation of this framework after one year of operation. According to this report, some objectives have been achieved, such as: (i) reducing the time and cost for innovative ideas to reach the market; (ii) facilitating access to funding for participating companies, due to the mitigation of regulatory uncertainty; (iii) enabling a greater number of products and services to be offered in the market; and (iv) building safeguards on new financial products and services to protect consumers.

Brazil has followed the launch of the FCA Regulatory Sandbox from the beginning, as well as analyzed its implementation in other countries. Although there is no conclusive evidence yet due to the recent implementation, some studies point out that these regulatory frameworks have increased the dynamics of the business environment for FinTechs. A World Bank study entitled Global Experiences from Regulatory Sandboxes[81] highlights that the regulatory sandbox can be a means to facilitate innovation and promote evidence-based regulatory changes. Furthermore, this study points out that these structures: (i) provide regulatory authorities with further information to understand financial innovations, helping to implement more appropriate regulation to the context of innovations; (ii) are used in many cases as mechanisms for financial inclusion; (iii) can facilitate the entry of innovative firms into the market; (iv) can stimulate market competition; and (v) allow regulators to increase their interaction with the market.

The study *The Impact of the Regulatory Sandbox on the FinTech Industry, with a Discussion on the Relation between Regulatory Sandboxes and Open Innovation*,[82] conducted by researchers at Yonsei University in South Korea, suggests that the implementation of regulatory sandboxes has positive effects on venture capital-based investments in the FinTech market. In addition, the

80 Available at: https://www.fca.org.uk/publication/research-and-data/regulatory-sandbox-lessons-learned-report.pdf

81 Available at: http://documents1.worldbank.org/curated/en/912001605241080935/pdf/Global-Experiences-from-Regulatory-Sandboxes.pdf

82 Available at: https://www.mdpi.com/2199-8531/6/2/43/htm.

researchers point out that the Sandbox structure generates the expectation of reducing legal and institutional risks by eliminating uncertainties through the adoption of a regulatory framework that is more open to innovation.

It is also worth noting that a study developed at the request of the European Parliament on the impact of Regulatory Sandboxes and innovation hubs on the business environment of FinTechs, called *Regulatory Sandboxes and Innovation Hubs for FinTech – Impact on innovation, financial stability and supervisory convergence*,[83] indicates that the main benefit of sandbox structures for regulators is the understanding of new risks or changes in existing risks associated with innovations, thus facilitating the regulatory response.

Also, according to this study, in general, the sandbox structure is expected to increase competition by enabling the development of new financial products and services, which could favor financial inclusion, increase the offer of financial products and services better suited to consumers' needs, and signal support for innovation by attracting more innovators and investors. Among the main risks is the possibility of using these structures for regulatory arbitrage and the fact that they could represent a breach of the level playing field.

Considering the evidence that the experiences of other jurisdictions have generated benefits, with reduced and controllable risks, the regulatory authorities in Brazil have expressed their intention to build similar structures. Thus, through a joint statement published on June 13, 2019, the Special Secretariat of Finance of the Ministry of Economy, the BCB, the Securities and Exchange Commission (CVM), and the Superintendence of Private Insurance (Susep) made public the intention to implement a regulatory sandbox model in Brazil. As of this statement, each regulatory authority began to develop the regulations pertaining to its area of competence.

Regarding the BCB, the proposed regulations on the subject were submitted to public consultation in the period from November 28, 2019 to January 31, 2020, to gather suggestions for improvement from interested parties. After analyzing the suggestions received from citizens, market institutions, law firms, members of academia, among others, and after several internal negotiations, CMN Resolution 4,865 and BCB Resolution 29, both approved on October 26, 2020, established the general

83 Available at: https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652752/IPOL_STU(2020)652752_EN.pdf.

rules of the Regulatory Sandbox within the financial market. It is important to note that two different normative acts have been issued to cover the institutions and entities comprising the SFN and the Brazilian Payment System (SPB), regulated by the CMN and the BCB.

The regulation established the functioning of the Regulatory Sandbox and the regulatory requirements that must be observed by its participants. In addition to the specific requirements, participants must observe rules for the prevention of money laundering and the combat against the financing of terrorism, as well as rules for handling complaints made by clients and users.

The main features of the BCB's Regulatory Sandbox are:

I. the participants do not need to be institutions authorized by the BCB;

II. the duration of the experiment is up to one year, and may be extended for an equal period, so that the competent regulatory authority may:

   a) make any adjustments to the regulations so that certain products or services can be provided on a permanent basis by the institutions authorized by the BCB; or

   b) conclude any permanent authorization processes for participants;

III. the participant may modify the scope of its project, upon the BCB's consent, in line with the common practice of startups known as "pivoting"; and

IV. interested entities must, for registration purposes:

   a) submit a proposal for offering a product or service within the concept of innovative project, under the scope of CMN and BCB regulatory competence;

   b) demonstrate the origin of the resources used or to be used in the development of the innovative project;

   c) prove the unblemished reputation of its controllers and administrators;

   d) submit a plan for the discontinuity of activities, subject to the BCB's approval; and

   e) appoint a director or legal representative responsible for its participation.

Another important aspect is that the BCB Regulatory Sandbox will be operationalized in cycles. Cycle 1, which will last one year, subject to extension for an equal period, may include from 10 to 15 participants. To facilitate the eventual need for classification of interested entities, priority themes have been defined, which will receive higher scores in the selection process of innovative projects. The strategic priorities are:

I. solutions for the foreign exchange market;

II. fostering the capital market through mechanisms of synergy with the credit market;

III. promotion of credit for micro-entrepreneurs and small-sized enterprises;

IV. Open Banking solutions;

V. Instant Payment Arrangement (Pix) solutions;

VI. rural credit market solutions;

VII. solutions to increase competition in the SFN and SPB;

VIII. financial and payment solutions with potential effects to stimulate financial inclusion;

IX. fostering sustainable finance.

Regarding the schedule for cycle 1, interested entities may register from February 22 to March 19, 2021, and the period for the selection and authorization of participants would be from March 22 to June 25, 2021, but due to the high number of applications received, it was postponed to September 23, 2021. Cycle 1 will start right after the publication of the results, which should take place in the second half of 2021.

Taking into account the successful international experience, the BCB expects, as a result of implementing the Regulatory Sandbox, to foster the development of new products and services within the financial system and the SPB and, therefore, to increase competition among market institutions, increase efficiency and reduce costs for institutions, promote financial inclusion, and increase the quality and security of products and services offered, among other benefits.

Bank competition in regional credit markets

This box analyzes the competition in Brazilian regional credit markets using the Lerner indicator. Since the 2017 Banking Report, the BCB has been using the Lerner indicator to assess competition at the national credit market level.[1] However, this aggregation level does not allow spatial analyses and by market segments, nor the identification of factors associated with specific competition conditions in local markets.

Using data from 2015 to 2020, this box shows the competition profile in local Brazilian markets, defined from Immediate Geographic Regions and denominated as localities.[2] A large heterogeneity is observed in the average price,[3] marginal cost, and Lerner indicator in Brazilian localities, even for those belonging to the same state or neighboring regions. The decline of average prices in 2020 seems to be more related to the exogenous effects of the Covid-19 pandemic than to market competition conditions.

Furthermore, local banks' financial variables and geographic and sociodemographic data of localities correlate with the local Lerner indicators. These results are partial correlations and cannot be interpreted as causal effects. Two analyses are performed. First, it is investigated how geographic and socioeconomic local factors are associated with rates, marginal costs, and Lerner indicators in different localities. For the same bank and credit type, it is observed higher Lerner indicators in localities where the bank has higher local market shares and higher shares of the local population as clients. Second, it is identified how bank factors are associated with rates, marginal costs, and Lerner indicators in the same locality. In the same locality and the same credit type, banks with higher market shares have the largest Lerner indicators. The increase in the Lerner indicator is mostly explained by the reduction of marginal cost in localities in which the banks have greater market shares, thus suggesting gains of scale.

Methodology

Central banks and the academia have used the Lerner (1934) indicator to assess competition in banking systems and the market power of financial institutions.[4] In the Lerner indicator calculation,[5] one considers that, in oligopolistic or monopolistic markets, banks optimize their profits by adjusting the price of their products

1 This action is aligned with guidelines defined in the Agenda BC# to increase the share of population that can benefit from cheaper credit.

2 Immediate Geographic Regions are defined and published by the Brazilian Institute of Geography and Statistics (IBGE). These regions are urban networks, composed of a local urban center and neighboring urban centers, connected by dependent relationships and people commuting in search of goods, jobs, health and education services, as well as public utility services, such as the Judiciary Branch and social assistance and insurance. To facilitate the understanding and definition of theoretical models, the term "localities" is used as synonym of Immediate Geographic Regions. Additionally, the locality attributed to credit operations is that of the borrower, in contrast with that of the branch that grants the credit.

3 In this box, the term "price" is adopted in reference to interest rates of credit operations with the aim of harmonizing the terminology used in the literature on Lerner indicators, as has been done in previous Banking Reports.

4 The work of Demirguc-Kunt and Peria (2010) presents the methodology used as the World Bank reference for calculating the Lerner indicator of national banking systems. Other examples are Tan *et al*. (2020) (International Monetary Fund – IMF), de-Ramon *et al*. (2018) (*Bank of England*), Cruz-Garcia *et al*. (2018) (*Banco de España*) and Shaffer and Spierdijk (2020) (*Journal of Banking and Finance*).

5 Originally the Lerner indicators were developed in the context of the Theory of the Firm. Later, they were adapted to assess the market power of banks by the banking literature.

above the marginal cost. The ratio of the mark-up (mark-up here defined as the difference between the price and the marginal cost) to the price is the Lerner indicator, which may be interpreted as a measure of the bank market power.[6] This indicator quantifies the surplus to the marginal cost that optimizes the bank profits, which is higher the greater is the bank market power.

The methodology developed in this box is based on the theoretical framework described in the box "Estimation of competition indicators" of the 2018 Banking Report, which describes the calculation of Lerner indicators for the credit market at the national level.

Model definition

The estimation of the Lerner indicator for one participant in a specific market requires two information: (i) the price (observable variable); and (ii) the marginal cost (unobservable variable) of the product. For estimating the marginal cost, the banking literature uses a total cost function built from input prices and banking products as a transcendental logarithmic function (translog).[7] [8] Then, the marginal cost of a specific product can be estimated from the derivative of the total cost function relative to the product under analysis.

The calculation of local Lerner indicators requires information on inputs and products at the locality level[9], allowing analyses for specific local markets.[10] Banking products remain the same, but markets are different, with their own conditions, and each bank may have higher or lower market power according to local conditions.

The Lerner indicator for bank b in locality l in the period t for banking product j is calculated by the following expression:

$$L_{blt}^{(j)} = \frac{p_{blt}^{(j)} - CM_{blt}^{(j)}}{p_{blt}^{(j)}} \qquad (1)$$

where $p_{blt}^{(j)}$ and $CM_{blt}^{(j)}$ are the average price[11] (average interest rate of the operation) and the marginal cost of bank b in locality l in the period t relative to banking product j. In this equation, all variables are local, referring to locality l. From this point on, when the Lerner indicator, average price, marginal cost, and total cost are mentioned, it should be understood as those with local coverage.

6 In the case of a banking system, each bank is optimizing profits when offering products in several markets with a different market power in each of them. The methodology employed by the BCB, from which the calculation presented in this box is proposed, is used to compute, at the national level, the Lerner indicators of each financial institution participating in the financial system for the aggregation of the markets in which they operate.

7 Shaffer and Spierdijk (2020) list more recent studies that use the translog functions for calculating the aggregate and specific Lerner indicator for products in several countries.

8 These variables could be, for input prices, the funding interest rate and, for produced quantities – in the case of credit operations – the average outstanding portfolio in the period.

9 The methodology in the box "Estimation of competition indicators", of the 2018 Banking Report, used in the calculation of competition indicators in section 6.3 of this Banking Report, uses only accounting aggregates at the banking conglomerate or independent institution level over a jurisdiction. Therefore, it does not allow spatial analyses over a territory smaller than the jurisdiction for which these aggregates are collected and reported. The main challenge of this box is to build strategies for estimating inputs and products at a less aggregate level than the national/jurisdiction level.

10 A specific local market is defined for a credit type in a specific locality. Examples can be given by: (i) the payroll-deducted market in Americana/SP; or (ii) the working capital market in Acaraú/CE.

11 In this box, the term "price" is adopted for interest rates of credit operations to harmonize the terminology used in the literature on Lerner indicators, as usually done in other Banking Reports.

To estimate the marginal cost, one uses a total cost function in the dimension bank-locality-period.[12] Considering that banks have a specific modus operandi in different Brazilian localities, the econometric model is saturated with fixed effects to consider the institutional specificities of banks in each locality and macroeconomic conditions. This approach is important because the translog model for the total cost assumes that banks have the same production function and, therefore, the parameters are the same for all banks, localities, and time. Thus, the total cost of bank b in locality l during period t is calculated as:

$$\ln\left(\frac{CT_{blt}}{W_{blt}^{(1)}}\right) = \alpha_{bl} + \alpha_{lt} + \sum_{j=1}^{N}\beta_j \ln Q_{blt}^{(j)} + \frac{1}{2}\sum_{j=1}^{N}\sum_{k=1}^{N}\beta_{jk}\ln Q_{blt}^{(j)}\ln Q_{blt}^{(k)} + \sum_{i=2}^{M}\delta_i \ln\frac{W_{blt}^{(i)}}{W_{blt}^{(1)}} + \frac{1}{2}\sum_{i=2}^{M}\sum_{k=2}^{M}\delta_{ik}\ln\frac{W_{blt}^{(i)}}{W_{blt}^{(1)}}\ln\frac{W_{blt}^{(k)}}{W_{blt}^{(1)}} + \sum_{j=1}^{N}\sum_{i=2}^{M}\gamma_{ji}\ln Q_{blt}^{(j)}\ln\frac{W_{blt}^{(i)}}{W_{blt}^{(1)}} + \varepsilon_{blt} \quad (2)$$

where $W_{blt}^{(i)}$ and $Q_{blt}^{(j)}$ represent the price of the i-th input and the amount produced of the j-th product of bank b in locality l during period t. The bank uses M inputs and produces N products. In Equation (2), the total cost CT_{blt} and prices of inputs, $W_{blt}^{(j)}$, $j \neq 1$, are divided by the price $W_{blt}^{(1)}$ so as to assure the linear homogeneity of the estimated cost function.[13] In addition, we consider $\beta_{jk} = \beta_{kj}, \forall j,k$ and $\delta_{ik} = \delta_{ki}, \forall i,k$. We use the fixed effects of bank-locality α_{bl} to capture unobservable characteristics of bank b in locality l, which are invariable over time, and fixed effects of time-locality α_{lt} to absorb the effects of specific factors of each locality affecting banks over time.[14] The term ϵ_{blt} is the stochastic error.

To obtain the local marginal costs associated with product j, we evaluate the derivative of the total cost relative to the amount produced of product j, by bank b, in locality l during period t:

$$CM_{blt}^{(j)} = \frac{\partial\, CT_{blt}}{\partial Q_{blt}^{(j)}} = \left(\frac{CT_{blt}}{Q_{blt}^{(j)}}\right)\left(\beta_j + \beta_{jj}\ln Q_{blt}^{(j)} + \sum_{k=2}^{N}\beta_{jk}\ln Q_{blt}^{(k)} + \sum_{i=2}^{M}\gamma_{ji}\ln\frac{W_{blt}^{(i)}}{W_{blt}^{(1)}}\right) \quad (3)$$

The marginal cost in (3) is interpreted as the value in BRL spent by bank b for increasing the banking product j by one BRL in locality l during the period t.

12 The total cost function presented in the Box "Estimation of competition indicators" of the 2018 Banking Report, varies only in the level bank-period.

13 That is, this equality should be maintained if the prices and the cost are multiplied by a constant and the other parameters are kept unchanged. To make this division, we choose the price of a relevant input for the banking activity, for example, funding rates, due to numeric stability.

14 The specification of the fixed effects of bank-locality α_{bl} may capture the effects of the strategic positioning of each bank relative to the local market needs to be satisfied and how this should happen in spatial terms, as well as the effects of organizational choices of each institution. The fixed effects of time-locality α_{lt} are introduced to absorb temporal effects of the local socioeconomic environment, for example, the effect of public policies on local economic activity.

Sample and database

Due to constraints on the availability of local data,[15] this box uses only the group of commercial, universal, and savings banks. This sample is representative, since that it accounted, in 2020, for more than 90% of the outstanding household and corporate credit operations.[16] The regional competition is analyzed in 508 localities.[17]

To estimate the Lerner indicator, we must define a time frame, in which are observed credit granting and their respective prices and marginal costs. A half-year period time frame was adopted, as in the box "Estimation of competition indicators" of the 2018 Banking Report.

Data[18] used for the calculation of the Lerner indicator in Brazilian localities comprise:

- data used by the BCB in the banking supervision compiled from the Accounting Plan of the National Financial System Institutions (Cosif). Data are available at the national level by banking conglomerate or independent institution (proprietary data);[19]

- data on households and corporations from the Brazilian Federal Revenue Office (RFB), for identifying the borrower locality (proprietary data);

- identified data of individual household and corporate credit operations in Brazil, from the BCB's Credit Information System (SCR). Combined SCR and RFB data allow to compute the outstanding credit by credit type, bank, and period, as well as the average price of operations in each Brazilian locality (proprietary data). We consider the locality of the operations as being that of the credit borrower;

- data from the Monthly Bank Statistic by Municipality (Estban), a declaratory database containing aggregate information of the balance sheet of each bank branch in the Brazilian municipalities over time (public data);[20]

- IBGE geographic data, used to associate municipalities to the corresponding localities (public data);[21]

- identified data of formal job links from the Annual Report on Social Information (Rais) and the General Registry of Employed and Unemployed Persons (Caged), both maintained by the Ministry of Economy. Data contain information on payroll and number of employees in each bank branch in Brazil (proprietary data).

15 The Monthly Banking Statistic by Municipality database, important for the allocation of bank expenses at the local level – only contains data for commercial, universal, and savings banks. This group of banks comprises the segment b1, according to the classification presented in footnote 3 of Chapter 6 of this Banking Report. Due to this data limitation, the group of financial institutions studied in this box differs from the group of institutions for which the Lerner credit indicator was computed at the national level in Chapter 6, section 6.3 of this Banking Report.

16 A limitation of the study is that in certain localities, the participation of commercial banks may be significantly low to the point of not representing the Lerner indicator of these local markets.

17 The IBGE releases 510 Immediate Geographic Regions. However, there are no banks in the sample in two of these regions, thus restricting the analysis to 508 localities.

18 We use data available until the elaboration of this box, replicating last available data for the following half-year periods if necessary.

19 In addition to Cosif accounts, we use supervision variables, computed from Cosif accounts above level 3, which is classified information. In both cases, the data source will be indicated as Cosif.

20 If a bank has several branches in the same municipality, the value found in the Estban corresponds to the aggregation of bank branches in the municipality. For a locality, we aggregate the value of the municipalities within it. Estban data are available at www.bcb.gov.br.

21 Localities (Immediate Geographic Regions) are available at https://www.ibge.gov.br.

Productive process

This section[22] details the components of the total cost function calculated by locality, according to Equation 2.

Input prices $W_{blt}^{(i)}$: input prices are defined in Table 1.

Table 1 – Bank input prices used in the estimation of the total cost function

i	Input price $W_{blt}^{(i)}$
1	$$W_{blt}^{(1)} = \frac{Funding\ Costs}{Total\ Funding_{bt}}$$ We assume that the local funding cost is uniform for the same bank in different localities since banks funding strategy normally follows an internal centralized governance. In this equation, the variables $Funding\ Costs_{bt}$ and $Total\ Funding_{bt}$ are the funding expense and volume, respectively, of bank b in the period t, from Cosif.
2	$$W_{blt}^{(2)} = \frac{Tax\ Costs_{bt}}{Total\ Assets_{bt}}$$ We assume that the local tax price is quite uniform among localities since tax expenses mostly refer to federal taxes.[23] Thus, tax rates of banking branches are similar in any Brazilian locality. In this equation, the variable $Tax\ Costs_{bt}$ is the tax expense, and the variable $Total\ Assets_{bt}$ is the bank b's total assets in the period t. Data from Cosif.
3	$$W_{blt}^{(3)} = \frac{IT\ Costs_{bt}}{Granted\ Credit_{bt}}$$ The price of using communication resources and data processing allocated to the credit granting is computed from the expenses for using these resources, $IT\ Costs_{bt}$, which are proportional to the credit granted by the branches in the locality during the period t, regardless of the physical localization of the borrower. These expenses are calculated by allocating communication and data processing expenses by the ratio between the total credit outstanding amount net of provisions and the total bank's usual assets. All variables refer to bank b in the period t and are from Cosif.
4	$$W_{blt}^{(4)} = \frac{Labor\ Costs_{blt}}{Number\ of\ Employees_{blt}}$$ The price of labor resources is computed as the average local wage. The variables (i) labor expenses of bank b in locality l and period t ($Labor\ Costs_{blt}$) and (ii) total corresponding number of employees ($Number\ of\ Employees_{blt}$) are from Rais/Caged.
5	$$W_{blt}^{(5)} = \frac{Adm\ Costs_{bt} + Amort_{bt} - IT\ Costs_{bt} - Labor\ Costs_{bt}}{Total\ Assets_{bt}}$$ We consider that the price for using the bank operational infrastructure is uniform among localities because of the lack of data, except for labor expenses, and expenses on communications and data processing allocated to credit granting operations. The variable $Labor\ Costs_{bt}$ (labor expenses of bank b in the period t) is from Rais/Caged. The other variables are from Cosif and refer to administrative expenses ($Adm\ Costs_{bt}$), amortization ($Amort_{bt}$) and communication and data processing expenses allocated to credit granting operations ($IT\ Costs_{bt}$).

Total cost CT_{blt}: whereas the BCB has detailed data on the total costs of each financial institution in Brazil from Cosif, there is no information about the total cost of each bank branch. Thus, we adopted a strategy for allocating these total costs for each institution to each locality with branches by using local Estban variables and Rais/Caged.

22 From this section on, the data source used for the computation of variables will be indicated according to the references listed in section "Sample and database".

23 The federal tax burden represents nearly 79% of all taxes collected between 2015 and 2020 by the financial institutions considered in this box.

The total bank cost is defined as the sum of five components, described in Table 2. For each cost component, we consider a base-value – which is a cost variable at the national level of a bank – and this value is allocated for the branches in Brazilian localities, according to the allocation heuristics described in the table.

Table 2 – Components of total bank cost and how they are distributed via allocation heuristics of a national base-value

Share	Base-value to be allocated (Variable at the national level)	Allocation heuristics (Variable at the locality level)
1	Funding expenses except those related to bonds and securities (Cosif).	Proportion of the credit volume (SCR) of branches in the locality relative to the bank's national aggregate
2	Funding expenses relative to bonds and securities (Cosif) and repurchase operations in the interbank market (Cosif).	Proportion of assets in the interbank and liquidity investments with bonds and securities (Estban) and financial derivative instruments (Estban) in the locality relative to the bank's national aggregate
3	Tax expenses and other administrative expenses and amortization, except those related to IT and labor costs (Cosif).	Proportion of the sum components: (Local credit operations (SCR)) + (local assets of interbank and liquidity investments (Estban)) + (bonds and securities and financial derivative instruments (Estban)) + (leasing and other values and goods (Estban)) relative to the bank's national aggregate.
4	IT expenses allocated to the credit granting operations (Cosif).	Proportion of credits granted by branches in the locality regardless of the borrower localization (Estban) relative to the volume of credit granted by the bank at the national level.
5	Labor expenses (Cosif).	Proportion of the branch's payroll (Rais/Caged) in the locality relative to the bank payroll at the national level.

Amounts produced $Q_{blt}^{(j)}$: we consider that banks produce three types of product − credit operations (SCR), bonds and securities operations (Estban), and operations with other assets (Estban).[24] Although this box focuses on the credit market, we have to consider all banking products in the translog function.[25]

To understand the specificities of the credit market, we consider each credit type as a specific bank product. Household and corporate credit types used are described in Table 3. However, since some credit types are long-term types, the stock of credit operations includes on-going operations contracted a long time ago, at different conditions from that for which the competition is analyzed.[26] For better capturing competition in each period (half-year) over time, the credit volume of each credit type is broken down into credit volume granted in the half-year period and before the half-year period. Contractual conditions of credit granting – including volume and rate – occurred in the half-year period are a better representation of the competition environment in the credit market than the contractual conditions of previous half-year periods. In addition, incurred costs for granting credit are different from that of monitoring the same operations, which reflects in the marginal cost associated with operations in that credit type in the half-year period. Thus, we focus only on the group of operations granted within the half-year period.

24 The value "Other assets" is calculated by exclusion: deducting from the current and long-term assets the value of availabilities, interbank liquidity investments, bonds and securities, interbank operations, operations between branches, and credit and leasing operations.

25 Since the model adopted in this box considers that a bank in a specific locality in a certain period is a firm maximizing profits, all bank products and all costs in the locality are considered (with different granularity degrees, according to the research focus).

26 For instance, real estate financing operations may have terms up to thirty years, whereas revolving working capital may have terms of less than one month.

Table 3 – Credit types that correspond to products for which is calculated the marginal cost of each bank-locality, by means of Equation (3). Each credit type is represented by two banking products: operations for that type occurred within the half-year period and outside the half-year period

Household credit types	Corporate credit types
1. Payroll-deducted loan	1. Working capital
2. Non-payroll-deducted loan	2. Revolving working capital
3. Real estate financing	3. Financing of infrastructure, development, project, and other credits
4. Rural credit	4. Real estate financing
5. Vehicles	5. Investment
6. Other credits	6. Account receivables
	7. Agribusiness
	8. Other credits

Therefore, in this model, we consider that each bank can produce thirty products: (i) fourteen products relative to operations in the half-year period of credit types listed in Table 3; (ii) fourteen for operations outside the half-year period of those same credit types; (iii) one for bonds and securities operations; and (iv) one for operations with the other assets.

Prices of products in the analyzed markets

For convenience, we denote by the subscript m the credit products granted in the half-year period and that will be analyzed in the following section. Banking literature normally uses the ratio between revenue of credit operations and the volume of credit as proxy for price (average credit interest rate).[27] The average interest rate obtained by this strategy is net of losses due to delinquency, since it measures revenues effectively received by the bank from its credit operations. It differs from the contractual/effective interest rate, which does not consider losses from delinquency and other risk factors. This box follows the banking literature and uses, as the average price for the credit product m granted by bank b in the period t in the locality l, the ratio between the income flow of credit operations granted in the half-year period t (SCR) and the volume of operations granted in that half-year period (SCR).

Since there is a significant volume of very short-term credit (with terms lower than one month), considering end-of-month accounting data generates a positive bias in the average price of each operation since, at the end of the month, the stock corresponding to this operation will not be in the outstanding portfolio (the operation has already matured), whereas the revenue of this operation will be added to credit operations revenues. To correct this problem, instead of calculating the average price considering the outstanding credit at the end of the month, we consider instead the outstanding credit before inflows of revenues in that month.[28] Thus, for calculating the average price in a certain half-year period t, we sum all revenues (R) and respective outstanding volume of credit before revenues (CA) for all months since the start of the credit operation until the final month in the half-year period t or the month in which the operation was settled, which occurs first. Therefore, the average price of credit product m for bank b in locality l during the half-year period t is:

$$p_{blt}^{(m)} = \frac{\sum_{k \in S_t} R_{blk}^{(m)}}{\frac{1}{6}\sum_{k \in S_t} CA_{blk}^{(m)}} \tag{4}$$

where S_t is the group of months in the half-year period t. The average price in (4) is expressed semiannually.

27 See, for example, Shaffer and Spierdijk (2020) and Erler *et al*. (2017).
28 Bank revenues such as interest, amortizations, and settlement of credit operations.

Competition indicators in regional credit markets

This section presents competition indicators in regional credit markets in Brazil semiannually.[29]

Figure 1 shows that the average price of credit operations in the household (individuals) segment was higher than in the corporate (non-financial firms) segment from 2015 to 2020 in all Brazilian regions. In 2020, the average price of operations dropped sharply in both segments, especially for households. This decline is possibly correlated with the effects of the Covid-19 pandemic on economic activity and with the debt renegotiation measures occurred in the period, which directly caused the reduction of net revenue flows relative to credit operations.

Figure 2 shows that the marginal cost of household operations was lower than that of corporate operations in all regions and periods. It also shows that, while the marginal cost of the corporate segment remained quite stable over the entire period, it decreased for the household segment until December 2019. In 2020, marginal costs for the household segment in the South and Southeast region increased while continued to decline in the other regions.[30]

Figure 1 – Average price in credit markets by segment and region

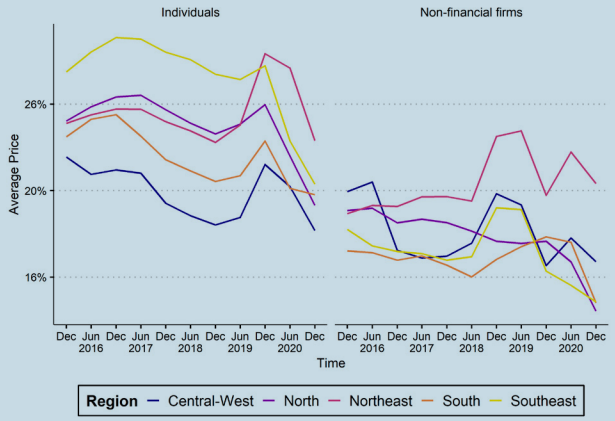
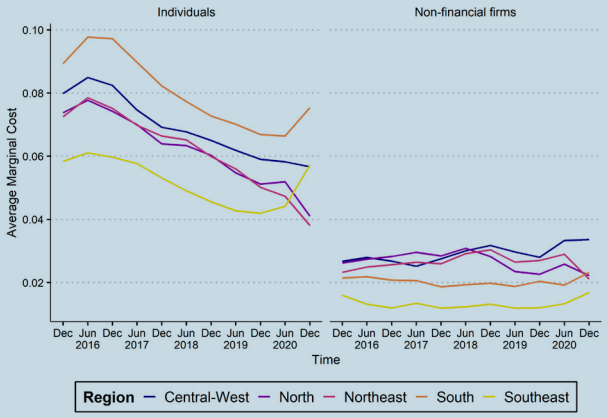


Figure 2 – Average marginal cost in credit markets by segment and region



29 In Chapter 6, section 6.3, of this Banking Report, computed Lerner indicators are plotted in figures with distributions around the median values. Figure 6.1.a – Credit Lerner (banking segment) shows these distributions calculated for the entire banking segment, which comprises the macro segments of commercial, universal, and savings banks (b1), universal banks that do not have a commercial portfolio, investment banks, and FX banks (b2) in the period from 2000 to 2020. As previously mentioned in this box, Lerner indicators are computed only for commercial, universal, and savings banks, due to the availability of local data only for this macro segment in the period from 2015 to 2020. In addition, the model adopted in this box for the estimation of the marginal cost is more saturated than that presented in the box "Estimation of competition indicators" of the 2018 Banking Report. Therefore, data herein presented are not directly comparable with those presented in that section.

30 An analysis of aggregate total costs observed in each region shows that in 2020 these costs fell in all regions but in the South and Southeast. Regarding the costs of each input, costs for funding, labor, IT, and other administrative inputs increased in the South and Southeast, falling in the North and Northeast regions. In the Central-West region, the costs of IT and other administrative inputs increased whereas the other costs decreased. Finally, the costs of bonds and securities operations fell in all regions but in the Southeast

Figure 3 shows the Lerner indicators in household and corporate credit markets. In the period from 2015 to 2019, Lerner indicators in household credit markets follow an upward trend while in the corporate segment the trend is strongly downward. In this period, in both segments, the pairs of regions North and Northeast and South and Central-West follow a similar trajectory. In addition, the Southeast region values are higher than in the other regions. In 2020, household credit markets in the Southeast, South, and Central-West Lerner indicators decline while, in the corporate credit segment, their downward trend is reverted to an upward trend in the North and Northeast regions. This trend results from interactions of regional trajectories observed in prices and marginal costs. In the household segment, in 2020, prices declined in all regions, due to the decrease observed in the revenue inflow of credit operations in Brazilian localities. This revenue inflow decline had a reducing effect on Lerner indicators in the period. However, the relative decline of marginal costs in the North and Northeast was higher than the decline in prices, leading to an increase in Lerner indicators in these regions in the period. The same effect is observed for these regions in the corporate segment.

Figure 4 shows Lerner indicators for aggregate regional credit markets from 2015 to 2020.[31] Until December 2019, Lerner indicators are relatively stable in their highest levels in the Southeast. Lerner indicators in the North and Northeast presented a similar behavior and intermediate values, with slight oscillations. South and Central-West showed the lowest indicators and similar trajectories. In 2020, these trajectories change, showing a sharper decrease in the most developed regions, *i.e.*, Southeast and South. In the North and Northeast regions, a slight increase was observed in the end of 2020.

