FINANCIAL **STABILITY REPORT**

ISSN - 2145 - 650X

II HALF/
2020

Second Half of 2020

FINANCIAL **STABILITY REPORT**

Banco de la República
Bogotá, D. C., Colombia

ISSN -

FINANCIAL **STABILITY REPORT**

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

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

1. Assesses and manages financial risks in such a way that it facilitates the performance of the economy and the efficient allocation of resources;

2. is capable of autonomously absorbing, dissipating, and mitigating the materialization of the risks that may arise as a result of adverse events.

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

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

Prepared by:
Financial Stability Department
Office for Monetary Operations and International Investments

Office of the Deputy Technical Governor
Hernando Vargas
Technical Governor

Office for Monetary Operations and International Investments
Pamela Cardozo
Chief Officer

Financial Stability Department
Daniel Osorio
Department Director

Systemic Risks Assessment Section
Wilmar Cabrera
Head

Liquidity Support and Risk Control Section
Nathali Cardozo
Head

Jorge Cely
Felipe Clavijo
Santiago Gamba
Camilo Gómez
Daniela Gualtero
María Fernanda Meneses
Angélica Lizarazo
Alida Narváez
Javier Pirateque
Daniela Rodriguez
Camilo Sánchez
Miguel Sarmiento
Santiago Segovia
Eduardo Yanquen

Laura León and Juan Sebastián Lemus, members of the Office of Monetary Operations and Investments; Fabio Ortega Castro and Carlos Alberto Cadena, members of the Financial Infrastructure Monitoring Department; and Sergio Castillo, Maria Jose Vélez, and Graciela Torresilla, interns in the Financial Stability Department participated in the preparation of this Report. The comments of the Research and Development Department of the Office of the Financial Superintendent of Colombia are greatly appreciated.

Suggestions and comments:
+57 (1) 343 1011
atencionalciudadano@banrep.gov.co

Content

Graphs

Tables

Glossary

OPA: OMO Placement Agent
PFM: Pension Fund Managers
TLS: Temporary Liquidity Support
BAAAFS: Banking Sector Benchmark Curve for Simple Fixed Rate Securities and AAA Rating
BOE: Bank of England
BIS: Bank of International Settlements
BVC: Colombia Stock Market
SLC: Savings and Loan Cooperatives
CDT: Certificates of Deposit
NSFR: Net Stable Funding Ratio
COP: Colombian Pesos
CCRC: Central Counterparty Risk Clearinghouses
CSD: Central Securities Depository
DSGE: Dynamic Stochastic General Equilibrium
DTF: Fixed Term Deposit Rate
CI: Credit institutions
ECB: European Central Bank
EUR: Euros
Fed: Federal Reserve of the United States
CIF: Collective Investment Funds
FNA: *Fondo Nacional del Ahorro*
FRECH: Reserve Fund for Mortgage Portfolio Stabilization
FSB: Financial Stability Board
GBP: Pounds sterling
NG: National Government
BBI: Banking Benchmark Indicator
QID: Quality Indicator by Default
QIR: Quality Indicator by Risk
ICE: Indicator of Consolidated Short-Term Exposure
FDI: Foreign Direct Investment
IIE: Indicator of Individual Short-Term Exposure
NBFI: Non-banking Financial Institutions
LRI: Liquidity Risk Indicator
CPI: Consumer Price Index
IRPR: Indicator of Risk Perception by Rating
IERR: Indicator of Exchange Rate Risk
LRI: Liquidity Risk Indicator
BDBR: Board of Directors of *Banco de la República*
MADR: Ministry of Agriculture and Rural Development
GFM: Gross Financial Margin
MHCP: Ministry of the Treasury and Public Credit
IFRS: International Financial Reporting Standards
OIS: Overnight Index Swap
OPEC+: Organization of Petroleum Exporting Countries and allies
PCMVR: National Plan for the Construction and Improvement of Low-Income Rural Housing
GDP: Gross Domestic Product
NLP: Net Liquidity Position
PCP: Proprietary Cash Position
LSRR: Liabilities Subject to Reserve Requirements
TC: Technical Capital
UAP: Unified Accounting Plan
FSR: Financial Stability Report
ROA: Return on Assets
ROE: Return on Equity
IMC: Investment Management Companies
ORMS: Operating Risk Management System
SBF: Stock Brokerage Firms
FSC: Office of the Financial Superintendent of Colombia
TF: Trust Fund companies
SMMLV: Minimum Legal Monthly Salary in Effect
SCA: Superintendency of Corporate Affairs
ST: Stress Tests
Sysmo: Systemic Stress Model
TES: Public Debt Securities issued by the General Office of Public Credit and the National Treasury
IBR: Interbank Rate
MER: Market Exchange Rate
USD: US Dollars
UVR: Units of Real Value
VAR: Autoregressive Vectors
VeR: Value at Risk
PH: Priority Housing
LIH: Low-income Housing
WATM: weighted average term to maturity

Executive Summary and Heatmap

The Colombian financial system has not suffered major structural disruptions during these months of deep economic contraction and has continued to carry out its basic functions as usual, thus facilitating the economy's response to extreme conditions. This is the result of the soundness of financial institutions at the beginning of the crisis, which was reflected in high liquidity and capital adequacy indicators as well as in the timely response of various authorities. *Banco de la República* lowered its policy interest rates 250 points to 1.75%, the lowest level since the creation of the new independent bank in 1991, and provided ample temporary and permanent liquidity in both pesos and foreign currency. The Office of the Financial Superintendent of Colombia, in turn, adopted prudential measures to facilitate changes in the conditions for loans in effect and temporary rules for rating and loan-loss provisions. Finally, the national government expanded the transfers as well as the guaranteed credit programs for the economy.

The supply of real credit (i.e. discounting inflation) in the economy is 4% higher today than it was 12 months ago with especially marked growth in the housing (5.6%) and commercial (4.7%) loan portfolios (2.3% in consumer and -0.1% in microloans), but there have been significant changes over time. During the first few months of the quarantine, firms increased their demands for liquidity sharply while consumers reduced theirs. Since then, the growth of credit to firms has tended to slow down, while consumer and housing credit has grown. The financial system has responded satisfactorily to the changes in the respective demands of each group or sector and loans may grow at high rates in 2021 if GDP grows at rates close to 4.6% as the technical staff at the Bank expects; but the forecasts are highly uncertain.

After the strict quarantine implemented by authorities in Colombia, the turmoil seen in March and early April, which was evident in the sudden reddening of macroeconomic variables on the risk heatmap

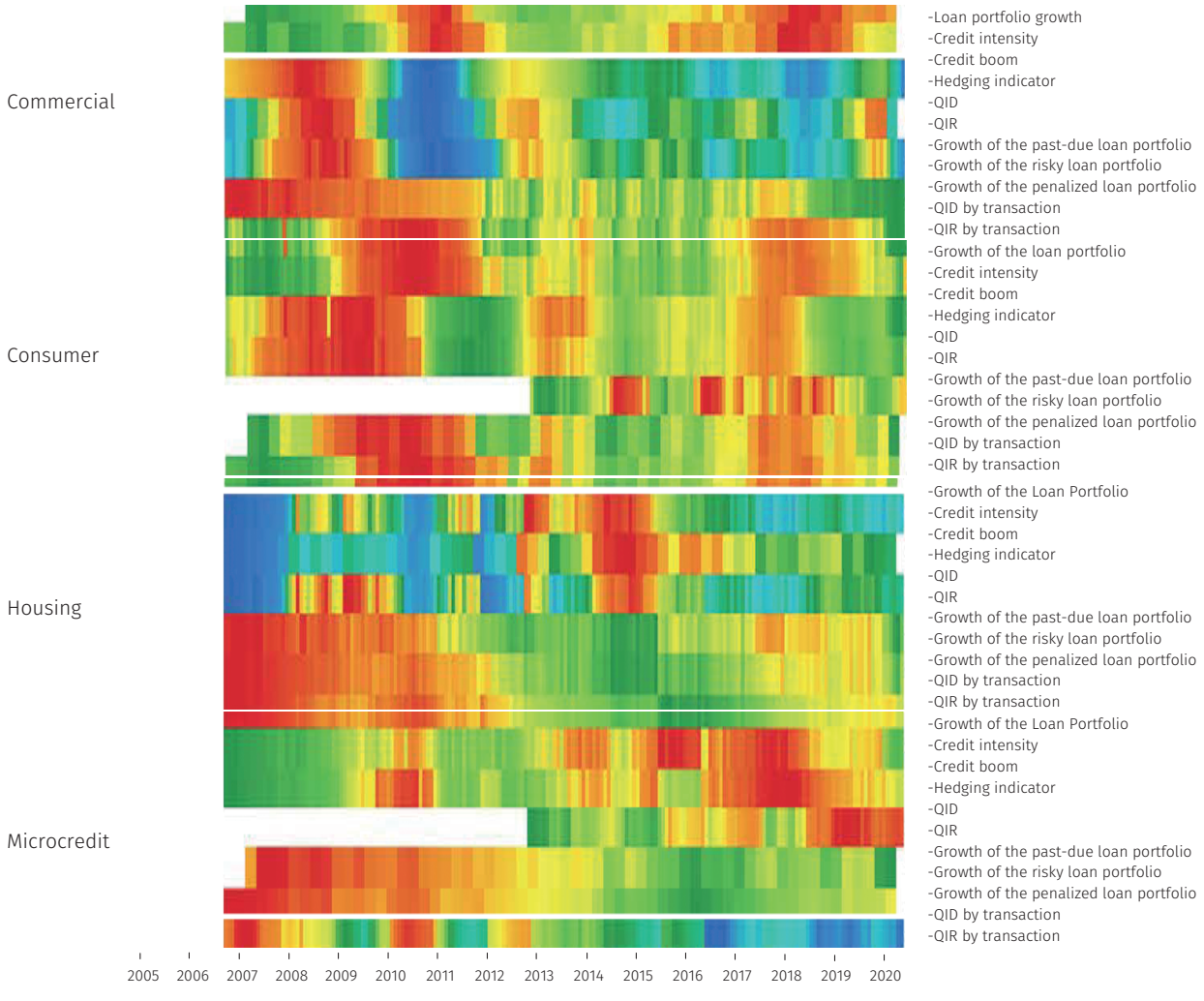
Graph A
Risk Map of the Colombian Financial System

Sources: Office of the Financial Superintendent of Colombia, DANE, Fedesarrollo, Bloomberg, and *Banco de la República*. Calculations by *Banco de la República*.

in Graph A,[1] and the drop in crude oil and coal prices (note the high volatility registered in market risk for the region on Graph A) the local financial markets stabilized relatively quickly. *Banco de la República*'s credible and sustained policy response played a decisive role in this stabilization in terms of liquidity provision through a sharp expansion of repo operations (and changes in amounts, terms, counterparties, and eligible instruments), the purchases of

1 The technical details on the reading of, construction of, and variables used on the map are presented in Box 1 of the September 2017 Financial Stability Report.

Graph B
Map of Credit Risks



Sources: Office of the Financial Superintendent of Colombia, DANE, Fedesarrollo, Bloomberg, and *Banco de la República*. Calculations by *Banco de la República*.

public and private debt, and the reduction in bank reserve requirements. In this respect, there is now abundant aggregate liquidity and significant improvements in the liquidity position of investment funds.

In this context, the main vulnerability factor for financial stability in the short term is still the high degree of uncertainty surrounding loan quality. First, the future trajectory of the number of people infected and deceased by the virus and the possible need for additional health measures is uncertain. For that reason, there is also uncertainty about the path for economic recovery in the short and medium term. Second, the degree to which the current shock will be reflected in loan quality once the risk materializes in banks' financial statements is uncertain. For the time being, the credit risk heatmap (Graph B) indicates that non-performing and risky loans have not shown major deterioration, but past experience indicates that periods of sharp economic slowdown eventually tend to coincide with rises in non-performing loans: the

calculations included in this report suggest that the impact of the recession on credit quality could be significant in the short term. This is particularly worrying since the profitability of credit institutions has been declining in recent months, and this could affect their ability to provide credit to the real sector of the economy.

In order to adopt a forward-looking approach to this vulnerability, this Report presents several stress tests that evaluate the resilience of the liquidity and capital adequacy of credit institutions and investment funds in the event of a hypothetical scenario that seeks to simulate an extreme version of current macroeconomic conditions. The results suggest that even though there could be strong impacts on the credit institutions' volume of credit and profitability under such scenarios, aggregate indicators of total and core capital adequacy will probably remain at levels that are above the regulatory limits over the horizon of a year. At the same time, the exercises highlight the high capacity of the system's liquidity to face adverse scenarios.

In compliance with its constitutional objectives and in coordination with the financial system's security network, *Banco de la República* will continue to closely monitor the outlook for financial stability at this juncture and will make the decisions that are necessary to ensure the proper functioning of the economy, facilitate the flow of sufficient credit and liquidity resources, and further the smooth operation of the payment systems.

Juan José Echavarría
Governor

01

Macroeconomic Environment

The crisis unleashed by the Covid-19 pandemic has caused a considerable loss of life and sharp reductions of production levels on a global scale over the course of 2020 and, thus, drastically affected the economic and social structure that prevailed in the pre-crisis period. While in most countries the more severe impact was expected to have occurred during the second quarter of 2020, there is still great uncertainty about the pace of economic recovery given the lack of knowledge about when a vaccine will be available, or the potential for a resurgence of outbreaks, along with other factors.

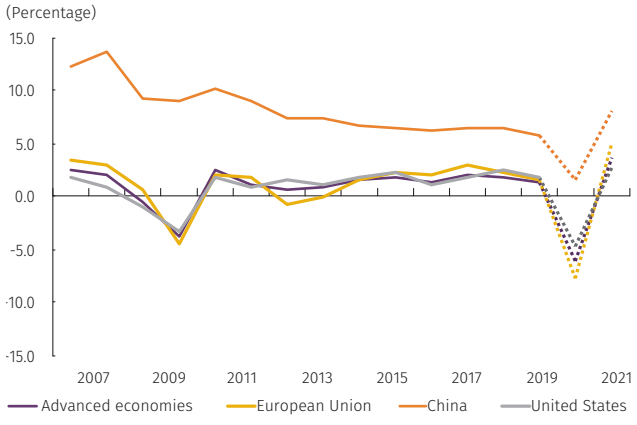
The economic collapse seen in various sectors of production in the first half of 2020 was dramatic and brought gross domestic product (GDP) indicators to historical lows with a high degree of synchronization in the cycles of the different economies. This occurred despite the large number of governmental and monetary support measures that were implemented in response to the crisis within a short period, and this presumably contributed to preventing the shock from being worse.

In the central scenario, expectations for recovery remain in a "V" shape (Graph 1.1, panels A and B) possibly due to the reduced market volatility (Graph 1.2) and how dynamic the Chinese economy has been shown to be after the outbreak of contagion that occurred in late 2019. Nevertheless, several countries have employed less optimistic scenarios with a slower recovery, U-like paths, especially in their financial system stress tests given the high uncertainty that persists regarding the performance of economies under the new rules for human interaction that the persistence of the virus and the absence of a vaccine have brought about.

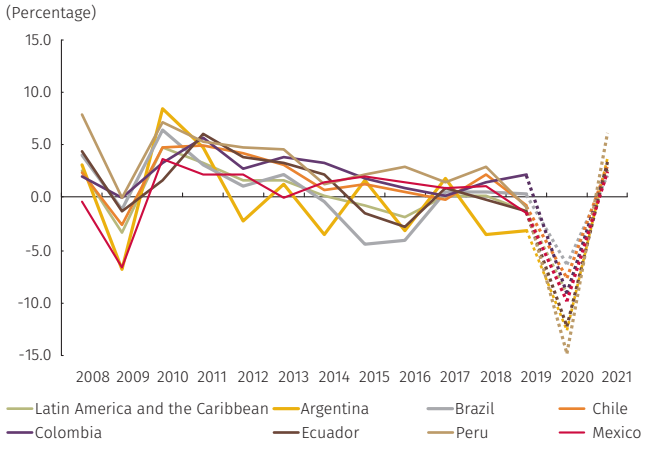
While controlling for purchasing power, the scenario of a "V" shaped recovery enables us to see how the crisis has affected the growth rate of the per capita GDP of the countries in the region. It is equivalent, at best, to a ten-year

Graph 1.1
Annual Growth of per capita GDP at Constant Prices[a/]

A. Main economies



B. Latin America and the Caribbean



a/ To calculate the per capita GDP at constant prices and make it comparable across countries, purchasing power parity (PPP) expressed in constant 2017 international dollars is used.
Source: World Economic Outlook (October 2020).

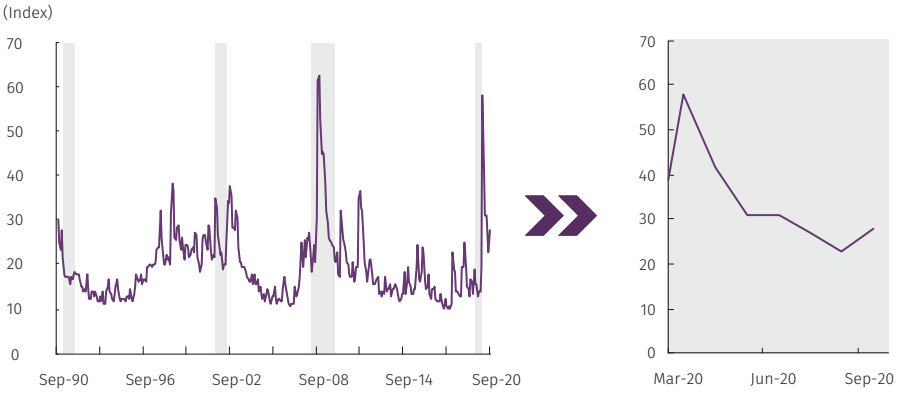
setback in the development of this measure. If a slower recovery scenario is added to the above, a return to the per capita production levels prior to the crisis can be expected to take several years.

The Colombian economy has been affected by the economic impacts and public policy challenges that the pandemic has raised. However, even though the effect has been widespread, the fiscal and labor deterioration has been greater when the country is compared to other jurisdictions that share the same sovereign rating. The above suggests that signs of weakness in the trend of these variables are sources of vulnerability for the perception of Colombia's credit quality.

As in most of countries, national production, employment, consumer and investor confidence along with other variables that are relevant for assessing the strength or weakness of the economy suffered a sudden shock at the beginning of the pandemic and, subsequently, have been recovering in the wake of the reduction in lockdown measures and the implementation of biosecurity plans that seek to restore consumer confidence and spur economic recovery.