Figure 3 – Average Lerner indicators in credit markets by segment and region

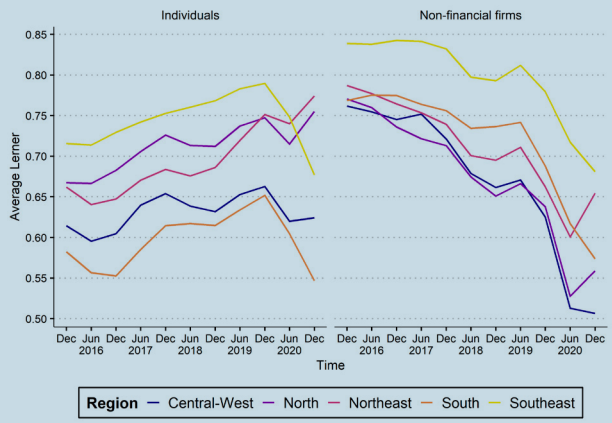


Figure 4 – Average Lerner indicators in credit markets by region

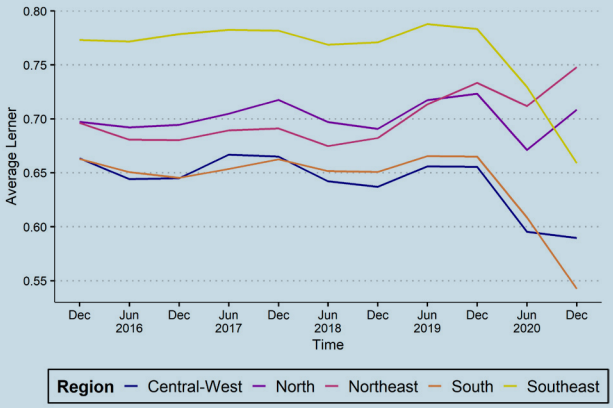
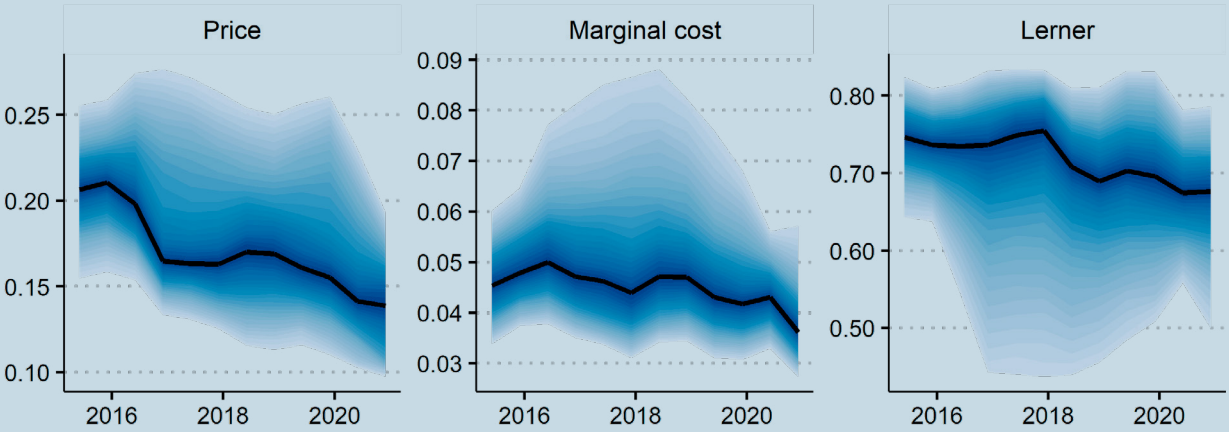


Figure 5 shows the distributions of competition indicators in regional credit markets.[32] The distributions are obtained by aggregating, for each bank-locality, prices, marginal costs, and Lerner indicators related to granted credit of the types in Table 3. The black line denotes the bank-locality variables' medians, and the distribution is plotted for the percentiles from 25 to 75%. The distribution of percentiles in Figure 5 brings complementary information to those showed in Figures 1 and 3 (weighted average). Whereas figures showing weighted averages are significantly influenced by large banks, the distributions of percentiles show a clear influence of small financial institutions.

31 Following Shaffer and Spierdijk (2020), for the analyses related to each credit type (SCR) in this box, the aggregation of the product statistics is done by using an average weighted by the revenue inflow of the related credit type (SCR).

32 The distributions are presented for percentiles 25 to 75, the same amplitude as that shown in Chapter 6, section 6.3, of this Banking Report. However, Lerner indicators in Figure 5 differ from those presented in section 6.3 due to differences in the level of spatial coverage considered in the analysis (aggregate local credit markets over the country versus national market) and by the reasons listed in footnote 29.

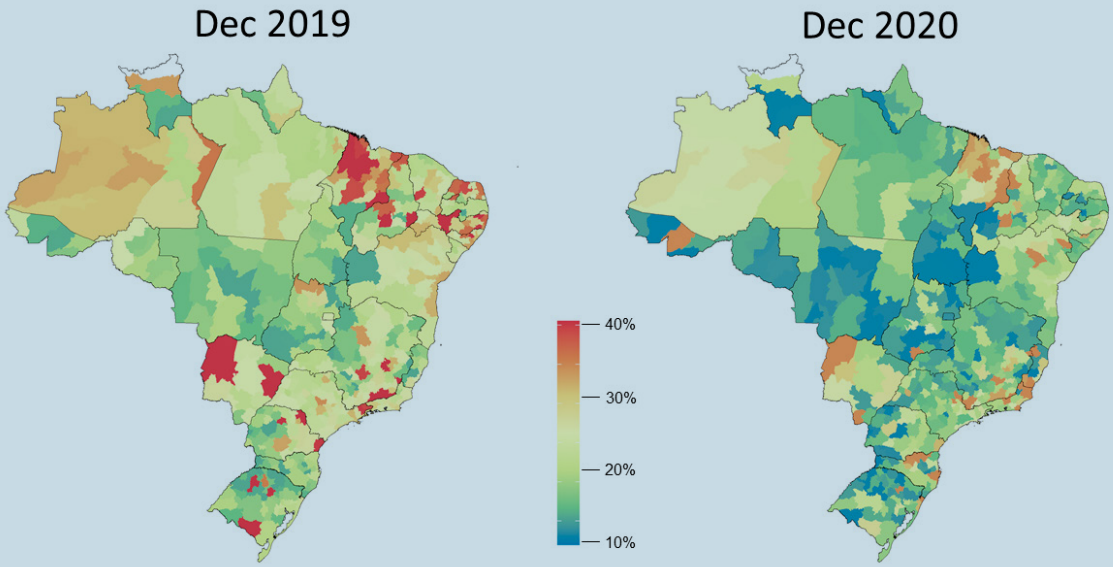
Figure 5 – Distributions of prices, marginal costs, and Lerner indicators of local credit markets



The spatial distribution of the measures of prices, marginal cost, and competition indicators of the aggregate credit market, at the local level, shows a clear heterogeneity, even within the same state. At least part of this heterogeneity can be explained by different compositions of the regional credit market.[33] Illustrations 1 to 3 present the comparison of the distributions of prices, marginal cost, and Lerner indicators in the aggregate local credit market from December 2019 to December 2020 in each Brazilian locality.

Consistent with the previous analysis, Illustration 1 shows that, in general, prices declined from 2019 to 2020. Illustration 2 shows that marginal costs remained more stable than prices. These decreases occurred mostly North and Northeast localities. On the other hand, in some South and Southeast localities, marginal costs increased. Illustration 3 shows a fall in Lerner indicators all around the country, highlighting that price declines in the period played a relevant role in this process.

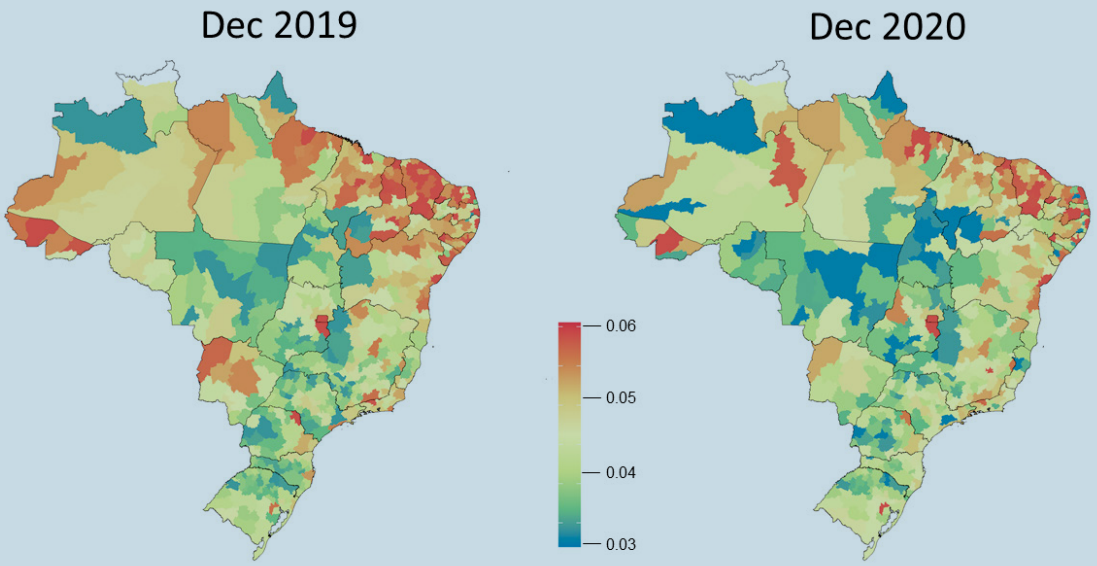
Illustration 1 – Evolution of the spatial distribution of prices in credit markets by locality



Note: Winsorized data for better visualization.

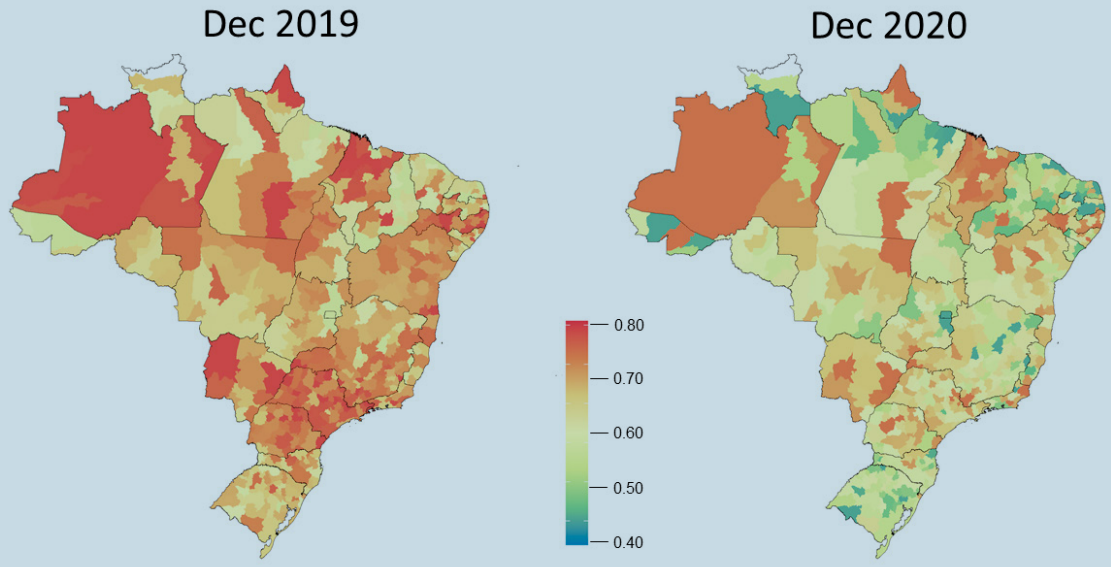
33 For example, in one locality real estate financing, with lower cost may prevail, whereas, in another, non-payroll-deducted credit, with higher cost.

Illustration 2 – Evolution of the spatial distribution of marginal costs in credit markets by locality



Note: Winsorized data for better visualization.

Illustration 3 – Evolution of the spatial distribution of Lerner indicators in credit markets by locality



Note: Winsorized data for better visualization.

Exploratory analysis

The previous sections presented quantitative information about the spatial distribution of the average price, marginal cost, and Lerner indicators in Brazilian regional credit markets. In this section, we carry out an exploratory analysis to identify what kind of financial, geographic, and socio-economic factors are correlated with the variables presented in the previous section. It is worth mentioning that the results achieved are partial correlations and cannot be interpreted as causal effects.

How financial, geographic, and socioeconomic factors are associated with rates, marginal costs, and Lerner indicators in different localities?

This section explores local factors that are correlated with average rates, marginal costs, and Lerner indicators of banks at the locality level (Immediate Geographic Region). Since these measures depend on unobservable characteristics, both from the borrower and the bank granting the credit, we use an approach from the perspective of the same bank (within-bank) operating in similar but different localities, for the same credit type. This allows us to control for unobservable supply factors related to the same bank. The variation obtained in our estimates is related to the heterogeneity of each locality in which the bank operates for a given credit type. To mitigate problems of omitted variables, we compare localities within the same state. As an example, the model compares how the average rate, marginal cost, and Lerner indicator vary between localities within the same state (e.g. Campinas versus Ribeirão Preto in São Paulo state) for the same bank in each credit type listed in Table 3.

To understand how financial, geographic, and socioeconomic factors are associated with average rates, marginal costs, and Lerner indicators, we use the following panel specification:

$$y_{b,m,l,e,t} = \alpha_{b,m,e,t} + \beta^T Factors_{b,m,l,e,t} + \epsilon_{b,m,l,e,t} \quad (5)$$

where b, m, l, e, t index the bank, credit type (according to the list in Table 3), locality (508 Immediate Geographic Regions), state of the locality (26 states + DF) and time (2015 to 2020, semiannually). Three dependent variables are used for $y_{b,m,l,e,t}$: average interest rate, marginal cost, and Lerner indicator of bank b for credit type m in the locality l in the state e in half-year t. The introduction of the fixed effect bank-credit-type-state-time $\alpha_{b,m,e,t}$ allows results to be interpreted for the *same* bank in the *same* credit type operating in *different* localities within the *same* state. The term $\epsilon_{b,m,l,e,t}$ is the stochastic error. Due to the interdependence of credit operations of the same bank in different localities, we cluster errors at the bank level.[34]

The vector $Factors_{b,m,l,e,t}$ in the Equation (5) contains the financial, geographic, and socioeconomic covariables listed in Table 4. The table presents data sources, the level of variation of each covariable, and the description of the contents of the variable. We standardize all the numeric variables (subtracting the average and then dividing by the sample standard-deviation). In this way, the interpretation of results is done in terms of standard-deviation of the sample average when the variable is numeric.

34 Conglomerate or independent banking institution.

Table 4 – Financial, geographic, and socioeconomic variables used in the empirical exercise for analyzing the correlation with the average rate, marginal cost, and Lerner indicator of banks operating in credit market type *m* in the locality *l* within the state *e* in the period *t*

Variable	Source	Used in the equation	Description
Level of variation of the covariable: bank-credit type-locality-time			
Market share	SCR	(5) and (6)	Ratio between the volume of credit bank-credit type-locality and the credit type-locality
Provisions/credit	SCR	(5) and (6)	Volume of provision/volume of credit
Weighted average time to maturity	SCR	(5) and (6)	Average time to maturity of each credit operation weighted by revenues inflow of the operation
Share of the population as clients	SCR + IBGE	(5) and (6)	Number of clients with credit/local population
Average ticket	SCR	(5) and (6)	Volume of operations of credit/number of clients with credit
Share of earmarked credit	SCR	(6)	Volume of earmarked credit/total credit volume
Share of earmarked credit in other credit types	SCR	(6)	Volume of earmarked credit in other credit types/total credit volume
Level of variation of the covariable: locality-time			
Credit unions market share	SCR	(5)	Volume of credit granted by credit unions in the locality/credit volume in the locality
Share of earmarked credit	SCR	(5)	Volume of earmarked credit in the locality/credit volume in the locality
GDP per capita	IBGE	(5)	Local GDP/local population
Population	IBGE	(5)	Local population
Number of banks	SCR	(5)	Number of different banks with credit operations
Share of state-owned banks	SCR + Unicad[35]	(5)	Number of state-owned banks with credit/number of banks
Locality specialized in agriculture	IBGE	(5)	Dummy is 1 if the local GDP mainly includes agricultural activities and 0, otherwise
Locality specialized in manufacturing	IBGE	(5)	Dummy is 1 if the local GDP mainly includes industrial activities and 0, otherwise
Level of variation of the covariable: locality			
Locality has a capital	IBGE	(5)	Dummy is 1 if the capital is in the locality and 0, otherwise
Level of variation of the covariable: Bank-Time			
State-owned bank	Unicad	(6)	Dummy is 1 if it as state-owned bank and 0, otherwise
Capitalization level	Cosif	(6)	Ratio between the adjusted net worth and adjusted total assets
LCR	Cosif	(6)	Liquidity Coverage Ratio (Basel III)
Total assets	Cosif	(6)	Adjusted total assets

Table 5 shows the estimated coefficients for Equation (5) for average rates (Specifications 1 and 2), marginal costs (Specifications 3 and 4), and Lerner indicators (Specifications 5 and 6). As most localities are formed by small municipalities, we use unweighted (odd specifications) and weighted by the local population (even specifications) regressions. This strategy allows us to verify whether the results are dominated by localities formed by small municipalities or if the relationships also persist in localities with large urban centers.

35 Information System on Institutions of Interest of the Central Bank (Unicad) is a repository of register data of entities related to BCB activities.

Table 5 – How financial, geographic, and socioeconomic factors are associated with rates, marginal costs, and Lerner indicators in different localities?

Dependent Variables:	Average Price$_{bmlt}$		Marginal Cost$_{bmlt}$		Lerner$_{bmlt}$	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
(Period: 2015 − 2020, semiannually)	(1)	(2)	(3)	(4)	(5)	(6)
Bankl-Credit Type-Locality Level						
Market Share$_{bmlt}$	-0.055***	-0.037*	-0.107***	-0.086***	0.123***	0.147***
	(0.015)	(0.019)	(0.025)	(0.030)	(0.028)	(0.045)
Provisions / Credit$_{bmlt}$	0.056***	0.071***	-0.010	-0.008	0.019	0.024
	(0.009)	(0.010)	(0.018)	(0.020)	(0.016)	(0.025)
Weighted Average Time to Maturity$_{bmlt}$	0.033**	0.097***	-0.095**	-0.196***	0.120**	0.243***
	(0.015)	(0.029)	(0.045)	(0.063)	(0.059)	(0.083)
Share of the Population as Clients$_{bmlt}$	0.024*	0.028	-0.086***	-0.124***	0.074***	0.114***
	(0.013)	(0.021)	(0.024)	(0.036)	(0.026)	(0.035)
Average Ticket$_{bmlt}$	-0.014**	-0.022	-0.058***	-0.049***	0.074***	0.008
	(0.007)	(0.015)	(0.020)	(0.011)	(0.020)	(0.040)
Locality Level						
Credit Unions Market Share$_{lt}$	-0.013	-0.017	-0.012	-0.031**	0.024*	0.058***
	(0.008)	(0.013)	(0.009)	(0.015)	(0.012)	(0.022)
Share of Earmarked Credit$_{lt}$	-0.023	-0.028	0.088**	0.171**	-0.192***	-0.330***
	(0.016)	(0.027)	(0.041)	(0.065)	(0.043)	(0.072)
GDP *per Capita*$_{lt}$	-0.023***	-0.021**	0.016	0.004	-0.008	0.005
	(0.007)	(0.009)	(0.010)	(0.019)	(0.007)	(0.016)
Population$_{lt}$	0.051***	0.034***	-0.042	-0.099**	0.024	0.088***
	(0.010)	(0.005)	(0.042)	(0.041)	(0.027)	(0.024)
Number of Banks$_{lt}$	-0.094***	-0.059***	0.016	0.069***	-0.016	-0.063***
	(0.010)	(0.007)	(0.039)	(0.026)	(0.027)	(0.018)
Share of State-Owned Banks$_{lt}$	0.002	-0.001	-0.014***	-0.020***	0.011***	0.012
	(0.002)	(0.002)	(0.003)	(0.006)	(0.003)	(0.009)
Locality Specialized in Agriculture$_{l}$	0.034***	0.051***	0.044***	0.072***	-0.044***	-0.086***
	(0.006)	(0.015)	(0.008)	(0.022)	(0.008)	(0.023)
Locality Specialized in Industry$_{l}$	0.040***	0.046***	0.002	0.016	-0.009	-0.024
	(0.006)	(0.010)	(0.012)	(0.017)	(0.013)	(0.017)
Locality has a Capital$_{l}$	-0.037**	-0.069***	0.072	0.075	-0.060	-0.070
	(0.016)	(0.019)	(0.090)	(0.096)	(0.072)	(0.078)
Fixed Effects						
Time-Credit Type-Locality-State	Yes	Yes	Yes	Yes	Yes	Yes
Observations	301,920	301,920	302,267	302,267	301,920	301,920
R^2	0.862	0.902	0.697	0.861	0.654	0.874
Error Clustering	Bank	Bank	Bank	Bank	Bank	Bank

Note: The table shows the estimates of the coefficients for Equation (5) for a sample of semiannual data from 2015 to 2020. Three dependent variables are used: average price (Specifications 1 and 2), marginal cost (Specifications 3 and 4), and Lerner's indicator (Specs 5 and 6), all varying for the bank-credit type-locality-time. Odd specs are unweighted and even specs are weighted by the locality population. The same set of independent variables is used in the six specifications, as listed in Table 4. A standardization transformation is applied to all numeric variables. Fixed time-bank-mode-state effects are introduced in the six specifications, such that the interpretation of each coefficient is made in terms of the same bank operating in the same credit type but in different locations of the same state in a given half-year. Errors were clustered at the bank level. Statistical significance: *** p < 0.01; ** p <0.05; * p <0.10.

The increase of the local market share of a bank in a certain credit type is associated with lower average prices relative to the prices practiced by the same bank in other localities within the same state for the same credit type. For the same bank and credit type, the average price is lower in richer localities (higher Gross Domestic Product − GDP per capita), with a larger number of banks operating locally and in state capitals. On the other hand, the price is higher in more populated localities, with greater weighted average time to maturity and activities preponderantly targeted to agriculture and industry (relatively to services). The results for average price are qualitatively similar for weighted and unweighted specifications.

For the same bank and credit type, we find that higher local market share, higher share of local population as clients, higher average tickets, and higher weighted average time to maturity are associated with lower marginal costs relatively to the same bank operating in different localities in the same state. These findings indicate the occurrence of probable gains of scale for the bank, since increases in the volume of operations and in the relative participation of the bank in local population are related with lower marginal costs.

Statistical local relations of covariables with the Lerner indicator can be viewed as their composite effect on price and marginal cost. For example, the positive association between the local market share and the Lerner indicator suggests that the relationship between participation and marginal cost is stronger than that between participation and price. On the other hand, a lower Lerner indicator in localities with a larger number of banks with a greater specialization in agriculture suggests that the price has a larger effect than the marginal cost. A larger local participation of credit unions is associated with larger Lerner indicators, mainly in more populated localities.[36] In general terms, the analysis of the terms of price and marginal cost provides clearer information on the dynamics of the Lerner indicator.

Which bank factors are associated with rates, marginal costs, and Lerner indicators in the same locality?

The previous section analyzed how local financial, geographic, and socioeconomic factors are associated with the average rates, marginal costs, and Lerner indicators for the same bank-credit type operating in *different* localities. To complement this approach, this section surveys how these three amounts are associated with observable characteristics of *different banks* operating in the *same* locality. Adopting the perspective from the same locality allows us to control unobservable factors related to that locality, such as local credit demand. Therefore, variations from the model are related to heterogeneities between different banks operating in the same locality.

The following econometric specification is used:

$$y_{b,m,l,t} = \alpha_{m,l,t} + \beta^T Factors_{b,m,l,t} + \epsilon_{b,m,l,t} \quad (6)$$

where b, m, l, e, t index the bank, credit type (according to the list of Table 3), locality (508 Immediate Geographic Regions), and time (2015 to 2020, half-yearly). We use the same dependent variables listed in the previous section. The introduction of credit type-locality-time $\alpha_{m,l,t}$ fixed effects allows the interpretation of results for the local credit market of credit type m in the *same* locality for *different* banks. The term $\epsilon_{b,m,l,t}$ is the usual stochastic error used in the literature. The errors at the bank level are clustered. The vector $Factors_{b,m,l,t}$ is formed by the observable variables according to the list in Table 4 for the Equation (6).

Table 6 reports the estimated coefficients for the Equation (6) for average rates (Specifications 1 and 2), marginal costs (Specifications 3 and 4), and Lerner indicators (Specifications 5 and 6). Similarly to the previous section, we use unweighted (odd specifications) and weighted by the local population (even specifications) regressions. Banks with high average tickets and larger shares of local earmarked credit in a given credit type have lower average prices than other banks operating in the same locality and credit type. State-owned banks have lower prices than private banks operating in the same locality and credit type. The correlation between the local market share and the average price is not statistically significant when comparing banks within the same locality.

36 Although there is a positive association between the participation of credit unions and the Lerner indicator, that has a negative correlation with the price (statically insignificant) and marginal cost (statistically significant). The negative association between the participation of credit unions and the average price corroborates the results in the Box "Cooperatives' participation in the credit market" of the 2017 Banking Report, which showed that the local interest rate of commercial banks is negatively correlated with the local share of credit unions for some credit types.

Table 6 – Which bank factors are associated with rates, marginal costs, and Lerner indicators in the same locality?

Dependent Variables:	Average Price$_{bmlt}$		Marginal Cost$_{bmlt}$		Lerner$_{bmlt}$	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
(Period: 2015 − 2020, semiannually)	(1)	(2)	(3)	(4)	(5)	(6)
Bank-Credit typey-Locality Level						
Market Share$_{bmlt}$	0.003	0.010	-0.180***	-0.243***	0.225***	0.337***
	(0.048)	(0.055)	(0.023)	(0.059)	(0.019)	(0.040)
Provisions / Credit$_{bmlt}$	0.143***	0.171***	0.028	-0.029	0.016	0.117**
	(0.034)	(0.029)	(0.024)	(0.044)	(0.02)	(0.047)
Average Maturity$_{bmlt}$	0.015	-0.118	-0.285**	-0.297**	0.307**	0.283*
	(0.057)	(0.082)	(0.141)	(0.146)	(0.124)	(0.159)
Share of the Population as Clients$_{bmlt}$	0.101	0.177**	-0.096**	-0.165***	0.039	0.082
	(0.064)	(0.080)	(0.040)	(0.051)	(0.053)	(0.064)
Average Ticket$_{bmlt}$	-0.076***	-0.064***	-0.008	-0.001	-0.048***	-0.063**
	(0.026)	(0.011)	(0.016)	(0.026)	(0.017)	(0.029)
Share of Earmarked Credit$_{bmlt}$	-0.387***	-0.214**	-0.138	-0.123	0.105	0.101
	(0.131)	(0.103)	(0.086)	(0.166)	(0.096)	(0.179)
Share of Earmarked Credit in Other Credit types$_{bmlt}$	-0.027	-0.042	0.044***	0.104	-0.051**	-0.091
	(0.028)	(0.032)	(0.016)	(0.090)	(0.021)	(0.087)
Bank Level						
State-Owned Bank$_{b}$	-0.549***	-0.335**	0.092	0.156	-0.221**	-0.175
	(0.109)	(0.152)	(0.168)	(0.190)	(0.112)	(0.190)
Capitalization Level$_{bt}$	-0.169***	-0.118***	-0.111*	-0.002	0.025	-0.022
	(0.031)	(0.043)	(0.061)	(0.092)	(0.046)	(0.094)
LCR$_{bt}$	-0.086**	-0.048	0.167***	0.098	-0.174***	-0.114
	(0.041)	(0.038)	(0.052)	(0.080)	(0.039)	(0.082)
Total Assets$_{bt}$	-0.038	0.025	-0.038	-0.137	0.077**	0.179**
	(0.038)	(0.038)	(0.059)	(0.084)	(0.038)	(0.085)
Fixed Effects						
Time-Credit Type-Locality	Yes	Yes	Yes	Yes	Yes	Yes
Observations	301,896	301,896	302,242	302,242	301,896	301,896
R^2	0.669	0.527	0.435	0.301	0.436	0.308
Error Clustering	Bank	Bank	Bank	Bank	Bank	Bank

Note: The table shows the estimates of the coefficients for Equation (6) for a sample of semiannual data from 2015 to 2020. Three dependent variables are used: average price (Specifications 1 and 2), marginal cost (Specifications 3 and 4), and Lerner's indicator (Specs 5 and 6), all varying for the bank-credit typey-locality-time. Odd specs are unweighted and even specs are weighted by the locality population. The same set of independent variables is used in the six specifications, as listed in Table 4. A standardization transformation is applied to all numeric variables. Credit typey-location-time fixed effects are introduced in the six specifications, such that the interpretation of each coefficient is made in terms of the same location and credit type but between different banks in a given half-year-year. Errors were grouped at the bank level. Statistical significance: *** p < 0,01; ** p <0,05; * p <0,10.

The marginal cost is negatively associated with the local market share and the share of population as client when comparing banks operating in the same locality and in the same credit market, again suggesting gains of scale. High shares of earmarked credit in other credit types (all credit types excluding that analyzed) are associated with higher marginal costs for the credit type under analysis. Regarding the Lerner indicator, it is remarkable the positive statistical correlation between the local market share and the indicator, and the negative correlation with the average ticket.

Conclusion

This box proposes a new methodology for estimating banking competition at a local level for each credit type. Research on banking competition typically uses as unit of analysis the bank in the national territory, disregarding details at the subnational level. Usually, this limitation results from the lack of necessary microdata for estimating banks' local production function. This box overcomes this limitation by using microdata from several proprietary

and public sources and heuristics to allocate resources for estimating inputs, products, and costs for each bank in each locality. The estimation of competition at a more granular level allows: (i) to understand possible competition correlations between credit types (earmarked *versus* non-earmarked, collateralized *versus* non-collateralized, households *versus* corporations; short-term *versus* long-term) in the same or even in different financial institutions in all localities; and (ii) to identify similar localities through some observable criterion, but with different local competition levels. The understanding of these relationships may allow the implementation of policies for encouraging credit market competition.

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FinTechs: conceptual framework and regulatory practices[1]

Based on a compilation of studies by international organizations, this box presents a broad conceptual framework of the FinTech phenomenon. It presents the different modalities of this new ecosystem both in theoretical and practical terms and considers the main regulatory solutions adopted around the world. The goal of this analysis is to demonstrate that FinTech is a broader and more heterogeneous concept than what is usually known, which comprehends, in its various forms, practically all modalities and sectors operating in financial markets.

Concept and classification of FinTechs

A single agreed-upon concept of FinTech does not exist. For customers and users, FinTechs are small companies operating through digital platforms, providing differentiated, low-cost, easily accessible, and technologically appealing financial services. For the financial regulator, the concept is broader. The Financial Stability Board (FSB) defines FinTech as "technologically enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on markets and institutions and on the provision of financial services". According to this definition, the identification and understanding of this process incorporates not only the financial institutions performing these activities, under the conventional model of authorization and supervision, but also, and mainly, the activities, products, and services created or transformed through technological innovations, inside or outside the conventional regulatory framework.

Therefore, FinTechs are not restricted to size thresholds and to the classification as a bank or non-bank financial institution. As business models, FinTechs may operate in a variety of ways. For example, FinTechs may operate without a specific license from the financial supervisor as partners or correspondents of authorized financial institutions, and as digital banks, originally settled under this premise or digitalized throughout time. In some situations, they may be confused with specific segments or modalities of financial institutions, created for the purpose of regulating them. Finally, they may even operate as conventional banks with modern technological models, or these traditional banks may create specific institutions within their conglomerates to accommodate this concept.

Regarding FinTechs classification, their categories are usually defined according to how these institutions fit into the production matrix of the financial industry. Thus, FinTechs can be classified as suppliers of financial inputs to other institutions or as providers of financial services to consumers and final users. In the first case, the so-called Business to Business (B2B) model, they offer differentiated technology to the final providers of financial services (focus on technology). In the second case, under the Business to Consumer (B2C) model, they deliver financial services to customers through differentiated technology (focus on finance).

1 This text complements information presented in the box "SCDs and SEPs: origins and performance in the credit market", of this Report, and two texts from the 2019 Banking Report: (i) box "Credit FinTechs and Digital Banks" (p. xxx); and (ii) section 6.4 "Financial Innovations and the performance of the BCB" (p. xxx).

When it comes to possible lines of business, given that FinTechs consist predominantly in a way of doing business and not exactly in a segment or type of institution, there is a broad spectrum of classification. FinTechs may operate in virtually all segments of the financial system, like securities, insurance, and pension plans. These possibilities vary according to their position in the production matrix. FinTechs dealing with final customers may operate in the modalities of payments,[2] lending, deposits, insurance, investments, financial planning, consulting, and crowdfunding. The FinTechs providing services to other financial institutions operate in areas such as cloud computing, information management, credit analysis, and biometrics.

It is also possible to classify FinTechs by their size. Although most FinTechs are micro and small companies, there are also large technology companies – BigTechs – that come from other industries. These new entrants have increasingly sought to operate in the financial system using not only technology, but a large and captive customer network. Corporations like Google, Apple, Facebook, or Amazon, which have started to extend their business into the financial system, are the clearest examples of this category.

Regarding modalities for regulatory purposes, FinTechs can also be defined in several ways. As suppliers, partners or correspondents of authorized financial institutions, they may operate without a specific license. When carrying out activities that require prior authorization, they may operate as non-banking institutions or even as banks, giving rise to the so-called "digital banks", which still lacks a precise definition. Even conventional or incumbent banks, which do not appoint themselves as digital banks, may present FinTech characteristics. This phenomenon is due to the increasing digitalization and technological changes of their business models, or even by the establishment of specific institutions within the conglomerate.

When exempted from any specific authorization, FinTechs may work in the "Tech" mode, providing technology to authorized institutions; or in the "Fin" mode, as a representative or agent of these institutions towards users and clients. In the latter case, due to the way they present themselves in the market and the operational autonomy they receive from the contracting party, it works like a "rental license". If these FinTechs may be assumed by clients as *de facto* authorized institutions, they require attention from regulatory agencies.

When acting as non-banking institutions, which, accordingly to international practice, usually comprises institutions offering credit not funded by checking accounts, FinTechs fall into two categories, balance sheet lending and peer-to-peer lending. Depending on each country's regulations, balance sheet lending FinTechs – regulated as Direct Credit Societies (*Sociedade de Crédito Direto* – SCD) in Brazil –, can use other resources and financing strategies besides own equity, such as the assignment or securitization of credit operations.

In the peer-to-peer lending model – regulated as Peer-to-Peer Loan Companies (*Sociedade de Empréstimo entre Pessoas* – SEP) in Brazil –, FinTechs act as platforms that promote a direct connection between investors and borrowers, without assuming a permanent creditor or debtor position with any of the parties. Concerning technological features, such as the use of artificial intelligence techniques and an expanded database, besides the accessible and friendly negotiation environment provided for the parties, platforms also permit a differentiated evaluation of the potential debtors' risk level.