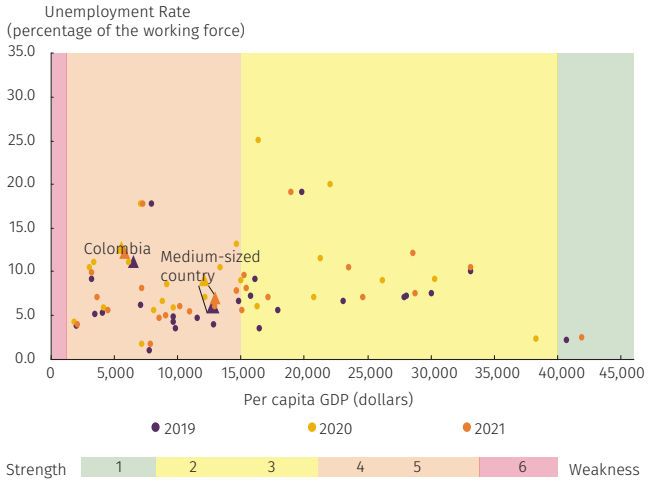
Even though the economy has been showing signs of recovery, the shock led to the materializing of one of the highest levels of unemployment in the region due to structural problems in the labor market such as the high informality

Graph 1.2
Volatility Index: VIX



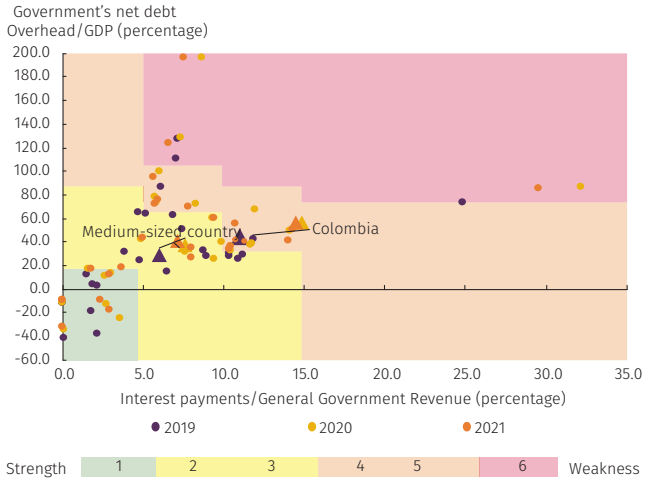
Source: Federal Reserve Bank of St. Louis, Chicago Board Options Exchange.

Graph 1.3
Sovereign Economic Valuation of Countries with S&P Investment Grade Rating



Note: The S&P rating agency assigns a score between 1 and 6 to the country's economic valuation based on the value of per capita GDP in dollars. Thus, countries that receive a score of 1 are considered the strongest while, in contrast, the countries that receive a score of 6 are those that present a weaker economic environment.
Source: Standard and Poor's Global Ratings, calculations by *Banco de la República.*

Graph 1.4
Sovereign Economic Valuation of Countries with S&P Investment Grade Rating



Note: as part of S&P's fiscal assessment, a score of 1 to 6 is assigned based on the combination of values of the interest paid on the general government revenue and the general government's net debt as a percentage of the GDP. Thus, countries that receive a score of 1 are considered the strongest while, in contrast, the countries that receive a score of 6 are those that present a weaker economic environment.
Source: Standard and Poor's Global Ratings, calculations by *Banco de la República.*

of the sector and the unequal access to the labor market based on age and gender. In this vein, when Colombia is compared to countries that share the same Standard & Poor's (S&P) BBB- rating, the projected impact on employment levels in 2021 will be among the highest, and the economic valuation based on the dollar-denominated per capita GDP indicator used by the rating agency will be weak. In addition, the persistence of the effect on employment in Colombia contrasts with the rapid recovery expected for the medium-size country in the sample (Graph 1.3).

Added to this is the fact that management of the crisis has generated higher expenses for the government in a context of lower economic activity and, therefore, a smaller income base. This has led to a significant increase in the level of sovereign debt during the recent period. The rise in the public debt has also been greater in Colombia in comparison to the countries that share its credit rating and places it in a more vulnerable position according to the S&P (Graph 1.4). This suggests that the change in these variables and the appearance of signs of weakness may be sources of vulnerability with respect to the rating agencies' perception of Colombia's credit rating.

However, the strength of the financial system prior to the shock together with the policy measures that have been implemented by the different entities in the financial system security net have, up to this point, prevented major problems and allowed this sector to contribute to the recovery of the economy instead of acting as a shock amplifier. In line with the above, the materialization of the effect on the creditworthiness of the system debtors and the way this risk is managed will be decisive in defining the role that credit institutions will continue to play in the future recovery.

The economic crisis that the country is going through right now appeared initially in the real sector of the economy given the impossibility of using certain services and the change in agents' consumption patterns. However, the financial system has not been seriously affected in its normal operations. This was possible to

the extent that the supervisory and management work that entities did during the period prior to the shock allowed the system to receive the impact with levels of liquidity and capital in aggregate terms that was largely above the regulatory limits. Thus, the strength of the sector made it possible for it to grant moratorium agreements to a high percentage of the loan portfolio[1], to resume granting new loans, although the levels of disbursements in all categories are lower than those seen before March and to channel government aid resources (such as the Solidarity Income Program), along with other functions.

The banking system faces the task of identifying the level of actual harm suffered by its debtors and disclosing such risk on its balance sheets in accordance with what is set forth in the Debtor Assistance Plan (PAD in Spanish) that the Office of the Financial Superintendent of Colombia (FSC) introduced in External Circular 022/2020. This is in a context where the management of the health crisis is projected to be based on less prohibitive rules and, therefore, the economy is expected to be more dynamic. Given the importance of the loan portfolio on credit institutions' (CI) balance sheets, debtors trend towards default during the second half of 2020 and the beginning of 2021 is critical to understand the potential effect that the financial system could suffer. This will determine the extent to which the system can continue to provide credit to the economy and thus contribute to the recovery and reactivation required by the economy.

Given the above, the resilience of the Colombian financial system is evaluated up to December 2021 in chapter 3 of this report using a hypothetical economic environment based on the low GDP forecast scenario by the technical staff at *Banco de la República* but considers a slower recovery during 2021. The usefulness of the exercise lies in providing an estimate of the potential losses that could be seen in this scenario and revealing the possible transmission channels through which the vulnerabilities identified could end up affecting financial stability. The results indicate that, in this stress scenario, there would be negative effects on aggregate indicators of total and core capital adequacy ratios although they would remain at levels above the regulatory limits during the period of the exercise. However, at the individual level, there will probably be a broad range of heterogeneity in the performance of these indicators. In addition, the loan portfolio and aggregate profitability of credit institutions could present significant deterioration which would reflect the impact that the hypothetical adverse scenario could have on the ability of the entities to grant loans and continue with their intermediation work.

1 Based on information as of 31 July 2020, the date on which the implementation of SFC's external circulars 007 and 014 of 2020 expired, the loan portfolio that was subject to financial relief amounted to COP 225.5 trillion, which corresponds to 43.3% of the gross portfolio in that month.

The exercise uses the historical relationships between economic activity and the materialization of credit risk to determine the impact of an adverse macroeconomic scenario on the financial health of institutions. However, the unprecedented nature of the shock imposed by the pandemic, in addition to policy actions to counteract its harmful effects, may have altered the historical relationships used in the stress test and, thus, exacerbated the uncertainty about the materialization of risks at the current juncture. Given the above, a reverse stress exercise was done in order to evaluate how strong the materialization of credit risk would have to be in order for the system to reach a high level of vulnerability when it presents a capital adequacy indicator in aggregate terms that is lower than the regulatory standard. The test suggests that the aggregate quality risk indicator would have to be at levels above 28%, which represents more than three times the current level of the system, for it to present a systemic vulnerability scenario like the one described. Even though the individual analysis is quite mixed, the above implies that the system currently has a substantial cushion for dealing with losses from loan-loss provision costs and the lower interest income that a deterioration in the quality of the portfolio could cause.

The results of stress tests are obtained from hypothetical scenarios that use a set of restrictive assumptions and do not consider potential policy responses that the group of authorities who share a macroprudential objective could implement. It is, therefore, to be expected that, the active and timely policy response of the different entities at the financial system security network as well as a lower magnitude of the shock, could imply that the impact on financial stability will presumably be lower.

02

Vulnerabilities of the Financial System

This chapter analyzes the overall situation of financial institutions in the framework of the health emergency caused by the coronavirus and of the policies implemented by authorities to deal with the crisis. An overview of the financial system and an analysis of its exposure to credit, market, liquidity, and interest rate risks are presented below.

2.1 Current Situation of the Financial System

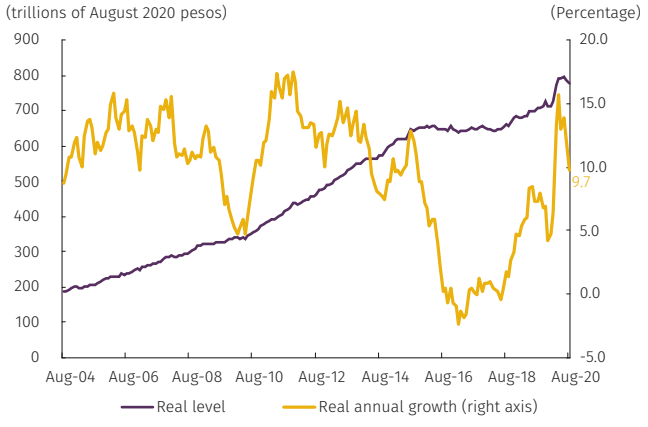
Between February and August 2020, the credit institutions' (CI) balance sheet showed a surge mainly due to the performance of investments and, to a lesser degree, of the loan portfolio and cash.

As of August 2020, CI assets (COP 776.7 trillion, t) registered a real annual growth rate of 9.7%,[2] reversing the downward trend they had been presenting since June 2019 (Graph 2.1). The greater dynamism of assets took place in a context of greater liquidity in the economy and occurred because of an upturn in the expansion rate of investments and, to a lesser extent, due to the performance of the loan portfolio and cash. The higher growth of investments and cash relative to the loan portfolio led to a reduction in the latter's share of total assets (Graph 2.2).

The investment portfolio of CIs has expanded in response to an increase of the position in other securities issued by the CNG, specifically in the Solidarity Securities (SS) which were ordered to be issued by the CNG in

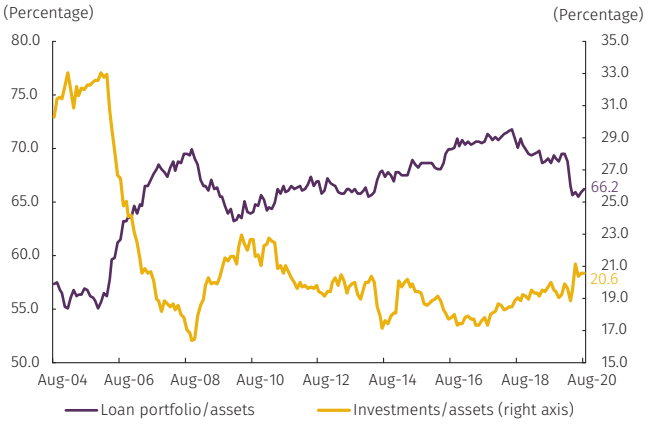
2 Real growth was calculated by using the consumer price index (CPI) excluding food.

Graph 2.1
Credit Institutions' Assets



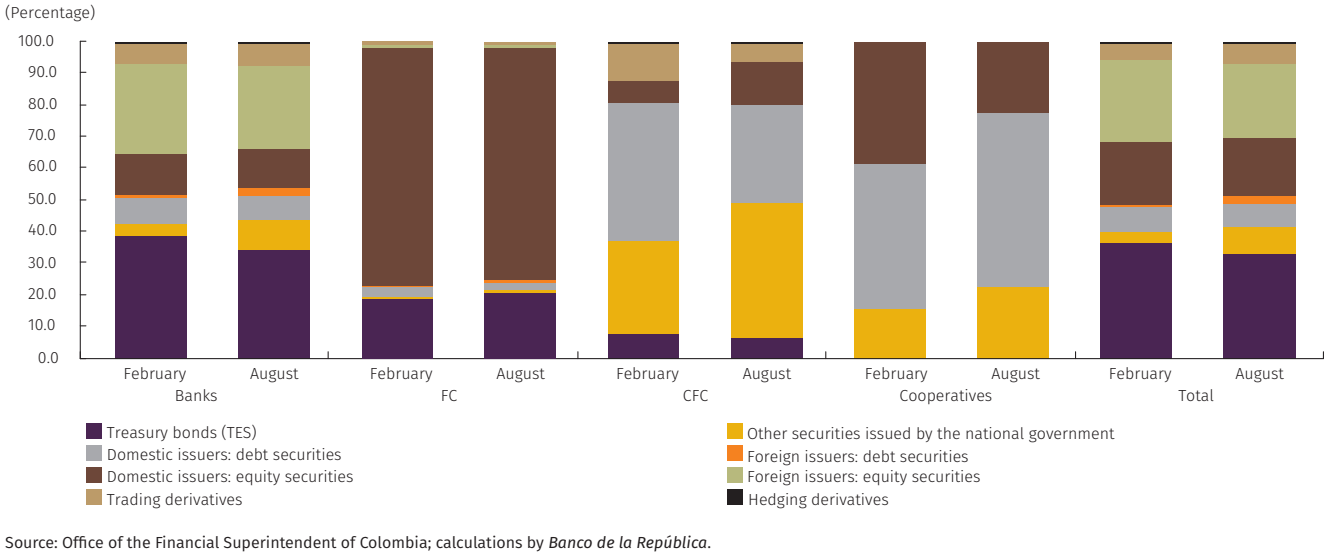
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Graph 2.2
Percentage Share of Investments and Gross Loan Portfolio in Total Credit Institutions' Assets



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Graph 2.3
Composition of Credit Institutions' Investments
(February 2020 vs. August 2020)



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

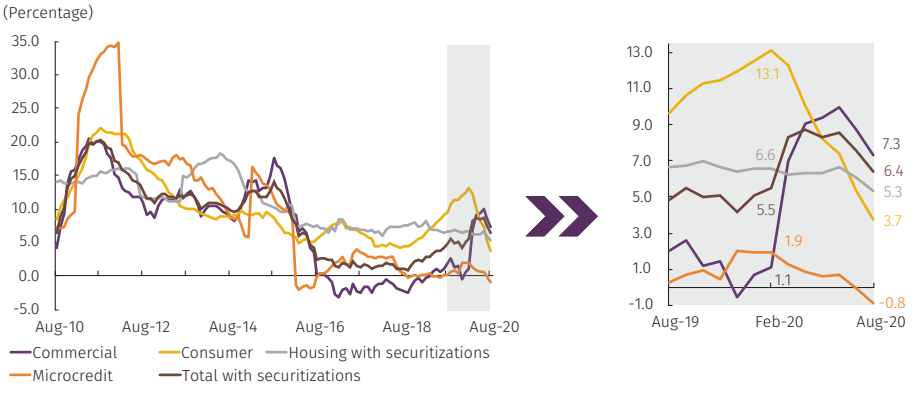
May 2020 in order to reinforce the budget of the Emergency Mitigation Fund (FOME in Spanish) (Graph 2.3).

The higher growth registered by the total loan portfolio was explained mainly by the commercial loan portfolio which showed surges between February and July 2020 derived, to a great extent, from higher disbursements to large companies possibly because of existing pre-approved credit lines. Nevertheless, this trend seems to have been temporary, because starting in August, this category of loan portfolio began to adjust downwards. The remaining categories have shown sustained slowdowns in line with the increased risk perception in the economy resulting from the health crisis (Graph 2.4).

The credit risk indicators for the total loan portfolio experienced a decline as a result of the control measures authorized by the Office of the Financial Superintendent of Colombia. However, with the beginning of their expiration, the indicators have begun to register increases.

In March 2020, The Office of the Financial Superintendent of Colombia (FSC) issued External Circulars (EC) 007 and 014 by means of which

Graph 2.4
Real Annual Growth of Credit Institutions' Gross Loan Portfolio



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

instructions were given to mitigate the effects of the health emergency caused by Covid-19. The primary measure consisted of allowing the CIs to grant grace periods between April and July 2020 to debtors who were not able to continue making payments on their debt obligations, without affecting their credit rating. Its implementation had an impact on the performing loan portfolio due to the fact that, in addition to restraining its deterioration, it introduced a positive effect since it allowed CIs to reclassify as performing loans that, as of 29 February, were between thirty and sixty days in arrears.

Given that the ECs 007 and 014 expired and that the negative impact on debtors persists due to the extension of preventive isolation measures, the FSC generated a second set of measures to ensure structural solutions for debtors and issued EC 022/30 June 2020 by means of which the Debtor Assistance Program (PAD in Spanish) was implemented. The main goal of this program was to give CIs and their borrowers tools so that they could redefine their loan conditions in line with their new economic reality. The PAD went into effect on 1 August and will remain in effect until 31 December 2020.

The first stage of measures, which included grace periods, reached 11.8 million (m) debtors who had 16.8 m loans that came to a total of COP 224.9 t (43.3% of the total loan portfolio). Loans allocated to households, i.e., housing and consumption, were those with the highest balance in grace periods as a percentage of their total portfolio, followed by the microcredit and commercial loan portfolios. In the framework of PAD with a cut-off date of 28 October 2020, a total of 1,394,685 beneficiaries of the program were reported who have loans with a total value of COP 25.5 t (Table 2.1).

The measures taken by the FSC and implemented by the CIs to mitigate the impact of the health crisis were reflected in the performance of the risky and non-performing loan portfolios. In the majority of the categories, these presented a considerable reduction in their real

Table 2.1
Loans Accommodated to Measures Issued in External Circulars 007, 014, and 022/2020.

Loan category	31 July 2020		28 October 2020
	Balance of loans with measures taken in ECs 007 and 014 (trillions)	Share (percentage)	Balance of loans in PAD (trillions)
Commercial	COP 88.2	31.8	COP 7.7
Consumer	COP 81.4	52.5	COP 13.6
Microcredit	COP 6.2	48.0	COP 0.4
Housing	COP 49.1	69.1	COP 3.8
Total	COP 224.9	43.3	COP 25.5

Note: the balance of loans in PAD should not be added to that of the first stage of measures. In addition, to the extent that PAD is individualized, it grows at a more contained pace compared to the dynamics of the first-stage measures.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

annual growth with the exception of the commercial loan portfolio. However, with the beginning of the expiration of the grace periods, this downward trend was reversed in August 2020 (Graph 2.5, panels A and B). Unlike the non-performing portfolio, the write-offs in all categories showed positive growth rates, and for instance, the housing and consumer write-offs grew at higher rates (Graph 2.5, panel C).

In line with the trend of the risky and non-performing loan portfolios, the traditional credit risk indicators (quality indicator by risk, QIR and non-performing loans indicator, NPL) presented declines up to July 2020 and, subsequently, they adjusted in accordance with the lower demand and supply of credit as well as with the perception and materialization of risk in the current situation (Graph 2.6, panels A and B). When write-offs are taken into account, it is clear that the decline in the NPL up to July is registered at a smaller magnitude for the consumer loan portfolio, and in fact, in the case of microcredit, the indicator rises slightly (Graph 2.6, panel C).

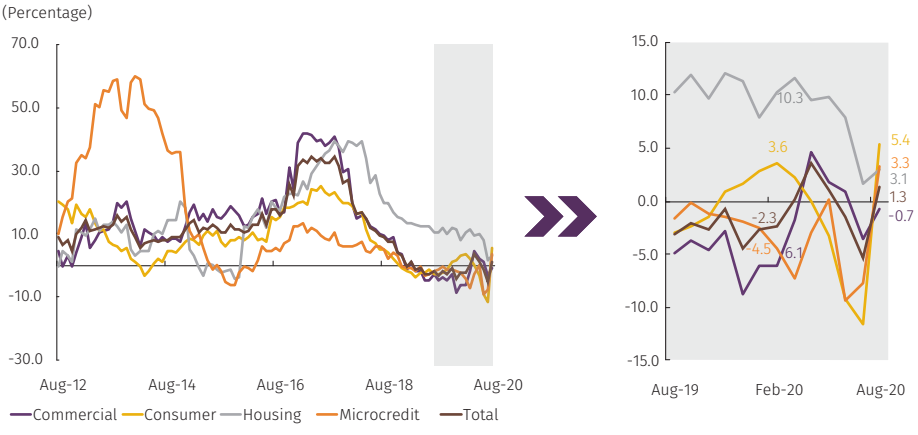
Despite the performance seen for the risky and non-performing loan portfolios, the loan-loss provisions surged during the grace periods. This was accompanied by an increase in the total loan portfolio coverage indicator. These dynamics reflected the prospective recognition, on the part of CIs, of the increase in credit risk as a result of the slowdown in economic activity.