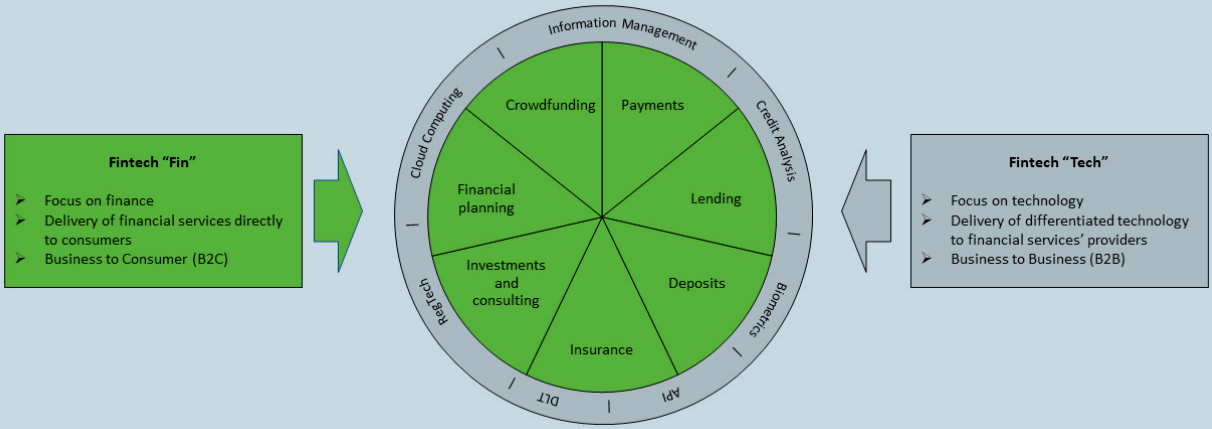
Regarding institutions known as digital banks – which are how FinTechs present themselves in the banking segment –, we can distinguish them by their origin or business model. Considering their origin, three types are possible: (i) native digital banks, which are settled entirely on the digital model; (ii) digitalized banks, which result from digitalization of conventional banks; and (iii) digital representations of traditional banks, which are specific banks or business units created or advertised under the digital model by conventional banking

2 The box "Transformation of Payment Service Providers into Financial Service Provider Conglomerates", of this Report, discusses payment FinTechs and their performance in different business models.

conglomerates. These representations aim to occupy specific niches and reinforce incumbents' image and may define the beginning of a gradual process of transformation of the entire group.

As for the business model, the literature mentions three conceptual categories of digital banks: (i) closed platform digital banks, which offer to customers a differentiated digital experience, although with products and services similar to those of conventional banks; (ii) open platform or marketplace digital banks, which mix their own products and services with those of third parties, including non-financial e-commerce institutions; and (iii) banking-as-a-service, which are banks that are specialized in providing technological solutions combined with private banking services, generating economies of scale, technology improvements, and reduction or elimination of regulatory costs for authorized or unauthorized financial institutions, under the concept that the banking license is a service that can be contracted.

Figure 1 – FinTechs activities



Regulation

If, for users, FinTechs are a cheaper, more accessible, and practical alternative, for the financial regulator this phenomenon represents both an opportunity and a regulatory challenge. On the one hand, FinTechs represent an important mechanism to increase efficiency and competition, reduce costs, and democratize the financial system, which is an increasingly relevant objective demanded by society. On the other hand, they raise questions about the extension of the regulatory perimeter and the supervision processes, which require a broad review of criteria, principles, and procedures. This is a complex and sensitive adjustment, with no consensual formulas or principles. If regulation is not adapted or becomes too lenient and permissive to FinTechs, it may induce or fail to curb excessive risks and damages to customers and users. Otherwise, if regulation becomes too rigid or disproportionate to the FinTechs' specificities, the risk is to stifle the speed of innovation, limiting the efficiency gains that this trend can bring about.

Faced with the challenge represented by FinTechs, a wide menu of regulatory alternatives is available to the financial regulator, whose materialization depends on each country's idiosyncrasies, the operation modalities, and the risks presented by these business models. In general, the regulator can choose one or more of the following options:

- enlarge the regulatory perimeter, creating specific licensing modalities to FinTechs;
- implement adjustments in the existing licenses, including temporary or permanent flexibilities that facilitate and reduce the cost of access and permanence in the financial system;

- regulate the relationship between FinTechs and financial institutions;
- regulate the relationship between FinTechs and payment schemes, as well as the interoperability among participants;
- keep the focus of supervision on authorized institutions, highlighting the risks posed by FinTechs that are providers or partners of those institutions;
- adapt the regulation applicable to all institutions, taking digital business as a parameter; or
- do not establish specific regulation, expecting that FinTechs will adapt to the pre-existing regulations, under the assumption that these regulations are flexible enough to curb the new risks and not inhibit the pace of expansion of this segment.

Regarding the strategy to deal with the subject, some countries choose to create segregated and specialized structures related to FinTechs within regulatory agencies, under the premise that this segment requires a more specialized treatment due to the specificity of business models and less experienced managers, often coming from technology or other non-financial segments.

International benchmark for regulation and supervision

This section provides an overview of the regulation and licensing arrangements for FinTechs adopted by regulators around the world.

Banking institutions

Most countries apply existing regulations to banks, regardless of the technology employed in their transactions. However, there are initiatives that aim to guarantee differentiated conditions for allowing new banks to enter the market. Examples are the transitional regime, adopted in Australia, and capital mobilization, employed in the United Kingdom.

Some countries, however, adopt specific licensing frameworks for digital banking, such as: Taiwan, Hong Kong, South Korea, Singapore, Malaysia, and the United Arab Emirates. Interestingly, among this select group of countries adopting a specific license for digital banking, there are still some specificities. For example, Malaysia and Singapore have adopted transitional regimes for these licenses, easing the entry of new institutions; while in South Korea and in Singapore these licenses are mandatory for specific market segments, notably small and medium-sized enterprises (SMEs).

Non-banking institutions

- Balance sheet lending

All the jurisdictions surveyed are subject to existing regulations for traditional financial institutions. Then, there is no specific regulatory framework for balance sheet lending. However, countries differ in how they frame these institutions within their respective regulatory frameworks.

In most countries, balance sheet lending companies fall under some pre-existing non-banking license, as in Hong Kong, Japan, Italy, and the USA. In other countries, like Austria and Germany, since the exercise of any credit activity presumes a banking license, balance sheet lending institutions must act as banks. Another exception, in the opposite direction, is Peru, which exempts these institutions from the requirement of a financial institution licensing, allowing them to comply only with the country's commercial law.

- Loan crowdfunding

The regulatory frameworks for peer-to-peer lending platforms generally have two broad sets of requirements:

- regulate how platforms can operate, which activities they can perform, and what they must do to mitigate the risks they incur; and

- protect investors and make them aware of the risks involved in the transactions conducted through the platform.

In addition to these requirements, jurisdictions that regulate peer-to-peer lending are concerned with the necessity of disclosure and due diligence[3] on the part of the platform offering this service, and the security of customer funds held in accounts offered by these institutions.

Regulatory approaches

The rise of initiatives or the creation of dedicated structures to assess, regulate or supervise FinTechs is the strategy adopted by a set of countries. However, this strategy tends to widespread to other jurisdictions as this type of business model expands and because of the prospects for the increase of competition and financial inclusion that FinTechs bring.

Such initiatives are frequent among European countries. Bank of Portugal has created a permanent unit dedicated to financial innovation, called "SCTECH". This is a multidisciplinary group, headed by a member of the bank's board of directors, involving several departments of the institution, which has developed initiatives to promote the dialogue and cooperation with market participants. Banque de France has created a specific unit for FinTechs – the Fintech Innovation Unit – and appointed a Chief Digital Officer and a Chief Data Officer. In the UK, in a joint initiative between the two financial regulators (the Prudential Regulation Authority – PRA and the Financial Conduct Authority – FCA), the New Bank Start-up Unit has been created, providing to those interested in setting up new financial institutions a differentiated treatment, which includes the licensing process and a follow-up of the first years of operation.

Outside Europe, in South Africa, the Intergovernmental FinTech Working Group (IFWG) has been created with the participation of several government levels. The South Africa Reserve Bank (SARB) set up a specific working group to assess the risks and benefits of FinTechs, with emphasis on virtual currencies and Distributed Ledger Technology (DLT).

Brazilian experience

In Brazil, the regulation of FinTechs operating in the financial system takes place in a broader context of modernization of the regulatory framework, which aims to stimulate competition and mitigate regulatory barriers

3 Selection and assessment process of the risk profile of potential borrowers, aiming at supporting the investors' decision process.

to the process of innovation and digitalization of all institutions. While most regulation in recent years expressly or implicitly observe these objectives, some are more directly identified with the FinTechs' business model.

Firstly, CMN Resolution 4,658, of April 26, 2018, established the requirements for contracting data processing and cloud computing services, increasing financial institutions security in hiring companies for rendering technology services, including providers based abroad. This regulation has boosted the growth of FinTechs, favoring not only the process of digital transformation of financial institutions, but also the setup of FinTechs as service providers for these institutions.

On the other hand, CMN Resolution 4,480, of April 25, 2016, brought the possibility to open, maintain, and close deposit accounts exclusively through digital channels, allowing banks and other financial institutions to deal with customers without their physical presence, which is a common feature of all FinTechs. CMN Resolution 4,753, of September 26, 2019, facilitated digital relationships by establishing the possibility of more simplified procedures and requirements, proportionally to the risk and nature of the relationship.

CMN Resolution 4,656, of April 26, 2018, then, defined specific regulations for credit FinTechs to operate in the financial system with their own authorization, including the modalities of balance sheet lending – regulated as SCDs –, and peer-to-peer lending – designated as SEPs. With the regulation of SCDs, Brazil stood out as the first country to establish a specific financial license modality for this type of activity. Both types of FinTechs may establish partnerships with authorized institutions or operate in the credit market with their own authorization and regulation. These specific licenses are more proportional to the nature of their activities and in line with the objectives of financial regulation aimed at increasing competition and democratizing the access to the financial system.

Finally, BCB Resolution 29/2020 and BCB 50/2020 established guidelines and procedures for the implementation of the Regulatory Sandbox for financial institutions. This technique consists in creating, under special and temporary authorization, a controlled environment for testing business models that could promote gains of efficiency, scope, capillarity, cost reduction, and increase security in the financial system. Through this prerogative, it is possible for FinTechs to test, under real-world conditions, innovations on financial operations that are exclusive to authorized institutions, without full compliance to all requirements established by licensing and operating regulations.

Conclusion

This box aimed at clarifying how the FinTech phenomenon is embedded in a broader context of structural transformation of the production and circulation of financial services. Besides the more visible aspects to the public, incorporated in digitalization processes, non-presential relationships, and integrated service provision, the use of intensive technology in the financial system reflects the gradual unbundling of business models, allowing new firms to specialize in the provision of products and services in specific scales and modalities.

Digital transformation also involves traditional financial institutions which, while facing new competitors, also look for new technologies and cost rationalization opportunities in partnerships with the innovative institutions, setting up a new ecosystem in which the vectors of competition and associations are integrated for the benefit of cost reduction and greater access to financial services.

This process also opens new fields to non-financial companies, especially those conventionally referred to as BigTechs (Internet search engine providers, telecommunications services, social media, e-commerce, storage and technical solutions, and delivery and transport services by apps), with opportunities to offer financial products and services, either by joining authorized financial institutions or by applying for their own license.

In the context of rapid and constant innovation, the financial regulator looks for focusing on a regulation that, on the one hand, does not inhibit innovation, but, on the other, does not give rise to disproportionate risks for users as well as to the financial system stability. The alternatives for the regulator in the face of this challenge are, among others, the establishment of controlled environments for testing innovative business models in the market and also from the regulatory point of view (regulatory sandbox), the effective integration of operating licenses available with the business models already put into practice, the creation of specific licenses, the regulation of partnerships between FinTechs and financial institutions, and the adaptation of existing operation and customer relationship general rules for the digital and virtual environment.

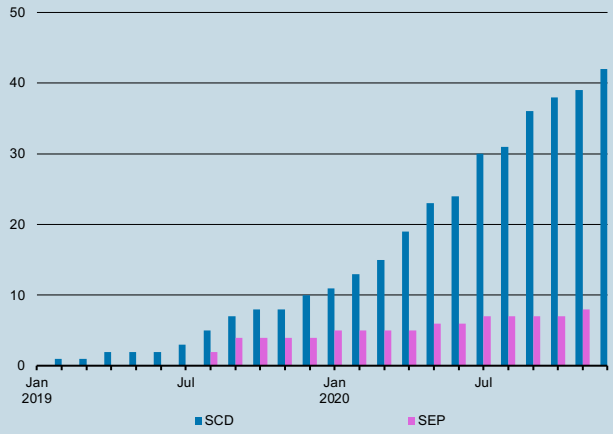
SCDs and SEPs – performance in the credit market

Regulated by Resolution 4,656, dated April 26, 2018, Direct Credit Companies (SCD) and Peer-to-Peer Loan Companies (SEP) – credit FinTechs – began their activities in the market in 2019. Their business models are characterized by intensive use of technology and execution of transactions exclusively through electronic means. They are forbidden to raise funds from the public to finance its own operations and are considered innovative and capable of increasing the capillarity of the National Financial System (SFN), targeting new market niches, and promoting financial inclusion. This box presents the main aspects of its credit portfolio, providing an overview of its performance in lending operations. Moreover, it brings an attempt of categorizing these institutions, taking as a starting point the analysis of the business plans submitted to the Financial System Organization Department (Deorf) when an authorization to operate is requested, and taking into consideration the operational dynamics shown so far, from the point of view of prudential supervision.

Authorized institutions

The number of institutions authorized by BCB to operate as credit FinTechs has been growing significantly, reaching a total of 42 SCDs and 9 SEPs by December 2020 (Figure 1).

Figure 1 – Number of authorized SCDs and SEPs

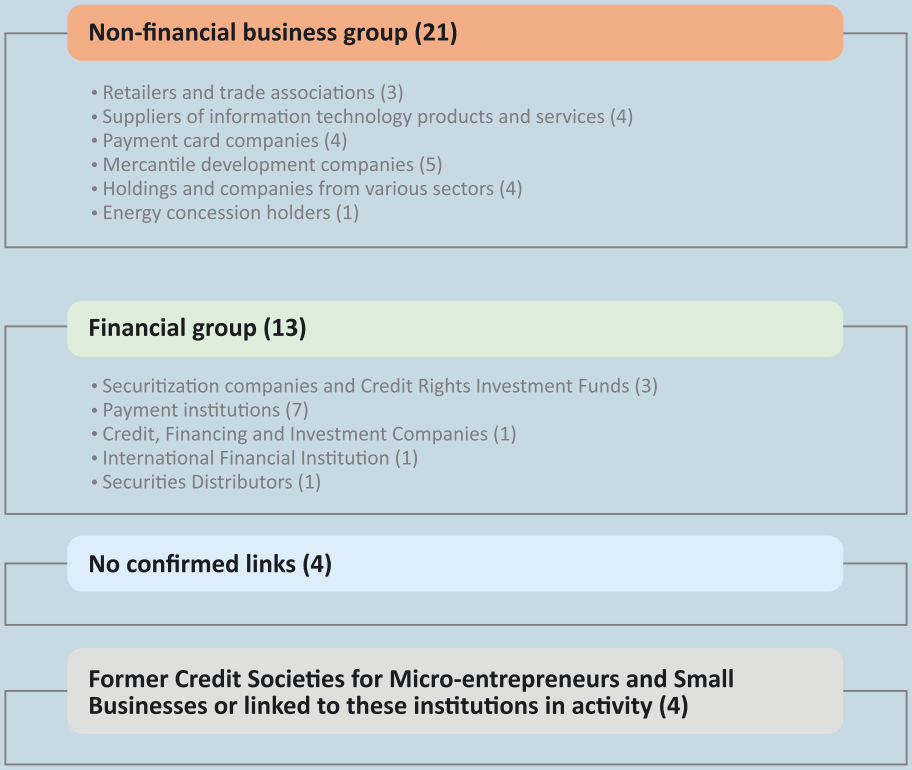


The number of authorization requests also keeps increasing. On December 31, 2020, 31 requests for SCDs and 2 for SEPs were under analysis, indicating the market interest in operating in these segments.

SCDs – categorization and overview of credit granting

The SCD segment is characterized by entities with different profiles. An attempt to categorize SCDs can be based on information about the origin of each institution, the performance proposed in their business plans submitted to Deorf for authorization purposes, and the dynamics presented so far, especially regarding the partnerships agreed upon. From this point of view, there are four major groups: 1) former Credit Societies for Micro-entrepreneurs and Small Businesses (SCMEPPs) that changed their corporate purpose and SCDs linked to active SCMEPPs; 2) societies linked to a non-financial business group; 3) societies linked to a financial group; and 4) societies with no confirmed links. Figure 1 presents the internal division of these groups, as well as the number of SCDs that each sub-group contains.

Figure 1 – SCD categories



The groups of former SCMEPPs/linked SCMEPP and SCDs with no confirmed links have the smallest number of institutions. The institutions in the first group carry the clients and the portfolio of operations from when they were SCMEPPs. One of them indicates the intention to focus on revolving credit, and the others only expand their range of potential clients and services offered, without focusing on a specific niche.

The group formed by institutions that have not shown to have pre-established links has recently received authorization and has not yet started its activities.

The largest group is made up of institutions linked to a non-financial corporate group, accounting for half of the total SCDs authorized. Except for one SCD controlled by an energy utility, this group can be divided into five subgroups, according to the type of companies they are linked to:

- retailers and trade associations: based in São Paulo and Minas Gerais, these SCDs target the associated companies and their customers – households and/or firms;

- suppliers of IT products and services: headquartered in Rio de Janeiro and São Paulo, with focus on households. Their specific niches are self-employed workers and employees seeking payroll-deducted credit. Other FinTechs are among the firms served;

- pay cards companies: a subgroup that is more geographically dispersed, with headquarters in São Paulo, Paraná, Goiás and Minas Gerais. Their public is households and firms that use pay cards issued by these companies. One of the SCDs focuses on households that are unable to provide guaranties;

- commercial development companies: mostly headquartered in Rio Grande do Sul, the subgroup still has institutions in Sergipe and Paraná. Only a small portion of them have started their activities, and one of them has confirmed its intention to work with clients from development agencies;

- holdings and companies from diverse sectors: based in São Paulo, Minas Gerais, Paraná and Bahia, these SCDs have diversified target public and credit lines offered.

SCDs linked to financial groups, on the other hand, constitute the second largest category in number of institutions and are mostly divided into two main segments:

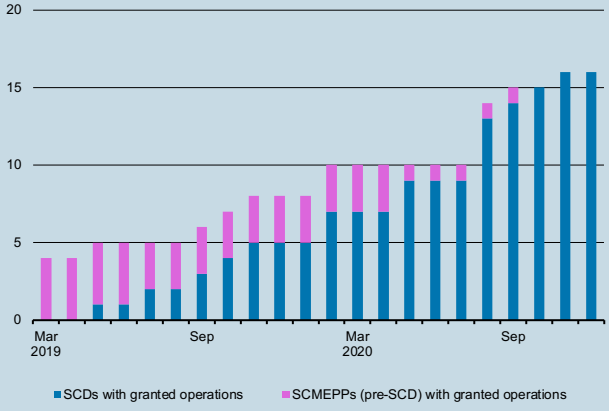
- securitization companies and credit rights investment funds (FIDCs): all based in São Paulo, they act as a connection platform between funds/securitization companies and clients and some offer collateral management services. Among its target public are micro, small and medium sized PJs, as well as credit takers that offer automobiles as collateral and those involved in agribusiness;

- payment institutions (IPs): distributed between São Paulo and Minas Gerais. Most have both households and firms as their public, targeting micro, small and medium-sized enterprises and clients of partner IPs, with the anticipation of receivables and working capital as their main credit lines.

According to the categorization presented, one can see that the vast majority of SCDs were set up to make it possible to do business for other firms, financial or otherwise, by providing credit within the conglomerate or group of partners.

Of the total 42 SCDs authorized to operate, sixteen had already granted credit by December 2020. Of these, four were SCMEPPs that gradually converted into SCDs, and the others are new institutions that began operations during the analyzed period. Figure 2 shows the increase in the number of SCDs that started to grant credit, with a gradual reduction in the SCMEPPs converted over the period.

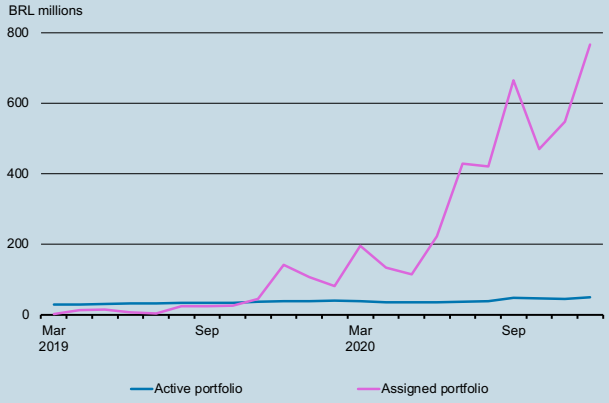
Figure 2 – Number of active SCDs and SCMEPPs with credit operations



Of the total credit generated by SCDs, part remains in their assets ("outstanding portfolio"), accounted for in the balance sheet as credit operations, whose risks are assumed by the institutions. Another part is the object of assignment to investment funds, to securitization companies and to other financial institutions, entitling them the credit rights relative to the assigned operations. In case these assignments are made without co-obligation, once these companies cease to be the creditor end, they no longer incur the credit risks linked to these operations, removing the assigned portfolios from their assets. At the same time, they obtain funding for new operations. Until the date considered, a little less than half of the SCDs carried out credit assignment operations.

The evaluation of the evolution of the outstanding portfolio (Figure 3)[1] makes it possible to verify that no great oscillations occurred during the nineteen months in question, with a monthly average of around BRL 35.7 million, which indicates that a growing number of institutions are assigning their credit operations without keeping the risk related to these operations on their balance sheet.

Figure 3 – Evolution of the active and assigned portfolio of SCDs



In turn, the assignments are, to date, all made without co-obligation. In the period from March 2019 to December 2020, they gained expressive volume, having increased by 33,182.6%, reaching a total of BRL 4.5 billion. Funds were the main assignees in the period, with 81.1% of the amounts assigned, followed by securitization companies with 15.4% (Table 1).

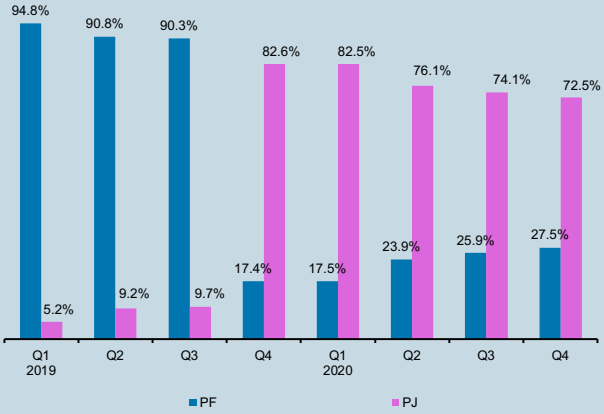
Table 1 – Distribution of portfolio assigned by assignee type
From March 2019 to December 2020

Addignee type	Value assigned	
	BRL	%
Investment fund	3,610,258,151	81.1
Securatization company	687,702,728	15.4
Financial institution	150,668,940	3.4
Unespecified	4,748,250	0.1
Total granted	**4,453,378,069**	**100.0**

Throughout the first three quarters of 2019, the credits granted[2] by SCDs were almost entirely directed to households. However, since the end of 2019 and throughout 2020, new institutions began to operate with large volumes in corporate credit granting, causing a profound change in the customer profile (Figure 4).

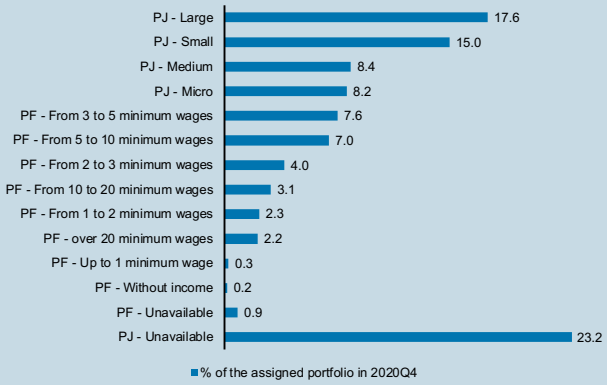
1 The monthly figures represent the portfolios balances of the SCMEPPs before they were transformed into SCDs.
2 The granted portfolio is composed of operations originated in the reference month. They may remain on the SCD's balance sheet, thus constituting its outstanding portfolio (OP), or be assigned to third parties, no longer being part of the financial institution assets.

Figure 4 – Share of credit granting of SCDs by customer profile



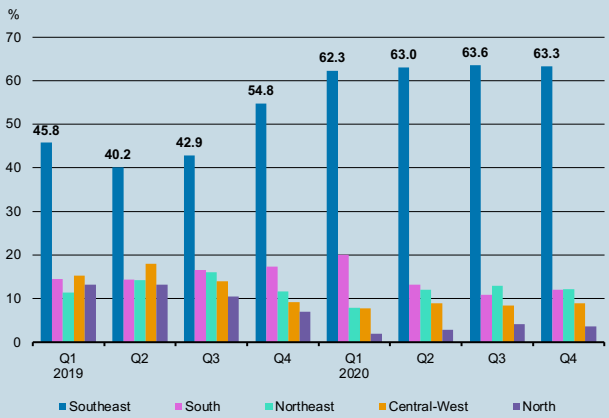
The breakdown of the composition of the portfolio granted in 2020Q4 (Figure 5) shows a greater participation of large and small companies seeking credit in SCDs, accounting for 32.6% of the resources available. As for households, the largest participation is for those with reported incomes between three and ten minimum wages, which were responsible for 14.6% of the credit granted by SCDs in the period.

Figure 5 – Composition of the portfolio granted by SCDs in the 4th quarter of 2020 by borrower size



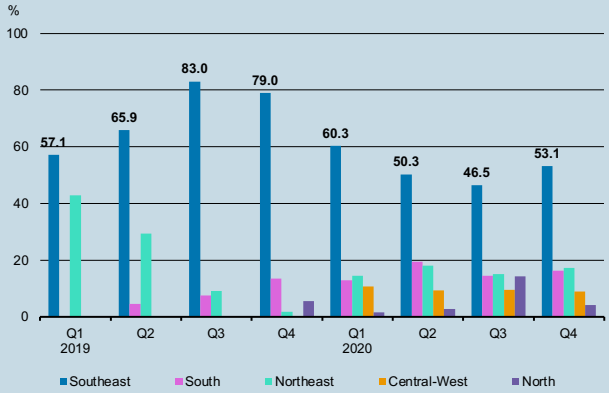
The data regarding household credit granting show that SCDs have already reached all Brazilian federative units (UFs). The highest values are concentrated in the Southeast Region, where most of its headquarters are located. The other regions alternate their levels of representativity between the quarters analyzed, as shown in Figure 6.

Figure 6 – Share in the credit granting of SCDs for households by region



Corporate credit granting by SCD were also reported in all Brazilian UFs. Figure 7 shows that the Northeast and Southeast regions stood out in the first half of 2019, while the behavior verified in 2020 shows great variation in the participation of the regions.

Figure 7 – Share in credit granting of SCDs for firms by region



In the second half of 2020, in terms of clients' sectors of activity, the road cargo transport sector stands out, with 53.4% of the SCDs' outstanding portfolio composed of credit operations whose risk is kept by the institutions in their balance sheets (Table 2).[3]

Table 2 – Share in the balance of the active portfolio of SCDs by sector customer sector of activity

%

CNAE	Description	2019Q1	2019Q2	2020Q1	2020Q2
4930202	Road cargo transportation, except dangerous products and removals, intercity, interstate and international	-	-	-	33.1
4930201	Road cargo transportation, except dangerous products and removals, municipal	-	-	-	20.3
7490104	Activities of intermediation and agency services and business in general, except real estate	-	-	0.3	12.7
7020400	Business management consulting activities, except specific technical consulting	8.4	1.2	6.3	9.2
4693100	Wholesale of merchandise in general, not predominantly food or agricultural inputs	-	-	10.8	3.3
4530703	Retail sale of new motor vehicle parts and accessories	9.0	12.7	10.9	2.4
1533500	Manufacture of footwear of synthetic material	-	-	-	2.1
4763602	Retail sale of sporting goods	-	-	3.8	1.5
1531901	Manufacture of leather shoes	-	-	-	1.2
3092000	Manufacture of non-motorized bicycles and tricycles, parts and accessories	-	-	-	1.2

The distribution of the outstanding portfolio of SCDs according to the value ranges of their operations (Table 3) reveals that there has been a migration over time from lower value to higher value operations. This movement follows the percentage growth of higher income households and of firms as borrowers, as explained above.

Table 3 – Share in the balance of active portfolio of SCDs by operations value range

%

Value range (BRL)	2019Q1	2019Q2	2020Q1	2020Q2
From 0 to 50.000	96.9	96.0	93.6	85.9
From 50.000 to 500.000	3.1	4.0	6.1	8.4
From 500.000 to 2.000.00	-	-	0.3	4.5
Over 2.000.000	-	-	-	1.1

3 Considering CNAE 4930201 and 4930202. The National Classification of Economic Activities (CNAE) is applied to all economic agents involved in the production of goods and services, including autonomous agents (households).

Regarding the composition of the total value of the outstanding portfolio of SCDs in terms of types of operation, the percentage of working capital loans maturing after 365 days increased when compared with working capital loans maturing up to 365 days. The latter has significantly reduced its participation, in a movement before the pandemic (Table 4). The Micro-credit facility has little representation (code 212), notwithstanding the fact that some SCDs originate from SCMEPPs.

Table 4 – Share in the balance of the active portfolio of the SCDs by credit type

%

Type	2019Q1	2019Q2	2020Q1	2020Q2
Personal credit - non-payroll-deducted	0.7	8.2	11.1	13.1
Micro-credit	-	-	0.0	0.0
Working capital maturing up to 365 days	83.0	67.4	54.1	37.2
Working capital maturing after 365 days	14.4	21.8	27.7	29.3
Other loans	-	-	-	0.0
Discount of invoices	0.7	2.1	1.9	0.6
Discount of checks	0.1	-	-	-
Other discounted credit rights	-	-	0.0	0.0
Other discounted securities	1.2	-	-	-
Assets acquisition - motor vehicles	-	0.5	4.7	9.3
Other fuding	-	-	0.4	10.4

Regarding the risk classification of operations in the outstanding SCD portfolio, the highlights are the significant increase in the percentage of loans classified at risk level A, contrasting with the reduction in the percentage of the portfolio classified at risk level H (Table 5).

Table 5 – Distribution of the balance of active portfolio operations of SCDs by risk rating

%

Risk	2019Q1	2019Q2	2020Q1	2020Q2
AA	-	0.1	0.7	0.0
A	45.6	53.8	56.0	66.9
B	5.7	4.8	5.0	3.0
C	5.3	4.3	5.4	3.0
D	4.9	3.7	4.1	2.5
E	4.8	3.5	3.4	2.2
F	4.8	3.5	3.1	2.1
G	4.0	3.8	2.9	2.3
H	24.9	22.5	19.3	17.8

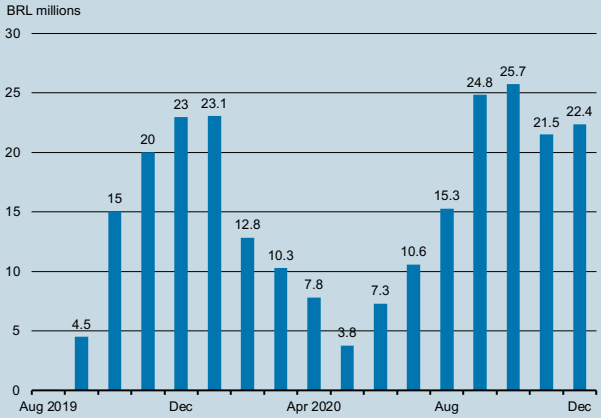
SEPs – profile and performance in credit intermediation

The vast majority of SEPs have their physical offices in the state of São Paulo and offer loans and financing to both households and firms, exclusively through an electronic platform. Micro enterprises, as well as small and medium sized companies are the intended target public for a larger number of institutions, although there are SEPs set up specially to serve university students, employees of a certain group of companies and lower social classes of the population. All were authorized to offer insurance, credit analysis and third-party collection services. As for the issuance of electronic money, a small number of institutions already offer this service, and a good number intend to do so.

SEPs are characterized by performing financial intermediation operations, collecting financial resources from creditors (or "investors") and directing them to borrowers. SEPs and their controlled or affiliated companies do not hold the credit risk of these operations, either directly or indirectly. Therefore, differently from other financial institutions, SEPs do not have an outstanding portfolio, i.e. the operations they intermediate – or "originate" – are not part of the assets on their balance sheet and are not accounted for as credit operations on the assets side, but only in settlement accounts. The credit risk is fully assumed by the creditors.

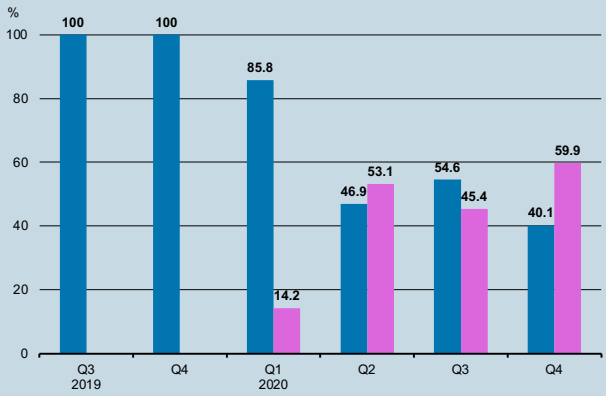
SEPs originated BRL 247.9 million in credits from September 2019 to December 2020, with a monthly average of BRL 15.5 million (Figure 8).[4] SEPs were especially impacted in May 2020, the third month of the pandemic, intermediating only BRL 3.8 million in that period. However, they showed a consistent recovery in the following months.

Figure 8 – Evolution of the credit volume intermediated by SEPs



Regarding the profile of creditors, or "investors", of the operations intermediated by SEPs, until December 2019, only households were registered in this condition. However, as of early 2020, there was a significant increase in the participation of firms, which acted as creditors in practically 60% of the operations originated in 2020Q4 (Figure 9).

Figure 9 – Share in operations intermediated by SEPs by creditors (investors) profile



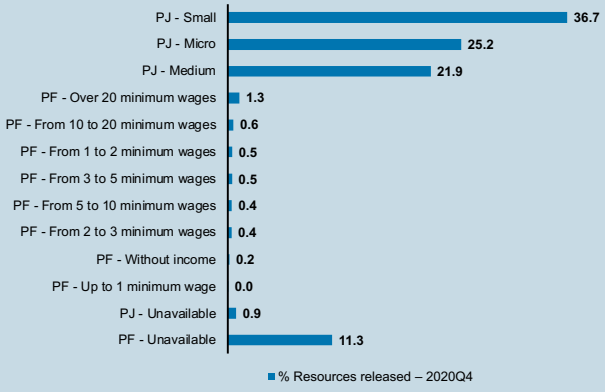
In turn, the first borrowers of credit in the segment were exclusively firms (Figure 10), which remained predominant throughout the analyzed period. Only in 2020Q4 the participation of households increases more significantly, representing 15.2% of the total accumulated in that period.

4 By December 2019 there were three SEPs in activity, increasing to four as of January 2020.

Figure 10 – Share in operations intermediated by SEPs by borrowers profile

The detailing of the portfolio granted in 2020Q4 (Figure 11) highlights the participation of small companies, responsible for 36.7% of the resources released by SEPs in the period. Households with incomes above 20 minimum wages had the largest share of resources taken in this type of institution.

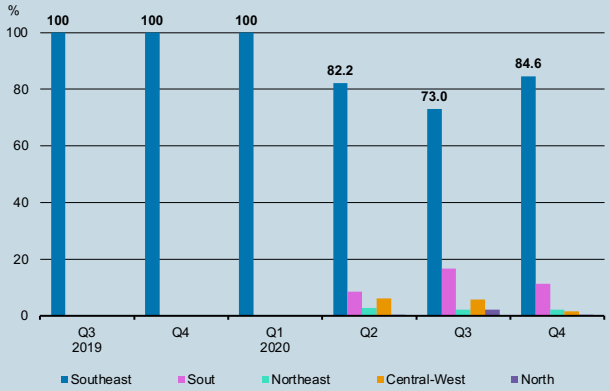
Figure 11 – Composition of portfolio intermediated by SEPs in the 4th quarter of 2020 by borrower size



In terms of geographical distribution of the intermediated portfolio, in December 2020, the SEPs already had households as clients in 25 states, having not yet reached Acre and Sergipe.[5] The Southeast Region, although showing a decrease in its participation, remained the largest recipient of resources, having obtained all credits in the first three quarters analyzed (Figure 12). The other regions of the country began to participate as of 2020Q2, in a significant increase in the capillarity of the SEPs.

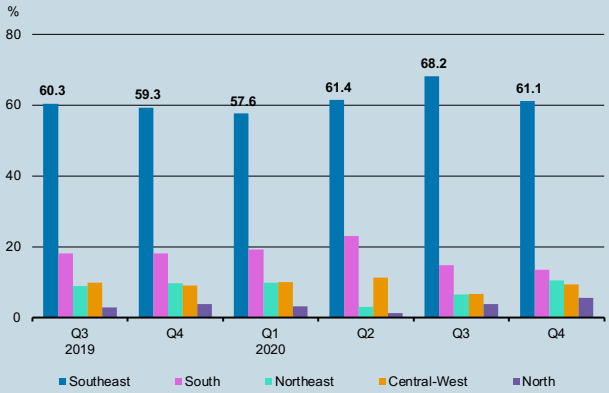
5 The first two SEPs started their activities on August 19 and 22, 2019.

Figure 12 – Share in portfolio intermediated by SEPs for households by region



Regarding households borrowers, the SEPs managed to reach all Brazilian UFs, having reached 25 of the 27 states in the first quarter of operation. In terms of regions, the Southeast emerges as the largest recipient of credits, followed by the South (Figure 13). The North region, until the end of 2020, received the least resources granted by SEPs.

Figure 13 – Share of portfolio intermediated by SEPs for firms by region



Regarding the activity sector to which the loans granted by SEPs were directed, there is a wide scattering (529 different CNAEs). The ten CNAEs with the highest percentages of participation in the intermediated portfolio were responsible for 22.3% of the total in the second half of 2020 (Table 6). In this group, the food sector – which here involves three CNAEs – stands out, receiving 9.3% of the SEPs' grantings.

Table 6 – Share in the balance of intermediated portfolio of SEPs by borrowers activity sector

%

CNAE	Description	2019Q2	2020Q1	2020Q2
5611201	Restaurants and similar	2.1	2.4	4.8
5611203	Snack bars, tea houses, juice houses and similar	0.8	0.9	2.9
7020400	Business management consulting activities, except specific technical consulting	2.2	2.4	2.5
4930202	Road cargo transportation, except dangerous products and removals, intercity, interstate and international	2.6	2.8	2.2
4781400	Retail sale of clothing and accessories	1.5	2.1	2.1
4110700	Real estate development	0.4	1.0	2.0
5620104	Supply of prepared food preponderantly for home consumption	0.1	0.4	1.6
6920601	Accounting activities	2.0	1.9	1.5
4744099	Retail trade of construction materials in general	0.9	1.3	1.4
6204000	Information technology consulting	1.8	1.4	1.3

The distribution of the portfolio intermediated by SEPs according to the value ranges of their operations (Table 7) shows a migration of credits from the intermediate range, BRL 50 to BRL 500 thousand – which suffered a reduction of 10.9 p.p. between the second half of 2019 and the same period of 2020 – to the other ranges, especially to operations of up to BRL 50 thousand – which increased 9.9 p.p in the same period.

Table 7 – Share in the balance of intermediated portfolio of SEPs by operations value range

%

Value range (BRL)	2019Q2	2020Q1	2020Q2
From 0 to 50.000	13.6	13.3	23.5
From 50.000 to 500.000	83.2	80.7	72.3
From 500.000 to 2.000.000	3.2	2.7	3.8
Over 2.000.000	-	3.3	0.4

Regarding the types of operations granted by SEPs (Table 8), it is worth noting the sharp drop of the participation of the Working Capital loan type with maturity exceeding 365 days (19.5 p.p.), when compared the second half of 2019 with the same period of 2020. At the same time, there is a significant increase in Other Loans (13.5 p.p.), in addition to the increase in personal non-payroll-deducted loans.

Table 8 – Share in the balance of intermediated portfolio of SEPs by credit type

%

Type	2019Q2	2020Q1	2020Q2
Personal credit - payroll-deducted	-	-	0.1
Personal credit - non-payroll-deducted	0.1	0.7	3.4
Working capital maturing up to 365 days	1.2	1.5	3.6
Working capital maturing after 365 days	98.5	92.7	79.0
Working capital with revolving ceiling	-	-	0.1
Other loans	0.3	5.1	13.8
Assets acquisition - motor vehicles	-	-	0.0

Conclusion

SCDs and SEPs are two segments authorized by the Banco Central do Brasil (BCB) with a view to increasing financial inclusion and competitiveness in the SFN. With new entrants all the time and with varied profiles, both segments, although with modest participations in the total credit of the SFN, are based on business models focused on serving market niches and formatted to involve partnerships with agents from the most diverse sectors of the economy, possibly creating chains capable of providing increasingly customized services to their clients.

The panorama of their performance in credit granting, presented in this box, reveals interesting aspects, such as the rapid territorial expansion, which can be seen as an indication of its capillarity potential. And the fact that the North and Northeast regions of the country have been less well served so far is not surprising, since this is the usual movement for financial –and especially for non-banking– institutions. Furthermore, it is understood that the pandemic may have slowed their growth but was not a hindering factor for SCDs and SEPs to continue to make their businesses viable and achieve consistent numbers.

A fundamental dynamic for SCDs is to assign credit, which have already reached significant volumes, being an important fundraising way. In turn, the SEPs, still in small number, have been increasing their intermediation of credit to households, having strongly increased the percentage of credits in the lower range of values (up to BRL 50 thousand). However, the moment is not propitious to point out trends, either because of the already mentioned modest participation of the two segments, or because of the effects of the pandemic, on the segments of these FinTechs. Effects not yet fully known and therefore, not properly evaluated.

The BCB keeps an eye on these new segments, through constant monitoring and supervision actions, carried out by organizational components dedicated to following them up. Frequent improvements are being promoted, in coordinated action between the teams involved.

Transformation of payment service providers into financial services conglomerates

For some time now, more traditional financial institutions (FIs) have been busy reinventing their vertical business models[1] by fragmenting financial services to achieve lower costs and a better customer experience. This unbundling of services has become feasible due to the digitalization of their legacy systems.[2]

Additionally, FinTech companies often play a pivotal role in the reorganization or regrouping of these services (also referred to as "rebundling"). When FinTechs merge with FIs or other technological platforms in the marketplace, they add value and efficiency to operations that were previously confined within a single institution. These processes, combined with updated regulation, have enabled innovative business models and new providers.

Bundling is a strategy that has been adopted by payment institutions (PIs)[3] in Brazil. It is a process by which a company starts off by providing only payment service and, as the customers' trust in the platform increases, adds up other services as needed in the area it chooses to operate.

PIs authorized to operate by the BCB may become financial services conglomerates. This box analyzes the transformation of their business models and its impact on regulation and supervision of the National Financial System (SFN).

PI bundling

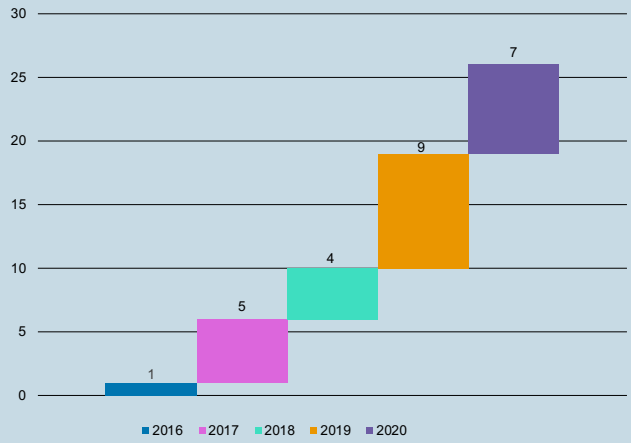
Law 12,865/2013 defines the overall rules for the operation of PIs in the provision of payment services in Brazil. It also outlines expected benefits from these entities, such as increased competition, lower costs and prices, more convenience for users, improved quality of services, and deepening financial inclusion. The need for regulation and oversight derives from the potential risks inherent to activities related to these services. Once identified, risks can be mitigated with a view towards promoting soundness and efficiency in the payment ecosystem.

The infra-legal regulation related to this law allowed PIs to enter the SFN with compliance costs commensurate with the services they provide, i.e., less regulatory burden for less complex institutions. As an example, the BCB waived the initial authorization process for smaller institutions (Circular 3,885/2018[4]). An indication of enhanced competition in the payments industry is the presence of 190 payment FinTechs operating in the

1 It is a strategy of internalization of several successive stages of a commodity chain by a company.
2 The term "legacy system" describes a long-established system that remains in operation in an organization. Source: Ian Warren (1999). The Renaissance of Legacy Systems. Method Support for Software System Evolution.
3 FinTechs that enable commercial or financial transactions and movement of funds, under a payment arrangement, but not allowed to grant loans to or finance its clients. Law 12,865 of 2013 considers payment arrangement the set of rules and procedures that disciplines the provision of a certain payment service, which is accepted by more than one recipient, through direct access by final users, payers and recipients.
4 In 2021, Resolution 80 revoked Circular 3,885 of 2018 and began to discipline the establishment and operation of payment institutions.

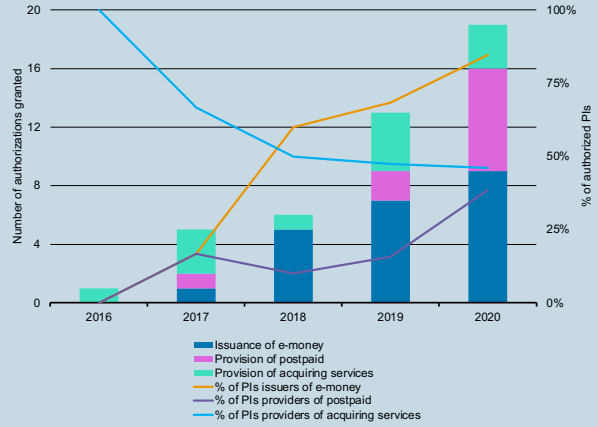
Brazilian market in 2020,[5] a growth of 26% over the previous year, of which 26 institutions have reached the threshold for mandatory authorization from the BCB (Figure 1).

Figure 1 – Number of authorized payment institutions



One of the bundling strategies used by these authorized institutions is to bundle payment services such as the issuance of electronic money, provision of postpaid payment instrument, acquiring and payment initiation. In 2020, nineteen PIs were authorized to operate, six more than in the previous year, if one considers the first three types of services. As a result, 85% of authorized PIs issue e-money while 38% issue postpaid payment instrument and 46% provide acquiring services (Figure 2). The payment initiation function, which was incorporated into the regulatory framework in October 2020, did not account for any authorization that year.[6]

Figure 2 – Authorizations granted by type



The percentage of PIs authorized by type considers the number of PIs authorized in each type in each year. The total sum of the type exceeds 100% due to the possibility of the same IP being authorized in more than one type.

The growth and consolidation of PIs in each modality allow the business expansion of institutions individually as well as for the growth of that sector as a whole. Electronic money issued by most authorized PIs has shown strong growth in recent years (Figure 3). The performance of independent PIs (not linked to or controlled by

5 According to FintechLab's radar: https://fintechlab.com.br/index.php/2020/08/25/edicao-2020-do-radar-fintechlab-detecta-270-novas-fintechs-em-um-ano/, accessed January 11, 2020.

6 The very first payment transaction initiator PI was authorized in March 2021.

S1[7] banks) stand out. Their aggregate volume of deposits in prepaid payment in 2020Q3 is approximately six times higher when compared to the same period in 2018.

Regarding cards issued by independent PIs (Table 1), the number of active postpaid cards more than doubled in 2019[8] and represented 10% of the entire SFN, reaching BRL 58 billion in transaction value. Prepaid instruments issued by independent PIs in 2019 accounted for almost BRL 20 billion, approximately half the figure for the entire SFN.

Table 1 – Cards issued by Payment Institutions

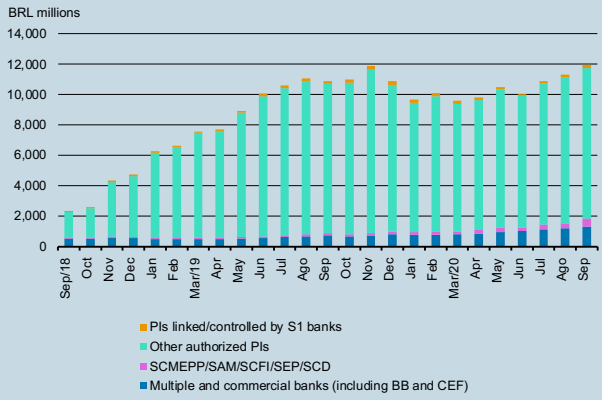
Card type	Category	2018		2019	
		N°	%SFN	N°	%SFN
Postpaid cards	Issued	7,751,506	1%	38,013,508.00	4%
	Active	5,399,048	5%	12,034,033.00	10%
	Volume of national transactions (BRL)	9,640,993,666.34	1%	58,487,436,742.03	5%
Prepaid cards	Issued	9,180,630	21%	61,049,022.00	53%
	Active	2,388,918	33%	6,152,353.00	49%
	Volume of national transactions (BRL)	1,604,993,207.56	21%	19,708,991,096.12	68%

Source: Issuers

Notes: (1) The payment card, retail, and service channel data published here consolidate the statements submitted by the institutions up to August 31, 2020.
(2) The structure for collecting the data contained in this publication can be consulted on the Internet page "Remessa de informações ao Banco Central".
(https://www.bcb.gov.br/estabilidadefinanceira/arranjospagamento).
(3) Active cards in the 4th quarter of each year were considered.
(4) For this table the PIs not connected/controlled by S1 banks were considered.

Another dimension of payment transactions is also worth highlighting: the amounts that acquirers are entitled to receive from FIs and other institutions participating in the arrangement (issuers), as well as the amounts that postpaid instruments issuers are entitled to receive from the end users (mostly credit card payment transactions). From September 2018 to September 2020, these assets increased 35% in banks, 10% in PIs linked to S1 banks, and 349% in the other PIs[9] (Figure 3). The percentage of PIs in relation to the total SFN has not shifted significantly (around 40%), but the percentage of PIs not linked to S1 banks has grown from 4% to 12% in that two-year period.

Figure 3 – Deposits in prepaid payment account in SFN



* For the purposes of evaluating the volume of e-money issued by institutions authorized to operate by the BCB, data from individual trial balances were considered, avoiding elimination of balances due to consolidation
** Safeguard volume includes all securities under custody in the Selic account 028, as well as the balance of the CCME account
Source: Cosif - Document 4010; Selic; STR

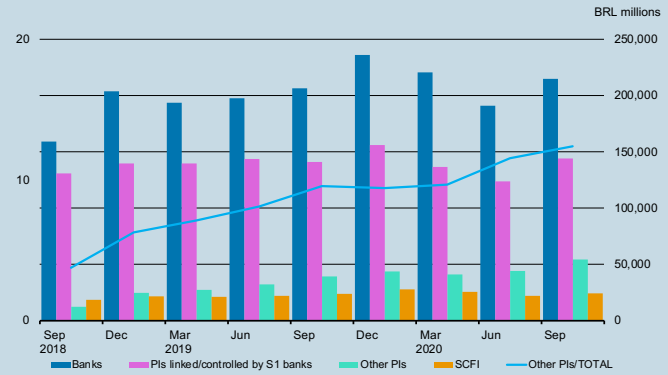
7 S1 banks are institutions classified under Segment 1 of Resolution 4,553, of January 30, 2017, which establishes the segmentation of the set of financial institutions and other institutions authorized to operate by the BCB for purposes of proportional application of prudential regulation. For the purposes of this box, PIs whose foundation is linked to large banks were included in this category, even though not being part of their prudential conglomerate.

8 The 2020 data were not yet available for publication at the time of writing this box.

9 For the purposes of this box, "other PIs" are payment institutions authorized by the BCB that are not linked to or controlled by S1 banks.

The number of customers has grown alongside the expansion of these segments, which helps consolidating PIs and favors the diversification of services available. In 2020, there were fourteen authorized PIs whose group of affiliates included FIs such as banks, SCDs, credit, financing, and investment companies (SCFIs or finance companies) and broker-dealer companies (DTVMs). Some of them initially had payments as their core business. However, catering to their customers' needs led PIs to establish or acquire other companies to enable them to provide their customers with complementary financial services. Such PIs (included in the "other PIs" segment in Figure 4), despite being a few, accounted nevertheless for 78% of payment transactions (or BRL 42 billion) in September 2020. Although the annexation of these financial structures[10] to PIs' conglomerates is a recent phenomenon, they accounted for BRL 2.5 billion in credit operations in November 2020 and, by December 2020 they already had almost 40.5 million clients.[11]

Figure 4 - Receivables from payment transactions



However, not all PIs seek to organize themselves this way. Some have explored alternative business models such as joining the rebundling of traditional financial institutions, leveraging on synergies derived from being part of a larger group. It is also the case of enterprises that focus exclusively on providing payment services or even those that aim to facilitate non-financial businesses by providing specific and customized payment services to suit a particular company's needs.[12]

Other than the payment services outlined in Circular 3,885/2018 and the possibility of leading financial conglomerates, IPs can also provide other services compatible with their corporate mandate, such as becoming Pix[13] or Open Banking participants.[14]

How regulation and supervision have adapted to this changing structure

The BCB and the National Monetary Council (CMN), being aware of the transformation that has taken place in PI industry over time, the increased complexity of their groups, and the risks inherent to that expansion, sought to harmonize the regulatory and supervisory treatment of such institutions with that of other entities under jurisdiction of the BCB. Despite of having distinct social objects, PIs tend to be subject to analogous regulation, as the services they provide are correlated.

10 Institutions that can offer credit operations.
11 Total number of unique CPFs/CNPJs in the database of the Financial System Customer Register (CCS) at the referenced institutions (base date December 2020).
12 Further details on PIs' business models may be found in box "Payment Institutions and Their Business Models" published in the 2019 REB edition, available at: https://www.bcb.gov.br/content/publicacoes/relatorioeconomiabancaria/REB_2019.pdf.
13 Pix is the Brazilian instant payment system. Further information at: https://www.bcb.gov.br/estabilidadefinanceira/pix.
14 Open Banking, or open financial system, is the possibility, granted to customers of financial products and services, of sharing their personal information with different financial institutions authorized by the BCB and operating their bank accounts based on different platforms. Further information at: https://www.bcb.gov.br/estabilidadefinanceira/openbanking.

Some actions were taken in this direction in 2020. Public Consultation 78, concerning the harmonization of the prudential treatment applicable to payment transactions is an example. The proposed regulatory change seeks to harmonize the minimum capital requirements according to the complexity and risk of the operations in which any authorized institution operates, regardless of who is the leader of the conglomerate.

Public Consultation 79/2020[15] is yet another initiative to foster competition. This time, in the foreign exchange market, which also speaks to PIs' interest in meeting the specific needs of their clients. It aims to increase efficiency in the rendering of foreign currency services to citizens and businesses, providing users with international payments and transfers in a more competitive, inclusive, and innovative environment. For that matter, the intention is, among other changes in current regulation, to enable IPs to operate in the foreign exchange market.

Also in line with the regulatory harmonization, Resolution 4871/2020 updated the rules regarding the establishment, organization, and operation of brokerage firms (CTVMs and DTVMs), allowing them to also issue electronic currency and therefore to be able to manage prepaid payment accounts, initially meant for PIs.

Supervision also had to adapt itself to these changes. At a high level, supervision activities seek to ensure the soundness of the SFN and the security, integrity, and reliability of the Brazilian Payment System (SPB), as well as the regular operation of supervised entities. It must now focus on the business model of the supervised entity and the group to which it belongs rather than on the entity type or its formal mandate. That approach seems to be more robust to assess whether the risks are adequately mitigated.

Among the challenges of these constant innovations is the difficulty in categorizing new products and services within the regulatory framework and determining what the liabilities are among increasingly complex payment flows.

Conclusion

In the field of PIs, bundling and rebundling processes occur due to the call to broaden the user experience on payment platforms, that is, to increasingly present solutions that cater for the diversity of customer needs, driven by payment service providers seeking consolidation and expansion in market share.

The platform that offers payment services also serves as the doorstep to the SFN, providing other services that were previously other institutions' territory. These service providers tend to expand and consolidate their operations, moving closer to a digital banking concept. However, the business models and strategies of PIs are plural. Some PIs focus exclusively on providing payment services while others operate as business enablers.

Among the payment services, the figures presented along this box show that the increase in market share[16] is relevant for this segment, especially among institutions that are not linked to the largest banks.[17] As for financial services, currently provided by more than half of the conglomerates with authorized PIs, it is still too early to assess the impact of the groups that have not started in this business field. However, considering the significant number of customers and the increased confidence of the population, an expansion like the other services already provided can be expected. Broadly speaking, the entire financial industry and the payments ecosystem continue to find opportunities to offer new solutions and services better suited to their customers. The new challenges that supervision must face with increasing frequency are the entry of non-traditional players, innovative business models, and products and services based on new technologies. In that sense, regulation has a considerable influence over the creation of new business models, the mitigation of risks, and the consequent financial inclusion that can be generated.

15 For more details on Public Consultation 79, see box "Public Consultation on Exchange Market Innovations Standard", in this Report.
16 Percentage that corresponds to the segment share before the competitor segments in the industry in which it operates.
17 Segment 1 (S1) banks under Resolution 4,553 of 2017.

Finally, the BCB already has plans to reduce asymmetries in regulation and supervision in the face of an increasingly complex, dynamic, and connected market. Aligned with the BC# Agenda, especially with the Competitiveness and Inclusion dimensions, the BCB should continue to seek harmonization and equitable treatment for similar business models, regardless of their corporate purpose.

Rural credit

The rural credit model in Brazil

Countries consider agriculture and livestock a strategic sector both for guaranteeing the domestic food supply (food security) and disputing export markets. Therefore, this sector receives different forms of subsidy or support from governments.[1]

In 2020, the trade balance surplus reached USD 50.9 billion.[2] Total agribusiness exports were around USD 100 billion,[3] from total exports of nearly USD 210 billion.

Law 4.829, of November 5, 1965, institutionalized rural credit and, among other provisions, established, in its 4th article, the powers of the National Monetary Council (CMN) and, in its 5th and 6th articles, the attributions of the BCB for regulating rural credit. Art. 21 of mentioned Law allowed an increase of the resources of the financial institutions subject to be earmarked for rural credit was expended.

The current rural credit model allowed the development of Brazilian agriculture in the 60s, 70s and 80s, providing the country's self-sufficiency in several products. Brazilian economic transformations of the 90s, with the currency stabilization provided by Real Plan and the change in the foreign exchange rate regime, led to the prominent insertion of the country's agriculture and livestock sector in the international commodity chains.

However, the changes in the economic environment made clear that the current model in unable to meet the demands and dynamics of the Brazilian agribusiness for several reasons. Some of the reasons include: (i) the complexity of control, which raises compliance costs for financial institutions and delays the availability of resources to producers; and (ii) the insufficiency of earmarked resources as source to meet the demand for funding and investment needed by agribusiness.

In addition, negative externalities are evident, such as: (i) the possible allocative distortions of resources arising from the cross-subsidies implicit in the current model; and (ii) the reduction of monetary policy power due to funding through earmarked resources.

BCB, in its Agenda BC#, proposes the evolution of the current rural credit model – based on earmarked resources – to a model based on non-earmarked resources for funding costs and, mainly, investments, with an increased participation of the capital market. In this new model, the current rural credit mechanism would be restricted to the small producer, who have greater difficulty in obtaining private financing.

1 Further information on agricultural subsidies in several countries may be found on the website of the Organization for Economic Cooperation and Development (OECD), available at: https://data.oecd.org/agrpolicy/agricultural-support.htm
2 Data obtained from the website of the Special Secretariat for Foreign Trade and International Affairs, available at: http://comexstat.mdic.gov.br/pt/home.
3 Insper Agro Global estimates.

The proposed model is in line with practices in other countries with developed agriculture, where the interest rate is agreed between the financial institution and the producer, who receives a subsidy to cover part of rural insurance costs.[4] The mitigation of risks inherent in the segment through insurance make it unnecessary to renegotiate debts when adverse events strike production and reduce compliance costs of financial institutions.

Recent developments of rural credit loans and interest rates

Table 1 shows the evolution of rural credit contracts in Brazil. One observes a reduction in rural credit contracting backed by controlled resources and an increase in operations with non-earmarked resources and non-controlled earmarked resources. The share of rural credit granted with interest rates agreed between financial institutions and borrowers was 14.5% p.a. in the 2015/2016 crop year,[5] and reached 30.2% p.a. in 2019/2020.

Table 1 – Rural Credit

Rural Credit contracted by source of resources — R$ billion

Source of resources	Crop year[1/]		
	15/16	17/18	19/20
Controlled[2/]	142.6	131.0	133.3
Non-controlled earmarked[3/]	16.2	33.6	44.0
Non-earmarked[4/]	7.9	6.8	13.8
Total	166.7	171.4	191.1
Non-controlled earmarked + Non-earmarked / Total (%)	14.5%	23.6%	30.2%

Source: Derop Bulletin

1/ Period from July 1st to June 30th of the following year.

2/ Resources to which CMN sets the maximum interest rate, the term and the limit of the operations.

3/ CMN determines the percentage of earmarked resources raised by the financial institution, but not interest, term or limit of the operation.

4/ Resources from the treasury that the financial institution has freely decided to invest in the agricultural sector.

The reduction in the Selic rate has, to a large extent, influenced the decrease of interest rates agreed between financial institutions and producers. Table 2 shows interest rates agreed between financial institutions and borrowers for rural credit lines converged to those stipulated by the CMN.

Table 2 – Rural Credit

Average interest rates for Rural Credit[1/] — % p.a.

Source of resources	Producer size	Crop year[2/]		
		15/16	17/18	19/20
Controlled[3/]	Small	5.0%	4.5%	4.2%
	Medium	7.7%	7.4%	6.1%
	Large	8.9%	7.9%	7.2%
Non-controlled earmarked [4/]	All	16.1%	9.1%	8.2%
Non-earmarked[5/]	All	14.1%	10.1%	9.1%

Source: Derop Bulletin

1/ Weighted average of prefixed interest rates.

2/ Period from July 1st to June 30th of the following year.

3/ Resources to which CMN sets the maximum interest rate, the term and the limit of the operations.

4/ CMN determines the percentage of earmarked resources raised by the financial institution, but not interest, term or limit of the operation.

5/ Resources from the treasury that the financial institution has freely decided to invest in the agricultural sector.

4 Data from the Ministry of Agriculture, Livestock and Food Supply indicate that, in Brazil, about 20% of the cultivated area is insured. Detailed information on Rural Insurance can be found in the Atlas of Rural Insurance, available at: http://indicadores.agricultura.gov.br/atlasdoseguro/index.htm.

5 The crop year refers to the period from July 1st to June 30th of the following year.

Concentration and competition in the rural credit market

The transition from the current funding model for agriculture and livestock to other models, including wider market mechanisms, should avoid risks to the organization of the primary production and to the agribusiness chains of production and trade.

Among the measures conducted or supported by the BCB that may have contributed to greater competition in the granting of rural credit, the following stand out:

a) stable reduction in the economy's basic interest rate, thus enabling the convergence of interest rates of controlled rural credit to those of non-earmarked credit;

b) implementation of measures that increased attractiveness of the Agribusiness Credit Bills (LCA) as funding for rural credit operations (CMN Resolution 4,709, of January 31, 2019; Law 13,986, of April 7, 2020; and CMN Resolution 4,829, of June 18, 2020);

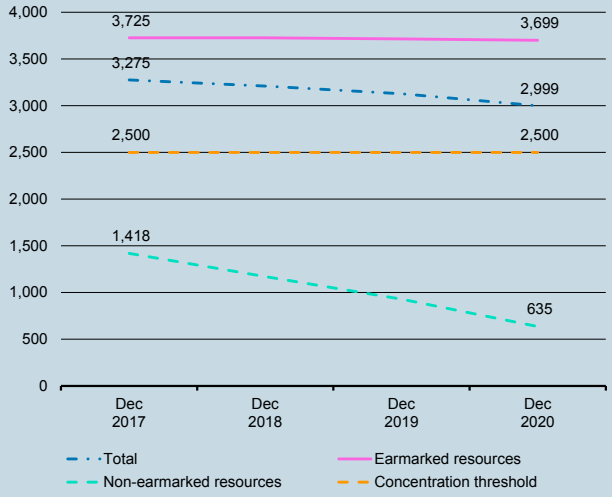
c) access to subsidy for all financial institutions that grant rural credit, which was previously granted only to federal state-owned banks, cooperative banks and credit union confederations (Law 13,986, of 2020); and

d) authorization for credit unions to raise rural savings (CMN Resolution 4,716, of April 25, 2019).

Banco do Brasil has traditionally played a leading role in the rural credit market, with a permanent market share of at least 50%. Until the publication of Law 13,986, of 2020, only federal state-owned banks, cooperative banks, and credit union confederations granted credits equalized by the National Treasury in this segment.

The Herfindahl-Hirschman Index (HHI)[6] of rural credit declined from 3,275 points (RC5[7] 73.4%) in December 2017 to 2,999 points (RC5 69.2%) in December 2020 (Figure 1), indicating a lower concentration in the segment.

Figure 1 – HHI by source of resources



6 The HHI is used by domestic and international authorities as an auxiliary instrument for the evaluation of economic concentration. The antitrust agencies of major developed countries consider the market highly concentrated above 2,500 HHI points. See Chapter 6 of this Report.

7 The CR5 is the sum of the market shares of the five largest lending financial institutions in the market.

When considering rural credit granting by resources alone (earmarked and non-earmarked), this reduction resulted from the decrease in the HHI of non-earmarked resources from 1,418 (CR5 68.9%) in December 2017 to 635 (CR5 49.2%) in December 2020. This impact was limited since non-earmarked resources accounted for only 13.1% of total resources in December 2020, although increasing by 6.3 p.p. since December 2017.

The agriculture and livestock sector, whose main products (soybeans, corn, and livestock) are increasingly integrated with international chains, has been investing in mechanization, especially in the medium and large farming areas. This fact may explain the increased demand for resources from non-state-owned banks. For example, from December 2019 to December 2020, state-owned institutions accounted for 30.1% of total non-earmarked credit growth, while private institutions accounted for 69.9%. When examining non-earmarked resources allocated to investment, these institutions accounted for 76.5% of the growth in 2020, while state-owned institutions accounted for 23.5%.

The analysis of non-earmarked resources by destination (operating costs, investment, and trade) shows that the sharpest drops in the HHI refer to operating costs and investment, with a participation of 55.2% and 34.8%, respectively, of total non-earmarked resources in December 2020. Since December 2017, the share of operating costs have remained close to 55% of non-earmarked resources, while the share of investments increased by 10.1 p.p. in the same period.

The outstanding balance of rural credit operations granted with non-earmarked resources in nominal terms increased 126.7% between 2017 and 2020 (reaching BRL 43.6 billion in 2020), while those granted with earmarked resources increased 10.5% (totaling BRL 289.7 billion). Regarding non-earmarked resources, the operating costs values in nominal terms increased by 128.6% (reaching BRL 24.1 billion), whereas investments rose 219.6% (to BRL 15.2 billion). With respect to earmarked resources, a similar trend is observed, with expansions of 10.8% in total operating costs values (to BRL 107.9 billion) and 15.5% in investments (to BRL 171.3 billion). As for trade, earmarked resources dropped 37.7% (to BRL 10.2 billion) while non-earmarked grew 10.4% (to BRL 4.4 billion). This increase was lower than the accumulated variation of the Extended National Consumer Price Index (IPCA) in this period (13.1%).

Leveling the competitive environment in which financial institutions operate through the reduction of regulatory asymmetries across segments has been fundamental for the improvement of supply conditions and greater efficiency in rural credit funding.

Agenda BC#

7

This chapter presents the initiatives implemented in the context of the Agenda BC#. This work plan of the Banco Central do Brasil (BCB) comprises strategic dimensions and initiatives based on the promotion of financial democratization. Through Agenda BC#, the BCB has been carrying out a wide range of reforms to expand access to financial products and services, extend the availability of cheaper credit to a greater number of persons and improve the transparency of the National Financial System (SFN). Additionally, the Agenda BC# is focused on technological evolution to develop structural solutions for the SFN and facilitate the accountability of initiatives set for the short, medium, and long term by the BCB.

The Agenda BC# has five dimensions: Inclusion, Competitiveness, Transparency, Education, and Sustainability. The latter was included in September 2020.

In 2020, Agenda BC# comprised 51 initiatives (14% completed, 86% still in progress). Sections 7.1 to 7.5 present the main results achieved in each dimension, while section 7.6 deals with some of the initiatives in progress.