The performance exhibited by the risky and non-performing loans while ECs 007 and 014 were in effect did not translate into lower loan-loss provisions for the total loan portfolio. On the contrary, these experienced surges throughout the course of 2020 since CIs constituted loan-loss provisions additional to regulatory ones, behavior accompanied by a rise in the total loan portfolio coverage indicator[3] (CI) (Graph

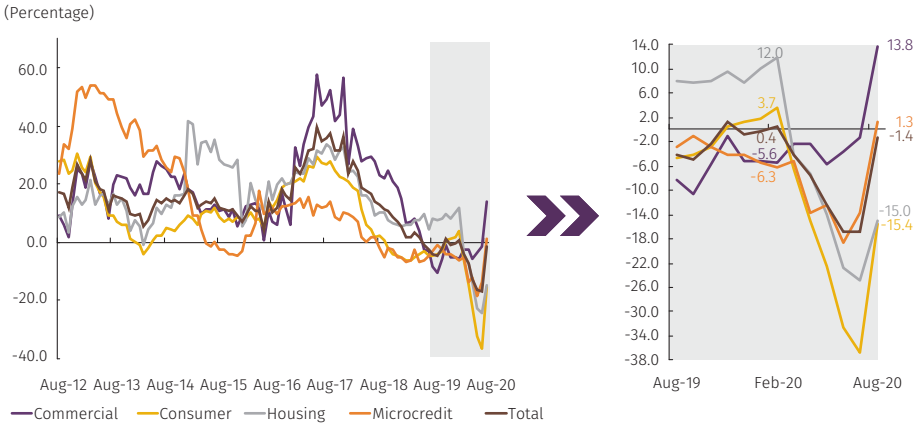
3 Calculated as the ratio between the balance of loan-loss provisions and that of the total loan portfolio.

Graph 2.5
Real Annual Growth of Risky Loans, Non-Performing Loans, and Write-Offs

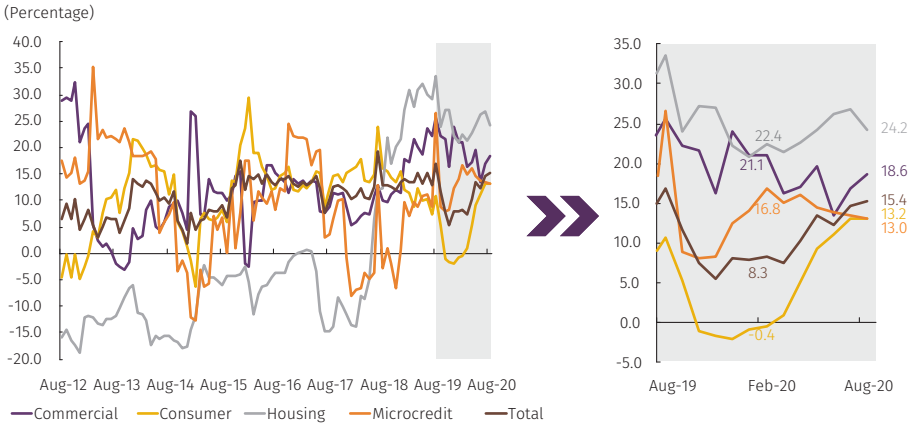
A. Real Annual Growth of the Risky Loan Portfolio



B. Real Annual Growth of Non-Performing Loans



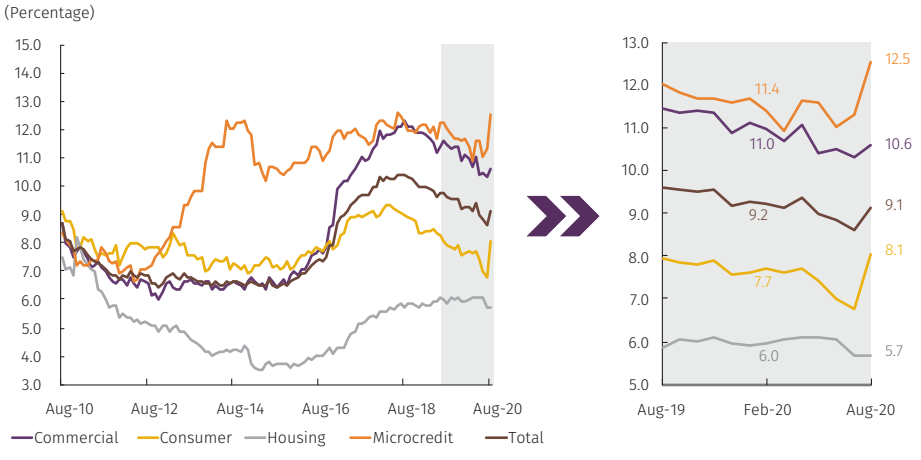
C. Real Annual Growth of Loan Write-Offs



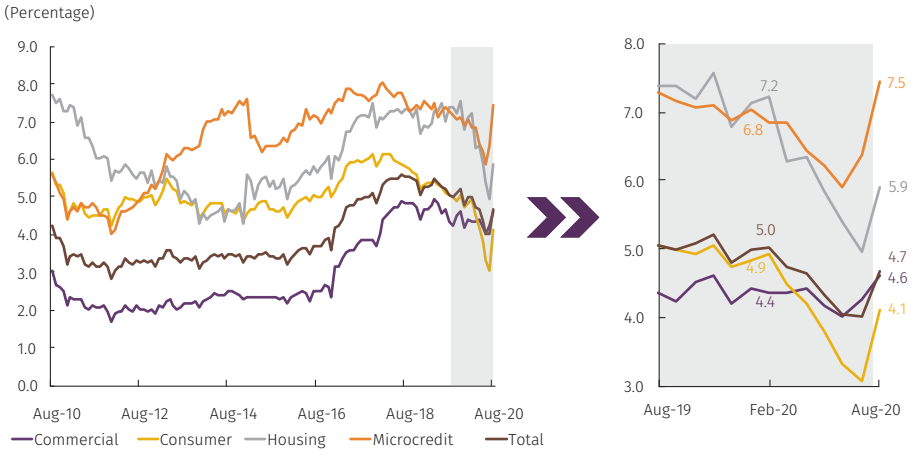
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Graph 2.6
Credit Risk Indicators

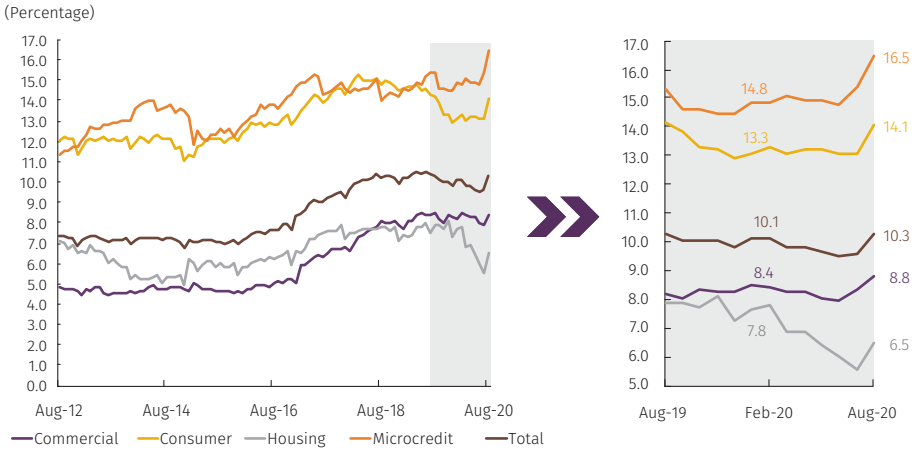
A. Qir



B. NPL



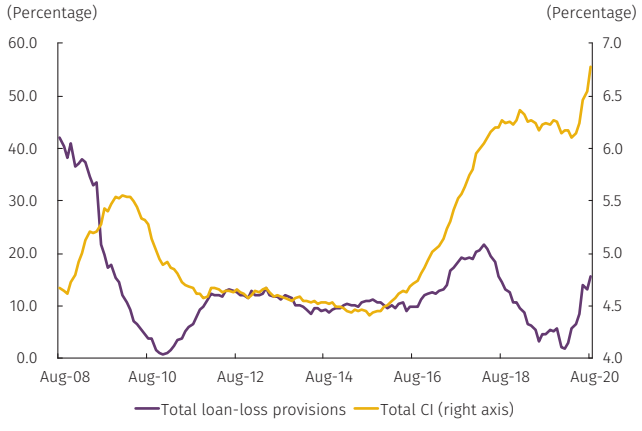
C. NPL including Write-Offs



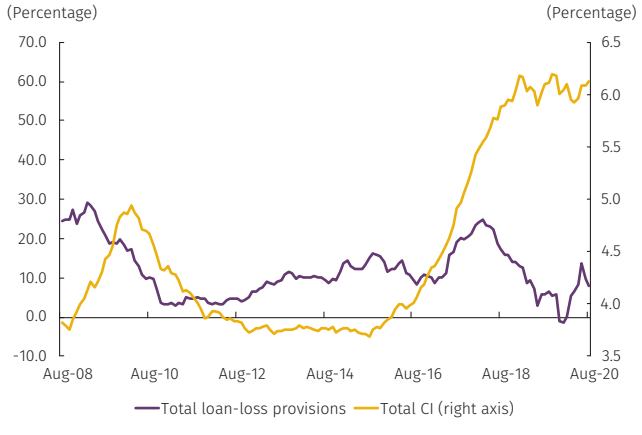
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Graph 2.7
Total Loan Portfolio Coverage Indicator and Real Annual Growth of Loan-Loss Provisions

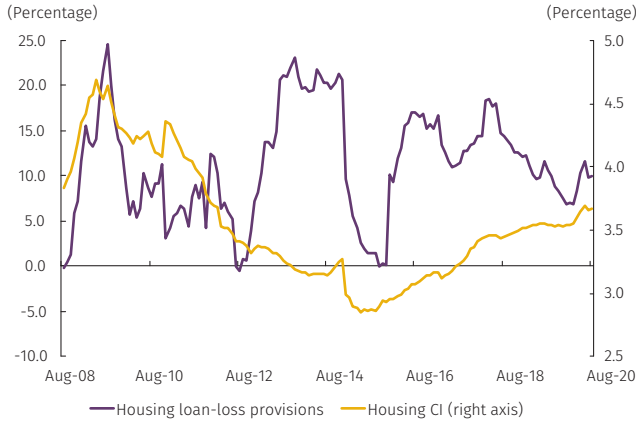
A. Total Loan Portfolio



B. Commercial Loan Portfolio



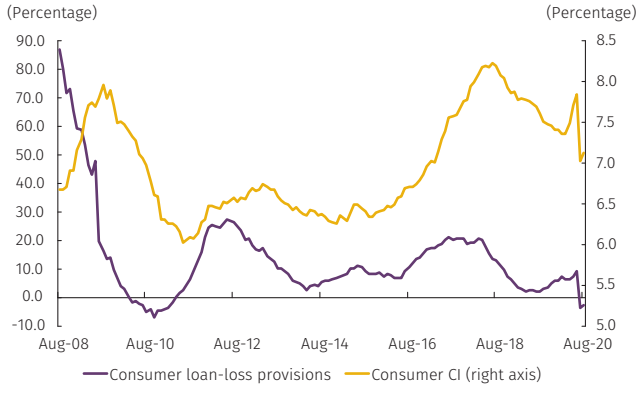
C. Housing loan portfolio



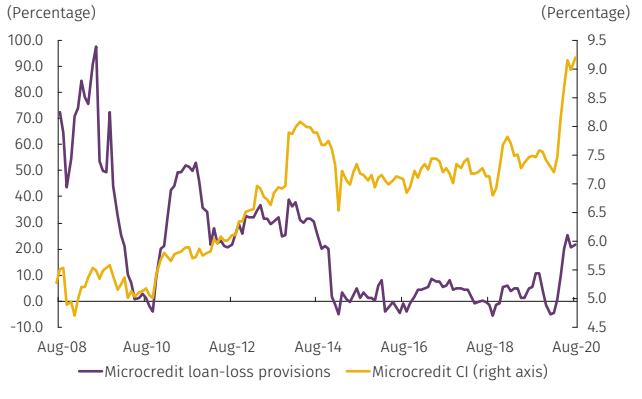
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

2.7, panel A). This reflected the prospective recognition of an increase in credit risk on the part of CIs given the slowdown in economic activity. For the different loan categories, a performance similar to that of the total loan portfolio can be seen with the exception of the consumer loan portfolio which began to register a reduction in loan-loss provisions[4] as of July 2020 and, hence, a decrease in its CI (Graph 2.7, panels B, C, D, and E).

D. Consumer Loan Portfolio



E. Microcredit Loan Portfolio



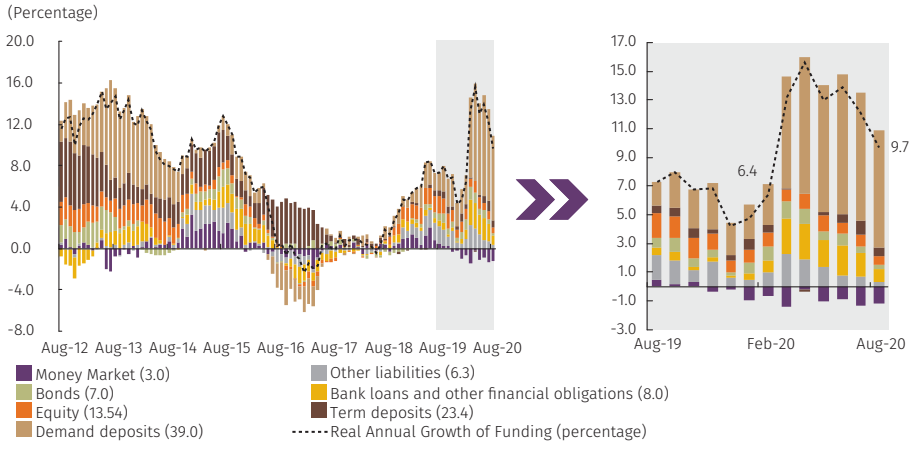
4 Between June and July 2020, the balance of the procyclical and general loan-loss provisions for all categories showed a decline with the exception of the general loan-loss provisions for the housing loan portfolio. This decrease resulted from a redistribution of the balance from pro-cyclical loan-loss provisions to the additional new general loan-loss provisions mandated by the FSC's EC 022, and from the general loan loss provisions to the new general loan loss provisions for uncollected accrued interest (UAI) as stipulated by the same Circular, which are registered in accounts receivable and not in the loan portfolio. Note that the new additional general loan-loss provisions stipulated by EC 022 are not disaggregated by category but registered as loan-loss provisions for the loan portfolio as a whole. The redistribution mentioned above occurred in greater magnitude for the consumer loan portfolio where general loan-loss provisions decreased, in real terms, COP 329.3 billion (b; -89.6%) and the procyclical ones, COP 992.2 b (-10.3%).

For the remainder of 2020, a further increase in loan-loss provisions may be expected due to measures adopted by the FSC in EC 022 which introduced the two additional general loan-loss provisions: one mandatory to recognize the potential risk of uncollected accrued interest while the grace periods were in effect, and one voluntary that is intended to cover the potential deterioration of the loan portfolio granted to sectors most affected by the current situation and which benefited from periods of grace and other measures adopted under ECs 007 and 014.

CIs liabilities have grown at a higher rate since March 2020 driven mainly by demand deposits and loans with other financial institutions.

Within the framework of measures adopted by *Banco de la República* to inject liquidity into the economy, funding of CIs expanded as it went from growing 6.4% in February 2020 to 9.7% six months later. This has been driven by increased growth in demand deposits. In contrast, money market funding, bonds, and other liabilities have lost relevance (Graph 2.8).

Graph 2.8
Real Annual Growth of Funding and Contribution of its Components



Note: the share of each component in funding (liabilities + equity) is in parenthesis.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

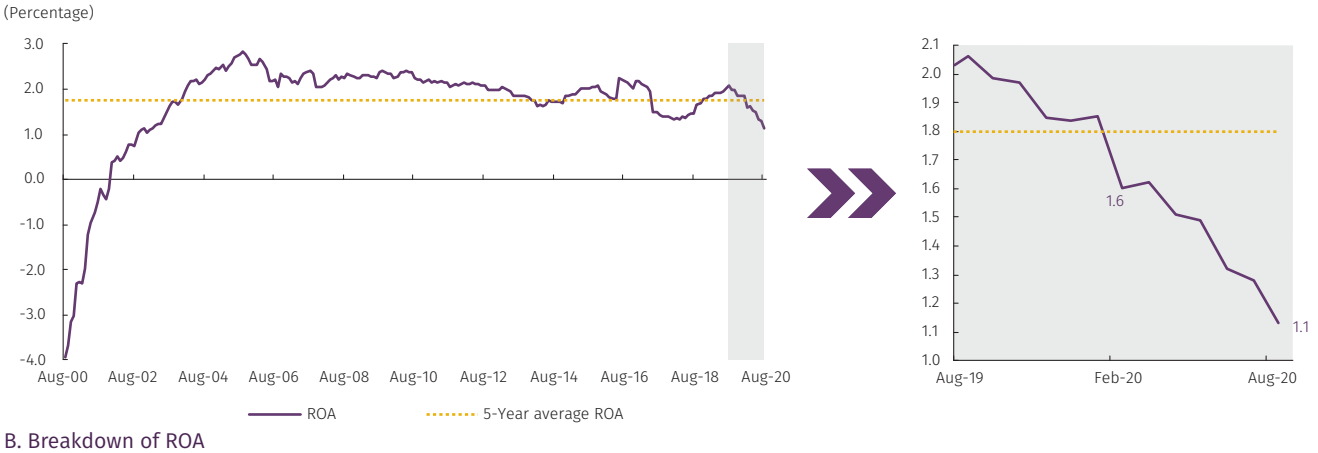
Amidst the current situation caused by Covid-19, the profitability of the CIs maintained the downward trend it has been showing since August 2019. In contrast, both capital adequacy and aggregate liquidity continued to stay well above their regulatory minimums.

As was mentioned in the Financial Stability Report (FSR) of the First Half of 2020, the return on assets (ROA) of CIs has been showing a downward trend since August 2019, primarily due to a greater competition between institutions. Amidst the current situation caused by Covid-19, the ROA continued to decline as a result of higher asset growth and earnings decreasing in real annual terms at a rate of 39.1% and, as of August 2020, registered a level of 1.1% which is lower

than the average of the last five years (1.8%, Graph 2.9, panel A). The decline in profits has been the result of lower reimbursements of loan-loss provisions or loan portfolio recoveries and less income from the loan portfolio given the reduction of disbursements in certain categories. With regards to expenses, the higher expenditures in loan-loss provisions due to the recognition and revelation of risk

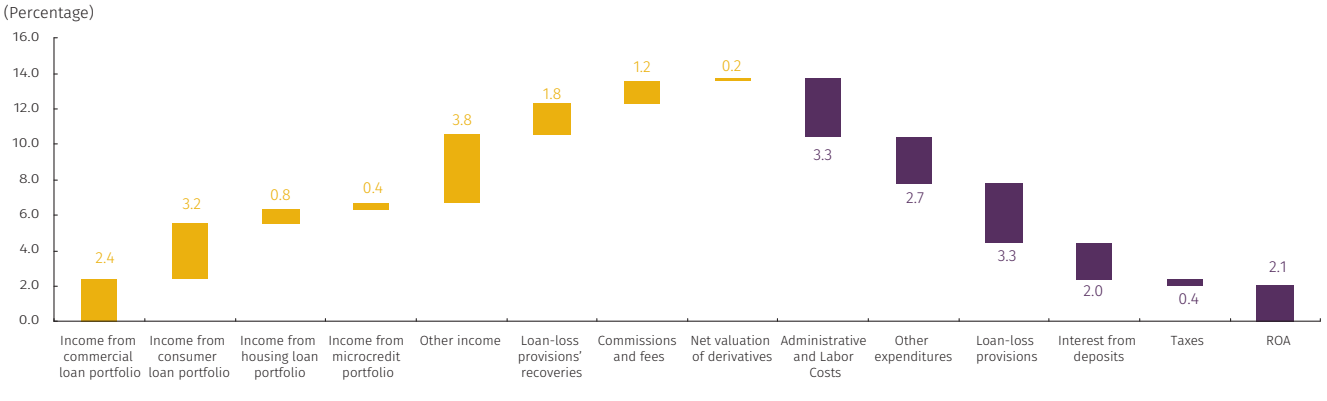
Graph 2.9

A. Return on assets (ROA)

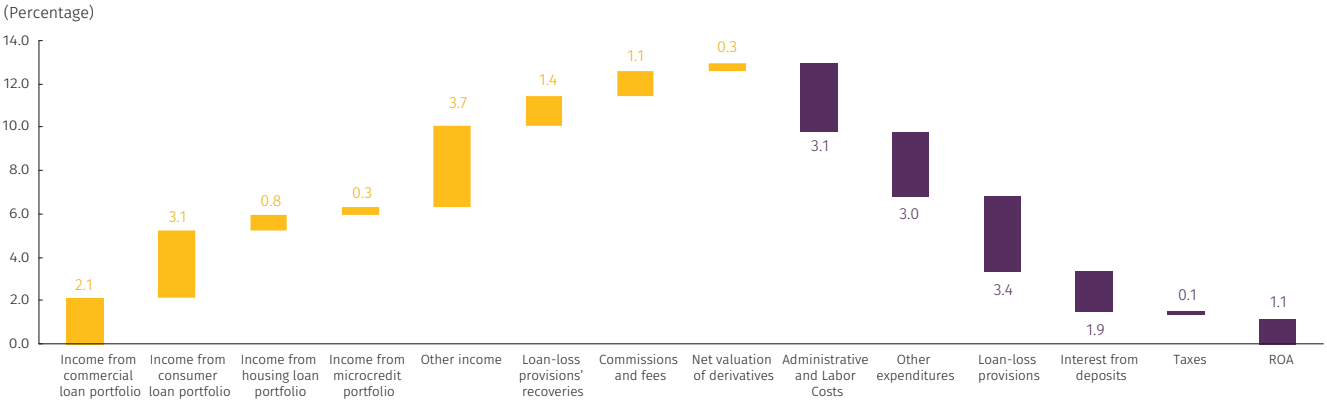


B. Breakdown of ROA

I. August 2019



II. August 2020

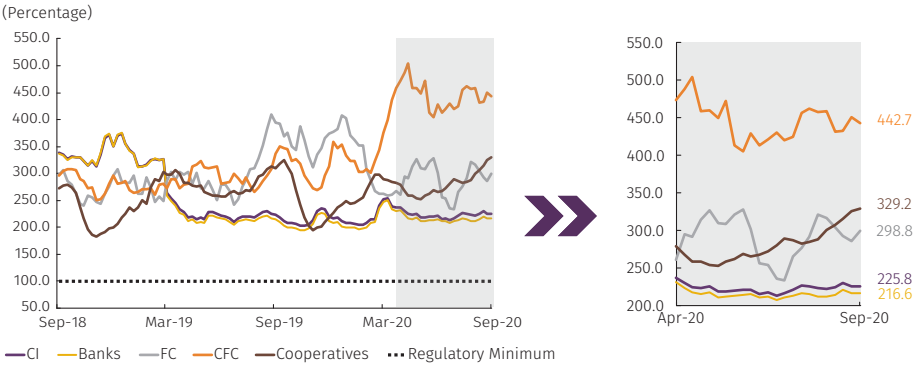


Source: *Office of the Financial Superintendent of Colombia;* calculations by *Banco de la República*.

and the increase in other expenses[5] have put downward pressure on earnings (Graph 2.9, panel B).

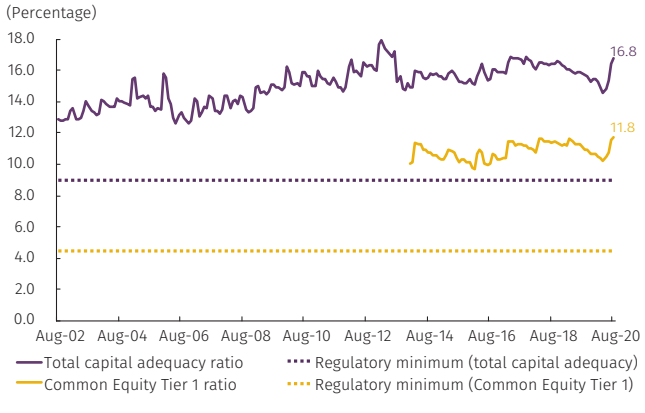
In view of this vulnerability and the deterioration in loan portfolio quality, the CIs have adequate levels of liquidity and capital adequacy as resiliency barriers. Aggregate liquid assets continue to significantly exceed the value of the 30-day net liquidity requirements, and as of 25 September 2020, the institutions registered a Liquidity Risk Indicator (LRI) of 225.8%. By type of institution, the LRI for the corporate financing companies (CFC) rose as a result of an increase in cash balance and, currently, its indicator registers levels that are higher than the average of the last few years (Graph 2.10). Regarding the soundness of the institutions' equity, the levels of total capital adequacy and Common Equity Tier 1 ratios are still well above their regulatory minimum. This, in principle, could make it possible for CIs to absorb the economic impacts generated by the spread of Covid-19. In fact, since April 2020, these indicators have been rising due to lower levels of disbursements in some loan categories and to the anticipated voluntary alignment of some CIs to guidelines established by Basel III[6] (Graph 2.11).

Graph 2.10
Weighted Average 30-day Liquidity Risk Indicator (LRI) for CIs[a/]



a/ average that gives a higher weight to most recent data.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Graph 2.11
Credit Institutions' Capital Adequacy Ratio



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

5 This includes interest on bank loans and other obligations, financial interest from money market transactions, commissions, expenses from the valuation of hedging derivatives, and the countercyclical component of individual loan-loss provisions).

6 With the issuance of Decrees 1477/2018 and 1421/2019, CIs must converge in January 2021 to the guidelines established by Basel III regarding capital. As part of this process, the FSC allowed these to be adopted early by the institutions on a voluntary basis starting in the second quarter of 2020. Based on the above, BBVA initiated early alignment in June, Banco Agrario and Tuya in July; Credifinanciera, Bancompartir, GM, Coltefinanciera, and Bancoldex in August; and Banco Falabella is expected to do so in September 2020.

2.1.1 Non-banking Financial Institutions

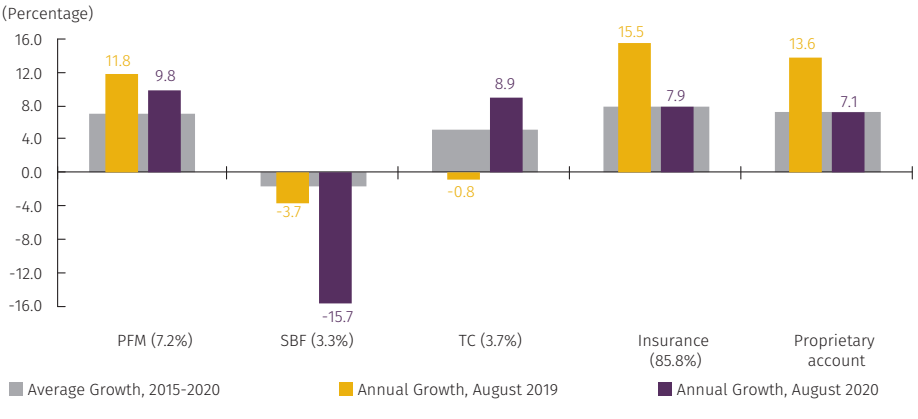
Assets in the proprietary account and those managed by non-banking financial institutions experienced a slowdown.

In August 2020, assets in the proprietary account of the Non-banking Financial Institutions (NBFI) represented 5.1% of the financial system assets. Also, there was a slowdown in growth compared to August 2019. Nevertheless, the growth remained close to its historical average. The stock-brokerage firms (SBF) continued to show negative growth, and it is the only business registering this trend. With respect to the assets in the proprietary position, those of the insurance companies, which have a share that is close to 90%, are the most representative (Graph 2.12, panel A).

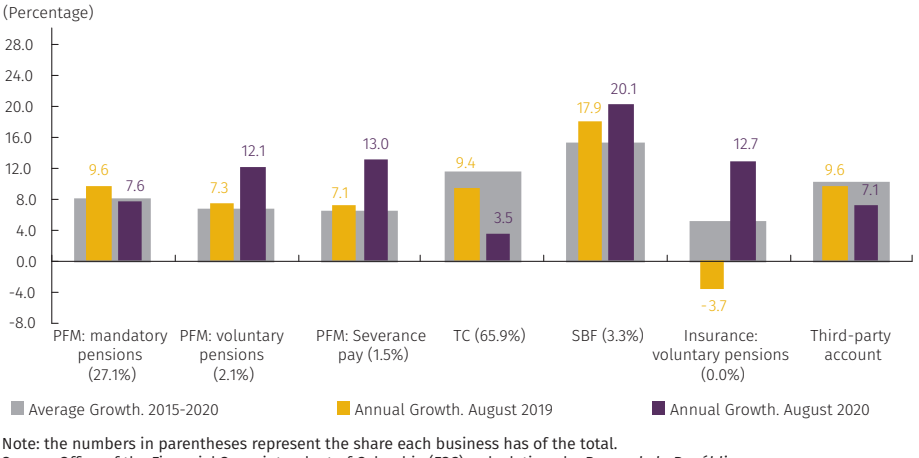
Regarding the portfolio managed by the NBFI, the balance represented 50.4% of the financial system assets and showed surges in growth for the main part of portfolios with the SBF portfolios seeing the most growth (Graph 2.12, panel B). Nevertheless, the total managed portfolio shows a growth below its historical average.

Graph 2.12
Real Annual Growth of NBFI Assets

A. In proprietary account

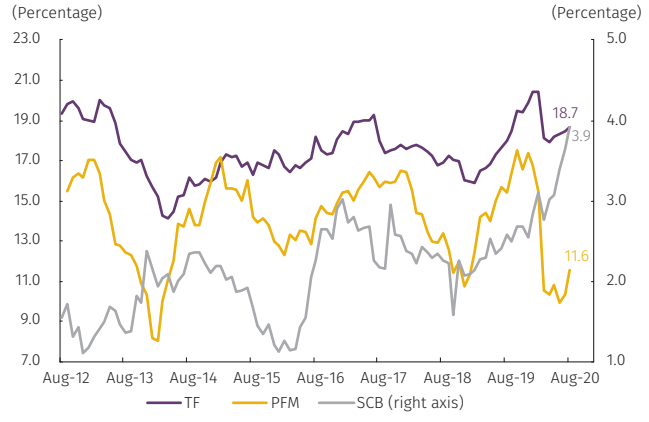


B. In third-party account



Note: the numbers in parentheses represent the share each business has of the total.
Source: Office of the Financial Superintendent of Colombia (FSC), calculations by *Banco de la República*

Graph 2.13
ROA of TC, SBF, and PFM

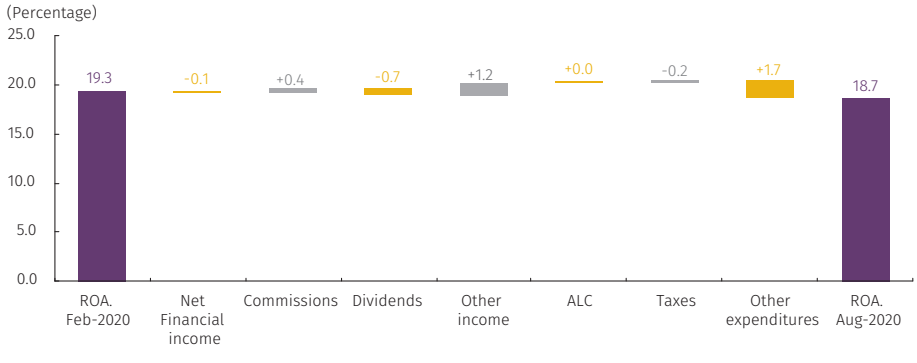


Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

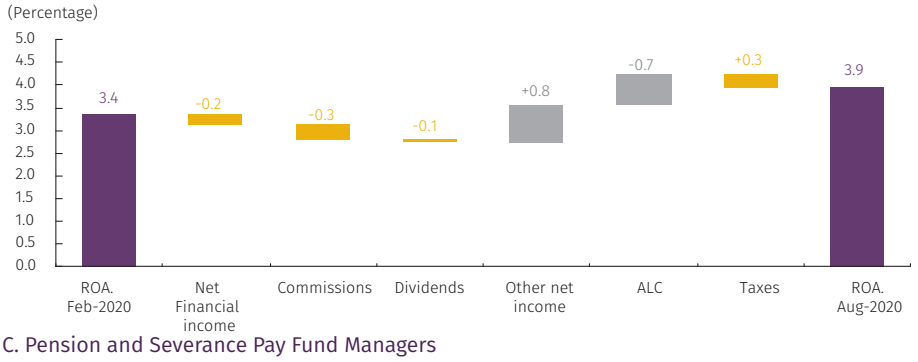
Over the course of the year, the ROA of the NBFI registered decreases that are associated mainly with the income from their investments.

After the shock registered towards mid-March, the ROA of the TC and PFM declined (Graph 2.13). At the same time, the indicator for the SBF continued with the growing trend that had been underway since the second half of 2018. In the case of the TC, this is mainly caused by the increase in their expenditures (Graph 2.14, panel A). The performance of the SBFs was primarily due to the favorable figures of their expenditures (Graph 2.14, panel B). Lower profitability

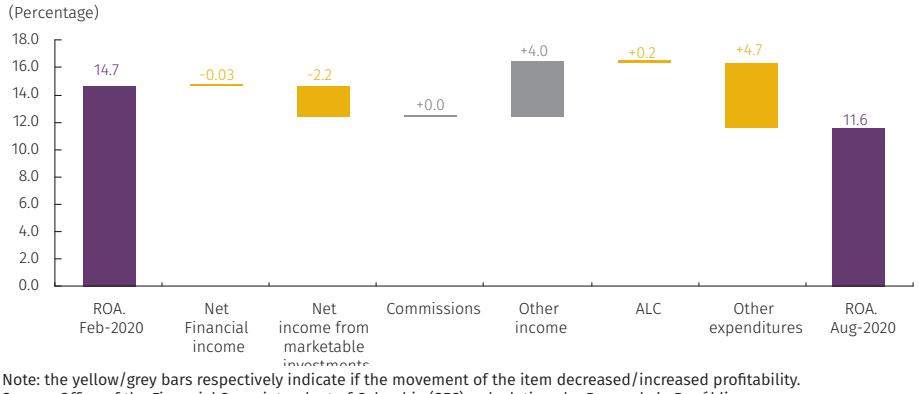
Graph 2.14
Breakdown of Profitability
A. Trust fund companies



B. Stock Brokerage Firms

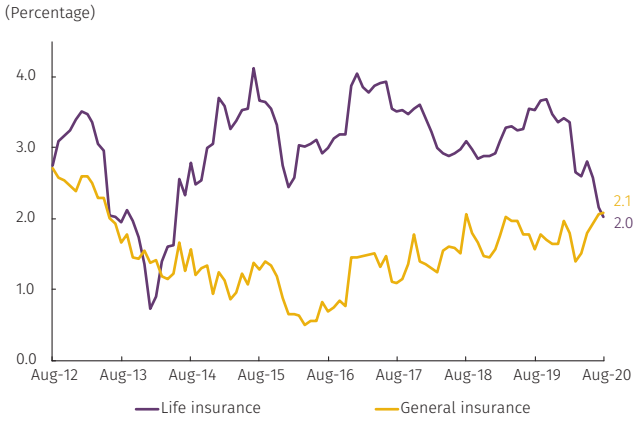


C. Pension and Severance Pay Fund Managers



Note: the yellow/grey bars respectively indicate if the movement of the item decreased/increased profitability.
Source: Office of the Financial Superintendent of Colombia (SFC), calculations by *Banco de la República*.

Graph 2.15
ROA of Life and General Insurance



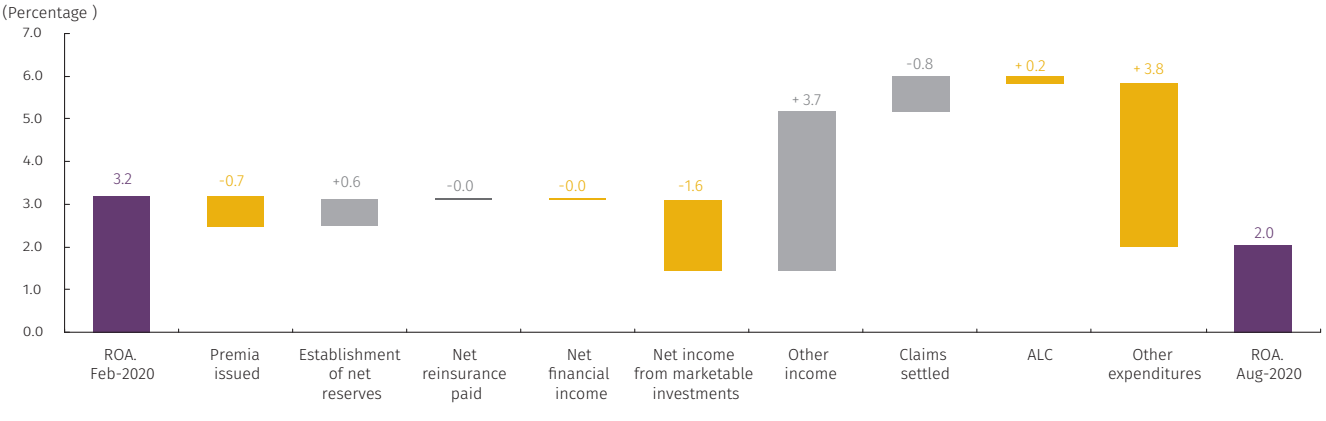
Source: Office of the Financial Superintendent of Colombia (SFC), calculations by *Banco de la República.*

of PFM is primarily due to a decline in their net income from marketable investments and an increase in their expenditures (Graph 2.14, panel C). Insignificant increases were seen in the financial income of the three types of entities.