7.1 Inclusion

The Inclusion dimension seeks to facilitate access to the market. Initiatives of this dimension aim to expand the cooperative segment; simplify and modernize the foreign exchange and international capital regulations; develop changes that allow the full development of the Brazilian capital market, based on the free market; and deepen access to financial services and microcredit.

Some of the means to achieve this goal are promoting digital platforms, reducing bureaucracy, and simplifying procedures.

In particular, BCB initiatives seek to increase the market share of private financing sources to reduce government participation.

Regarding credit unions, the BCB authorized the issuance of Real Estate Letters of Credit (LCI). This measure has the advantage of allowing the cooperative segment to use appropriate funding instruments to operate in the real estate credit market. At the same time, it improves competition and the supply of products and services within the financial system.[84]

As to the foreign exchange market, the BCB has lowered barriers for international payments. From now on, foreign exchange contracts may be electronically signed. In addition, international payments may be performed through prepaid payment accounts. These accounts are similar to current accounts, however, they are simpler to operate, and have been widely disseminated in Brazil.[85]

There has also been an improvement in the rules for non-resident accounts in Brazilian *reais* (BRL). The minimum value of movements in the deposit account of resident individuals or legal entities, domiciled or headquartered abroad that must be registered was raised from BRL 10,000 to BRL 100,000.[86]

Procedures for investors have also been simplified. Non-resident individual investors are exempt from the obligation of constituting a custodian. These changes allow the costs related to the appointment of a custodian to be reduced, making them affordable for non-resident individuals who want to make portfolio investments through retail operations. The measure is in line with the initiatives that have sought to improve the regulatory framework for the capital market in Brazil.[87]

The BCB has launched a public consultation[88] on foreign exchange regulations considering technological innovations and new business models related to international payments and transfers. The proposal consolidates and modernizes the regulation of international payment or transfer services in the foreign

84 Circular 4,000 of April 09, 2020.
85 Resolution BCB 16, of September 17, 2020.
86 Resolution CMN 4,844 of July 30, 2020.
87 Resolution CMN 4,852 of August 27, 2020.
88 Public Consultation 79, 2020.

exchange market and facilitates the performance of personal transfer operations (remittances). The proposal also authorizes payment institutions to perform certain operations in the foreign exchange market and expands the possibilities of using payment accounts in foreign exchange operations.

Regulations[89] have been issued to speed up and expand the granting of microcredit so that financial institutions can attend to a more significant number of small entrepreneurs. The process for guiding small entrepreneurs in obtaining production-oriented microcredit is now 100% digital. Until then, the requirement was that the initial contact between the financial institution and the micro-entrepreneur had to be in person. Now, all the credit-granting steps may be performed remotely. This innovation streamlines the process and reduces travel costs of credit agents, which are considerably high relative to the value of microcredit operations.

The new legislation also expanded the required income range of micro-entrepreneurs potentially granted credit. The annual gross income requirement to join the microcredit program went from BRL 200,000 to BRL 360,000.

7.2 Competitiveness

The Competitiveness dimension aims to seek fair pricing through instruments for competitive access to markets. This dimension comprises three themes: innovation, international reserves, and market efficiency.

Technological development promotes the onset of several innovations, potentially generating greater competition within the SFN.

The most crucial measure in this dimension was the implementation of Pix, the instant payment scheme created by the BCB. Pix allows transfers and payments – between persons, companies, and the government – in few seconds, 24 hours a day, including weekends and holidays.

Its implementation makes available to citizens and businesses a secure, convenient, inclusive, and innovative means of payment. Definitely, Pix will bring more competitiveness, efficiency and new opportunities to the Brazilian payment market.

89 Resolution 4,854 of September 24, 2020.

The registration of Pix keys (binding entries like mobile phone number, email address, Taxpayer Identification Number) began on October 5, 2020, and the official launch of the payment scheme took place on November 16.

It is important to notice that, before its operational launch, Pix regulations had to be drawn up. Through discussions in the Pix Forum and contributions gathered by public consultation, the market agents and potential users were able to participate in the elaboration of Pix's regulation.

Pix's regulations include several technical manuals, including the Brand Usage Manual, which establishes the regulation on the Pix brand. The "Minimum Requirements for User Experience" is also part of the approved regulation establishing that Pix providers must offer a simple, agile, secure, transparent, and convenient end-user experience.

In addition, the BCB regulation includes the possibility of a "Scheduled Pix", which is a Pix scheduled with settlement at a future date.

Moreover, through an agreement between BCB and the National Treasury, Brazilian citizens may use Pix to pay tributes to the Federal Government in a much simpler and faster way, significantly improving the current experience.

Another important measure in this dimension is the Open Banking system. It allows the sharing of customer information between financial institutions, provided the customer's authorization. It opens and integrates technology platforms and infrastructure in a secure, agile and convenient way. The possibility of receiving data about the financial behavior of potential customers tends to increase the SFN competitiveness.

Several steps were taken in 2020 for the implementation of Open Banking. Initially, the rules of operation were approved. Next were the rules regarding the initial structure responsible for the implementation governance of Open Banking. With this measure, the BCB has facilitated establishing a convention between the participating institutions on the technological standards and operational procedures necessary to implement the Open Banking initiative, ensuring its representativeness, plurality, non-discriminatory access, mitigation of conflicts of interest, and sustainability.

Another important measure of this dimension was the approval of the convention that stipulates rules for registering the receivables of payment arrangements, therefore facilitating their use in credit operations by merchants.[90]

The convention will contribute to increased security, competition, and transparency when transacting these receivables, allowing merchants to obtain credit secured by these financial assets.

The approval of the convention makes the receivable of a payment arrangement (typically, what the merchant has to receive from sales made by credit and debit card) an increasingly safe and effective instrument for carrying out financial transactions (loans secured by these receivables). The convention regulates the assignment (sale) of these receivables.

The convention addresses matters such as the filing and removing of liens and encumbrances, the asset registration and verification of uniqueness, the portability of these assets from one registry to another, and the overall functioning of the environment that supports interoperability among such registries.

With the registration of these receivables and the possibility of filing encumbrances and liens in the registrars' systems, it will be possible to expand the list of agents that can acquire or accept these assets as collateral in credit operations, both from merchants, accreditors, and sub-accreditors. This procedure shall provide more liquidity, expanding the market for these assets while improving the security of the transactions.

The process of drafting the convention included the associations representing financial institutions, accreditors, sub-accreditors, and the BCB itself.

In 2020, the first cycle of the regulatory sandbox – a testing environment for new technologies with flexibility and guidance from the regulator – was also regulated. In October, the guidelines for action and the conditions for the supply of products and services through this experience were established.[91] In December 2020, the BCB established the requirements and procedures for the service and defined the registration deadline for Cycle 1 of the initiative: from February 22 to March

90 Published on August 25, 2020.
91 Resolutions CMN 4,865, 4,866 and BCB 29, of October 26, 2020.

19, 2021.[92] The selection of projects will be made by the BCB between March 22 and June 25. There will be ten projects chosen, possibly up to fifteen. Cycle 1 will last one year and could be extended for an equal period.

The BCB has listed the following topics as priorities:

- solutions for the foreign exchange market;
- fostering the capital market through mechanisms of synergy with the credit market;
- promotion of credit for micro-entrepreneurs and small companies;
- solutions for Open Banking;
- solutions for Pix;
- solutions for the rural credit market;
- increasing competition in the SFN and SPB;
- financial and payment solutions with potential effects to stimulate financial inclusion;
- fostering sustainable finance.

The BCB has also regulated a new type of institution, the Payment Transaction Initiator, which will operate in Open Banking and Pix[93] and will be able to initiate transactions without holding the accounts involved in purchases and transfers.

Currently, to make purchases or transfers, customers need a payment instrument, the card being one of the best known. From now on, the purchase can be initiated by this new institution, which does not manage or move the funds on the account.

The payment initiator is responsible for triggering the paying customer's command, even without holding his account, and makes the funds fall directly into the payee's account. The initiator is only responsible for this initial command, i.e. he does not need and cannot have access to the funds moved by the customer.

Other innovations regulated in 2020 and worth mentioning are:

92 Resolution BCB 50 of December 16, 2020.
93 Resolution BCB 24 of October 22, 2020.

- new rules for the authorization of debits in deposit accounts and salary accounts, as well as similar rules for the authorization of debits in prepaid payment accounts. Debiting deposit accounts, salary accounts, and prepaid payment accounts must have the customer's prior authorization, a specific purpose, and contain, among other information, a breakdown of the account to be debited. Thus, the debit will only occur in the specific accounts informed by the account holders and will have a defined purpose;[94]

- rules regulating the conditions for the issuance of trade invoices in electronic form, as well as the negotiation of these trade invoices in the financial system in discount operations and credit operations guaranteed by these titles.[95]

7.3 Transparency

The Transparency dimension improves the price formation process and democratizes the dissemination of market and BCB information. It invests in a better communication of Monetary Policy, in the evaluation of results and information symmetry.

To this end, the relationship with parliamentarians, international portfolio investors and the general public is fundamental. The BCB works to ensure that information flows transparently in all operations, such as in the targeting of real estate credit and rural credit, and in financial services in general.

A measure that deserves to be highlighted is the launch of the Transparency and Accountability Portal.[96] The goal is to increase transparency and demonstrate, in a clear and objective way, the good and regular application of public resources, as well as the results of initiatives undertaken by the BCB, thus strengthening accountability and social control.

In addition to rendering accounts on past events, the BCB portal also presents the strategic direction of the Organization in the pursuit of results for society, making

94 Resolution BCB 51 of December 16, 2020.

95 Resolution BCB 4,815 and Circular BCB 4,016, dated May 4, 2020

96 The creation of the portal responds to the Normative Instruction 84, of April 22, 2020, of the Federal Court of Accounts (TCU). To this end, the Board of Governors approved the Regulation of the Transparency and Accountability Portal of the Central Bank – Ordinance 108.398, of September 30, 2020.

evident the application of public resources, as well as the products, results, and impacts produced.

In an effort to strengthen transparency and communication with society, the BCB has also updated the guidelines already in place for scheduling meetings between the Board of Governors members with external auditors to discuss the economic outlook, with emphasis on meetings with investors.[97]

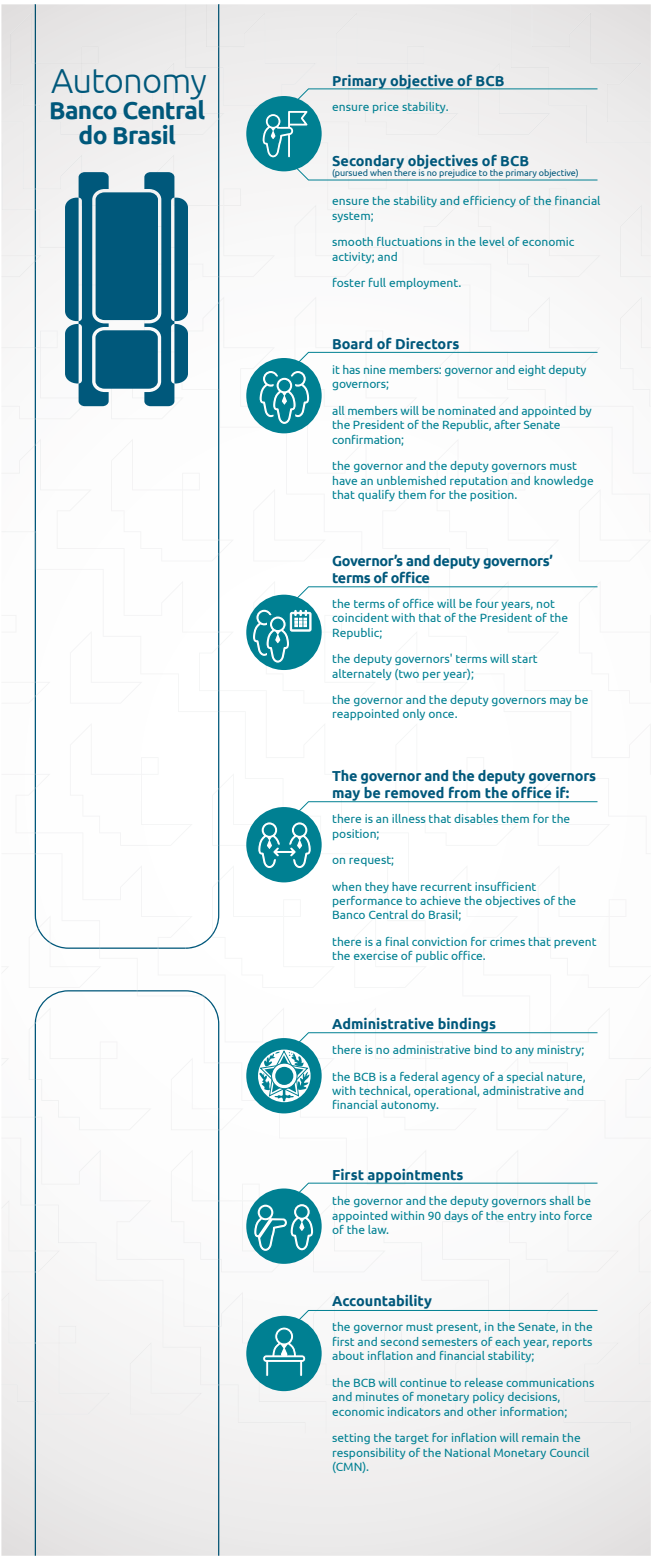
The communication documents related to monetary policy were also subject to improvement and increased transparency. The Inflation Report now provides more details about the determinants of inflation, the conditioning factors considered in the projections and the risks involved. The text is now more analytical and easier to read. Also, with a view to greater transparency, the macroeconomic models used by the BCB are now disclosed with an unprecedented level of detail. It is also worth mentioning that the minutes of the Monetary Policy Committee (Copom) meetings, besides the usual PDF format, are now also published in HTML, making them easier to read.

The BCB is also working on the revision and consolidation of normative acts under the competence of the agency and the CMN, in compliance with Decree 10,139, of November 28, 2019. The measure aims to simplify the regulatory framework, improve its management, extinguish obsolete rules and increase transparency in governmental bodies and related entities. Within the BCB, it will affect circulars, circular letters, joint normative acts, joint decisions, regulations, by-laws and other acts of a normative nature in force.

There has also been an improvement in the rules regarding the Policies for Prevention of Money Laundering and Terrorist Financing (PLDFT). As of July 2020, authorized institutions must conduct internal assessments for the risk of money laundering, which must consider the profiles of all their clients, the institution, the products and services and the employees, partners and outsourced personnel, without exception.[98]

The objective of the changes is to give greater efficiency and effectiveness to the procedures adopted in the PLDFT, expanding the adoption of a risk-based approach, which foresees the application of controls proportional to the risk.

97 Release 36.035, of August 12, 2020.
98 BCB Circular 3.978, of January 23, 2020.



On September 2, 2020, the BRL 200.00 banknote, the new member of the real family, went into circulation. With the economic effects brought on by the Covid-19 pandemic, the BCB understood that the time was right for the launch, as the people demand for cash increased. This was a behavior that could be observed not only in Brazil but in several countries. The amount of cash in circulation rose from about BRL 260 billion to BRL 351 billion between March and August 2020. The exceptional demand of Brazilians for paper money was something unheard of since the BRL came into circulation 26 years ago.

The debate surrounding the BCB autonomy made important advances in 2020, with the sanction of Complementary Law 179 on February 24, 2021. The new legislation establishes that price stability remains the fundamental objective of the BCB, which, without prejudice to this objective, will also oversee the stability and efficiency of the financial system, smooth out fluctuations in the level of economic activity and foster full employment. The main features of the law are represented in Figure 1.

7.4 Education

This dimension of the Agenda BC# aims to make citizens aware so that everyone participates in the market and cultivates financially healthy habits, such as the habit of saving, of responsibly using credit and of controlling and balancing domestic budget. To achieve this goal, the participation of various agents is crucial.

In this sense, the Brazilian Forum for Financial Education (FBEF) was created in June 2020, with the objectives of implementing and establishing the principles of the National Strategy for Financial Education (Enef) and disseminating, sharing and promoting financial, insurance, pension and tax education actions proposed by its members, by other government agencies and entities, or by private institutions.

The presidency of the FBEF will be held by the BCB until 2022. In addition to the BCB, the FBEF comprises the Securities and Exchange Commission (CVM), the Superintendency of Private Insurance (Susep), the National Treasury Secretariat (STN), the Social Security & Labor Secretariat of the Ministry of Economy (SPrev), the National Superintendence of Complementary Pensions (Previc), the National Consumer Secretariat of the Ministry of Justice and Public Security (Senacon) and the Ministry of Education (MEC).

The 7th National Week on Financial Education (Semana Enef) was held between 23-30 November 2020, in a renewed effort to promote financial education. During the period, thousands of people participated in countless financial education actions promoted under the scope of the initiative. Under the theme "Financial Resilience: how to get through the crisis", Enef Week focused on the difficulties faced by a large part of the Brazilian population due to the Covid-19 pandemic. With the restrictions imposed by the health crisis, the actions were mostly carried out in an online format.

The key topics were personal finance, indebtedness, financial education in schools, and financial education for specific groups (refugees, indigenous people, and fishermen).

Among the actions coordinated by BCB during the Enef Week, the following stand out:

- on-line workshop with the coordinators of the Learn Value Program. The Program, funded by the Fund for the Defense of Diffuse Rights (FDD) from the Ministry of Justice and Public Security, aims to develop in children and young people three essential financial skills, explained in the concept of Financial Citizenship: (i) planning the use of resources; (ii) actively saving; and (iii) managing the use of credit. It has the potential to reach 21 million students in the nine years of elementary school in the public network, through school projects ready for use in the classroom. In these school projects, financial education is developed across mandatory disciplines (Portuguese Language, Mathematics and Human Sciences);

- launching of the 3rd version of the Financial Information Booklet for Refugees and Migrants, in partnership with the United Nations High Commissioner for Refugees (UNHCR). The purpose of the document is to help migrants and refugees to access information about financial products and services, thus expanding the financial inclusion of this vulnerable part of the population; and

- launching of "*Quem Sonha, Poupa*" (Whoever dreams, saves), a program jointly conceived by the BCB, the Brazilian Federation of Banks (Febraban), and the banks. The project aims to stimulate knowledge, reflection, and awareness of the importance of the habit of saving, especially among young people between the ages of 18 and 28.

In addition, the Acceleration Program "*Meu Bolso em Dia*" (My Pocket in Good Standing) is a worthy note. The initiative, which is part of the Technical Cooperation Agreement between BCB and Febraban, aims to boost companies with financial education projects with high potential for economies of scale. The program seeks the development of innovative, comprehensive, inclusive solutions that are free or at no additional cost to the end user. The pillars for the participating initiatives are innovation, financial self-sustainability of the project, relevance of the problem, scope and scale.

Another important action in this dimension of the Agenda BC# was the publication, in June 2020, of a study on risk indebtedness in Brazil, as well as an analysis of the socioeconomic profile. The work, unprecedented, presents a panorama of borrowers classified in this situation based on objective parameters and describes the profile of this population, considering factors such as age, gender, income, and geographical location. The data analyzed were extracted from the Credit Information System (SCR) and are relative to the period from June 2016 to December 2019.

7.5 Sustainability

The new dimension of the Agenda BC#, launched in September 2020, recognizes the importance of Sustainability in the economy and in the SFN. The dimension is born with the objective of responding to yet another set of structural changes in the economy. It deals with the promotion of sustainable finance, the adequate management of socio-environmental and climate risks in the economy and in the SFN, besides integrating sustainability variables in the BCB's decision-making process.

The theme plays a fundamental role in directing resources for the development of a more sustainable, dynamic and modern economy.

The role of central banks and the financial market in sustainable finance and in mitigating the effects of socio-environmental risks is a rapidly developing theme in Brazil and worldwide.

As the regulator of the SFN, the BCB has developed a series of measures and rules on the subject over the last few years.

The initiatives included in the Sustainability dimension encompass socio-environmental responsibility measures directed both to the financial system and to the BCB itself.

Among the various measures in this dimension are:

- BCB's socio-environmental responsibility
    - inclusion of the sustainability theme in the Museum of Economics;
    - reduction of the environmental impact in the processes of circulating medium; and
    - Integrated Risk Management at BCB;
- Policies
    - inclusion of sustainable criteria in the international reserves; and
    - creation of a sustainability financial line;
- Supervision
    - structuring and expanding the collection of information on socio-environmental risks; and
    - climate risk monitoring and stress testing;
- Regulation
    - enhancement of socio-environmental risk management by financial institutions;
    - creation of the Green Bureau for rural credit; and
    - establishment of incentives for green rural credit.

An important set of initiatives in this dimension involves the establishment of partnerships between the BCB and several agents. Among them, the following are worth mentioning:

- BCB's joining the Network for Greening the Financial System (NGFS)
- memorandum of understanding with the Climate Bonds Initiative (CBI). This partnership aims to

exchange information related to the promotion of sustainable finance and the adequate management of socio-environmental and climate risks in the financial sector;

- leveraging partnerships with other central banks and international organizations.

7.6 On-going initiatives

Since the announcement of the Agenda BC#, several initiatives have been concluded and another 44 of great relevance are in progress. Part of this set of ongoing initiatives is under discussion in the National Congress because it depends on legal changes, while other actions depend on collaboration with other government agencies, with infra-legal changes. Among those initiatives, the highlights are:

- Bank Resolution Law:[99] 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, so that the BCB has more efficient instruments to deal with financial crises;

- Foreign Exchange Law:[100] The BCB sent a bill to the National Congress that seeks to simplify and modernize the regulation on the foreign exchange and international capital;

- Relationship BC-Cade: it aims to establish forms of cooperation and the sharing of competencies between the BCB and the Administrative Council for Economic Defense (Cade) on competition matters, with the BCB being responsible for the defense of competition in the scope of activity of financial institutions and other institutions subject to its supervision or surveillance;[101]

- Bill for the Financial Market Infrastructure: a proposal under discussion within the government, it 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 practices;

99 Complementary Law Bill 281 of December 23, 2019.
100 Bill 5,387 of December 23, 2019.
101 Complementary Law Bill 499 of 2018.

- Issuance of digital currency: a working group was formed to study digital currencies issued by central banks and assess what would be the benefits and impacts of the issuance of the Brazilian real in digital format. Among the expected results are the proposal of a digital currency issuance model with identification of risks, including cybersecurity, data protection, and normative and regulatory adherence, as well as the analysis of the impacts of a central bank digital currency on financial inclusion and stability and on the conduct of monetary and economic policies;[102] and

- Bill for Authorizations: proposes the modernization of the bank authorization process and related aspects of supervision and regulation.

102 Ordinance 108.092, of August 20, 2020.

Impact evaluation of capping the overdraft facility interest rate

The National Monetary Council Resolution 4,765, 2019,[1] capped the overdraft facility interest rate at 8%p.m. (151% p.a.). This ruling was applied to all households[2] and micro entrepreneurs (MEI, in the Brazilian acronym). This survey assesses how the supply and the use of the overdraft facility evolved during the first year after the regulation issuance.[3]

Context

The overdraft facility share in the household credit portfolio followed a steady downward trend recently, from 3.4% in January 2014 to 1.5% in December 2020. As the overdraft facility outstanding balance remained practically stable until early 2020, with an average of BRL 25.6 billion, the reduction in its participation in the non-earmarked portfolio reflects the increased balance of other credit types in the period (Figure 1.A). Comparing overdraft facility and revolving credit card portfolios,[4] both revolving types, it is possible to see that the balance of the former was similar to the latter's in January 2014. In contrast, such ratio fell to half in December 2020 (Figure 1.B).

Figure 1.A – Balance of non-earmarked credit and overdraft facility
Households

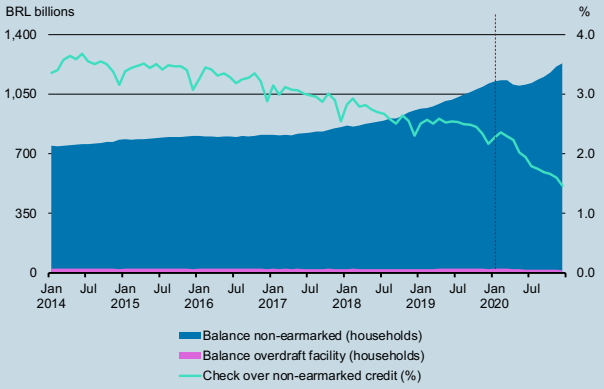
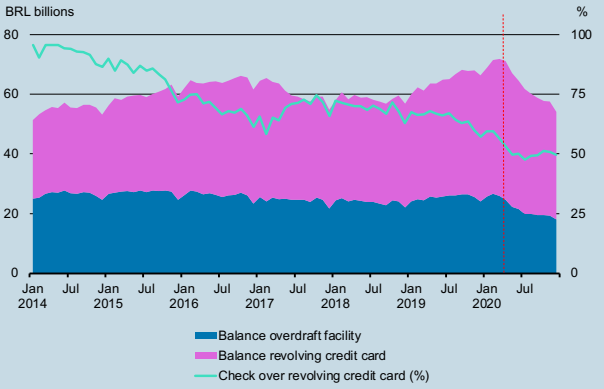


Figure 1.B – Balance of revolving credit card and overdraft facility
Households



1 Resolution CMN 4,765, of November 27, 2019. This resolution became effective on January 6, 2020, with immediate effects on contracts signed onwards and established the date of June 1st for effects on previously signed contracts.

2 Overdraft facility is the revolving credit facility linked to the current account in which a pre-approved limit of resources is made available for the client by means of withdrawals, checks, payments, or bank transfers. In case of insufficient funds when a transaction is requested, a credit operation at a fixed rate with daily renewals is carried out. Operations classified under this credit type are characterized by automatic amortization of the outstanding balance when funds are deposited in the borrower's current account.

3 The resolution also made it optional the charge of a tariff of up to 0.25% on the limit made available that exceeds BRL 500.00. The efficacy of the full contents of the art 2 of this resolution is suspended by judicial measure in the "Arguição de Descumprimento de Preceito Fundamental" (ADPF) 645, sanctioned by the Federal Supreme Court (STF) and converted into "Ação Direta de Inconstitucionalidade" (ADI) 6047.

4 Data relative to the Series 20587 disclosed in the BCB Time Series Management System (SGS). Revolving credit card comprises the regular, not migrated, and payroll-deducted revolving credit card types.

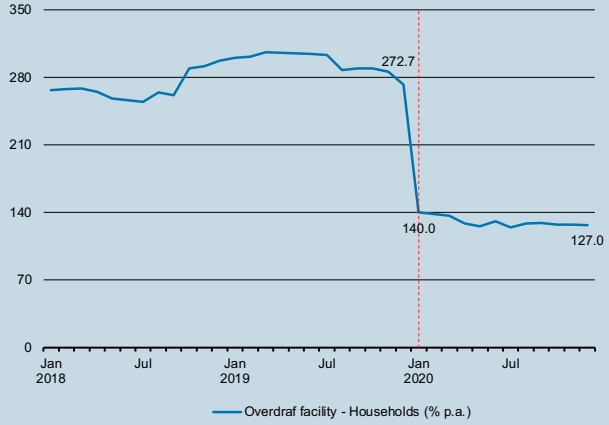
Between 2017 and 2019, the overdraft facility interest rate increased despite the base interest rate reduction, default rates stability, and lower banking spreads for almost all non-earmarked credit operations. In December 2019, the balance of household overdraft facility totaled BRL 24.1 billion, accounting for 36.4% of the revolving credit portfolio with an average interest rate of 272.7% p.a., one of the highest of the credit market.

The regulatory intervention was justified by a combination of low demand elasticity to interest rate, some degree of market power, regressiveness, and the presence of behavior deviations from the canonic rational model, especially for borrowers with lower income and education levels, among other factors.[5]

Interest rate changes

The overdraft facility average interest rate varied between December 2019 and January 2020 – when the Resolution entered into effect –, falling from 272.7% p.a to 140.0% p.a. The average rate reached 127.0% p.a. in the following December 2020, reaching 24 p.p. below the 151% p.a cap. (Figure 2).[6]

Figure 2 – Average interest rates overdraft facility
Weighted by active portfolio



In addition, when analyzing the distribution of the interest rate reduction among different clients' profiles, one observes a lower interest rate dispersion by income range. Sharper declines occurred in interest rates for lower-income clients, thus indicating that they were proportionally more benefited than higher-income clients (Figure 3).

5 The complete contents of the technical note that explain the regulatory action is available at: https://www.bcb.gov.br/pre/normativos/busca/downloadVoto.asp?arquivo=/Votos/CMN/201981/Voto_0812019_CMN.pdf.

6 It is worth highlighting that data herein presented are obtained from the Credit Information System (SCR) and may present slight changes relative to data made available in the SGS. It is also noteworthy the methodological change implemented in February 2020, when the calculation of weighted average overdraft facility interest rates began considering periods with no interest charges. To assure data consistency, time series of overdraft facility interest rates released by the BCB was fully revised, considering the new calculation methodology. For example, in December 2019, the household interest rate fell from 302.5% p.a. (statistic released in January) to 247.6% p.a. (revised statistic).

Figure 3 – Interest rate overdraft facility[1/]
Weighted by outstanding portfolio balance

1/ Does not consider operations past due for more than 90 days.

Change in the outstanding portfolio balance

On the one hand, the access to such revolving credit types as the overdraft facility helps to accommodate occasional personal income shocks. On the other hand, the easy access to this credit facility, associated with higher interest rates than the market average, demands greater attention from the financial consumer. As in any price limitation, it is worth evaluating if the interest rate cap, with the potential profitability reduction of this credit facility to financial institutions, would have led to a decrease in supply.

Household credit was rising throughout the second half of 2019. This trend was reverted with the outbreak of the Covid-19 pandemic at the end of 2020Q1. Among the most impacted credit types were credit card, revolving credit card, and overdraft facility. Even with the reduction of average interest rates to levels below the ones of the revolving credit card, the overdraft facility was the credit type that registered the sharpest outstanding portfolio reduction between December 2019 and December 2020. It is worth mentioning that this reduction is only perceived as of April, *i.e.*, three months after the establishment of the interest rate cap and coincides with the outbreak of the pandemic. The role of the pandemic, and not of the interest rate cap, becomes clear also when one observes that, in 2020Q1, the portfolio variation over 2020 kept at the same level of the 2019Q4 (Figures 4.A and 4.B).

Figure 4.A – Variation in the balance by type
Household – Variation in 12 months (%)

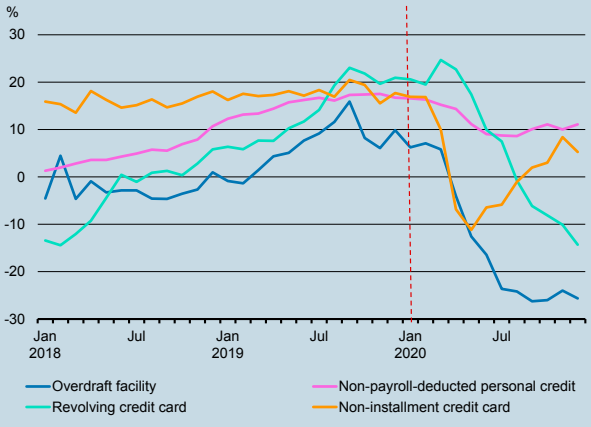
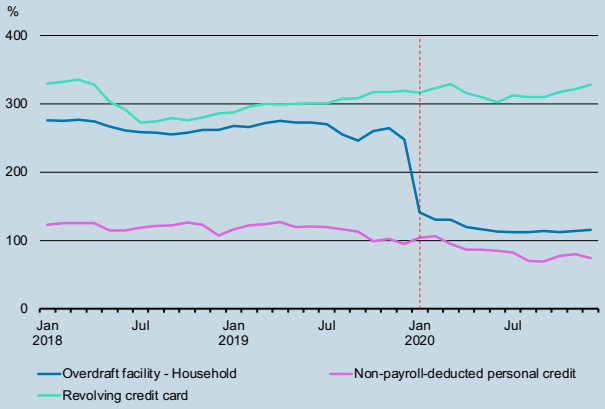
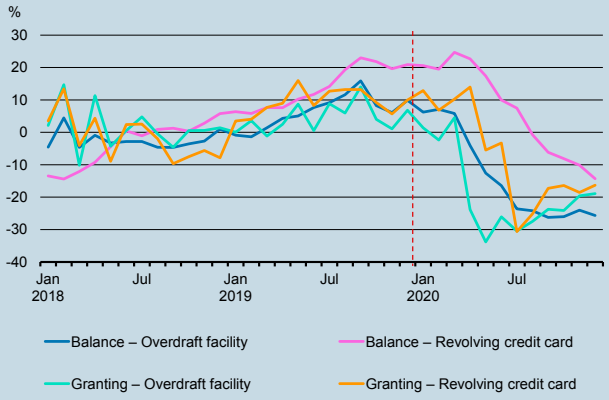


Figure 4.B – Average interest rates by type
Household – %p.a.



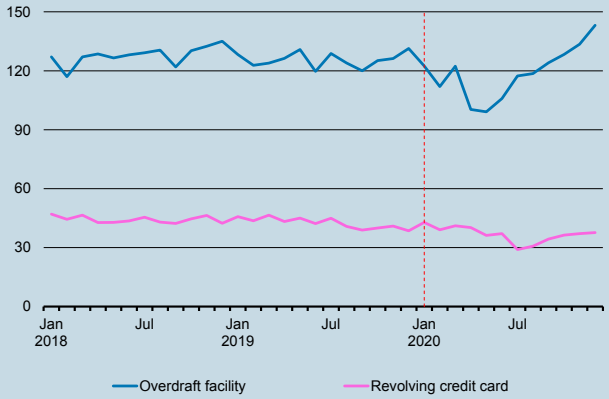
Finally, we compare the evolution of the amounts granted in the overdraft facility and in credit card loans. Both types of credit show similar dynamics throughout the observed period. Because the loan interest rate cap was applicable only to the overdraft facility, external factors (especially the Covid-19 pandemic) may explain the sharp reduction in loan balances and the amounts granted for both credit types (Figure 5).[7]

Figure 5 – Comparison of balance and granting: revolving types
Variation in 12 months (%)



Due to the different dynamics of the ratio of credit granting and credit balance for overdraft facility loans and revolving credit card loans, the decrease in the balance of overdraft facility loans is starker. One observes that credit granting account for more than 100% of the average overdraft facility balance and for nearly 40% of the average revolving credit card balance. The lower granting/balance ratio in the revolving credit card indicates that clients use this credit facility for longer periods, contributing to the balance stability, which was not observed for the overdraft facility (Figure 6).