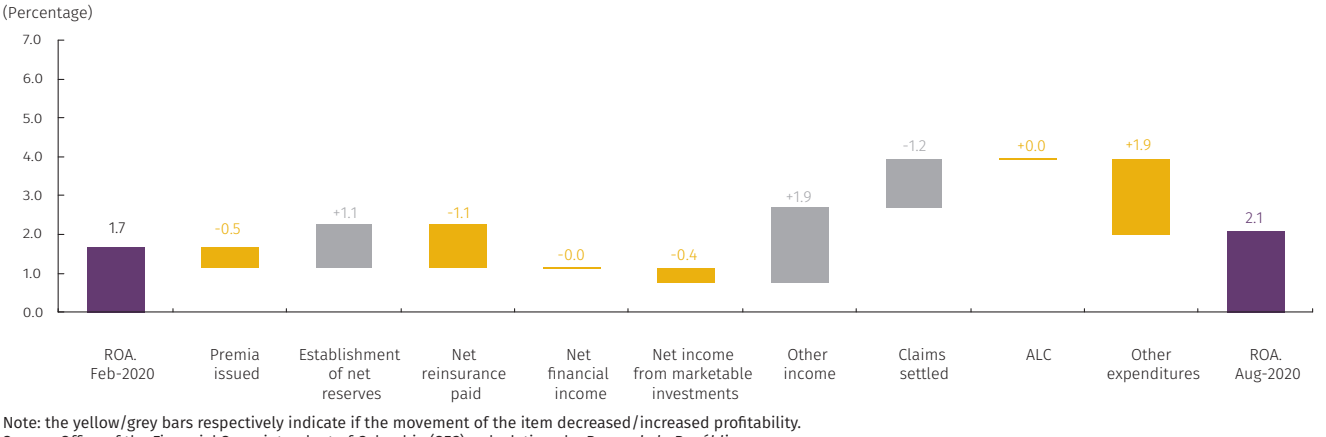
In the case of life insurance companies, ROA showed a downward trend since the end of last year and, at this point, it has reached its lowest value in the last six years. Meanwhile, a positive trend has been seen for general insurance companies and as of July, they had registered a value that has not been seen since mid-2013 (Graph 2.15). For the former, this decrease in their profitability is the result of lower net income from marketable investments and an increase in their expenses. Nevertheless, they have benefited from a lower number of claims settled (Graph 2.16, panel A). Regarding general insurance companies, the increase in their profitability was mainly due to a decrease

Graph 2.16
Breakdown of Insurance Company Profitability

A. Life insurance



B. General insurance



Note: the yellow/grey bars respectively indicate if the movement of the item decreased/increased profitability.
Source: Office of the Financial Superintendent of Colombia (SFC), calculations by *Banco de la República.*

in the accumulation of net reserves[7] and in the number of claims settled (Graph 2.16, panel B).

2.2 Credit Risk

The analysis of credit risk presented below is divided between the corporate sector and households. The development of corporate sector indebtedness and the perception and materializing of private companies' credit risk is analyzed by economic sector in the first subsection. The indebtedness of households is identified in the second sub-section and some risk indicators are presented that are related to the performance of this loan portfolio.

2.2.1 Corporate Sector[8]

2.2.1.1 Change in corporate sector indebtedness

In the first half of 2020, the corporate sector increased its indebtedness as a percentage of GDP. This is explained by an increase in the total debt and by the fall in economic activity. As of June 2020, the private corporate sector's debt in foreign currency is still mostly covered.

As of June 2020, the total indebtedness of the corporate sector as a share of the annualized GDP stood at 63.2% and showed a 7.3 pp upswing with respect to what had been seen six months earlier. Of the total, the private corporate sector[9] contributed 53.6 pp while the public sector contributed the remaining 9.6 pp. The former showed a rise that was spurred mainly by more indebtedness to domestic financial institutions (Graph 2.17, panel A). Likewise, the public corporate sector showed increases in its indebtedness that are largely due to a higher balance of bonds issued abroad (Graph 2.17, panel B).

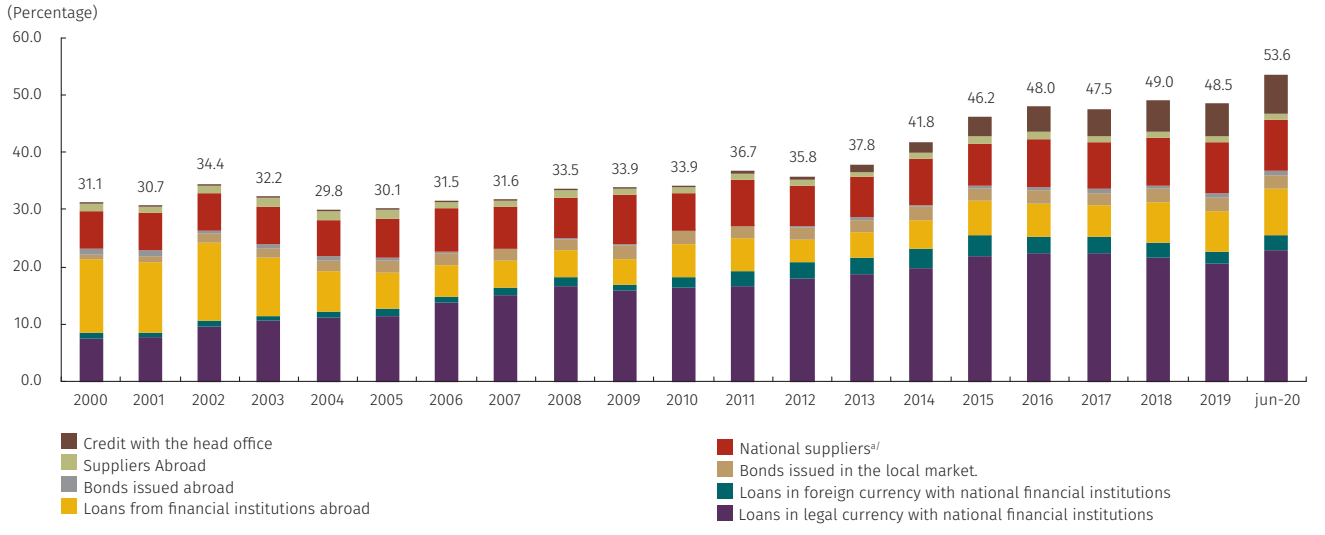
7 The accumulation of net reserves is understood as the result of the release of reserves minus the creation of reserves.

8 Due to availability of information from the FSC Format 341, "Individual Information by Debtor: Active Credit Transactions," the figures in this section were submitted as of June 2020. The weekly information from Format 088, "Weekly report - lending and deposit interest rates," in turn, is used with a cut-off date of 16 October 2020.

9 Throughout the entirety of this section, the term "private corporate sector" refers to private companies and excludes those that are monitored by the FSC.

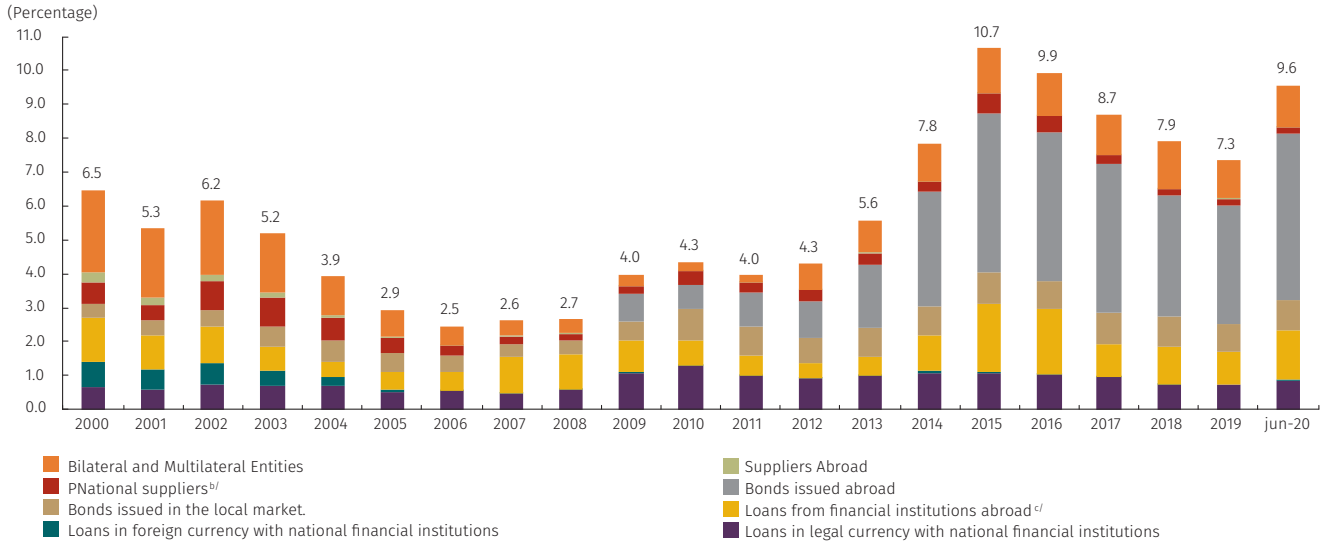
Graph 2.17
Corporate Sector Financial Debt as a Share of GDP by Instrument

A. Private Corporate Sector



a/ This only includes information from companies that report their financial statements to the Superintendency of Corporate Affairs. In 2016, all of the companies registered their financial statements using IFRS which did not make it possible to determine the balance of debt owed to national entities. Therefore, in order to do an approximation of the data from these companies, the average percentage that the short and long-term providers reported under current and non-current liabilities respectively, during this period, for the companies that reported between 2007 and 2015 using the UAP was calculated, and an equal percentage for the entities that submitted financial statements in 2016 was assumed.
Sources: Office of the Financial Superintendent of Colombia; Superintendency of Corporate Affairs, and *Banco de la República;* calculations by *Banco de la República.*

B. Public Corporate Sector



b/ Includes information on the balance of accounts payable of the main non-financial companies in the public sector.
c/ Financial leasing transactions are not included.
Sources: Office of the Financial Superintendent of Colombia; the National General Accounting Office, Ministry of the Treasury and Public Credit; calculations by *Banco de la República.*

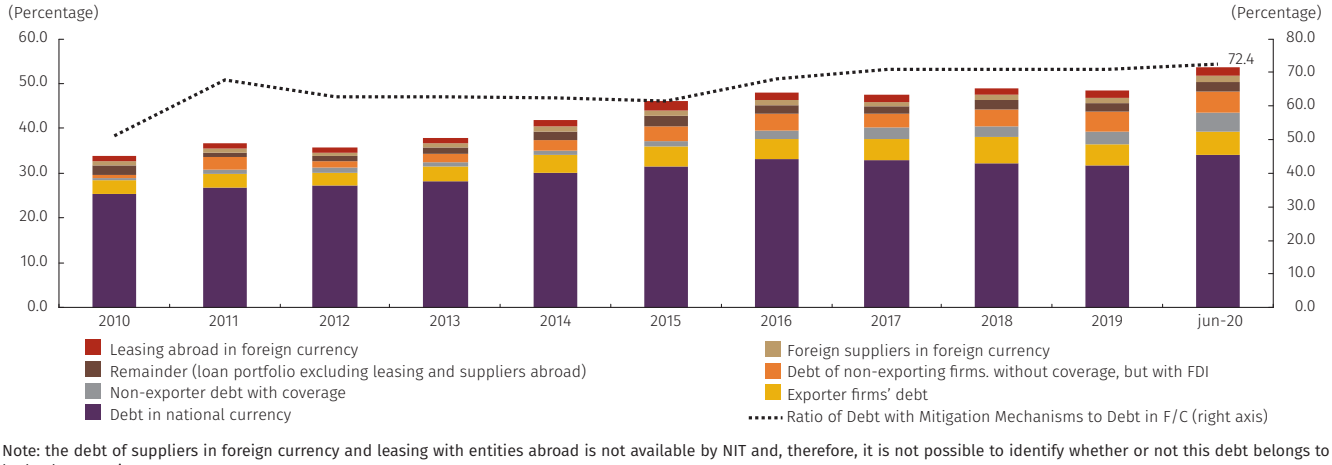
In a context like the current one in which the level of economic activity has fallen, it is relevant to analyze the trend of the level of debt contracted by the private corporate sector since the access firms have to credit could become a key factor for softening the shocks to their income. According to the latest available data, the private corporate sector has increased their debt balance with local financial institution since the beginning of the pandemic. The above could have been influenced by the actions implemented by the national

government in terms of access to credit for firms[10] and by their use of credit lines with CIs. In contrast, there is a lower balance of bonds that has been issued in the local market as of June 2020 and of the dollar-denominated balance of debt instruments issued abroad.

When indebtedness is analyzed by type of currency, private companies continued to keep the majority of their debt in pesos (63.7%). The rise in the aggregate debt as a percentage of the GDP was due to a rise in debt in local currency (2.3 pp) and in foreign currency (2.8 pp). The increase in debt denominated in foreign currency is mostly due to the effect of the depreciation of the peso this year. If the MER had remained constant at the value seen in December 2019, the debt in foreign currency as a share of the GDP would have risen 0.6 pp.

Debt denominated in foreign currency may be a source of vulnerability for the corporate sector to the extent that it exposes the entities to fluctuations in the exchange rate. Nevertheless, the exposure to exchange rate risk is mitigated if the company is an exporter, if it is hedged (through the use of exchange rate derivatives), or if it has the backing of a foreign entity (*i.e.*: through foreign direct investment [FDI]).[11] As of June 2020, Graph 2.18 shows the private corporate sector's financial debt as a share of the GDP by currency hedging, FDI, and the debtor's foreign trade. In spite of the rise in indebtedness

Graph 2.18
Corporate Sector Financial Debt as a Share of GDP by Exchange Rate Coverage, FDI, and Debtors' Foreign Trade



Note: the debt of suppliers in foreign currency and leasing with entities abroad is not available by NIT and, therefore, it is not possible to identify whether or not this debt belongs to hedged companies.
Sources: Office of the Financial Superintendent of Colombia; DANE, and *Banco de la República;* calculations by *Banco de la República.*

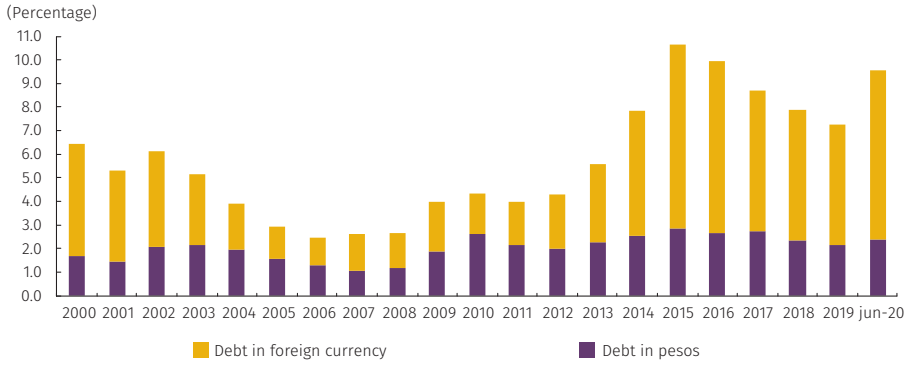
10 The national government implemented the special guarantee program "United for Colombia" by means of which the National Guarantee Fund will back loans to SMEs. With a cut-off date of 7 October 2020, the limit of the credit lines in this program amounted to COP 22.4 t and the amount disbursed to COP 8.6 t. Moreover, Findeter and Bancoldex were authorized to grant direct loans with an offsetting rate to companies that need to finance projects or activities in the sectors most affected by the pandemic.

11 When a foreign entity has FDI in a local company, the foreign exchange risk for the latter is mitigated due to the fact that it is assumed that the investor has an incentive to support the company in the case of a depreciation in the exchange rate.

in foreign currency, the share of debt that has some mechanism for mitigating the exchange rate risk experienced a 1.4 pp rise over the six-month period and stood at 72.4%. This debt has also had a growth trend since 2010 when it represented 51.1%.

Public companies continued to keep the majority of their debt in foreign currency. The rise of the debt of public firms as a share of GDP is primarily caused by a higher debt denominated in foreign currency (Graph 2.19) in line with the higher balance of bonds issued abroad.

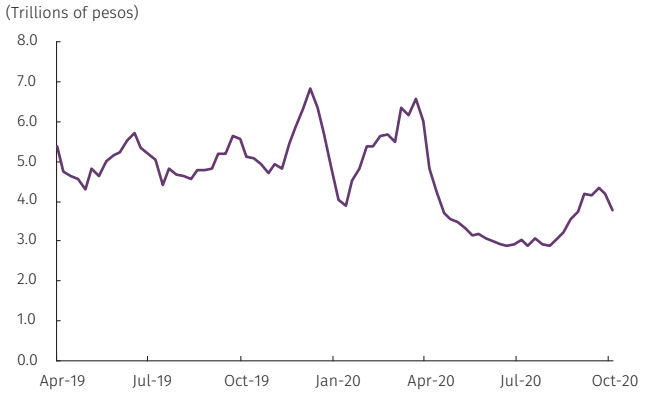
Graph 2.19
Public Corporate Sector Financial Debt as a Percentage of GDP by Currency



Note: Prepared using the same information as on Graph 2.17, panel B.
Sources: Office of the Financial Superintendent of Colombia; National General Accounting Office, Ministry of the Treasury and Public Credit; calculations by *Banco de la República*.

More recent data on weekly disbursements granted by the financial system to the corporate sector indicate that, after the decline experienced between April and August 2020, there was a recovery (Graph 2.20). However, the level of disbursements is at values that are lower than those registered before the lockdown measures.

Graph 2.20
Weekly Commercial Loan Portfolio Disbursements
(4-week moving average)



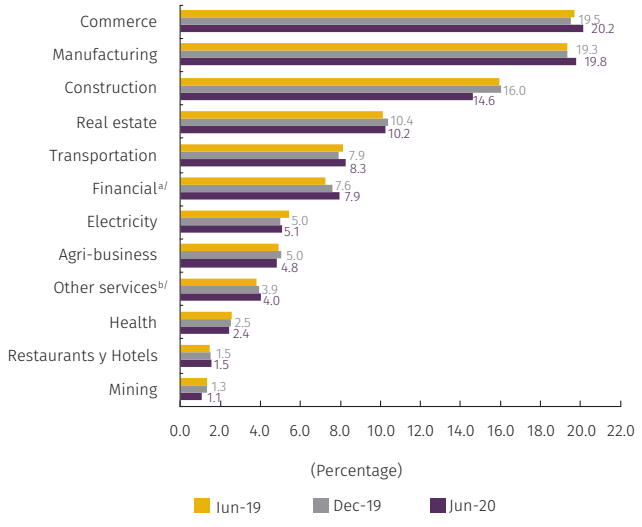
Source: *Office of the Financial Superintendent of Colombia;* calculations by *Banco de la República.*

2.2.1.2 Sector Analysis[12]

With the FSC grace periods going into effect, it has been possible to ease the shock to the traditional credit risk indicators and, thus, no major impacts on the levels of sectoral QIR and NPL have been seen.

12 In this subsection, abbreviations will be used for the following sectors: 1) real estate, rentals and business: real estate; 2) agriculture, animal husbandry, hunting, forestry, and fishing: agribusiness; 3) mining and quarrying: mining; 4) electricity, gas and water: electricity; 5) transportation, warehousing, and communications: transportation; and 6) financial intermediation: finance.

Graph 2.21
Breakdown of the Private Corporate Sector Portfolio Balance by Economic Sector



a/ The financial and insurance sector excludes the loan portfolio granted to entities supervised by the Office of the Financial Superintendent of Colombia.
b/ 'Other services' groups firms belonging to the following economic sectors: public administration and defense; education; other community, social and personal service activities; private households with domestic servants; and the organizations and extra-territorial entities.
Sources: Office of the Financial Superintendent of Colombia; Superintendency of Corporate Affairs, and *Banco de la República;* calculations by *Banco de la República.*

The economic sectors with the largest share of the loan portfolio granted to the private corporate sector were still commerce, manufacturing, and construction which, as a whole, accounted for 54.6% of this portfolio as of June 2020 (Graph 2.21). When the QIR is calculated by economic sector, it is evident that, in general, this indicator shows relatively stable performance with respect to what was seen in 2019 (Graph 2.22, panel A). With the exception of restaurants and hotels as well as mining, the QIR for the majority of the sectors did not present serious deterioration in spite of the adverse panorama the economy faces. Similarly, the contribution of each sector to the QIR does not show major changes (Graph 2.22, panel B).

The high levels of the risk indicators in the construction and transportation sectors are largely due to idiosyncratic factors. The former sector has been affected by the situation of the Concesionaria Ruta del Sol S.A.S, and the latter, by the performance of the companies that provide mass transportation for passengers. Up until the third quarter of 2019, the electricity sector was affected by the past-due portfolio of the Electrificadora del Caribe S. A., but this effect had declined significantly by December 2019 due to the fact that the majority of the entities that were exposed to this company wrote off their loans.

When the sectoral NPL is evaluated, a relative stability similar to that exhibited by the QIR is seen (Graph 2.23): no major deterioration in quality indicators by default is presented except for the agribusiness, construction, restaurants and hotels, and mining sectors.

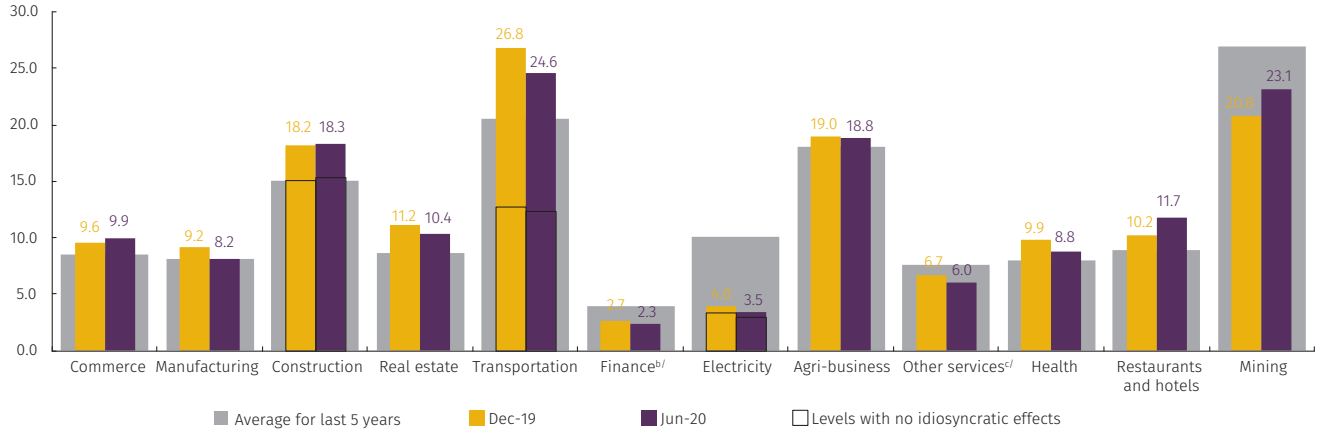
Graph 2.24 shows the QIR and NPL of the subsectors most affected by the health emergency.[13] As can be seen there, the branches of economic activity that have been most affected in the current situation also show stability in their credit risk indicators.

Stability in traditional credit risk indicators in the current context where the economy is sharply affected is partly explained by the relief periods implemented by the FSC's external circulars 007 and 014.

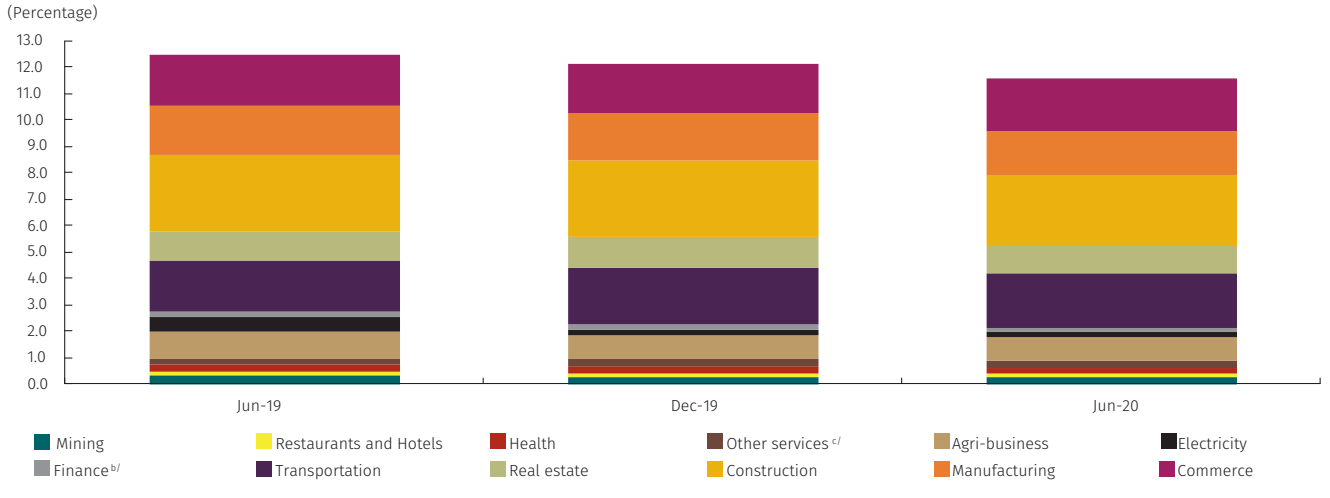
13 This classification was developed by the technical staff at *Banco de la República* and includes airline transportation, lodging and meal services, textile manufacturing, vehicle maintenance and repair, among others.

Graph 2.22
QIR of the Private Corporate Sector

A. Quality Indicator by Risk (QIR) by Economic Sector[a/]



B. Contribution to QIR by Economic Sector



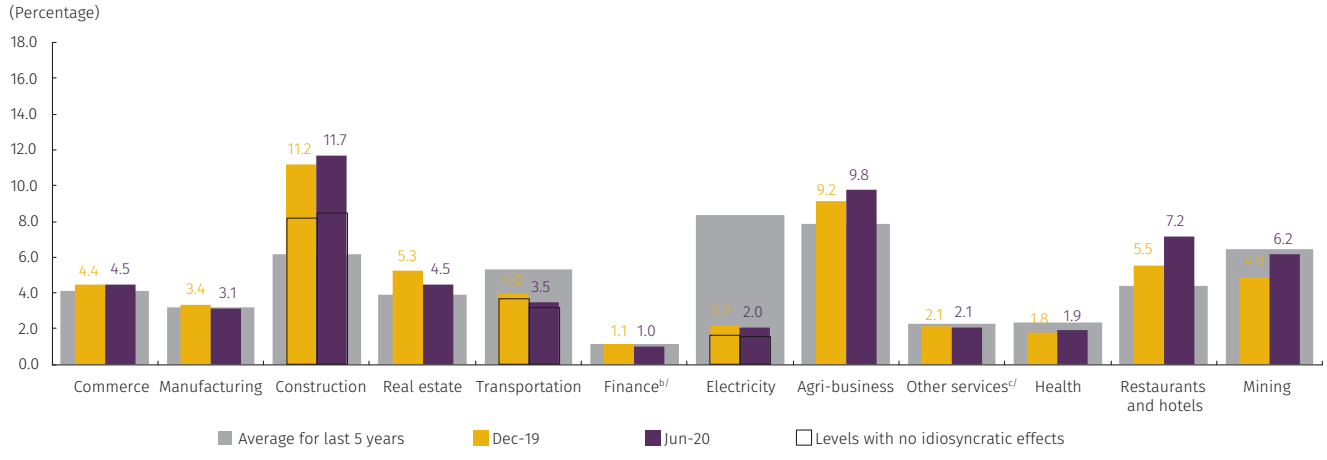
a/ The sectors are organized horizontally from the most to the least representative.
b/ The financial and insurance sector excludes the loan portfolio granted to entities supervised by the Office of the Financial Superintendent of Colombia.
c/ 'Other services' groups firms belonging to the following economic sectors: public administration and defense; education; other community, social and personal service activities; private households with domestic servants; and the organizations and extraterritorial entities.
Sources: Office of the Financial Superintendent of Colombia; Superintendency of Corporate Affairs, and *Banco de la República;* calculations by *Banco de la República.*

In order to evaluate companies' exposure to credit risk in the near future, a forecast exercise was done considering the potential shock of an economic slowdown on companies' financial statements.

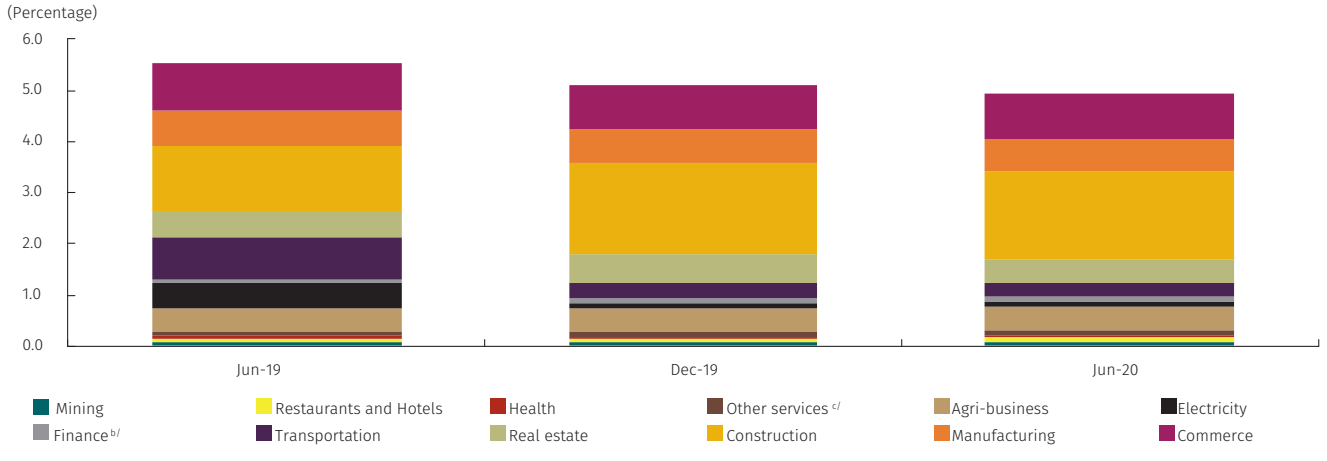
In order to evaluate the future trend of the credit risk firms have, a balance sheet simulation exercise was carried out for companies that report information to the Superintendency of Corporate Affairs (SCA) over a six-month period in which, in general terms, it is assumed that companies' income grows at the same actual rate as the GDP of the sub-sector to which they belong. Once the projected balances are available, the methodology proposed by Meneses, Pirateque & Segovia (2019) is applied, and this, based on three financial indicators (*i.e.*: debt ratio, debt-to-cash flow, and net margin), identifies non-fragile firms that could potentially move to a state of

Graph 2.23
NPL of the Private Corporate Sector

A. NPL by Economic Sector[a/]



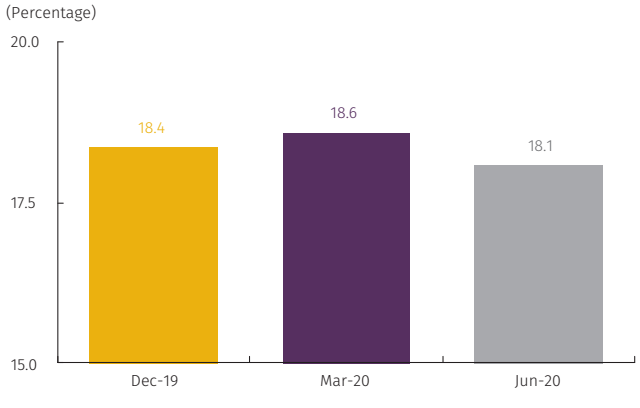
B. Contribution to NPL by Economic Sector



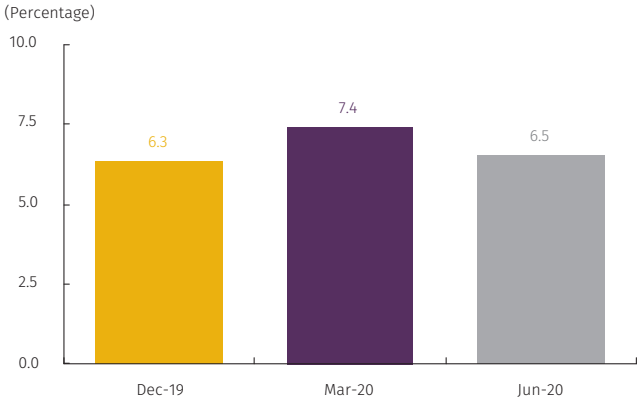
a/ The sectors are organized horizontally from the least to the most representative.
b/ The financial and insurance sector excludes the loan portfolio granted to entities supervised by the Office of the Financial Superintendent of Colombia.
c/ 'Other services' groups firms belonging to the following economic sectors: public administration and defense; education; other community, social and personal service activities; private households with domestic servants; and the organizations and extraterritorial entities.
Sources: Office of the Financial Superintendent of Colombia; Superintendency of Corporate Affairs, and *Banco de la República;* calculations by *Banco de la República.*

Graph 2.24
Indicators of Heavily Affected Subsectors

A. QIR



B. ICM



Note: includes air transportation, lodging and meal services, textile manufacturing, vehicle maintenance and repair, etc.
Source: *Office of the Financial Superintendent of Colombia;* calculations by *Banco de la República.*

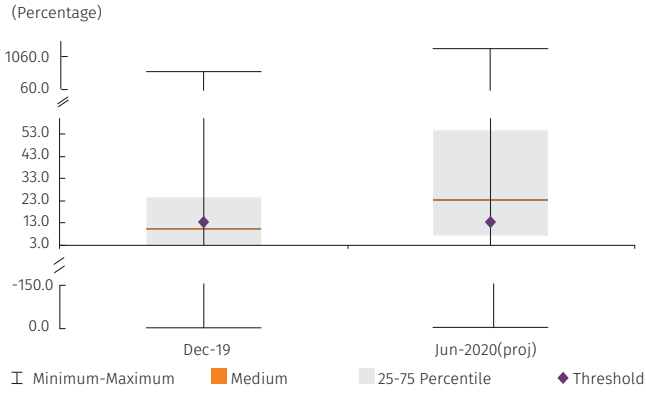
fragility within a year (*i.e.*: they file for insolvency proceedings or default on their financial obligations)[14].

Graph 2.25 shows the projected distributions of net margin and debt-to-cash flow indicators as well as the fragility thresholds identified for the commercial and manufacturing sectors, which are the ones that have the largest share of the loan portfolio[15]. The results of the projection exercise indicate that both sectors, especially manufacturing,

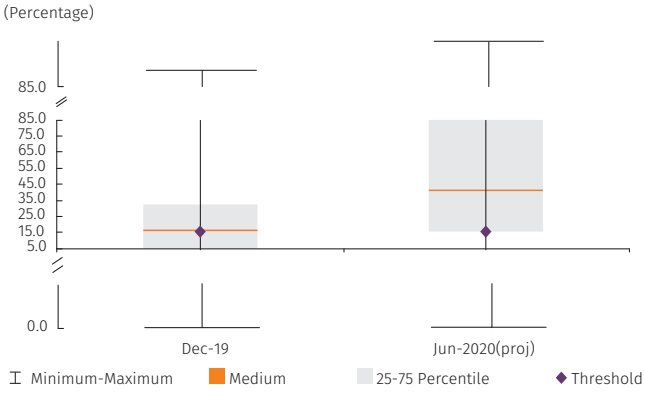
Graph 2.25
Actual and Projected Distributions of Financial Indicators for the Commerce and Manufacturing Sectors

A. Debt-to-Cash Flow

I. Commerce

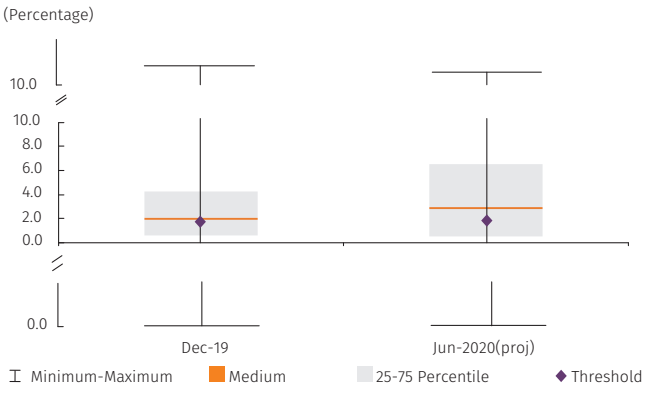


ii. Manufacturing

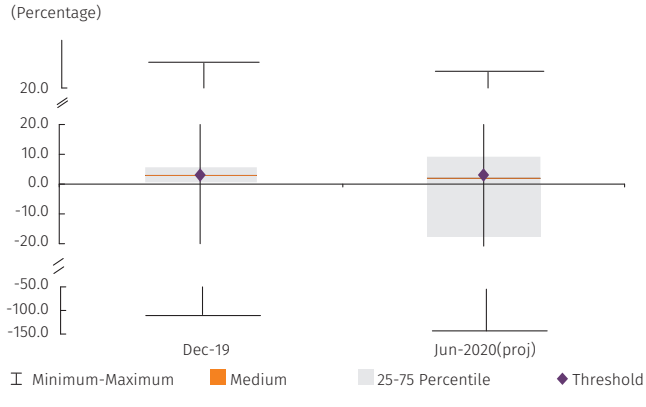


B. Net Margin

i. Commerce



ii. Manufacturing



Note: the data from June 2020 is projected.
Sources: DANE, Superintendency of Corporate Affairs, Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

14 Specifically, private corporate sector firms are classified in this document as vulnerable and non-vulnerable based on a risk criterion, and by minimizing a loss function that a policy maker would face, thresholds are calculated for the variables mentioned and for each economic sector. These thresholds make it possible to forecast the financial health of the firms. For more detail on the methodology, see "Indicadores de alerta temprana para el sector corporativo privado colombiano (Early warning indicators for the private Colombian corporate sector)," *Borradores de Economía*, no. 1084, *Banco de la República*.