Figure 6 – Granting speed of types
Granting/balance ratio

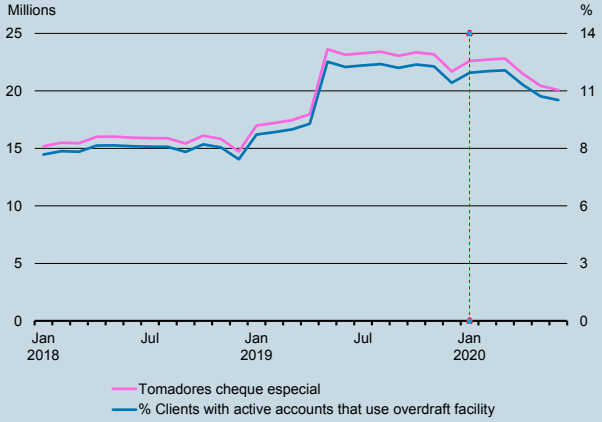


7 The balance corresponds to the sum of the outstanding balance of credit contracts at the end of the month. The credit card balance released by the BCB includes regular revolving credit (payroll and non-payroll-deducted) and not migrated revolving credit. However, these credit types present quite different dynamics. The balance of revolving credit card is highly influenced by revolving payroll-deducted credit, which corresponds to nearly 40% of the revolving credit portfolio in December 2020.

Change in the number of borrowers

The overdraft facility has hybrid characteristics. It is a credit facility provided as a financial service, associated with a bank account. The total number of clients with active banking relationships was stable during the analyzed period, nearly 187 million people.[8] Although at a lower level than in 2019, the number of clients using the overdraft facility remained stable after the issue of Resolution CMN 4,765, of 2019, registering a sharp reduction only after the outbreak of the pandemic, in April 2020, thus corroborating the results that indicated reduced use of this credit facility in previous analyzes (Figure 7). A seasonal downward trend in the use of the overdraft facility is observed in December, possibly due to the payment of the Christmas bonus.[9]

Figure 7 – Percentage of clients with active accounts that use overdraft facility



There is a downward trend in the number of clients of both the overdraft facility and the revolving credit card for all income ranges with the worsening of the Covid-19 pandemic. The reduction in the number of borrowers of the overdraft facility is sharper for higher income borrowers, which is not so significantly observed for the credit card (Figures 8.A and 8.B). It is worth noticing that, on the margin, the number of revolving credit card borrowers in the quarterly comparison was increasing at the end of 2020, while this trend was not so clear in the overdraft facility.

Figure 8.A – Overdraft facility borrowers
By income range – May 2019 =100

Figure 8.B – Revolving credit card borrowers
By income range – May 2019 = 100

8 A person has a relationship with financial institutions when she or he holds a current or savings account at a financial or payment institution. The data come from the Financial System Customer Register (CCS), which does not have data relative to values but includes all open accounts, even those with very low balances or that did not register withdrawals, deposits, or transfers for long periods.

9 The number of borrowers is calculated from the SCR, including identified information on borrowers with overdraft facility balances on the last day of the month. Thus, we do not observe the borrowers that resort to the overdraft facility for shorter periods over the months. The identification of these borrowers increased as of May 2019, since credit limits higher than BRL 200.00 associated with individuals whose overall operations were lower than BRL 200.00, had to be informed to the SCR.

Low-income borrowers are generally more susceptible to shocks and rely on the emergency credit lines, but the Federal Emergency Aid relieved some of their income shock.[10] A preliminary analysis with data made available by the Federal Government[11] indicates that the reduction in the use of revolving credit facilities by beneficiaries of the Emergency Aid was slightly higher than that observed for the other borrowers (Table 1).

Table 1 – Comparison of the variation of usage of revolving credit types

	Beneficiary of the emergency aid				Other individuals			
	Overdraft facility	Other non-earmarked types	Revolving credit card	Earmarked	Overdraft facility	Other non-earmarked types	Revolving credit card	Earmarked
Mar/2020	3.4	123.2	9.9	101.3	18.9	1,029.9	30.9	819.8
Aug/2020	2.4	124.3	7.9	104.7	14.6	1,047.3	26.5	856.0
Difference (BRL)	-1.0	1.1	-1.9	3.4	-4.3	17.4	-4.4	36.2
Difference (%)	**-28.61**	0.9	**-19.6**	3.3	**-22.9**	1.7	**-14.4**	4.4

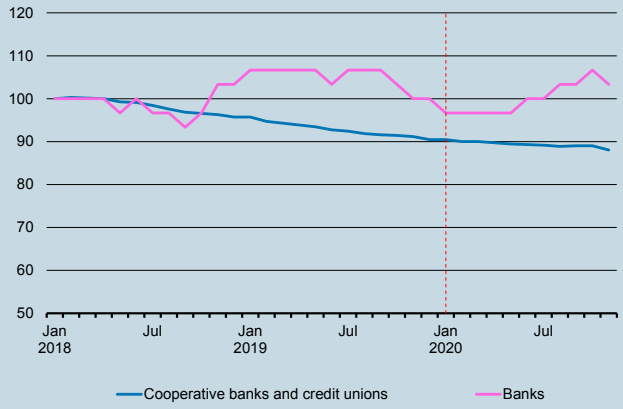
Source: SCR and Portal da Tranparência

However, the measurement of the specific impact of this benefit on the reduction of the usage of the revolving credit is only possible by using analyzes with deeper identification techniques, which were not the aim of this study.

Evolution of the overdraft facility supply

No relevant change is observed in the number of financial institutions offering the overdraft facility after the new regulation. In January 2018, 30 banks and 701 credit unions or cooperative banks offered this credit facility, changing to 31 and 618 in November 2020, respectively (Figure 9). The reduction in the number of credit unions is a trend observed since 2014 due to the consolidation of the National Cooperative Credit System (SNCC), following the reduction in the number of operating credit unions.[12]

Figure 9 – Institutions offering overdraft facility by segment
Jan 2018 = 100



10 The Emergency Aid established by Law 13,982 of April 2, 2020, regulated by Decree 10,316 of April 7, 2020, and by Directive 351 of April 7, 2020, of the Ministry of Citizenship, is a financial benefit granted by the federal government to non-registered workers, MEIs, self-employed workers, and the unemployed workers with the purpose of offering emergency protection in the period of fighting the Covid-19 pandemic crisis.

11 Data relative to benefits granted until August 2020 may be obtained at: http://www.portaltransparencia.gov.br/pagina-interna/603519-download-de-dados-auxilio-emergencial.

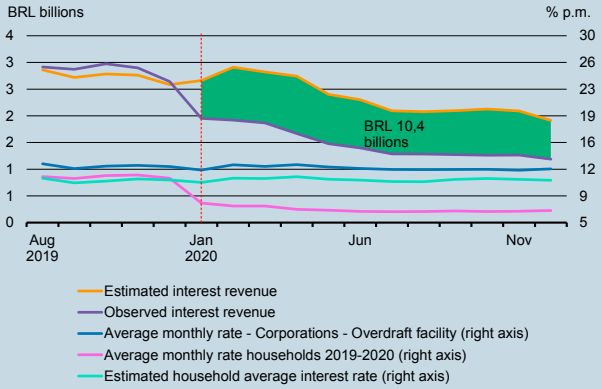
12 Further information in the report "Panorama do sistema nacional de crédito cooperativo", available at: https://www.bcb.gov.br/content/estabilidadefinanceira/coopcredpanorama/9_panorama_sncc_2018.pdf.

Estimated reduction of interest paid by borrowers

The reduction of interest rates due to the new regulation resulted in savings to consumers. To estimate the saved amounts, we first compare the interest rates charged on loans to households to the ones charged to corporations. Although at different levels, household and corporate interest rates apparently follow a similar path. Resolution CMN 4,765, of 2019, defines a cap for interest rate (8% p.m.) only for overdraft facility granted by financial institutions in demand deposit accounts of households.[13] With the regulation, a sharp reduction of household interest rate was observed, which were not matched in the corporate interest rates, which remained unchanged.

Thus, we use the 12-month variation of corporate interest rate to estimate what the household interest rate would be absent the regulatory change. By applying the estimated interest rate to calculate the amount of interest paid on the active portfolio, we obtain an average monthly reduction of BRL 866 million. Therefore, the estimated reduction amounts to BRL 10.4 billion between January and December 2020 (Figure 10).

Figure 10 – Estimated reduction in the amount of interest paid
Household interest rate estimated through the variation of corporate interest rates

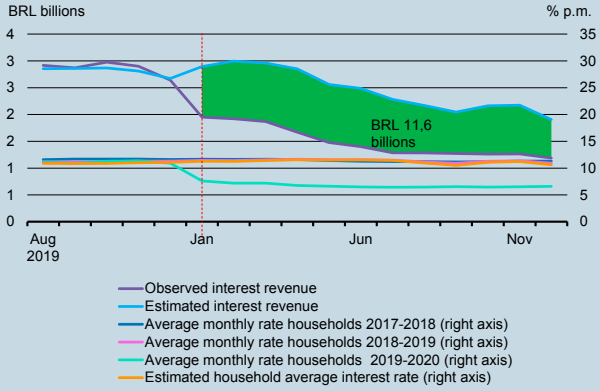


Alternatively, the interest rate of household overdraft facility following the introduction of the regulation is estimated by using the variation observed in its time series. Since the interest rate variation relative to the same month of the previous year was practically stable between August 2016 and December 2019, it can be considered a good proxy to estimate the interest rate in the absence of the new regulation. Thus, the interest rates in a given month of 2020 are calculated by applying the average variation for that month observed in the two years before the 2019 interest rate. The difference between the amount of interest effectively charged and the estimated amount in the absence of the regulation is nearly BRL 1 billion per month, totaling BRL 11.6 billion between January and December 2020 (Figure 11).

Therefore, both estimates provide similar results. It should also be highlighted that these estimates are based in the active portfolio monitored in 2020.

13 The resolution also includes MEIs, which are not included in the analysis.

Figure 11 – Estimated reduction in the amount of interest paid
Household interest rate estimated through the variation in the last years



Conclusion

Data analyzes indicate that the regulation effectively reduced interest rates, providing an estimated annual reduction of BRL 10 billion in paid interest.[14] In addition, the reduction in amounts granted in the overdraft facility reached the same level of the revolving credit card. As both are emergency revolving credit types with similar levels of interest rates until the issue of the regulation, this indicates that the reduction resulted from external factors (Covid-19) and not the regulatory change. Part of the observed reduction in the amounts granted and balances in the overdraft facility may be associated with the downward trend already observed in the period before the implementation of the new regulation.

The reduction of interest rates and the evidence that there was no supply reduction of this credit facility point to an increase in the consumer welfare, without any loss of economic efficiency. Therefore, one may conclude that the policy of establishing an interest rate cap achieved the expected results.

Among other factors, the specific overdraft facility conditions, such as the low elasticity of demand to interest rates, some market power degree, and regressiveness justified the regulatory intervention. Moreover, the adequate calibration of the measure adopted was an essential factor for not affecting the supply of this credit facility. It is worth highlighting that interest rate interventions without calibration and the analysis of market conditions may affect the supply and, consequently, consumer welfare.

Further studies are essential to keep monitoring the market to better understand its trends and dynamics. It is crucial to monitor the evolution of usage and limits offered in the overdraft facility and credit card and possible implications in a scenario where an increasing use of instant payments is expected. The evaluation of these trends will benefit from the extension of the observation period, since the analyzes were impaired by the adverse events associated with the Covid-19 pandemic. In addition, as of May 2021, the BCB will start receiving data regarding the disaggregate limit for revolving credit types, which is expected to improve analyzes.

14 This result corroborates the estimate presented in the box "Changes in overdraft facility and simulation of its impacts on account holders' expenditures" presented in the 2019 Banking Report. This exercise considered higher interest rates than those observed throughout 2020 and the charge of tariffs, which was not implemented. Thus, consumer savings was higher than the estimated BRL 7.2 billion.

Analysis on the implementation of the Positive Credit Report

Introduction

Pursuant to Article 5 of Complementary Law (LC) 166 of April 8, 2019, the Banco Central do Brasil (BCB) has submitted to the National Congress a report on the results achieved with the changes in the *Cadastro Positivo* (Positive Credit Report), focusing on the occurrence of reduction or increase in the banking spread, for the purposes of a legislative reevaluation.

The first part of the report is briefly presented here,[1] with an analysis of the implementation of the Positive Credit Report (PCR),[2] based on information gathered in meetings with representatives of entities involved in the process and questionnaires sent to the Database Managers[3] (DBMs) – Boa Vista, Quod, Serasa and SPC Brasil – as well as to institutions authorized to operate by the BCB.

Institutional Environment

The PCR was created by Law 12,414 of June 9, 2011, which authorized the establishment of databases with information on the credit performance of individuals and firms for the formation of credit histories. The original terms of Item III of Article 2 and Article 4 determined that each individual or firm could only be registered if they authorized the inclusion of their personal information in the database. That is, a person would have to expressly opt in to have his or her data included in the positive credit registries (aka opt-in regime).

The failure to obtain an expressive number of registrants motivated the amendment of Law 12,414/2011 by Complementary Law 166 of April 8, 2019, which gave new wording to Item III of Article 2 and to Article 4, henceforth requiring individuals or firms to expressly opt out to have their data included (also known as the opt-out regime).

1 The second part is in the box "Analysis of the effects of the Positive Credit Report" of this Report, which presents the econometric analysis of the effects of the PCR on credit spreads.

2 Separate meetings were held with (i) Database Managers and National Association of Credit Bureaus (ANBC); (ii) Brazilian Association of Digital Credit (ABCD); (iii) institutions authorized to operate by the BCB and the Brazilian Federation of Banks (Febraban); and (iv) the Interbank Chamber of Payments (CIP).

3 Under Article 2 of Law 12,414/2011, as amended by LC 166/2019: i. database is the set of data related to natural or legal persons stored to support the granting of credit, installment sales, or other commercial and business transactions involving financial risk; and ii. manager is the legal entity that meets the minimum operating requirements outlined in this Law and complementary regulations, responsible for database administration, as well as for collecting, storing, analyzing, and granting access to third parties to the stored data.

As shown in Figures 1 and 2, the number of active registrants remains for a few months at very low values after the enactment of LC 166/2019 in April and spikes in November and December 2019.[4] Two factors explain this phenomenon. The first and foremost is the paradigm shift in legislation from the opt-in to the opt-out regime, which caused the big leap itself. The second refers to the time elapsed before the spike. Both are described below.

Figure 1 – Evolution of the stock of natural persons with active Positive Credit Report

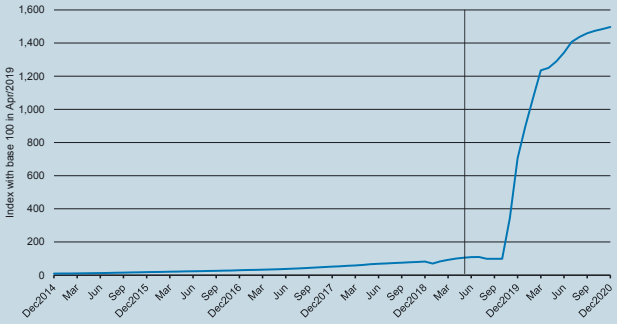
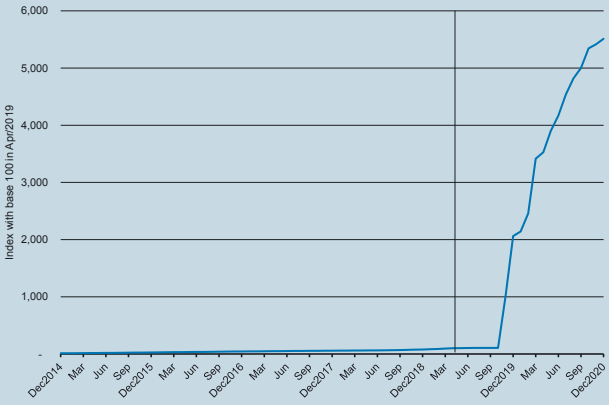


Figure 2 – Evolution of the stock of firms with active Positive Credit Report



Behavioral science explains the leap in the number of registrants by the concept of *status quo* bias. As presented by Thaler and Sustein (2008), the *status quo* bias is nothing more than inertia. In other words, people have a strong tendency to prefer the current situation, or the default option, which does not require any deliberate action. In the case of the original Law 12,414/2011, the default situation is to be outside the PCR, and the person would have to opt in. The main change brought by LC 166/2019 is that the registration is automatic, i.e., the default situation is now to be registered in the PCR.[5] In turn, Item I of Article 5 of Law 12,414/2011, as amended by LC 166/2019, entitles the registrant to request the cancellation or reopening of the registry. Therefore, the freedom to decide to be or not to be in the registry is preserved. However, changing the default situation serves as an incentive to keep people within the registry, leading to few people opting out.

4 Each Database Manager (DBM) was asked to inform the number of registrants in their databases in response to the questionnaire presented in annex A of the report "Analysis of the effects of the Positive Credit Report", available for consultation at https://www.bcb.gov.br/content/publicacoes/Documents/outras_pub_alfa/analise_dos_efeitos_do_cadastro_positivo.pdf. The total number of registered people encompasses the data received from the four DBMs summed up. The value for April/2019 was adopted as the base 100. This value is overestimated due to redundant registration of the same registrant in each of the DBMs but the purpose of this figure is only to stress the significant increase of registrants with the regime change.

5 The idea of nudging so as to change people's behavior while preserving their freedom of choice, became popular after the publication of the book Nudge, written by Richard Thaler (2017 Nobel Prize in Economics) and Cass Sustein. Several countries have set up working groups to think about public policies based on behavioral science. The UK, for example, created a Behavioral Insights Unit, which has designed and tested behavioral interventions in a variety of areas, such as tax, finance, health, and education. The opt-out system introduced by LC 166/2019 applies a "nudge", bringing most of the population into the PCR.

By the end of 2020, just under 330,000 individuals and 3,500 firms had been removed, on request, from the PCR.[6] In contrast, at least 100 million individuals were actively registered, which is equivalent to approximately 66% of the population over the age of 19, according to the projection of Brazil's population for the period 2010-2060 made by the Brazilian Institute of Geography and Statistics (IBGE).[7]

The second factor regarding the increase in the number of active registrants concerns the time that elapsed between April and November for the leap in the number of registrants to be observed. Due to Decree 9,936 of July 24, 2019, and Resolution 4,737 of July 29, 2019, data submission was interrupted on July 7, 2019, and resumed only on October 28, 2019, after the DBMs performed their registrations with the BCB. On October 28, 2019, the CIP[8] sent the DBMs the cancellation requests (ex ante opt-out). Between October 31, 2019, and November 6, 2019, the sources[9] sent to CIP the borrowers' registration data so that the DBMs could carry out the communication to start the positive credit registries. As the number of people with credit operations in financial institutions that send data to the CIP is quite significant, much of the growth occurred when the CIP started sending the registration data and the DBMs started communicating with these people, according to Paragraphs 4, 5 and 6, Article 4 of Law 12,414/2011, as amended by LC 166/2019.

It should be highlighted that the current legislation maintained an opt-in feature. DBMs are authorized to make available to queriers[10] the credit score of all active registrants but may only make credit history available upon prior authorization from the registrant, as set forth in Article 4(b)(IV) of Law 12,414/2011, as amended by LC 166/2019. Article 8 of Decree 9,936/2019 defines that authorization will be granted for each access made by the authorized querier or for access by the authorized querier for a period set in items "a" and "b". In practice, the conjunction of the opt-in requirement (status quo bias) for making credit histories available and the restrictions on such authorization resulted in approximately 2% of registered individuals having authorized access to their credit histories to a querier by the end of 2020.

Collection of information under the opt-out regime

According to what was reported in the meetings and questionnaires with the DBMs, the collection of positive information from some of the sources defined in Item IV of Article 2 of LC 166/2019 began in November 2019. Until the end of 2021Q1, institutions authorized to operate by the BCB were the sources responsible for the largest portion of the information in the PCR. The role of the CIP should be once more highlighted. After sending the registration data of individuals and firms, it started sending to the DBMs the credit histories on November 19, 2019, in an assisted manner, entering standard production mode in the platform hub model[11] as of December 9, 2019.

The DBMs expect to receive the information from continued telecom service providers throughout 2021. There is no expectation of incorporating most of the information from utility providers (electricity, gas, water, and sewage services). Only one DBM considers having most information from other source categories (individuals

6 In view of the obligation to communicate the registration cancellation option for all DBMs (Article 5, Paragraph VII, Item 6, II), the maximum value reported by the DBMs was considered as the number of cancellations.

7 It was not possible to determine the exact number of registrants because the BCB did not have access to the list of CPFs and CNPJs registered in each DBM, which would have allowed the elimination of multiple counts of a single person registered in several DBMs.

8 CIP is a civil organization that operates the Positive Credit Report Platform (PCPO).

9 According to Article 2 of Law 12,414/2011, as amended by LC 166/2019, a source is the natural or legal person that grants credit, manages self-financing operations or performs installment sales or other commercial and business transactions that involve financial risk, including institutions authorized to operate by the BCB and the providers of public utilities such as water, sewage, electricity, gas, telecommunications, etc.

10 According to Article 2 of Law 12,414/2011, as amended by LC 166/2019, a querier is the natural or legal person accessing information in databases for any purpose permitted by this Law.

11 In the PCPO's hub model, effective until June 2020, CIP receives the credit history files from various financial institutions and sends data to the DBMs without storing it. As of July 2020, the PCPO adopted the integrator model, in which CIP validates the information before sharing it with the DBMs, as well as enabling incremental submission of Credit History.

or firms outside the National Financial System granting credit, managing self-financing operations, or carrying out term sales or other business transactions that involve financial risk) incorporated by the end of 2020. The remaining DBMs have no expectation about incorporating information from these other sources.

Challenges in the implementation of the PCR

Despite the success in sending to DBMs data from most of the institutions authorized to operate by the BCB, and despite the expectations of expanding the PCR with information from other data sources, DBMs point out that the low engagement of data sources has generated relevant difficulties for the implementation of such database. The first difficulty is the lack of data from the utility service providers (water, sewage, electricity, gas, and telecommunications). In fact, there are no penalties provided by law for sources that refuse or extend the deadline for accreditation and submission of payment data to the DBMs. The DBMs find it challenging to receive data from utility service providers for several reasons, among which were mentioned: (i) the disregard for the importance and benefits of the PCR for society; (ii) the nonexistence of an institution that organizes and integrates the data, as CIP does for a significant number of financial institutions; and (iii) the cost for companies to prepare for data submission.

The need to include these new sources was a point of improvement cited by the queriers that are financial institutions, whether "traditional" or FinTechs. The modeling of credit scores is likely to become stronger as DBMs incorporate data from ongoing service providers. Moreover, it increases the likelihood that non-banked population will appear in the PCR and benefit from their credit history being incorporated into credit scores.

The second difficulty pointed out by the DBMs is the initial quality of the data received. According to them, sources often fail to comply with the maximum period of ten business days to update and correct information sent to managers, established in Item IV of Article 8 of Law 12,414/2011, as amended by LC 166/2019. There is also no legal provision for penalties in case of non-compliance with this and other obligations of the sources. Poor quality data affect the consumer's score unfairly, cause a higher number of disputes, and reduce the confidence of registrants and the queriers, thus deteriorating the quality of credit scoring models. According to information from the CIP, approximately 23% of the disputes had not been answered by the sources up to February 2021.

A third difficulty faced by the DBMs refers to the first submissions (at the end of 2019) of data by sources in the opt-out regime, which had a payment history of only thirteen months. Some DBMs mentioned that a track record of at least 24 months would have allowed for better delinquency assessment and the development of even more accurate credit scores.

Trading credit scores under the opt-out regime

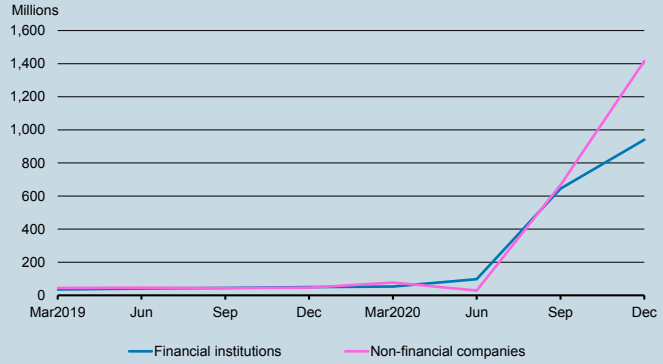
By the end of 2021Q1, half of DBMs had not traded credit scores with positive information of firms. In turn, all DBMs have traded registered scores of individuals since 2020Q1. According to the DBMs, the delay between the collection of information (November 2019) and the start of trading registers occurred due to the requirement of a minimum legal period of 60 (sixty) days after opening the registration before information could be made available to queriers.[12]

Figure 3 shows that the credit scores of registered individuals only started to be queried by the market with greater intensity in the second half of 2020. In 2020Q4, the number of queries submitted by non-financial companies to scores of registered individuals represented approximately 60% of the total. This suggests that the effects of

12 See Paragraph 7 of Article 4 of Law 12.414/2011, as amended by LC 166/2019.

the PCR are not restricted to the National Financial System (SFN) and that non-financial companies perceive value in credit scores with positive information on registered individuals. Corroborating this argument, the DBMs foresee that smaller companies will benefit the most from using the PCR, as in general they do not have enough data or specialized personnel to develop sophisticated models for credit decision-making.

Figure 3 – Quarterly number of queries to registered natural persons



Use of credit scores under the opt-out regime by querying institutions authorized to operate by the BCB

The use of credit scores was assessed through questionnaires sent together with the Quarterly Survey on Credit Conditions (PTC)[13] to institutions with the following credit segments: (i) micro, small and medium enterprises (MSMEs); (ii) consumer credit for individuals (Consumer – individual); and (iii) housing credit for individuals (Housing – individual). Expanded questionnaires were sent out to the five largest banks in the country, with a greater number of qualitative questions and other details, such as the use of information from the PCR during the opt-in period.[14] Questionnaires were also sent to some institutions not included in the PTC, to include institutions representing the digital credit niches (FinTechs) and credit unions confederations.

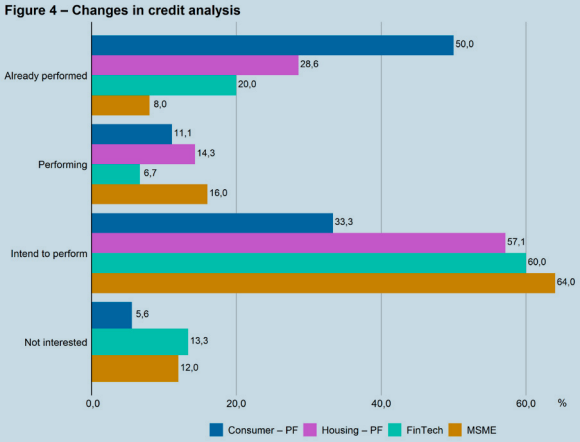
Figure 4[15] shows that the segment that more quickly incorporated information from the PCR into the credit granting process was the Consumer – individual segment. Half of the institutions that operate in this segment mentioned they had already changed their credit granting processes to incorporate information from the PCR, 11% are in the process of changing, and another 1/3 of them intend to do so. The MSME segment was the one that presented the lowest percentage of institutions already using information from the PCR. However, most of them indicate that they are adjusting to use the data or intend to do so.

13 Through the PTC, the BCB has been collecting assessments from the most representative financial institutions within each segment on the conditions of domestic banking credit since March 2011.

14 None of the five largest banks claimed to have used information from the PCR during the period in which the opt-in model was effective. One of the reasons alleged was the perception that the products available until then did not add value to the set of information they already had and were, in practice, costly to incorporate, due to the low number of registrants. Another obstacle mentioned was the significant sample bias of those registered, since it was not uncommon for DBMs to obtain registrants to the PCR during "renegotiation fairs", making the profile of those registered riskier than the average population.

15 Has your institution already made, is making or intend to make any changes in the process of analysis and granting of credit due to the availability of information from the PCR?

Figure 4 – Changes in credit analysis



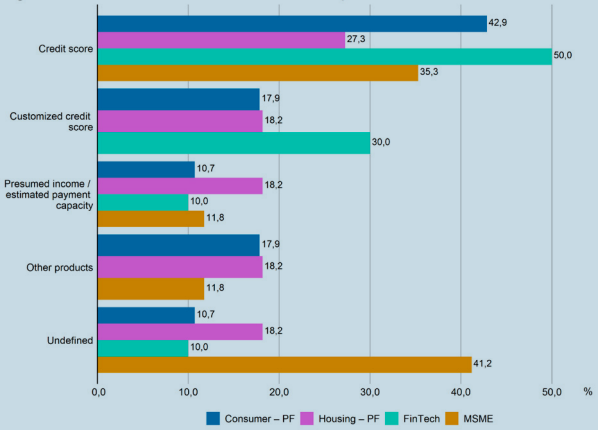
Among the institutions that have no interest in using information from the PCR – in the case of MSMEs –, 75% indicated that they use other sources for credit analysis and that available information does not add value to the analysis processes of business models. As for FinTechs, operational issues and cost of access were also indicated as important barriers.

The five largest banks reported in the extended questionnaire that they began using data in their credit analysis processes as of June 2020. They emphasized the use in the following types of Consumer – individual: credit card, non-payroll-deducted personal credit, and overdraft facility. The use of the PCR for vehicle purchases and payroll-deducted personal credit is more restricted. One may suppose that the more intensive use of the PCR in the uncollateralized loan types is due to the fundamental importance of the borrower's risk assessment.

The confederations of central credit unions informed that they either already use the PCR, or intend to do so to change the process of analysis and granting of credit.

All segments reported that the credit score is the most used product, and the use of customized scores for specific groups is also significant, especially by FinTechs. In accordance with the previous result, Figure 5[16] shows that a significant percentage of the participating institutions had not yet defined the products to be used for the MSME segment.

Figure 5 – Products used from the Positive Credit Report



16 Which credit bureau(s) does your institution use – or intend to use – information from the PCR and what would the products be? (more than one answer is possible)

Effects reported by DBMs and querying financial institutions on the inclusion of positive information in credit scores

According to estimates made by the DBMs based on December 2020 data, the inclusion of information from the PCR in credit scores resulted in 41% of the registered individuals, on average, migrating to lower risk levels. On average, 33% of registered individuals remained in the risk range. In turn, on average 26% of the registered individuals migrated to higher credit risk levels.

Two of the DBMs highlighted that individuals under 30 years of age benefited the most from having positive information scores. For them, migration to lower risk levels averaged 59%, while migration to higher risk levels averaged 16%.

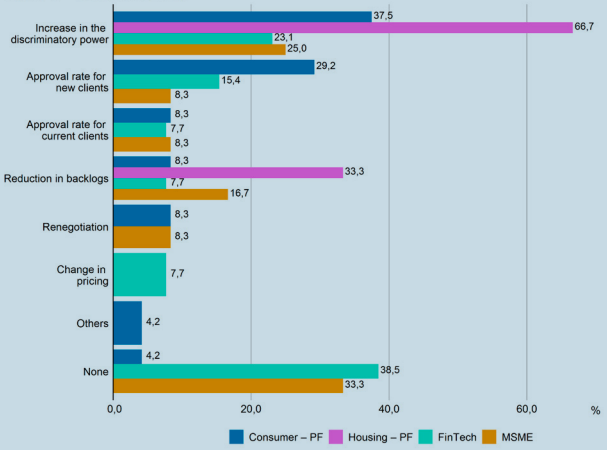
The DBMs that generate scores for firms have reported that on average 30% of them have benefited from migration to lower risk levels. About half kept their risk levels, and on average 20% were classified in higher risk levels.

The DBMs reported the Kolmogorov-Smirnov (K-S)[17] statistic values for the model with and without the information from the PCR. Each DBM used a different horizon checking for denial of credit granting. While some estimated for individuals and firms, others estimated only for the former. There was a large dispersion in the K-S changes reported, but the overall average of the statistics points to a gain of approximately 4 K-S points.

The querying financial institutions already perceive the effects of using data from the PCR, despite the short period since the trading of credit scores collected under the opt-out regime began. The analysis of the questionnaire responses indicates that the impacts were greater for traditional institutions (29.4% of FinTechs claimed there was no benefit) and in the Consumer – individual segment (only 3.7% of respondents claimed to have seen no effect in this segment).

The main effect reported by the querying financial institutions is the increased discriminatory power of the credit risk models (Figure 6[18]). The second most reported effect by the Consumer – individual segment and FinTechs was on the approval rates of credit operations for new borrowers. The Housing – individual and MSME segments highlighted the reduction in overdue installments.

Figure 6 – Observed effects

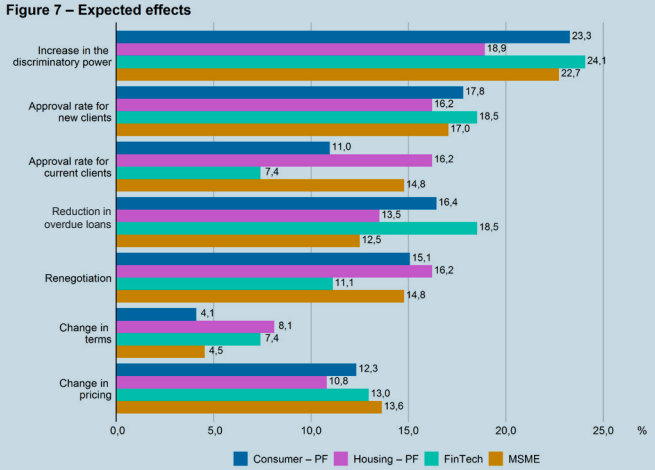


17 The K-S statistic is a statistical test that compares the cumulative distribution of two variables: in this case, the scores of "good" and "bad" payers). To this end, one considers the greatest distance between the curves of these distributions. Thus, the greater the value of this statistic, which is limited within the interval [0, 1], the greater the degree of discrimination of the model; that is, the greater the ability of the model to differentiate the "good"from the "bad" payers. The K-S calculation using the score without the information from the PCR showed lower values than those observed with the use of this information.

18 What effect(s) does your institution already observe related to the use of information from the PCR? (more than one answer is possible)

Compared with the higher concentration of already observed types of effects, Figure 7 shows[19] a greater dispersion of the effects expected from the full use of the PCR information. In other words, besides the increase in discriminating power, queriers expect effects on new and current customer approval rates, reduction in overdue loans, renegotiation, and pricing.