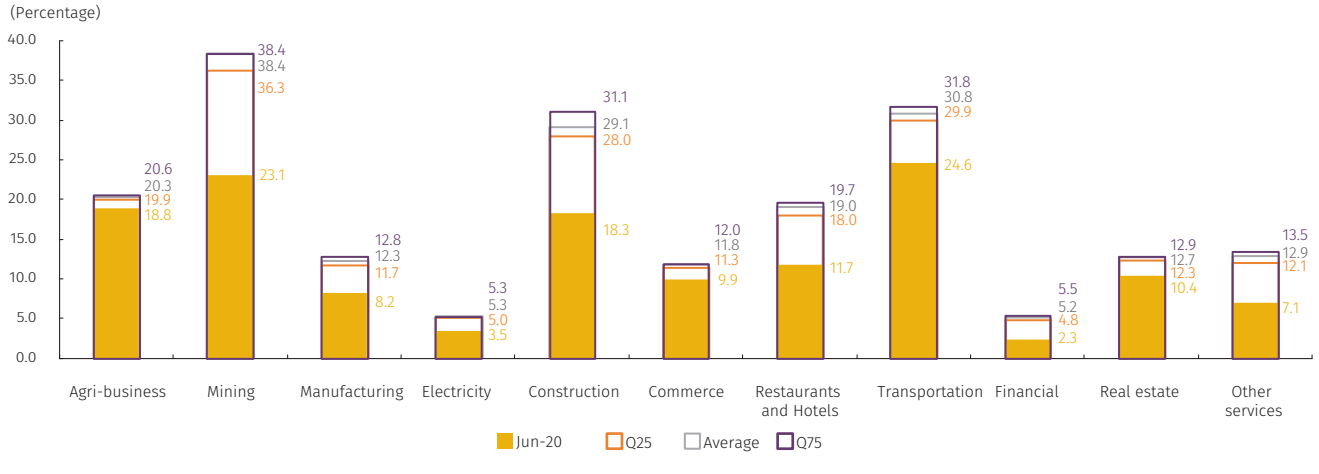
15 A net margin value that is lower than the threshold indicates greater vulnerability and an indicator of debt-to-cash flow that is above the threshold implies greater vulnerability.

would see their indebtedness greatly increased if the decline in GDP and the growth of debt were greater[16]. With respect to the net margin indicator, it is evident that the manufacturing sector has been highly affected while the distribution of this indicator in the commerce sector does not show major changes.

The results of applying the methodology to the projected figures indicate a significant increase in the group of companies that are likely to cross at least one of the thresholds and potentially impose a greater vulnerability for the banking sector. The forecasting exercise, in turn, shows evidence of a rise in the QIR of the commercial loan portfolio in which the sectors most affected are likely to be construction, mining, and restaurants and hotels.

The information above and the historical capacity of the methodology to accurately forecast a firm's state of fragility are used to adjust the change in the quality of the commercial loan portfolio, specifically, that of the QIR at one year without considering the mitigating effects of measures for financial relief implemented by the FSC. The results show that a 3.1 pp to 4.1 pp increase in the QIR of the commercial loan portfolio can probably be expected for September 2020. The sectors that will probably present the largest rises in the QIR would be mining (act.: 23.1%; proj.: 38.4%), construction (act.: 18.3%; proj.: 29.1%), and restaurants and hotels (act.: 11.7%; proj.: 19.0%) (Graph 2.26). When analyzing the effects on each institution, it can be noted that the rise in the indicator will be stronger for financial intermediaries with a low share in the system's total commercial loan portfolio.

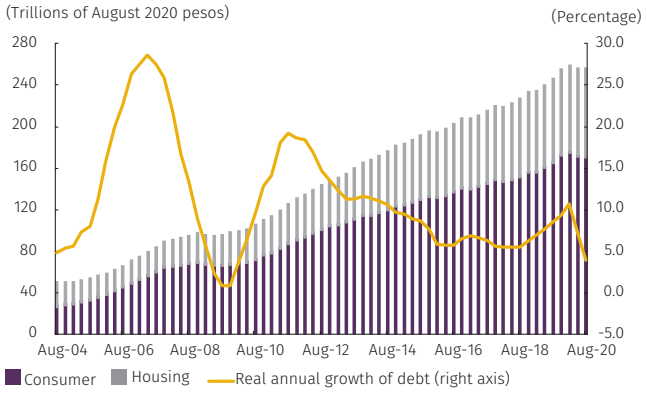
Graph 2.26
QIR Forecasts by Economic Sector



Source: *Office of the Financial Superintendent of Colombia;* calculations by *Banco de la República*.

16 The nominal annual change in the six-month GDP of the commerce sector was -2.6% while it was -9.6% in the manufacturing sector. With respect to indebtedness, the six-month growth of the loan portfolio was 12.5% for commercial and 15.6% for manufacturing.

Graph 2.27
Breakdown and Real Annual Growth of Household Indebtedness



Sources: Office of the Financial Superintendent of Colombia; Superintendency of Economic Solidarity, *Titularizadora Colombia*, calculations by *Banco de la República*.

2.2.2 Households

As of August 2020, the indebtedness of Colombian households exhibited a slowdown trend, mainly due to the consumer loan portfolio.

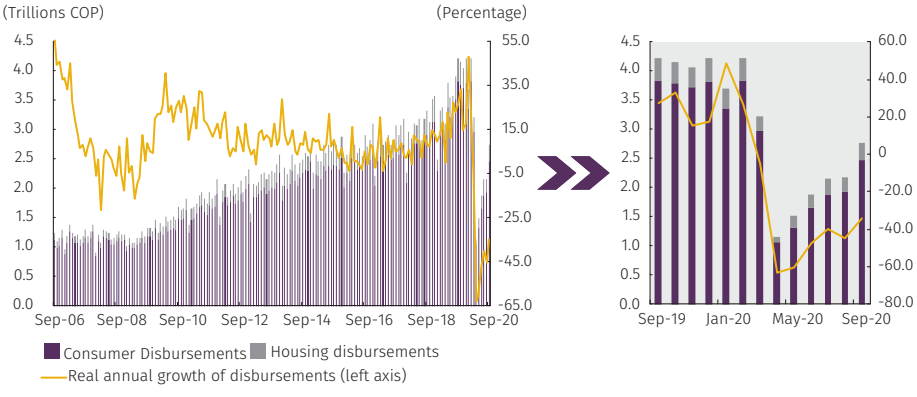
The loan portfolio allocated to households[17] stood at COP 255.9 t, registering a real annual growth rate of 3.9%, which indicates a downturn after having reached a growth of 10.7% in February 2020. Approximately two-thirds of the total indebtedness corresponds to consumer loans and the remainder to mortgage loans (Graph 2.27).

The lower growth was mainly explained by the sharp slowdown in the consumption loan portfolio. This registered a growth of 3.2% in August 2020 in contrast to the 12.4% registered in February 2020, the highest growth rate since 2013.

This is in line with the sharp fall in disbursements and in the indicators of perceived supply and demand of credit after March 2020, as a result of the health emergency caused by Covid-19.

During 2020, the real annual growth of disbursements in the mortgage and consumer loan portfolios has been declining to negative rates, with a historic low of -66.0% in May 2020 and a slight recovery in September, when the rate was -34.6% (housing: -25.0%, consumption: -35.5%, Graph 2.28).

Graph 2.28
Real Annual Growth of the Housing Loan Portfolio by Type

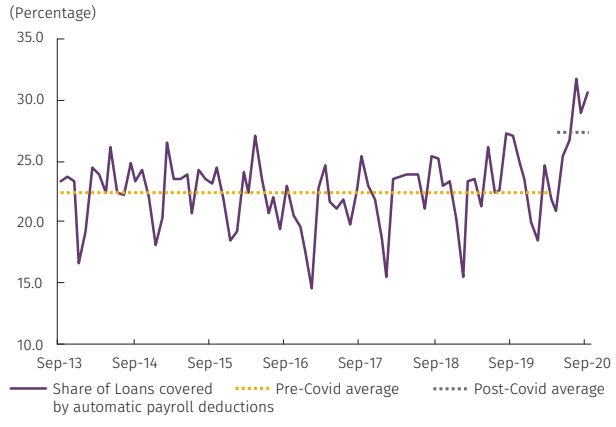


Source: *Office of the Financial Superintendent of Colombia;* calculations by *Banco de la República*.

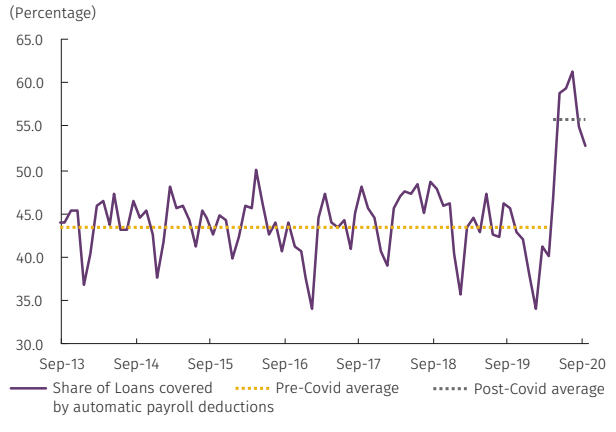
17 The household loan portfolio refers to consumer and housing loans granted by intermediaries that are supervised by the FSC and the Superintendency of Economic Solidarity (SES). That is why the data presented differ from those reported by the FSC.

Graph 2.29
Share of Disbursements in Automatic Payroll Deduction Segment

A. Loans covered by automatic payroll deductions in total consumption



B. Loans covered by automatic payroll deductions in consumption excluding credit cards



Source: Office of the Financial Superintendent of Colombia (form 88), calculations by *Banco de la República.*

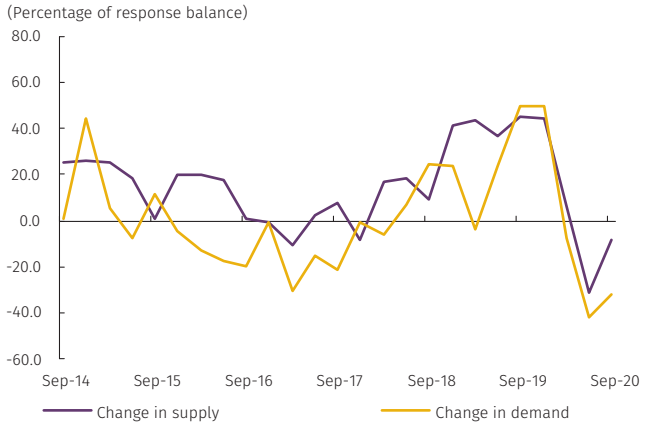
The recovery in consumer loan portfolio disbursements has been driven by the increase in the share held by the loans covered by automatic payroll deduction segment, which is considered the least risky loan portfolio, as it went from an average share of 22.3% of the total consumer disbursements (43.5% excluding credit cards) to one of 27.3% (55.7% excluding credit cards) (Graph 2.29).

In line with the above, the *Report on the Current Credit Situation in Colombia* for the third quarter of 2020, published by *Banco de la República*, made it clear that the current economic conditions which resulted from the pandemic have had a strong impact on the supply and demand for new housing and consumer loans. During 2020, the indicators of change in credit supply and demand from CIs have shown sharp declines for the consumer loan portfolio and a slight recovery in the latest quarter (Graph 2.30, panel A). For mortgages, a less pronounced drop and a greater recovery has been seen in the supply indicator, while the demand indicator reached an all-time low in September 2020 (Graph 2.30, panel B).

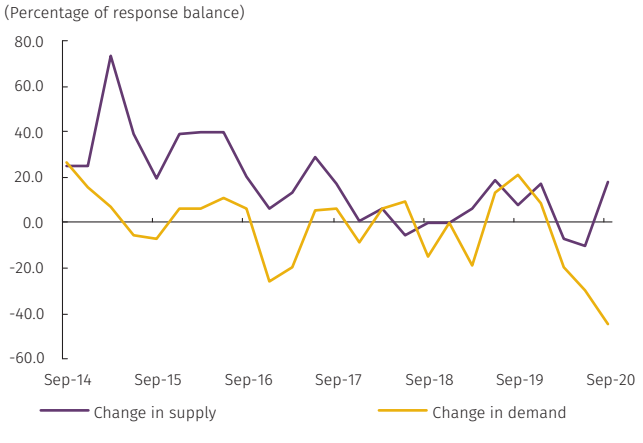
The supply of credit for Colombian households could recover in the coming months given that a small percentage of banks expect to raise their requirements at the end of 2020.

Graph 2.30
Indicator of the Change in Supply and Demand of New Loans to Households

A. Consumer



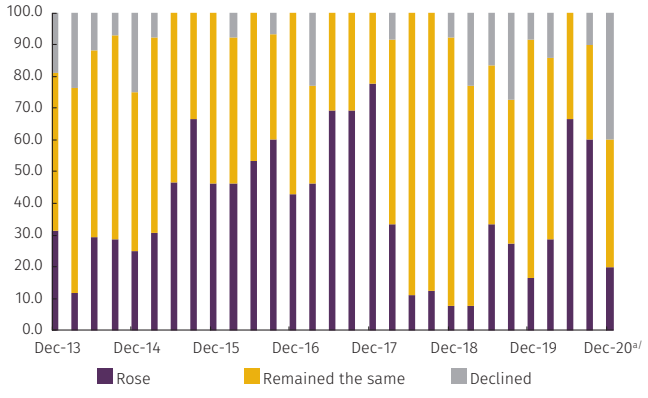
B. Housing



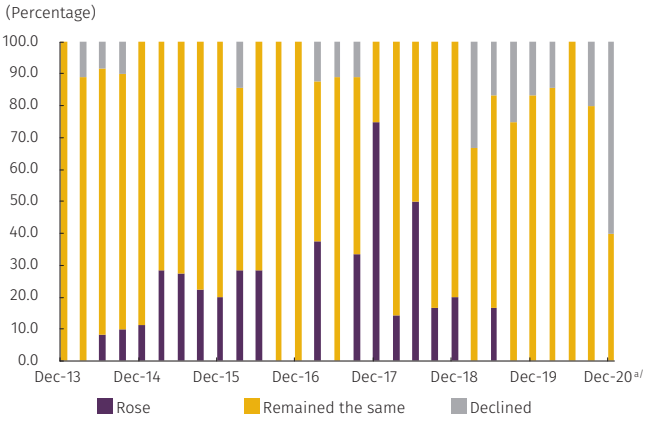
Source: *Banco de la República* (Survey of current situation for credit in Colombia).

Graph 2.31
Change in Requirements for Granting New Loans to Households

A. Consumer



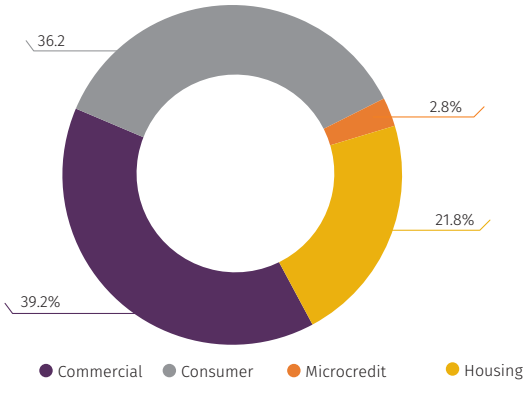
B. Housing



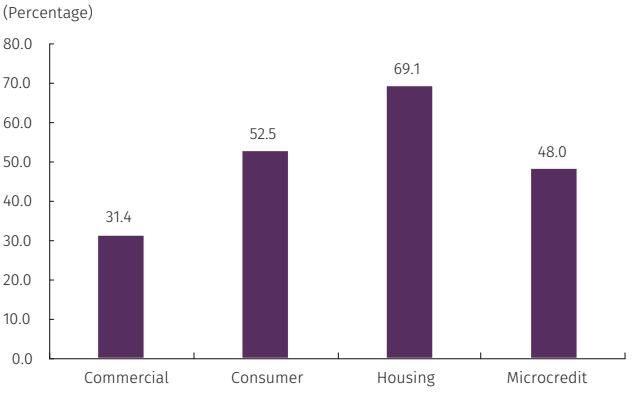
a/ Expectations for next quarter.
Source: *Banco de la República* (*Survey of the loan situation in Colombia*).

Graph 2.32
Financial Relief Corresponding to the First Stage

A. Share of the total by category



B. Share within Each Category



Note: information up to 31 July 2020.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

The cited report also showed that only 20% of the banks expect to raise their requirements for new consumer loans for the fourth quarter of 2020 compared to 67% who did in June. For the mortgage loan portfolio, most of the banks expect to reduce their requirements, and this is the highest number since the survey has been done (April 2008) (Graph 2.31).

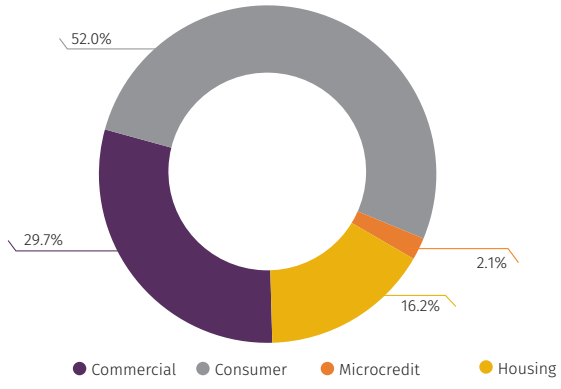
Along with the implementation of the measures provided by the FSC, the quality indicators for households (QIR and NPL) showed declines. However, this performance has recently reversed as the expiration of some of the grace periods granted by the CIs has begun.

The portfolio allocated to households was the one that benefited most from the first stage of measures provided by the FSC.[18] Indeed, during this phase (from March to July 2020) 36.2% and 21.8% of the redefinitions corresponded to consumer and housing loans respectively (Graph 2.32, panel A). The share of the relief was also the highest in these categories with the case of housing loans standing out the most (Graph 2.32, panel B). Since PAD went into effect and up to 14 October 2020, 68.2% of the total measures corresponds to the portfolio allocated to households and, within each category, the one for consumers stands as the most relevant (Graph 2.33).

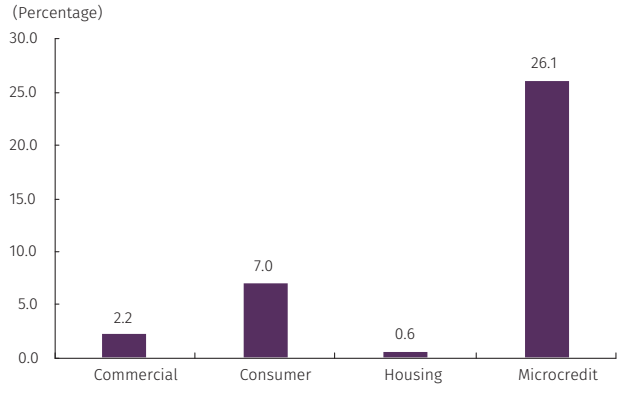
18 For more information see External Circulars 007 and 014/2020 issued by the FSC.

Graph 2.33
Financial Relief Corresponding to PAD

A. Share of the total by category



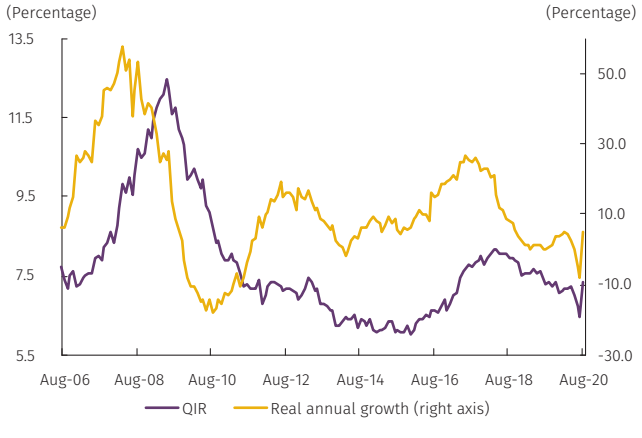
B. Share within Each Category



Note: information up to 14 October 2020.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

Graph 2.34
Trend of Risky and Past-Due Portfolios and Household Risk Indicators

A. Risky and QIR



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

Along with the implementation of the first stage of these programs, the quality indicators for this sector showed marked downturns up to July 2020. However, given the recent expiration of some of the grace periods granted during the first half of the year, the risky and past-due portfolios surged in August 2020, and this translated into an increase in the QIR and NPL respectively (Graph 2.34).