Figure 7 – Expected effects



However, when asked about the types of credit whose interest rates are expected to be most affected by the full incorporation of information from the PCR, most of their responses indicated the Personal Loans.

Considering the profile of the registrants, the querying financial institutions foresee that micro-enterprises, individual micro-entrepreneurs and low-income individuals tend to be the ones that will benefit the most when the PCR is fully implemented.

While this is not a reality, queriers in the MSME segment report greater benefits for small companies, followed by micro-enterprises and individual microentrepreneurs (MEIs) (Figure 8a[20]). However, the results observed are still below the expected potential for all profiles. Queriers from the Consumer – individual segment observe a greater benefit for lower income registrants, while those from the housing segment, despite expecting greater benefits for this income range upon full implementation of the PCR, so far observe benefits for higher income registrants (Figures 8b and 8c).

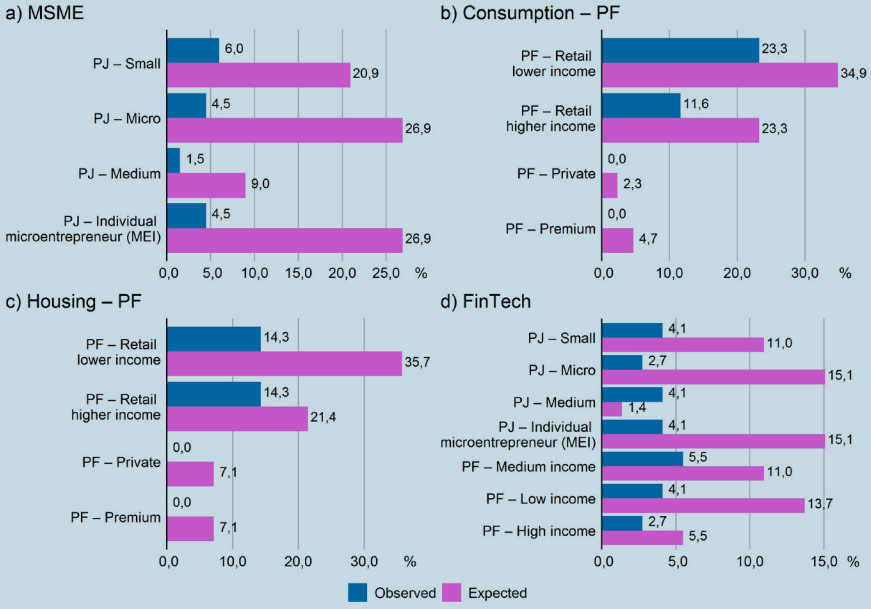
In line with the results of the other segments, FinTechs expect that low-income individuals, micro-enterprises and MEIs will benefit the most from the full operation of the PCR (Figure 8d). At the current stage of development, however, the profile for which results are mostly observable is middle-income individuals.

The financial institutions have diverse views on the observable benefits of the PCR for society in general. For some, it is still too early to observe major effects on society. Others already perceive an incipient movement of greater credit access and supply and of individuals and firms seeking to better understand credit scores to use them to obtain more favorable conditions regarding terms and rates. This should foster greater financial awareness, since all the information history and payment habits are used in the construction of credit scores.

19 What result(s) does your institution expect to see after the full use of information from the PCR? (more than one answer is possible)

20 Questions regarding this data:
Question 5. The results currently observed are most relevant to: (more than one answer is possible)
Question 8. After the full use of information from the PCR, the results observed will be more relevant to: (more than one answer is possible)

Figure 8 – Relevance of expected and observed effects by agent type



Corroborating this scenario of an improved financial awareness, some DBMs report that the registered individuals have queried their own credit scores frequently. When inconsistencies are identified, the DBMs are questioned. From July 2019 to February 2021, approximately 766,000 disputes were opened. Of those, about 178,800 have not yet been resolved by the data sources. This indicates that registrants realize the value of closely monitoring how the score responds to the dynamics of their financial behaviors and demand that errors be corrected.

Conclusions

Complementary Law 166/2019, of April 8, 2019, amended Law 12,414, of June 9, 2011, which authorized the formation of databases with default information of individuals and firms for the formation of credit history (PCR), instituting the opt-out regime.

There has been a significant increase in the number of registrants under the opt-out regime, but the implementation process of the PCR is still incomplete. The reasons are: (i) many sources defined in LC 166/2019 do not yet submit data to the DBMs; (ii) only two of the four DBMs traded credit scores to firms at the end of 2020; (iii) the start of trading PCR scores of individuals occurred in 2020Q1, concomitant to the Covid-19 pandemic and the consequent economic crisis; and (iv) credit scores based on the PCR are not yet fully incorporated into the credit granting processes of financial institutions.

Although the full implementation of the PCR has not yet been fulfilled, institutions that use credit scores based on it – large banks, confederations of cooperatives, and other financial institutions that operate in the consumer credit segment – already mention effects such as increased discriminatory power of credit risk models and increased approval rates for new borrowers.

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THALER, Richard and SUSTEIN, Cass (2008). *Nudge*: How to make better decisions about health, money, and happiness Penguin Books Ltd.

Analysis of the Positive Credit Report effects[1]

Introduction

Pursuant to Article 5 of Complementary Law (LC) 166 of April 8, 2019, and for the purposes of a legislative reevaluation, the Banco Central do Brasil (BCB) was requested to submit to the Brazilian National Congress a report on the results achieved by the Positive Credit Report (PCR), focusing on whether the banking spread has reduced or increased. This box reports an empirical study of the effects of the PCR, using confidential databases available at the BCB – subject to financial privacy – and at Database Managers (DBMs) – subject to commercial confidentiality. The DBMs shared a sample of 200 thousand CPFs with BCB exclusively for this analysis of the effects of the PCR.

The PCR was created by Law 12,414 of June 9, 2011, which authorized the establishment of databases with information on the credit performance of individuals and firms for the storage of credit histories. Under this legislation, every person had to deliberately opt-in to have their data included in the PCR (opt-in regime). However, the hurdles in obtaining a large enough number of registrants motivated the Law 166/2019, in which the default situation is now to be included in the PCR, unless one expresses the desire to leave it (opt-out regime). The new default situation acts as a strong incentive to keep people in the PCR. Nevertheless, it is important to remark that in either regime, opt-in or opt-out, freedom of decision is maintained as individuals and firms have the right to choose to take part or not in the PCR.

The implementation of the PCR is not yet fully completed, and most of the information used in the models that define the credit scores comes from institutions authorized to operate by the BCB. Data from utility providers (telecommunications, electricity, gas, water, and sewage) are not yet incorporated into the PCR. Due to the procedures required for the implementation of the PCR,[2] only in the second half of 2020 it was possible to query more intensely the credit scores with positive information of individuals registered. However, the usage of the PCR information for the purposes of granting credit by financial institutions was quite heterogeneous. According to reports from surveyed financial institutions, consumer credit for individuals was the segment that more rapidly incorporated information from the PCR. In turn, although most surveyed institutions have expressed interest in using the new positive information for micro, small, and medium enterprises (MSME), most of them pointed out that they are still adjusting be able to use this data or intend to do so in the future.

Considering that the implementation of the PCR is still in progress, the empirical analysis focused on non-payroll deducted personal loans to individuals (a credit type to the Consumer – individual segment) and considered new borrowers from each financial institution, even if they were not new in others. Such credit type choice derives from two factors. The first one is its wide usage. The second is that it is a credit type without collateral.[3] The absence of collateral makes the borrower's risk assessment crucial since the creditor cannot mitigate any loss

1 The full report on the analysis of the *Cadastro Positivo* (Positive Credit Report) is available at https://www.bcb.gov.br/content/publicacoes/Documents/outras_pub_alfa/analise_dos_efeitos_do_cadastro_positivo.pdf.
2 For more details on the implementation of the PCR, see box "Analysis on the implementation of the Positive Credit Report", in this Report.
3 Any operations with guarantees or collateral were eliminated.

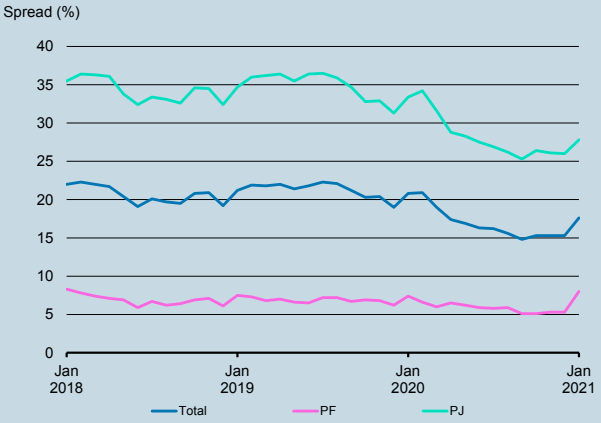
through default by executing the collateral. Therefore, it is reasonable to assume that the impact of the additional information of the scores based on the PCR is more relevant for credit operations without collateral.[4] The focus on operations for new borrowers is explained by the fact that financial institutions usually keep detailed historical records on past loan and payments of their old (or current) borrowers. These histories represent, in fact, the largest mass of positive data received by DBMs in the sample period of this analysis. Therefore, the additional informational value of the scores based on the PCR should be greater for new borrowers than for those with whom the financial institution already has an established relationship.

Identification Strategy

As mentioned earlier, only in the second half of 2020 the credit scores[5] with positive information of registered individuals started to be queried by market participants with greater intensity, amid the Covid-19 pandemic crisis.

Thus, despite the reduction in the banking spread for households and firms after February 2020 (Figure 1), this reduction cannot be attributed solely to the PCR. To identify the effects of the opt-out version of the PCR, it is necessary to build a strategy to compare what is observed (factual) with what would be observed in the absence of the legal change (counterfactual). If well designed, this strategy reduces confusion caused by concomitant phenomena that are not due to the adopted changes and that could lead to wrong conclusions.

Figure 1 – Evolution of the bank spread



For the purposes of this analysis, credit scores offered to the market before the implementation of Law 166/2019, which did not include information from the PCR, are called old scores. These scores were based on information collected directly by the DBMs, mainly negative credit information registered with them by financial institutions, retailers, and utility providers (telecommunications, electricity, gas, water, and sewage, among others). On the other hand, we refer as new scores the credit scores produced after the incorporation of information from the PCR under the opt-out regime.

To identify the effects on the spread resulting from the use of information from the PCR by financial institutions, we compare interest rates of credit operations granted to borrowers that held a new score with those granted to quite similar borrowers whose new scores were not available yet. This strategy allows drawing a counterfactual about how interest rates would have behaved if change to the opt-out regime would have not occurred. Specifically, the effect of the regime change could be measured, on average, by comparing interest rates obtained by borrowers using PCR information with that obtained by quite similar borrowers without the same information.

4 Additionally, according to a survey among financial institutions, 44.4% of them indicated that personal credit would be one of the credit types for individuals with interest rates mostly affected by the PCR. As for credit for MSMEs, working capital was mentioned by 12% of respondents.

5 "Score" is used in this section as this is the term commonly used by DBMs.

To improve the comparison between these two groups of borrowers, we used several variables as control, especially the old score. This variable allows, for instance, to compare interest rates of credit operations for a borrower with an old score[6] of 650 points, but that, after the PCR, increased to 700 points, with another borrower with the same old score of 650, but whose new score is not being traded yet.

The main estimated equation (1), which incorporates the points just remarked, is represented below:

$$\ln(r_{ibt}) = \alpha + \beta * \mathbf{1}(info\_p_i) + \gamma * score\_o_{it} + \theta_{bt} + \pi_{mt} + \mathbf{X_{ibt}}\boldsymbol{\lambda} + \varepsilon_{ibt} \quad (1)$$

where i is the index that identifies the individual, b the lending financial institution and t the period (month) of the loan granting. The variable $\ln(r_{ibt})$ represents the logarithm of the nominal interest rate. The function $\mathbf{1}(info\_p_i)$ assumes the value 1, if there is a new score is available from at least one DBM for the individual in the sample period[7] and 0, otherwise. The variable $score\_o_{it}$ represents the average of old scores calculated by DBMs for the registered individual i, in period t (using only information not included in the PCR). The term θ_{bt} represents the fixed effect of the financial institution in period t, which captures all observable and unobservable effects relative to the credit supply, including funding costs. Similarly, π_{mt} represents the fixed effect of municipality m in period t and controls for the local demand conditions, including higher or lower credit appetite due to restrictions to mobility and economic activity during the pandemic. Controls and additional fixed effects are represented by the matrix $\mathbf{X_{ibt}}$. In equation (1), the coefficient of interest is β, which captures the average effect of the information contained in the PCR on the banking spread.

Although the dependent variable of the equation is the interest rate logarithm, this specification allows to identify the effects on the spread due to the inclusion of fixed effects of financial institutions over time. Indeed, the impacts of the funding cost and changes in the forward interest rate structure are controlled by such fixed effects, since they are not expected to change when operations granted in the same period by the same financial institution are considered.[8,9]

The possibility of borrowers obtaining distinct interest rates according to the value of the new score effectively observed was also investigated. For this, the difference between the new and old score of each client – informed by each DBM – was calculated. The average of these differences for each registered person represents the innovation about the creditworthiness brought about by the information from the PCR.[10] The individuals in the sample were grouped into quartiles defined according to this innovation about the creditworthiness. For each score difference quartile, a coefficient analogous to β in equation (1) was estimated, allowing the evaluation of heterogeneous effects among these groups, always measured against the group of borrowers whose new scores have not been traded yet:

$$\ln(r_{ibt}) = \alpha + \sum_{q=1}^{4} \beta_q d_{qi} + \gamma * score\_o_{it} + \theta_{bt} + \pi_{mt} + \mathbf{X_{ibt}}\boldsymbol{\lambda} + \varepsilon_{ibt} \quad (2)$$

where d_{qi} assumes the value 1 when the individual belongs to the quartile q, and zero otherwise.

We considered as controls in equations (1) and (2) those variables relative to gender (assuming the value 1 for female and 0 otherwise), age and income in logarithm of the borrower, loan maturity in days and loan amount in logarithm, in addition to fixed effects relative to the nature of the credit operation and to the ordinal risk classification of the loan according to the regulatory scale of Resolution CMN 2,682, of December 22, 1999.

6 DBMs estimated old scores for these borrowers exclusively for this study.
7 Changes of this measure for the same individual in the sample period occurred rarely, due to the short time period since Law 166/2019.
8 The analyses is restricted to operations with non-earmarked funds, thus eliminating concerns about the variation of funding costs of operations with different funding sources.
9 These fixed effects also control for the influence of any variable defined at the bank level in each time interval, including components of the spread itself, such as administrative costs, delinquency of the entire portfolio, and other characteristics of financial institutions.
10 In this equation, the $score\_o_{it}$ is an average that considers only DBMs that informed a new score for the individual.

Database

The database employed in this analysis was built by joining information from the Credit Information System (SCR)[11] and the new and old scores calculated by DBMs,[12] for a sample of 200 thousand CPFs requested by BCB exclusively for analyzing the effects of the PCR. Both scores refer to the first days of August 2019 and of the months of August 2020 to December 2020.

Estimates were carried out based on a sample of household members aged more than 18 years old who borrowed personal non-payroll-deducted loans for the first time in some financial institution in August 2019 (2,100 people) or between August and December 2020 (6,222 people).

Variables depicted in equations (1) and (2) and controls previously mentioned were built based on several data sources. The main source was the SCR, from which the following data were extracted: lending institution, interest rates, existence of guarantees, whether the borrower is new or old in the financial institution, income or revenue, borrower's outstanding credit in the financial institution, loan amount granted and maturity.

The Brazilian Federal Revenue Office database provided information about borrower's municipality of residence, gender, and age.

Results

DBMs provided the BCB with measures of new and old scores. As previously explained, the identification strategy is based on the comparison (within the same financial institution and month) of rates obtained by borrowers for whom new scores were available for sale with those obtained by borrowers whose new scores were not available for query by potential lenders.

Table 1 estimates the average effect of the existence of information from the PCR on the spread paid by borrowers on personal non-payroll-deducted loans with non-earmarked funds. In column (1) a model is fitted using several control variables, especially the old score, as well as the fixed effects of municipality, financial institution, and period. The coefficient of interest is statistically significant at 5% and indicates an average reduction of spreads of 7.1%. Subsequently, in column (2), by allowing that the fixed effects of financial institution and municipality vary over time (in a more saturated specification), we obtain a coefficient that indicates an average reduction of spreads of 10.4% and statistically significant at the 1% level. This reduction corresponds to spreads lower by approximately 31 p.p., when considering the average interest rate of 299% p.a. observed in this sample of operations.[13]

11 SCR is a credit register managed by the BCB and monthly sourced by financial institutions since 2003. The system stores individualized information on each credit operation and the contracted guarantees of clients whose direct risk in some financial institution (sum of credit operations, inter-financial on-lending, co-obligations and limits, credits to be released) is equal to or higher than BRL 200.00 (two hundred Brazilian *reais*). The regulatory basis is Resolution 4,571, dated May 26, 2017. The register is subject to financial privacy.

12 The scores are property of DBMs and subject to commercial confidentiality.

13 Table 1 also highlights a weakness of the identification strategy adopted, because of the small participation of the control group in the sample, around 5%. It would be better if this group were larger. It is noteworthy, however, that this is the result of the process of the implementation of the PCR itself, given that the greater deal of information comes from credit transactions histories within the SFN and that new borrowers in one institution usually have previous transactions with other financial institutions.

Table 1 – Average effect of information from the Positive Credit Record on the bank spread
Natural persons, new clients in the financial institution[1/]

	(1) August to December 2020 ln(interest rate)	(2) August to December 2020 ln(interest rate)	(3) August 2019 ln(interest rate)
1[info.Positive Credit Record]	-0,071**	-0,104***	-0,058
	(0,032)	(0,040)	(0,086)
old score	-0,000***	-0,000***	-0,000*
	(0,000)	(0,000)	(0,000)
Controls	yes	yes	yes
Fixed effects			
municipality	yes		yes
period	yes		yes
financial institution	yes		yes
financial institution x period	no	yes	no
municipality x period	no	yes	no
Observations	5,294	3,904	1,538
R2	0,83	0,85	0.90
Supplementary statistics			
Number of financial institutions	92	54	35
Number of municipalities	797	454	295
Number of months	5	5	1
% treated	95%	95%	98%
Average rate (% p.a)	295	299	392

1/ Standard deviations in parentheses
* p < 0,10; ** p < 0,05; *** p < 0,01

However, according to the analysis carried out so far, we cannot rule out completely the existence of characteristics not captured by the control variables that are correlated with the availability of information from the PCR or with the quartile of the score differences. One such example would derive from a situation where financial institutions could use borrowers' characteristics so informative as the new score (and correlated with it) without necessarily paying for it. In this case, the econometric analysis would be limited by the availability of data on borrowers within the BCB, which does not reflect the whole information available to financial institutions about these same clients. Omitted information in the econometric model may generate a bias of known direction, *i.e.*, an overestimation of the causal effects related to the adoption of the PCR.

To test the overestimation concern, we carried out a similar estimation exercise, using data for August 2019 – a placebo period – when the new scores had not been sold yet. This counterfactual score for 2019 was produced by DBMs to support this analysis. If the average spread reduction found for borrowers with positive information stemmed from other information not observable in the econometric model but available to financial institutions, a negative and statistically significant coefficient should be found also in August 2019, when the new scores were not yet sold.

Column (3) of Table 1[14] shows, as expected, that the existence of information from the PCR, before it is made available to the market through the new scores, is not negatively correlated with spreads in a statistically significant way. This reinforces the interpretation that the drop in spreads observed for the better evaluated borrowers' results from information sharing made possible by the PCR and not from variables omitted from the specification.

14 Since this regression corresponds to only one period, there is no time variation in this subsample.

Table 2 – Descriptive statistics by quartile

	August to December 2020						August 2019					
	Old score			Score difference			Old score			Score difference		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Score quartile:												
Q1	426.7631	143	920	-39.3	-252.3	6.7	443.9	199.3	761	-41.0	-123.0	2
Q2	421.8393	101	828	33.7	7.0	57.3	413.8	199.3	761	24.8	1.7	49
Q3	404.8681	168.7	785.5	82.4	57.5	109.0	396.4	199.3	761	73.9	49.5	103
Q4	402.169	167.7	708	155.4	109.3	444.5	393.8	199.3	730	155.0	103.5	245

Table 3 – Heterogeneous effects of the new score on bank spread
Natural persons, new clients in the financial institution[1/]

	(1) August to December 2020 ln(interest rate)	(2) August to December 2020 ln(interest rate)	(3) August 2019 ln(interest rate)
Quartile of score difference:			
Q1	-0,043	-0,065	-0,062
	(0,034)	(0,042)	(0,087)
Q2	-0,046	-0,092**	-0,019
	(0,034)	(0,042)	(0,087)
Q3	-0,081**	-0,122***	-0,128
	(0,034)	(0,042)	(0,087)
Q4	-0,126***	-0,159***	-0,103
	(0,034)	(0,043)	(0,088)
old score	-0,000***	-0,000***	-0,000*
	(0,000)	(0,000)	(0,000)
Controls	yes	yes	yes
Fixed effects			
municipality	yes	no	yes
period	yes	no	yes
financial institution	yes	no	yes
financial institution x period	no	yes	no
municipality x period	no	yes	no
Observations	5,294	3,904	1,549
R2	0,83	0,85	0.90
Supplementary statistics			
Number of financial institutions	92	54	35
Number of municipalities	797	454	298
Number of months	5	5	1
% treated	95%	95%	98%
Average rate (% p.a)	295	299	392
p-value test Q2-Q1	0.8541	0.2555	0,1755
p-value test Q3-Q1	0.0509	0.0155	0,0335
p-value test Q4-Q1	0.0000	0.0002	0,1973

1/ Standard deviations in parentheses
* p < 0,10; ** p < 0,05; *** p < 0,01

Due to the reduced number of borrowers without new scores in the sample, the analysis of the intensity of the innovation represented by the PCR, according to equation (2), becomes more relevant. As explained in section 2, registered borrowers were grouped into quartiles, according to the value observed for the difference between new and old scores (Table 2). The first quartile of score differences comprise borrowers for whom the information provided by the PCR caused a worsening in credit quality. Column (1) of Table 3 shows that for this group there were no statistically significant differences in the spread relative to the control group. To make the analysis more robust, tests of equality between the coefficient of this first quartile and the coefficient of the upper quartiles are performed,[15] thus making comparisons between sets with similar number of borrowers. The more complete specification of column (2) shows that the reduction in the spread observed in relation to the group of

15 The p-values of these equality tests are shown in the last three lines in table (2).

borrowers with no new scores available gets stronger along the quartiles with the best score revaluations. Thus, the quartile with the highest score differences reaches an average spread reduction of 15.9% (or approximately 40 p.p. when considering the average rate of 257.0% for this specific group). In the comparison with the first quartile, the second quartile coefficient is not statistically different. However, the third and furth quartiles are statistically different from the first quartile at 5% and 1%, respectively. This indicates that borrowers who had a significant improvement in credit evaluation with Law 166/2019 obtained credit operations with significantly reduced spreads, and this result does not depend on the number of borrowers without new scores.

Column (3) shows results from the estimation exercise using August 2019 data (placebo period) considering the quartiles of differences between scores. Similarly, to what was shown in model (1), there are no effects in the placebo period, reinforcing the interpretation that the effects observed come from the implementation of the PCR and not from variables omitted from the specification.

Therefore, the results on the relationship between spreads and scores show evidence that the information from the PCR probably led to a drop, on average, in spreads for new customers of personal loan operations, in the period from August to December 2020. This drop was statistically significant and economically relevant for those borrowers whose new score was better than the old score. One should note that the sample period chosen included the Covid-19 pandemic, which hinders generalization of results to other periods.

An additional relevant question is whether the scores can be used to predict default for the loans in this sample. The relationship between scores and interest rates becomes irrelevant if the scores have no predictive power over default. For assessing the relationship between scores and default in this sample, it was necessary to narrow the sample to loans made in August 2020, and to verify the existence of arrears in December 2020, i.e., four months after origination. Any unpaid installment for more than 15 days was considered to be in arrears. The Kolmogorov-Smirnov (K-S)[16] statistic was calculated for the old score and the new score for each bureau. In this sample, both the new and old scores were able to discriminate between loans in arrears, with the new score having a higher K-S statistic than the old score for all bureaus. The results in this sample are consistent with what was reported by the DBMs. Therefore, there was evidence of superior discriminatory power of the new score, based on information from the PCR, compared to the old score.

Conclusion

The PCR was created by Law 12,414 of June 9, 2011, which authorized the building of databases with information on the credit performance of individual and firms for the storage of credit histories. Complementary Law 166/2019, of April 8, 2019, established the opt-out regime and by doing so encouraged people to stay within the PCR, even though they were guaranteed the individual right to choose to be included or not. With this new regime, the number of registered participants increased over 15 times, but this rise did not occur until November 2019, due to regulatory requirements and operational issues.

The implementation of the PCR is still incomplete. So far, most of the information used in the models that define the credit scores comes from institutions authorized to operate by the BCB. Information from telecommunications providers is still missing, as well as much of the information from other sources, such as electricity and gas providers.

16 The K-S statistic is a statistical test that compares the cumulative score distributions of "good" and "bad" borrowers. To this end, it considers the greatest distance between the cummulative-distribution functions. Hence the higher the value of this statistic, which is bounded in the range [0, 1], the higher the degree of discrimination of the model. The K-S statistics using the score without the information from the PCR showed lower values than those computed with the use of this information.

An empirical study was conducted based on confidential databases available at the BCB and databases prepared by the DBMs for the period from August to December 2020. It indicates that Law 166/2019 resulted in an average drop of about 31 p.p. in spreads on non-payroll deducted personal credit operations for new borrowers with scores based on the PCR, compared to those who did not have them. Furthermore, the spread reduction was statistically significant and economically relevant for those new borrowers whose assessment of good credit quality intensified more because of the inclusion of information from the PCR in the credit score.

Among the main limitations of this empirical study is the coincidence of the sample period with the Covid-19 pandemic, which hinders generalization of results to other periods. In addition, the identification strategy is based on the availability of the scores with information from the PCR, but not on the effective use of these in the credit granting processes of the financial institutions themselves. As more financial institutions incorporate these scores into their internal processes, it is possible that the effects found in this analysis will intensify. The BCB will continue to monitor the evolution of the PCR, assessing, to the extent possible, the impact of these effects on other credit types and customer profiles.

Pix: the new Brazilian instant payment scheme

On November 16, 2020, Pix became a new alternative for payments and financial transfers for Brazilian citizens, businesses, and government entities. Pix is an instant payment scheme created by the Banco Central do Brasil (BCB), which sets the rules and procedures related to the provision of instant payment services. Pix adds to cash, checks, other credit transfers means of payments (TED, DOC, and *boleto*), and credit, debit and prepaid cards, to compose the portfolio of means of payments available to the Brazilian population.

Pix is a digital means of payment that allows the transfer of funds among different participant institutions from one account to another. It bears eight main features:

a) instant funds availability for the beneficiary account: funds are credited within 10 seconds in 99% of transactions and within 6 seconds in 50%;

b) full-time availability: Pix is available 24 hours every day, all year long, including non-business days;

c) multiplicity of use cases: Pix potentially meets any payment or transfer made in Brazil, including transfers between persons, purchases of goods and services in stores and in the e-commerce and m-commerce, transfers between businesses, payment of invoices, including those related to public services, and payments involving government entities, both for the purpose of fulfilling their obligations and for the collection of taxes;

d) convenience: for citizens, a Pix transaction is typically initiated on smartphones, making it easy, simple, and intuitive, either by using a Pix key[1] or by scanning a QR code;

e) easy reconciliation and automation of processes for payees: Pix allows relevant transaction information to flow within the payment order (through ISO 20022 standardized messages), enabling increased efficiency in internal procedures for businesses that need to reconcile payments received;

f) open and competitive environment: by the end of December 2020, 735 participants had successfully joined Pix, representing a multiplicity of players, such as traditional banks, emerging banks (aka "digital banks"), credit unions, other financial institutions, and FinTechs, including non-banks that do not require BCB authorization to operate;

g) safe environment: Pix has three safety dimensions:

- user digital authentication: any transaction, including those related to user-handling of Pix keys, can only be initiated in a secure environment accessed through a password or other security features integrated into the smartphone, such as biometric and facial recognition;

1 A Pix key is an alias (mobile number, e-mail, individual taxpayer identification number or corporate taxpayer registry, or a random alphanumeric code) that turns the identification of the beneficiary's data account straightforward.

- transactions information run encrypted in the National Financial System Network (RSFN), which is a network entirely segregated from the Internet where all the transactions of the Brazilian Payment System (SPB) take place. All Pix participant institutions must issue security certificates to be able to operate on this network. In addition, all transaction information and personal data linked to Pix keys are encrypted and stored in the BCB's internal systems; and

- Pix operating rules: Pix's regulatory framework provides for measures that mitigate the risk of fraud, such as: (i) participant institutions may set maximum value thresholds based on their clients' risk profile; (ii) differentiated time limits for transaction authorization by the participant institutions, when unusual transactions – those highly indicative of fraud – are initiated by their clients; (iii) central information shared with all participant institutions about Pix keys, account numbers and CPF/CNPJ that have been involved in fraudulent transactions; and (iv) Dynamic QR code generation allowed only for participant institutions that send specific security certificates to the BCB; and

h) low cost: Pix initiation for individuals is always free. Although fees are allowed for both the initiation and the receiving of funds in Pix, fees are expected to be low for businesses, as a result of the open and competitive environment and the existence of few intermediaries in the payment chain.

Due to these characteristics, the BCB understands that Pix can bring about several benefits to the Brazilian population.

For payers, Pix is the means of payment that most resembles regular cash. For payees, the speed with which the resources become available is noteworthy. Pix is the only digital means of payment with this characteristic. This speed improves cash management for persons, businesses, and government entities, decreasing their need for credit. In addition, Pix enables significant efficiency gains for businesses and government entities by facilitating their payments reconciliation, process automation, and system integration. Finally, Pix tends to have a lower acceptance cost than other means of payments.

For the Brazilian economy, Pix contributes:

a) to increase market efficiency via digitalization of means of payment, given the relative reduction in cash use, which is the means of payment with the highest social cost;

b) to increase competition in the SPB by allowing the entry and participation of several institutions, including institutions that do not require BCB authorization to operate, and to give equal competitive conditions to all of them;

c) to increase competition in the retail payments market by becoming a direct competitor to other payment schemes, notably credit, debit, and prepaid cards;

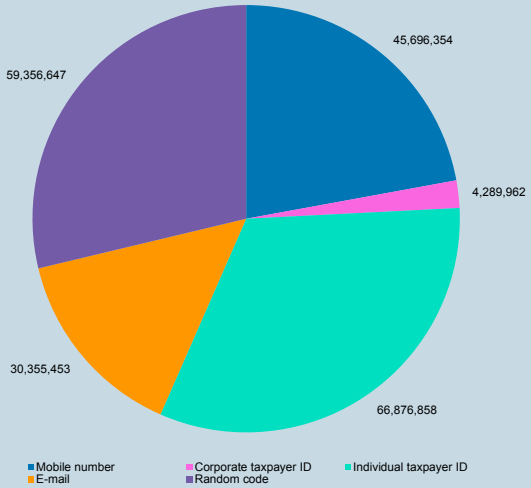
d) to encourage financial inclusion, by providing an inexpensive digital payment service that can be offered by several institutions that operate in niches poorly served by the traditional institutions of the National Financial System (SFN); and

e) to increase efficiency in some processes that, to be initiated, need notification of the credit on the payee's account, such as e-commerce transactions. Pix's speed significantly accelerates these processes.

Despite the short time it has been available to the public, Pix has already been widely used. On March 31, 2021, just four and a half months after its launch, 206.6 million Pix keys were registered (Figure 1). In fact,

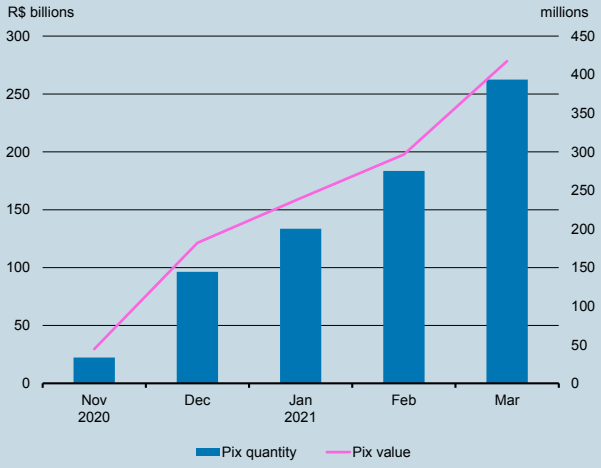
75.6 million individuals and 5.0 million firms had already registered at least one Pix key, while the number of individuals and firms that had already initiated at least one Pix was at 53.0 million and 4.1 million respectively. From a beneficiary's perspective, 58.4 million natural persons and 4.1 million firms had already received at least one Pix.[2]

Figure 1 – Distribution of Pix keys by key type



Regarding transactions, between November 2020 and March 2021, 1.0 billion Pix transactions had already been made, which amounts to a total of BRL 787.2 billion (Figure 2). 79.9% of the number of transactions were carried out between individuals (P2P). This share drops to 44.3% when the value of transaction is considered. Transactions between firms (B2B) represented 35.7% of the total value transacted in the period. Transactions initiated by individuals and received by firms (P2B), which generally characterize purchase transactions, represented 9.1% and 8.0% of the total, in terms of quantity and value, respectively.

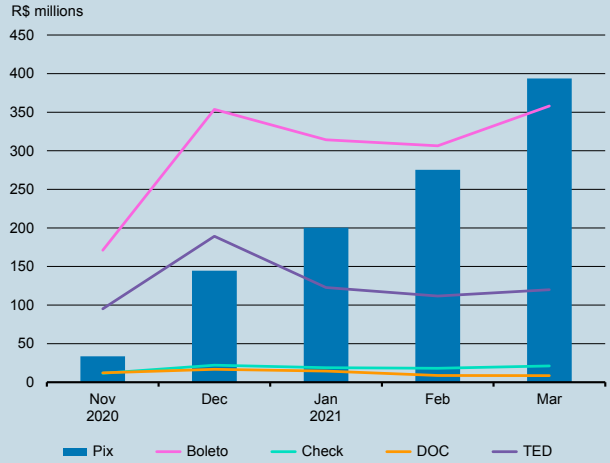
Figure 2 – Pix transactions



Compared to other means of payment, the use of Pix has been growing every month and is already larger than the use of TEDs and DOCs combined (Figure 3). In March, the number of Pix transactions surpassed the number of *boletos* paid.

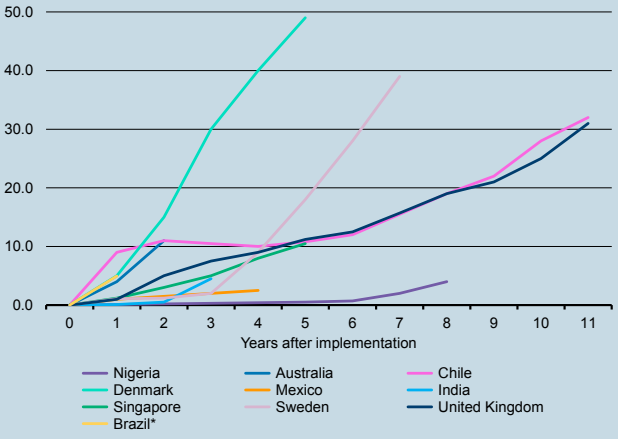
2 Updated data about Pix is available at https://www.bcb.gov.br/estabilidadefinanceira/estatisticaspix

Figure 3 – Pix and other instruments



Pix's high usage becomes even more evident when its adoption rate, defined as the number of transactions per inhabitant in the country, is compared with that of instant payment schemes in other countries. In its first year, considering only five months of data, Pix is the second fastest adopting instant payment scheme among the identified countries (Figure 4). Given the monthly growth rate of Pix usage, the Pix adoption rate is expected to be the highest ever identified when full data for the first year after implementation is available.

Figure 4 – Adoption rate of instant payment schemes in other countries (transactions number per capita)



* Data from November 2020 to March 2021
Source: Bech, Hancock e Zhang (2020) and BCB (data for Brazil)

In short, the BCB understands that the high usage of Pix in such short time indicates that the Brazilian population in general has been very receptive to this new means of payment. Its increasing adoption, including a growing usage variety, has contributed to building a more competitive, efficient, inclusive, and secure retail payments market.

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 2020.

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 there are installments overdue for more than 90 days. 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) at: <http://www.bcb.gov.br/fis/crc/ftp/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 R$200.00[1] 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 R$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.

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.

1 In force since June 2016, as per Circular 3,567 of December 12, 2011, modified by Circular 3,786 of March 10, 2016.

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): 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: the equivalent to the total of the outstanding portfolio, and includes both overdue and not yet due installments, excluding operations accrued as losses. The outstanding 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 – Chapter 1

Table A – Household credit balances by federal unit

R$ million

	Dec 2018	Dec 2019	Dec 2020	Variation (%)			
				2018	2019	2020	Average
Total – Brazil	1,803,027	2,017,046	2,242,450	8.6	11.9	11.2	1055.0
North	88,358	102,304	116,626	9.9	15.8	14.0	1324.1
Acre	4,464	5,199	5,971	11.8	16.5	14.8	1436.3
Amapá	4,337	4,973	5,582	4.3	14.7	12.2	1039.4
Amazonas	15,398	17,995	20,096	8.7	16.9	11.7	1242.4
Pará	33,100	38,689	43,990	9.6	16.9	13.7	1340.2
Rondônia	16,101	18,802	22,122	15.0	16.8	17.7	1648.8
Roraima	3,623	3,998	4,468	7.1	10.3	11.8	974.9
Tocantins	11,335	12,649	14,398	8.1	11.6	13.8	1118.7
Northeast	289,189	325,712	357,127	9.1	12.6	9.6	1046.8
Alagoas	17,131	19,152	20,893	7.2	11.8	9.1	937.3
Bahia	75,871	84,919	92,642	9.1	11.9	9.1	1002.7
Ceará	41,227	47,084	52,523	9.4	14.2	11.6	1171.0
Maranhão	30,636	34,556	38,638	10.2	12.8	11.8	1159.1
Paraíba	25,148	28,203	30,921	10.6	12.1	9.6	1079.2
Pernambuco	46,893	53,729	58,910	11.1	14.6	9.6	1177.0
Piauí	15,142	17,319	19,015	8.7	14.4	9.8	1094.5
Rio Grande do Norte	22,584	24,628	26,530	6.0	9.1	7.7	759.9
Sergipe	14,556	16,121	17,055	5.8	10.8	5.8	744.7
Central-West	234,811	265,054	301,918	10.3	12.9	13.9	1236.2
Federal District	50,726	55,225	61,063	4.1	8.9	10.6	786.1
Goiás	85,173	96,282	109,207	11.0	13.0	13.4	1247.7
Mato Grosso	60,361	69,658	81,822	14.3	15.4	17.5	1572.0
Mato Grosso do Sul	38,550	43,890	49,826	11.4	13.8	13.5	1291.7
Southeast	823,606	917,340	1,014,066	8.1	11.4	10.5	999.8
Espírito Santo	29,847	32,189	34,451	5.4	7.8	7.0	675.1
Minas Gerais	172,549	190,859	211,842	7.4	10.6	11.0	965.9
Rio de Janeiro	133,920	150,832	164,075	7.7	12.6	8.8	970.9
São Paulo	487,289	543,459	603,699	8.6	11.5	11.1	1039.8
South	365,344	405,089	451,273	8.2	10.9	11.4	1014.4
Paraná	139,116	154,746	172,638	7.9	11.2	11.6	1024.5
Rio Grande do Sul	140,734	155,207	171,718	7.9	10.3	10.6	960.3
Santa Catarina	85,494	95,137	106,917	8.9	11.3	12.4	1086.9
Unidentified	1,720	1,546	1,439	-13.3	-10.1	-6.9	-1012.2

Table B – Household credit density by federal unit (volume of credit per capita)

R$

	Credit density in 2018	Credit density in 2019	Credit density in 2020	Variation (%)			
				2018	2019	2020	Average
Total – Brazil	8,671	9,669	10,715	8.5	11.5	10.8	10.3
North	4,860	5,551	6,246	8.5	14.2	12.5	11.7
Acre	5,136	5,895	6,675	6.7	14.8	13.2	11.6
Amapá	5,228	5,880	6,477	0.3	12.5	10.2	7.6
Amazonas	3,774	4,342	4,776	8.3	15.1	10.0	11.1
Pará	3,888	4,497	5,062	7.7	15.7	12.6	12.0
Rondônia	9,161	10,579	12,314	18.2	15.5	16.4	16.7
Roraima	6,283	6,599	7,079	-2.9	5.0	7.3	3.1
Tocantins	7,288	8,042	9,054	7.8	10.3	12.6	10.2
Northeast	5,111	5,756	6,311	10.4	12.6	9.6	10.9
Alagoas	5,156	5,739	6,234	8.9	11.3	8.6	9.6
Bahia	5,122	5,710	6,205	13.0	11.5	8.7	11.0
Ceará	4,543	5,156	5,717	8.7	13.5	10.9	11.0
Maranhão	4,355	4,884	5,431	9.6	12.2	11.2	11.0
Paraíba	6,293	7,019	7,655	11.4	11.5	9.1	10.7
Pernambuco	4,938	5,622	6,126	10.8	13.8	9.0	11.2
Piauí	4,638	5,291	5,794	7.2	14.1	9.5	10.2
Rio Grande do Norte	6,491	7,023	7,507	6.9	8.2	6.9	7.3
Sergipe	6,389	7,013	7,355	6.2	9.8	4.9	7.0
Central-West	14,597	16,264	18,293	8.9	11.4	12.5	10.9
Federal District	17,052	18,315	19,987	6.4	7.4	9.1	7.6
Goiás	12,306	13,719	15,352	8.7	11.5	11.9	10.7
Mato Grosso	17,537	19,991	23,204	11.1	14.0	16.1	13.7
Mato Grosso do Sul	14,028	15,793	17,736	10.0	12.6	12.3	11.6
Southeast	9,432	10,505	11,613	7.6	11.4	10.5	9.8
Espírito Santo	7,514	8,010	8,477	6.5	6.6	5.8	6.3
Minas Gerais	8,201	9,016	9,949	7.8	9.9	10.3	9.4
Rio de Janeiro	7,804	8,736	9,448	4.9	11.9	8.1	8.3
São Paulo	10,700	11,835	13,042	7.5	10.6	10.2	9.4
South	12,279	13,514	14,947	7.8	10.1	10.6	9.5
Paraná	12,258	13,534	14,990	7.7	10.4	10.8	9.6
Rio Grande do Sul	12,422	13,642	15,033	7.8	9.8	10.2	9.3
Santa Catarina	12,083	13,278	14,742	7.8	9.9	11.0	9.6

Tabela C – Household delinquency rates by federal unit

%

	Dec 2018	Dec 2019	Dec 2020
Total – Brazil	3.3	3.5	2.9
North			
Acre	3.2	3.6	2.6
Amapá	4.9	4.8	4.2
Amazonas	4.2	4.4	3.7
Pará	4.3	4.4	3.3
Rondônia	2.3	2.6	2.1
Roraima	7.5	4.2	3.5
Tocantins	3.9	3.7	2.7
Northeast			
Alagoas	4.2	4.6	3.9
Bahia	4.1	4.4	3.7
Ceará	3.9	4.2	3.6
Maranhão	3.7	4.3	3.8
Paraíba	3.9	4.6	3.6
Pernambuco	4.2	4.8	4.3
Piauí	3.8	4.4	3.4
Rio Grande do Norte	4.3	4.7	4.0
Sergipe	3.6	3.9	3.1
Central-West			
Federal District	3.1	3.2	2.6
Goiás	2.9	3.1	2.4
Mato Grosso	2.0	2.3	1.8
Mato Grosso do Sul	2.4	2.7	2.0
Southeast			
Espírito Santo	3.6	4.2	3.1
Minas Gerais	3.1	3.2	2.4
Rio de Janeiro	4.5	4.8	4.6
São Paulo	3.3	3.4	2.7
South			
Paraná	2.5	2.8	2.2
Rio Grande do Sul	2.6	2.7	2.1
Santa Catarina	2.3	2.7	2.1
Unidentified	11.3	15.5	13.2

Tabela D – Corporate credit balances by federal unit

R$ million

	Dec 2018	Dec 2019	Dec 2020	Variation (%)			
				2018	2019	2020	Average
Total – Brazil	1,461,906	1,460,069	1,779,109	1.2	-0.1	21.9	7.6
North	42,338	46,385	57,922	3.1	9.6	24.9	12.5
Acre	2,521	2,545	2,883	2.2	0.9	13.3	5.5
Amapá	3,192	3,295	3,659	-0.8	3.2	11.0	4.5
Amazonas	10,927	12,764	16,789	4.1	16.8	31.5	17.5
Pará	14,910	16,179	20,478	4.1	8.5	26.6	13.1
Rondônia	4,132	4,804	5,770	11.5	16.3	20.1	15.9
Roraima	1,596	1,579	1,818	-2.2	-1.1	15.1	3.9
Tocantins	5,060	5,218	6,527	-3.0	3.1	25.1	8.4
Northeast	137,622	143,640	166,800	-4.7	4.4	16.1	5.3
Alagoas	5,061	5,274	6,760	-6.8	4.2	28.2	8.5
Bahia	37,300	42,896	50,673	3.4	15.0	18.1	12.2
Ceará	31,747	32,205	36,612	-5.8	1.4	13.7	3.1
Maranhão	9,976	10,951	12,331	-11.5	9.8	12.6	3.6
Paraíba	5,886	5,680	7,100	-4.4	-3.5	25.0	5.7
Pernambuco	26,790	25,474	28,228	-12.0	-4.9	10.8	-2.0
Piauí	6,672	7,736	9,206	-9.4	16.0	19.0	8.5
Rio Grande do Norte	10,018	9,388	11,060	4.0	-6.3	17.8	5.2
Sergipe	4,172	4,037	4,831	-5.3	-3.2	19.7	3.7
Central-West	140,865	147,565	179,603	5.5	4.8	21.7	10.7
Federal District	52,147	52,307	57,827	-2.5	0.3	10.6	2.8
Goiás	40,010	41,370	52,013	8.5	3.4	25.7	12.5
Mato Grosso	34,473	39,927	51,721	18.0	15.8	29.5	21.1
Mato Grosso do Sul	14,235	13,961	18,042	2.6	-1.9	29.2	10.0
Southeast	874,123	849,244	1,032,503	0.1	-2.8	21.6	6.3
Espírito Santo	19,874	22,099	26,435	5.9	11.2	19.6	12.2
Minas Gerais	120,175	116,810	147,056	-1.0	-2.8	25.9	7.4
Rio de Janeiro	247,930	226,056	263,935	-0.8	-8.8	16.8	2.4
São Paulo	486,143	484,279	595,076	0.5	-0.4	22.9	7.7
South	244,693	264,024	333,013	7.8	7.9	26.1	13.9
Paraná	91,799	96,836	125,884	7.0	5.5	30.0	14.2
Rio Grande do Sul	75,753	82,862	103,378	5.5	9.4	24.8	13.2
Santa Catarina	77,141	84,326	103,751	11.0	9.3	23.0	14.4
Unidentified	22,265	9,211	9,269	-12.6	-58.6	0.6	-23.5

Table E – Corporate delinquency rates by federal unit

%

	Dec 2018	Dec 2019	Dec 2020
Total– Brazil	2.4	2.1	1.2
North	2.5	4.0	1.3
Acre	1.9	3.2	2.1
Amapá	1.1	1.2	0.6
Amazonas	3.0	2.7	1.1
Pará	2.7	6.7	1.6
Rondônia	2.6	3.4	1.5
Roraima	1.2	1.2	0.7
Tocantins	2.7	2.5	1.1
Northeast	2.8	3.2	1.3
Alagoas	4.6	3.8	2.3
Bahia	2.4	4.0	1.1
Ceará	2.0	1.8	0.6
Maranhão	3.2	1.7	1.6
Paraíba	3.0	4.5	3.4
Pernambuco	3.5	4.9	1.5
Piauí	1.5	1.2	1.0
Rio Grande do Norte	2.0	1.9	1.5
Sergipe	8.2	2.8	2.1
Central-West	2.9	2.1	1.1
Federal District	0.9	0.8	0.7
Goiás	4.6	2.2	1.3
Mato Grosso	2.4	2.0	1.1
Mato Grosso do Sul	6.7	6.8	2.3
Southeast	2.1	1.9	1.2
Espírito Santo	3.0	4.3	0.9
Minas Gerais	2.0	1.4	0.8
Rio de Janeiro	1.5	1.2	0.8
São Paulo	2.4	2.3	1.5
South	2.3	2.0	1.2
Paraná	2.6	2.6	1.4
Rio Grande do Sul	2.7	2.2	1.5
Santa Catarina	1.4	1.1	0.7
Unidentified	9.9	1.5	1.5

Table F – Balance of corporate credit by activity sector

R$ million

Economic sector	Dec 2018	Dec 2019	Dec 2020	Variation (%)		
				2018	2019	2020
Total	1,461,906	1,460,069	1,779,109	1.2	-0.1	21.9
Agriculture, livestock, forestry, fishing and aquaculture	27,437	27,099	33,403	4.6	-1.2	23.3
Extractive	17,887	15,413	16,799	-16.2	-13.8	9.0
Manufacturing	386,098	351,544	427,544	5.6	-8.9	21.6
Food	100,149	93,155	108,771	17.8	-7.0	16.8
Beverage	6,875	7,493	7,562	37.6	9.0	0.9
Tobacco	1,800	1,366	1,759	19.5	-24.1	28.8
Textile	7,444	7,361	8,617	13.8	-1.1	17.1
Wearing apparel	7,631	8,039	10,636	-2.9	5.3	32.3
Leather tanning, leather products, travel accessories and footwear	4,993	4,519	5,498	5.7	-9.5	21.7
Timber	5,278	5,954	7,508	22.3	12.8	26.1
Pulp, paper and paper products	24,099	19,540	20,862	20.5	-18.9	6.8
Sound recording and reproduction	1,945	1,997	3,133	-5.2	2.6	56.9
Coke, petroleum-derived products and biofuel	53,220	31,530	41,496	-3.6	-40.8	31.6
Chemical	15,481	18,286	25,654	-12.6	18.1	40.3
Pharma Chemical and pharmaceutical	4,027	4,035	6,785	-6.8	0.2	68.2
Rubber and plastic	11,597	12,287	17,722	5.5	6.0	44.2
Non-metallic mineral	10,876	10,649	11,996	-20.1	-2.1	12.6
Metallurgy	38,820	31,722	34,797	4.1	-18.3	9.7
Metal products, except machinery and equipment	10,938	12,843	16,700	10.6	17.4	30.0
IT equipment, electronic and optical products	3,305	3,512	5,859	17.9	6.2	66.9
Electrical machines, appliances and materials	9,689	10,020	12,936	21.2	3.4	29.1
Machinery and equipment	11,969	12,656	15,093	2.0	5.7	19.3
Motor vehicles, trailers and bodywork	37,475	38,085	44,952	-2.1	1.6	18.0
Other transportation equipments, except motor vehicles	9,190	6,259	5,289	-3.7	-31.9	-15.5
Furniture	4,058	4,408	5,957	3.3	8.6	35.1
Other products	2,754	2,980	4,063	5.8	8.2	36.3
Machinery and equipment maintenance, repair and installation	2,484	2,847	3,899	-2.9	14.6	37.0
Construction	74,608	66,525	76,749	-18.4	-10.8	15.4
Public utility industrial services	187,121	181,984	205,658	-4.6	-2.7	13.0
Electricity and natural gas	166,828	161,309	183,185	-5.7	-3.3	13.6
Water, sewage, waste disposal and decontamination activities	20,293	20,675	22,473	5.2	1.9	8.7
Trade and repair of motor vehicles and motorcycles	264,734	291,119	381,048	6.3	10.0	30.9
Trade and repair of motor vehicles and motorcycles	38,305	42,946	39,956	10.7	12.1	-7.0
Wholesale trade, except motor vehicles and motorcycles	111,947	121,843	166,960	9.5	8.8	37.0
Retail trade	114,482	126,331	174,132	1.9	10.3	37.8
Transport, storage and mail	124,898	135,809	166,539	8.1	8.7	22.6
Ground transportation	68,191	77,999	97,765	8.1	14.4	25.3
Waterway transportation	17,163	17,870	22,455	15.5	4.1	25.7
Air transportation	1,837	2,422	3,326	40.3	31.8	37.3
Storage and transport. aux. activ., mail and other delivery activities	37,707	37,518	42,992	4.1	-0.5	14.6
Public administration, defense and social security	138,465	141,012	163,044	3.9	1.8	15.6
Other services	219,030	237,083	307,865	6.4	8.2	29.9
Lodging and food	13,293	16,631	24,745	4.2	25.1	48.8
Information and communication, except telecommunication	9,303	10,598	12,912	3.2	13.9	21.8
Telecommunication	15,016	16,073	11,189	23.2	7.0	-30.4
Financial and insurance activities and related services	47,303	52,124	70,205	-14.9	10.2	34.7
Real estate, profes., scientific, technical, adm. and compl. services activ.	89,954	98,123	120,419	3.5	9.1	22.7
Education	9,450	11,346	13,901	6.9	20.1	22.5
Human health and social services	18,033	21,877	27,813	3.1	21.3	27.1
Arts, culture, sports and recreation	3,109	3,871	4,521	-0.1	24.5	16.8
Legal entities headquartered abroad	21,628	12,481	460	-46.8	-42.3	-96.3

Table G – Corporate delinquency rates by subsector

%

Economic sector	Dec 2018	Dec 2019	Dec 2020	Variation (p.p.)		
				2018	2019	2020
Total	2.4	2.1	1.2	-0.5	-0.3	-0.9
Agriculture, livestock, forestry, fishing and aquaculture	2.5	3.6	1.3	0.2	1.1	-2.3
Extractive	1.1	0.7	0.2	0.6	-0.4	-0.5
Manufacturing	2.1	2.4	0.8	-0.4	0.3	-1.6
Food	1.3	1.1	0.5	-0.4	-0.2	-0.6
Beverage	1.4	0.3	0.2	1.0	-1.1	-0.1
Tobacco	0.0	0.1	0.0	-0.3	0.1	0.0
Textile	2.0	1.0	1.7	-0.3	-1.0	0.7
Wearing apparel	3.9	3.8	3.7	-1.8	-0.1	-0.1
Leather tanning, leather products, travel accessories and footwear	2.8	8.0	4.3	0.4	5.2	-3.7
Timber	1.4	1.4	0.8	-4.0	-0.1	-0.6
Pulp, paper and paper products	0.3	0.3	0.3	-0.6	0.0	0.0
Sound recording and reproduction	5.4	3.9	1.5	-4.5	-1.5	-2.4
Coke, petroleum-derived products and biofuel	4.3	8.9	0.3	3.5	4.6	-8.6
Chemical	1.3	3.3	0.3	-0.2	2.0	-3.0
Pharma Chemical and pharmaceutical	0.3	0.2	0.7	-0.4	-0.1	0.5
Rubber and plastic	2.8	1.5	0.7	-5.6	-1.3	-0.8
Non-metallic mineral	2.8	1.4	0.8	-4.5	-1.4	-0.6
Metallurgy	0.6	0.3	0.3	-1.4	-0.3	0.0
Metal products, except machinery and equipment	4.1	3.0	1.2	-2.5	-1.1	-1.8
IT equipment, electronic and optical products	1.3	1.0	0.4	-4.1	-0.3	-0.6
Electrical machines, appliances and materials	4.0	1.1	2.1	1.7	-2.9	0.9
Machinery and equipment	4.7	1.6	2.6	-1.9	-3.1	1.1
Motor vehicles, trailers and bodywork	1.0	0.2	0.3	-0.3	-0.7	0.1
Other transportation equipments, except motor vehicles	3.1	24.3	1.6	0.8	21.2	-22.7
Furniture	4.3	3.0	1.7	-2.9	-1.3	-1.4
Other products	5.2	2.3	1.2	-0.3	-3.0	-1.1
Machinery and equipment maintenance, repair and installation	4.6	3.0	1.9	-0.7	-1.6	-1.1
Construction	7.0	6.6	3.7	-0.2	-0.4	-2.9
Public utility industrial services	0.2	0.1	0.5	-0.7	-0.2	0.4
Electricity and natural gas	0.1	0.0	0.0	-0.9	-0.1	0.0
Water, sewage, waste disposal and decontamination activities	1.6	0.5	4.1	1.1	-1.1	3.6
Trade and repair of motor vehicles and motorcycles	3.0	2.5	1.6	-1.6	-0.6	-0.9
Trade and repair of motor vehicles and motorcycles	2.4	1.6	1.5	-1.7	-0.8	-0.1
Wholesale trade, except motor vehicles and motorcycles	2.3	2.1	1.4	-1.2	-0.3	-0.7
Retail trade	3.9	3.2	1.9	-1.8	-0.8	-1.3
Transport, storage and mail	1.5	1.5	0.9	-0.3	0.0	-0.6
Ground transportation	1.5	1.0	0.8	-1.0	-0.5	-0.2
Waterway transportation	0.1	0.4	0.1	-1.0	0.3	-0.3
Air transportation	0.1	0.2	4.8	-0.3	0.1	4.5
Storage and transport. aux. activ., mail and other delivery activities	2.3	3.3	1.3	1.5	1.0	-2.0
Public administration, defense and social security	0.1	0.3	0.0	0.1	0.2	-0.3
Other services	3.5	2.4	1.5	-1.0	-1.1	-0.9
Lodging and food	6.6	6.5	3.9	-2.0	0.0	-2.7
Information and communication, except telecommunication	2.4	2.2	2.0	-0.8	-0.2	-0.1
Telecommunication	0.1	0.2	0.3	-21.6	0.1	0.1
Financial and insurance activities and related services	5.9	3.1	2.0	3.6	-2.8	-1.1
Real estate, profes., scientific, technical, adm. and compl. services activ.	3.5	1.9	1.1	-0.1	-1.7	-0.8
Education	2.6	2.7	1.8	0.3	0.1	-0.9
Human health and social services	0.9	1.1	0.8	-0.3	0.2	-0.3
Arts, culture, sports and recreation	2.8	2.3	2.0	-2.8	-0.5	-0.3
Legal entities headquartered abroad	1.4	3.7	1.0	0.3	2.4	-2.8

Annex C – Chapter 6

Table A – Market share in outstanding credit

Earmarked credit with BNDES resources

%

Position	2018		2019		2020	
1	BNDES	76.3	BNDES	77.0	BNDES	75.6
2	Caixa Econômica Federal	7.3	Caixa Econômica Federal	7.5	Caixa Econômica Federal	6.9
3	Banco do Brasil S.A.	4.5	Banco do Brasil S.A.	4.1	Banco do Brasil S.A.	4.3
4	Banco Bradesco S.A.	2.4	Banco Bradesco S.A.	2.9	Banco Bradesco S.A.	3.5
5	Itaú Unibanco S.A.	2.1	Banco Desenv. Regional do Extremo Sul	2.3	Banco Desenv. Regional do Extremo Sul	2.0
6	Other commercial / multiple banks with commercial portfolio	4.3	Other commercial / multiple banks with commercial portfolio	5.1	Other commercial / multiple banks with commercial portfolio	4.3
7	Other development banks	2.4	Other development banks	0.3	Other development banks	2.3
8	Non-banking segment	0.4	Non-banking segment	0.4	Non-banking segment	0.4
9	Investment / multiple banks w/o commercial portfolio	0.3	Investment / multiple banks w/o commercial portfolio	0.4	Investment / multiple banks w/o commercial portfolio	0.4
10	Credit unions	0.0	Credit unions	0.1	Credit unions	0.2
Total		100.0		100.0		100.0
HHIn		0.5988		0.6022		0.5813
HHIn equivalent		1.7		1.7		1.7
RC5(%)		92.5		93.7		92.4

Table B – Market share in outstanding credit – Working capital

%

Position	2018		2019		2020	
1	Banco do Brasil S.A.	16.4	Banco do Brasil S.A.	16.1	Itaú Unibanco S.A.	16.5
2	Banco Bradesco S.A.	14.7	Banco Bradesco S.A.	15.7	Banco Bradesco S.A.	16.4
3	Itaú Unibanco S.A.	14.1	Itaú Unibanco S.A.	14.9	Banco do Brasil S.A.	13.5
4	Caixa Econômica Federal	13.9	Caixa Econômica Federal	10.2	Caixa Econômica Federal	10.6
5	Banco Santander (Brasil) S.A.	8.4	Banco Santander (Brasil) S.A.	7.7	Banco Santander (Brasil) S.A.	8.9
6	Other commercial / multiple banks with commercial portfolio	21.2	Other commercial / multiple banks with commercial portfolio	22.1	Other commercial / multiple banks with commercial portfolio	22.9
7	Credit unions	9.1	Credit unions	11.1	Credit unions	10.1
8	Investment / multiple banks w/o commercial portfolio	1.6	Investment / multiple banks w/o commercial portfolio	1.6	Investment / multiple banks w/o commercial portfolio	0.6
9	Non-banking segment	0.4	Non-banking segment	0.4	Non-banking segment	0.2
10	Development banks	0.2	Development banks	0.2	Development banks	0.2
Total		100.0		100.0		100.0
HHIn		0.0989		0.0941		0.0973
HHIn equivalent		10.1		10.6		10.3
RC5(%)		67.5		64.6		66.0

Table C – Market share in outstanding credit – Consumer credit

%

Position	2018		2019		2020	
1	Banco do Brasil S.A.	22.0	Banco do Brasil S.A.	21.9	Banco do Brasil S.A.	21.4
2	Banco Bradesco S.A.	15.0	Banco Bradesco S.A.	16.9	Banco Bradesco S.A.	16.0
3	Caixa Econômica Federal	14.4	Caixa Econômica Federal	13.1	Caixa Econômica Federal	13.5
4	Itaú Unibanco S.A.	13.6	Itaú Unibanco S.A.	12.6	Itaú Unibanco S.A.	11.6
5	Banco Santander (Brasil) S.A.	9.8	Banco Santander (Brasil) S.A.	10.2	Banco Santander (Brasil) S.A.	9.8
6	Other commercial / multiple banks with commercial portfolio	18.1	Other commercial / multiple banks with commercial portfolio	18.0	Other commercial / multiple banks with commercial portfolio	19.8
7	Credit unions	6.1	Credit unions	6.4	Credit unions	6.9
8	Non-banking segment	0.7	Non-banking segment	0.8	Non-banking segment	0.8
9	Investment / multiple banks w/o commercial portfolio	0.2	Investment / multiple banks w/o commercial portfolio	0.2	Investment / multiple banks w/o commercial portfolio	0.1
10	Development banks	0.0	Development banks	0.0	Development banks	0.0
Total		100.0		100.0		100.0
HHIn		0.1231		0.1226		0.1161
HHIn equivalent		8.1		8.2		8.6
RC5(%)		74.9		74.6		72.5

Table D – Market share in outstanding credit – Payroll-deducted credit

%

Position	2018		2019		2020	
1	Banco do Brasil S.A.	21.1	Banco do Brasil S.A.	21.2	Banco do Brasil S.A.	21.3
2	Caixa Econômica Federal	17.7	Banco Bradesco S.A.	16.4	Caixa Econômica Federal	16.0
3	Banco Bradesco S.A.	15.1	Caixa Econômica Federal	16.2	Banco Bradesco S.A.	15.8
4	Itaú Unibanco S.A.	13.8	Itaú Unibanco S.A.	12.7	Itaú Unibanco S.A.	12.6
5	Banco Santander (Brasil) S.A.	9.6	Banco Santander (Brasil) S.A.	10.7	Banco Santander (Brasil) S.A.	10.7
6	Other commercial / multiple banks with commercial portfolio	19.7	Other commercial / multiple banks with commercial portfolio	19.6	Other commercial / multiple banks with commercial portfolio	20.4
7	Credit unions	2.6	Credit unions	2.8	Credit unions	2.8
8	Non-banking segment	0.2	Non-banking segment	0.3	Non-banking segment	0.4
9	Investment / multiple banks w/o commercial portfolio	0.2	Investment / multiple banks w/o commercial portfolio	0.1	Investment / multiple banks w/o commercial portfolio	0.1
10	Development banks	0.0	Development banks	0.0	Development banks	0.0
Total		100.0		100.0		100.0
HHIn		0.1310		0.1297		0.1268
HHIn equivalent		7.6		7.7		7.9
RC5(%)		77.3		77.2		76.3

Table E – Market share in outstanding credit – Credit card

%

Position	2018		2019		2020	
1	Itaú Unibanco S.A.	33.1	Itaú Unibanco S.A.	32.7	Itaú Unibanco S.A.	28.0
2	Banco Bradesco S.A.	14.8	Banco Bradesco S.A.	14.3	Banco Bradesco S.A.	12.7
3	Banco Santander (Brasil) S.A.	13.4	Banco Santander (Brasil) S.A.	12.8	Banco Santander (Brasil) S.A.	11.9
4	Banco do Brasil S.A.	12.3	Banco do Brasil S.A.	11.5	Banco do Brasil S.A.	10.3
5	Caixa Econômica Federal	4.2	Caixa Econômica Federal	3.9	Nu Pagamentos S.A.	3.6
6	Other commercial / multiple banks with commercial portfolio	9.6	Non-banking segment	10.3	Other commercial / multiple banks with commercial portfolio	19.8
7	Non-banking segment	8.3	Other commercial / multiple banks with commercial portfolio	9.6	Other – non-banking segment	8.3
8	Investment / multiple banks w/o commercial portfolio	3.5	Investment / multiple banks w/o commercial portfolio	4.0	Investment / multiple banks w/o commercial portfolio	4.4
9	Credit unions	0.8	Credit unions	0.9	Credit unions	1.1
10	Development banks	0.0	Development banks	0.0	Development banks	0.0
Total		100.0		100.0		100.0
HHIn		0.1703		0.1636		0.1483
HHIn equivalent		5.9		6.1		6.7
RC5(%)		77.8		75.2		66.4

Table F – Market share in outstanding credit – Vehicle purchase
Households

%

Position	2018		2019		2020	
1	Banco Santander (Brasil) S.A.	25.3	Banco Santander (Brasil) S.A.	24.9	Banco Santander (Brasil) S.A.	25.0
2	Banco Votorantim S.A.	19.1	Banco Votorantim S.A.	18.6	Banco Votorantim S.A.	18.5
3	Banco Bradesco S.A.	13.8	Banco Bradesco S.A.	14.1	Banco Bradesco S.A.	13.3
4	Itaú Unibanco S.A.	9.4	Itaú Unibanco S.A.	9.4	Itaú Unibanco S.A.	10.7
5	Banco Safra S.A.	5.6	Banco Safra S.A.	6.7	Banco Safra S.A.	6.3
6	Investment / multiple banks w/o commercial portfolio	13.0	Investment / multiple banks w/o commercial portfolio	13.0	Investment / multiple banks w/o commercial portfolio	12.1
7	Other commercial / multiple banks with commercial portfolio	10.3	Other commercial / multiple banks with commercial portfolio	9.5	Other commercial / multiple banks with commercial portfolio	9.5
8	Credit unions	2.3	Credit unions	2.6	Credit unions	3.0
9	Non-banking segment	1.2	Non-banking segment	1.3	Non-banking segment	1.5
10	Development banks	0.0	Development banks	0.0	Development banks	0.0
Total		100.0		100.0		100.0
HHIn		0.1377		0.1360		0.1367
HHIn equivalent		7.3		7.4		7.3
RC5(%)		73.1		73.7		73.9

Table G – Market share in outstanding credit
Households by prudential segment

%

Position	2018		2019		2020	
1	S1	80.5	S1	79.3	S1	78.2
2	S3	6.9	S3	7.7	S3	8.5
3	S4	5.6	S4	5.5	S4	5.7
4	S2	4.7	S2	4.9	S2	4.8
5	S5	2.3	S5	2.5	S5	2.8
Total		100.0		100.0		100.0
HHIn		0.6579		0.6411		0.6249
HHIn equivalent		1.5		1.6		1.6

Table H – Market share in outstanding credit

Corporate by prudential segment

%

Position	2018		2019		2020	
1	S1	58.2	S1	57.2	S1	58.4
2	S2	26.1	S2	24.1	S2	21.8
3	S3	8.7	S3	10.2	S3	10.5
4	S4	5.1	S4	6.1	S4	6.4
5	S5	1.8	S5	2.4	S5	2.9
Total		100.0		100.0		100.0
HHIn		0.4179		0.4003		0.4050
HHIn equivalent		2.4		2.5		2.5