Given the magnitude of the shock to the labor market and the historical relationship between unemployment and defaults, the materialization of credit risk in the short term is a factor that could influence the future performance of the financial system.

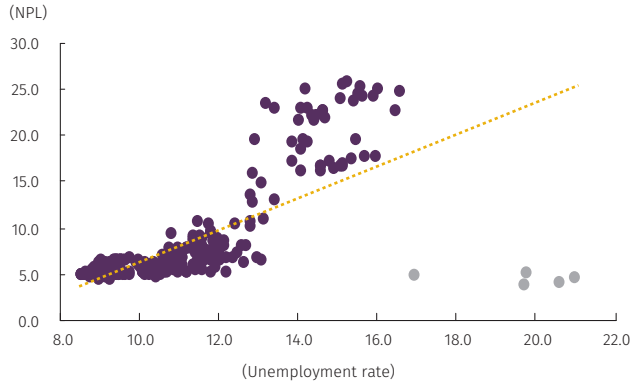
The fact that one of the determinants of households' failure to meet their obligations is a shock to their income because of a deterioration in labor market conditions has been extensively documented in the literature[19]. In this respect, in the absence of the grace periods, the high levels of unemployment observed recently should have been reflected in historically high levels of defaults (Graph 2.35).

While an uptick in defaults has been seen in the most recent information, it is reasonable to expect that this will rise as debtors continue to face difficulties in paying their debts. This could

B. Non-Performing and NPL

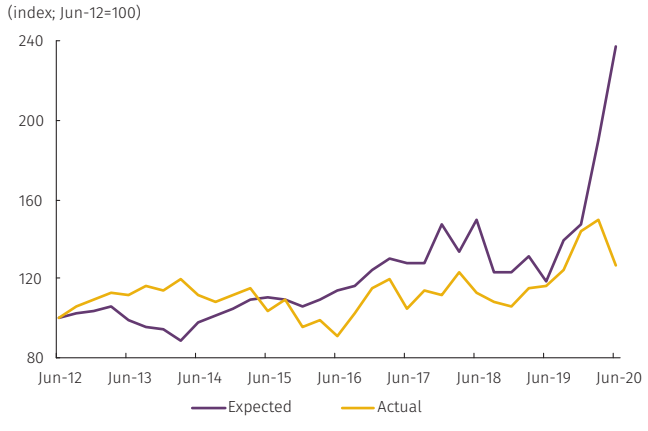
19 See, for example, Mian, Sufi, and Verner (2015) for international references, and Pacheco, Segovia, and Yaruro (2017) for the Colombian case.

Graph 2.35
NPL and Unemployment
(percentage)



Note: The gray dots correspond to the observations between April and August 2020.

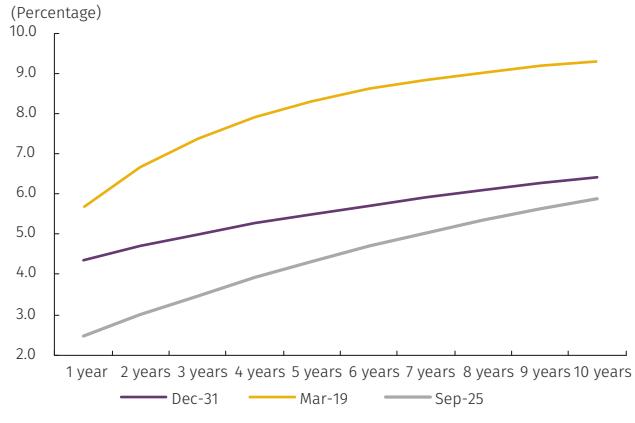
Graph 2.36
Trend of Household Financial Burden



Note: the "expected" burden uses the data from the credit installments expected by the CIs while the "actual" used the real portfolio collection. The income corresponds to what is reported in the GEIH in both cases.
Sources: Office of the Financial Superintendent of Colombia and DANE; calculations *by Banco de la República.*

Graph 2.37
Peso-Denominated Government Bond's Market

A. Yield Curve



Note: The yellow bars in panel B correspond to periods in which the change in the differential is greater than 100 basis points with respect to the previous month
Sources: DCV (electronic trading system) and Precia; calculations by *Banco de la República.*

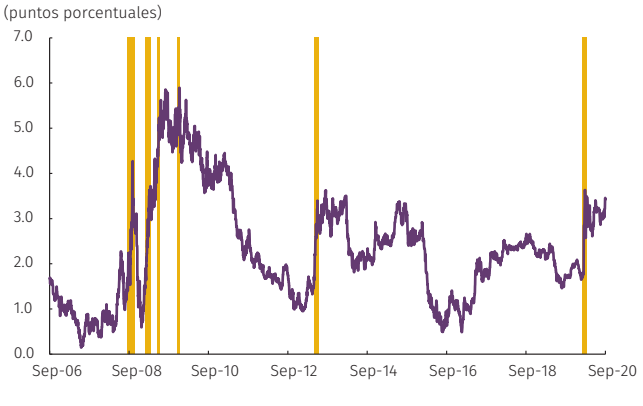
become more relevant when the fact that the household financial burden was at historically high levels prior to the onset of the crisis is considered[20] (Graph 2.36).

2.3 Market Risk

The fixed-income markets appreciated in all their maturities as a result of an expansionary monetary policy stance.

After the shock experienced by the financial markets towards mid-March 2020 due to the Covid-19 pandemic crisis, the fixed-income securities appreciated during the second and third quarters of 2020 (Graph 2.37, panel A). This meant lower rates for all terms, and a steep yield curve in which the short term interest rates were influenced by policy interest rate cuts between March and September 2020. Moreover, the slope of the yield curve, measured as the difference between 10-year Treasury bond rate and 1-year Treasury bond rate, continued to be at historically high levels, and the most recent data show an increasing trend (Graph 2.37, panel B).

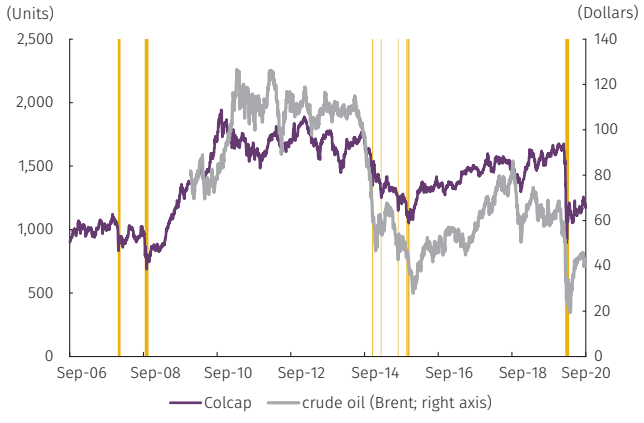
B. Differential for 1- to 10-year interest rates



20 The increase in the indicator of expected financial burden is mainly due to the drop in household income which, according to the GEIH, registered a change of -31.7% between December 2019 and June 2020. This decrease in income did not have a major effect on the actual financial burden due to the effect that the financial relief plans had on the loan installment payments that fell 39.8% during the same period.

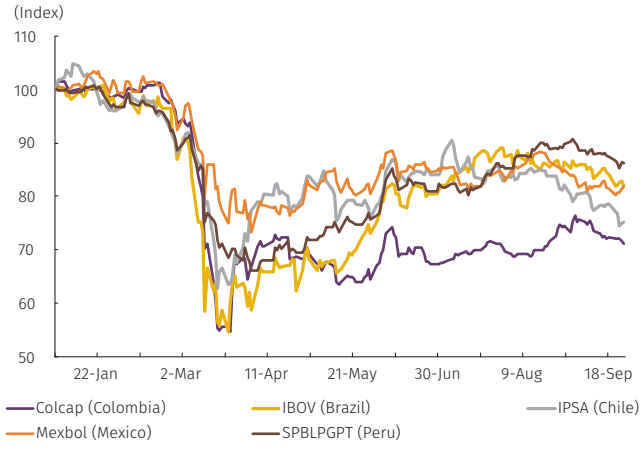
Graph 2.38
Stock Market

A. Behavior of Colcap



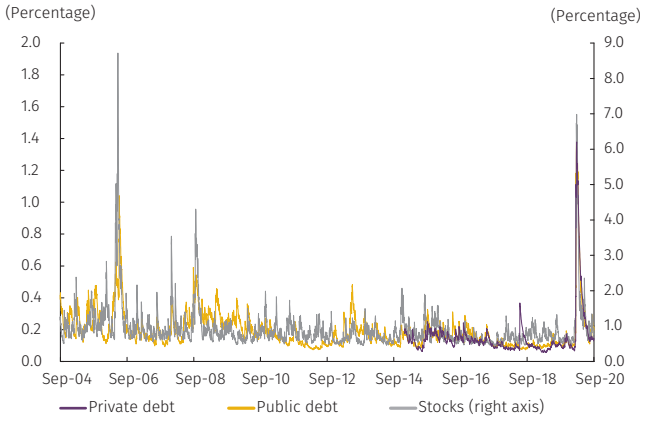
Note: The yellow bars indicate the periods in which the monthly devaluation of Colcap is greater than 10%.

B. Regional Stock Market Indexes



Note: The oil series starts in 2011 given that this was when Colombia migrated to Brent as the benchmark price for crude oil.
Sources: BVC and Yahoo Finance; calculations by *Banco de la República.*

Graph 2.39
Conditional Volatility of Colombia's Fixed Income and Stock Markets



Source: Precia; calculations *by Banco de la República.*

On the contrary, the variable income markets have not yet been able to recover from the shock they faced earlier this year. Nevertheless, the volatility has returned to normal levels.

The variable income market price, measured by the Colcap index, has shown slight recoveries since the price decline during the first quarter of the year. The index is still at historically low levels, and oil, which had been correlated with the stock index, has grown faster during this period, but it has not spurred the recovery of this market (Graph 2.38, panel A). Furthermore, when the stock index is compared to its peers in the region, it appears to be the one with the slowest recovery (Graph 2.38, panel B). The latter may be due to the weak recovery of the financial stocks that hold a high share in the Colombian market.

After the rise seen in March 2020, the volatility in fixed income and variable income markets is at its usual historical levels (Graph 2.39). However, the volatility of government bonds is higher than the average for the past two years.

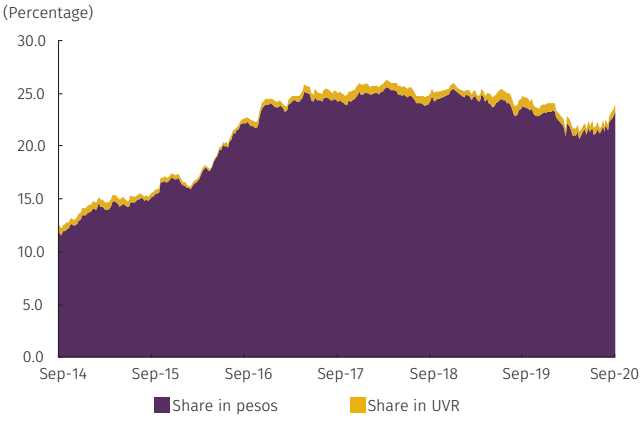
To date, there are fewer outflows of foreigners in the Treasury market, and a stable policy interest rate perception.

The share held by foreigners in the Treasury market continued falling during the first quarter 2020, and after the Covid-19 shock, it reached a minimum value of 21.3% in early May (Graph 2.40, panel A). However, in September the trend was reversed, and the share began to grow. One reason is the inclusion of Colombia in the Bloomberg-Barclays public debt index at the beginning of the month, as well as the issuance of TES 2050. Despite this, the cumulative change in the share held by foreigners continues to be negative (Graph 2.40, panel B).

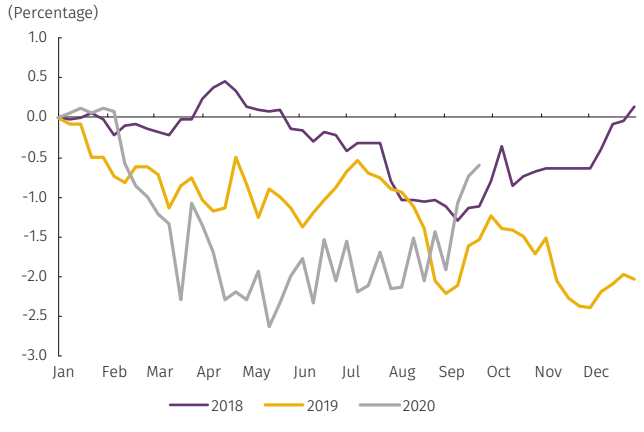
Concerning the policy interest rate, market analysts changed their forecasts due to the expansionary monetary policy scenario

Graph 2.40
Share of TES held by foreigners

A. Historical Performance

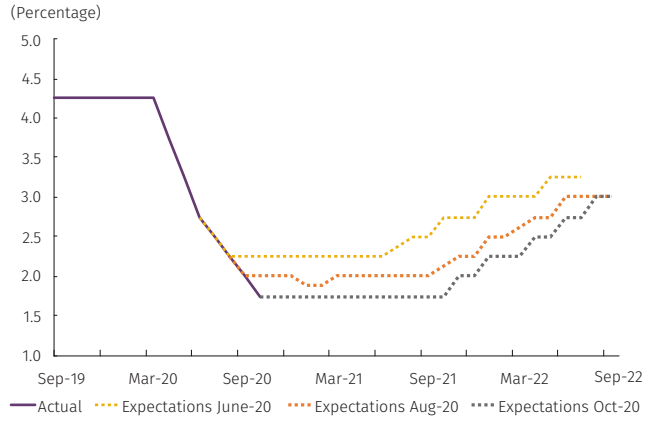


B. Cumulative Change



Source: CSD, calculations by *Banco de la República.*

Graph 2.41
Expectations for Benchmark Rates



Source: *Banco de la República* (*Survey of Economic Analysts' Expectations*)

caused by the pandemic crisis (Graph 2.41). While a relatively short period of stability was predicted in June, the new forecasts suggest a larger period with policy interest rate cuts. Therefore, the stabilization will begin towards late 2021 rather than in the middle of the year as it was initially forecast.

Finally, although financial entities registered a restructuration of the investment portfolio, the main exposure to market risk is still concentrated in fixed income securities.

Exposure to fixed and variable income markets, measured as investments in securities exposed to market risk[21,22], is still concentrated in the fixed income securities where the government bond market represents the largest share (Table 2.2). During the last six months, there has been a fall in the exposure the CIs have to fixed income securities, and a 5.36% increase in stock. The sharpest fall was registered by the banks' positions in fixed income securities, while the CFC were the ones that increased the most their share of stocks.

Regarding the NBFI, the insurance companies have a large investment in private debt securities. Therefore, the total of the NBFI shows a high exposure to this market, even though a significant decrease in this segment was registered during September. As for the managed position, the TC registered significant increases, and are the ones that account for the largest number of fixed income and variable income securities.

In the future, there are risks that could affect the financial health of the system should they materialize. On the one hand, there are latent vulnerabilities in the foreign sector that could

21 This balance is at market prices and is calculated according to the guidelines of the Basic Accounting and Financial Circular. The balance in shares was analyzed for the equity instruments of domestic issuers while, for debt securities, the ones that are marketable and available for sale were analyzed.

22 The cut-off date for this information is 25 September 2020.

Table 2.2
TES Balances (in pesos and UVR), Financial Institutions' Private Debt Securities and Shares Exposed to Market Risk

Type of Entity	TES[b/]	Private debt	Stocks	Total	TES	Private debt	Stocks	Total
	(balance in trillions of pesos)				(percentage change in the last six months)			
Credit institutions	43.96	4.71	12.80	61.46	-13.90	-15.43	5.22	-10.64
Commercial banks	40.14	4.41	0.00	44.55	-15.15	-17.21	0.00	-15.36
Investment banks	3.18	0.19	12.79	16.17	-4.17	30.20	5.35	3.56
Finance companies	0.63	0.08	0.00	0.72	50.37	4.12	10.50	42.94
Financial cooperatives	0.00	0.03	0.00	0.03	0.00	56.45	0.00	56.45
Non-banking Financial Institutions (NBFI)	10.45	12.60	6.54	29.59	1.38	-9.16	4.93	-2.70
Pension Funds: proprietary position	0.27	0.85	0.14	1.27	226.66	-17.27	4.66	1.26
Stock Brokerage Firms: proprietary position	1.27	0.17	0.13	1.57	-16.33	-5.74	42.71	-12.18
Trust Fund Companies: proprietary position	0.14	0.42	1.00	1.56	-60.53	35.66	49.88	17.00
Insurance and Capitalization Companies	8.76	11.16	5.27	25.19	5.02	-9.65	-1.35	-3.25
Financial System's Proprietary Position	54.40	17.31	19.34	91.06	-11.33	-10.96	5.12	-8.21
Managed position								
Stock-brokerage firms: third party position	1.26	12.81	7.37	21.45	27.02	43.17	9.03	28.40
Trust Fund Companies: third party position[a/]	112.24	43.94	14.65	170.83	15.70	74.31	46.51	29.20
System	167.91	74.06	41.36	283.33	5.36	38.18	17.65	14.19

a/ Pension liabilities managed by trust companies are excluded.
b/ The value of the proprietary position is obtained from "Investment Portfolio" on format 351. The value of the managed position is obtained from CSD data.
Sources: Central Securities Depository (CSD), Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

produce an increase in the risk premium. Therefore, these risks could result in a lower assessment of the securities.

2.4 Liquidity and Trading Book Interest Rate Risk

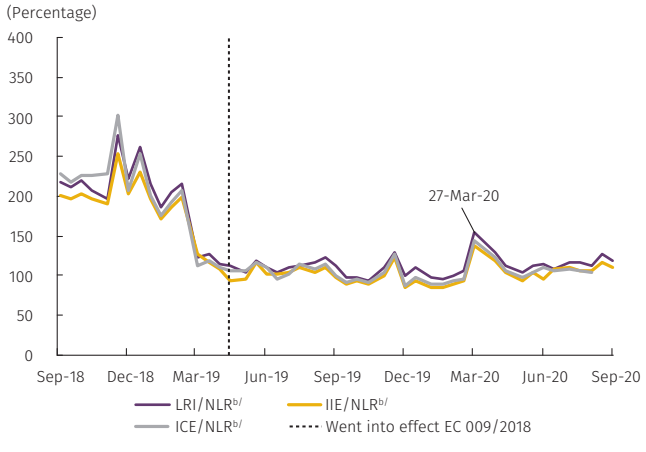
2.4.1. Liquidity Risk

During the current situation, the CIs have shown a sound liquidity position both in the short term and at the structural level. This fact—which is the result of the measures adopted by the economic authorities, a broad and stable deposit base, and appropriate risk management by the CIs—has contributed to reinforcing the ability of the intermediaries to meet their obligations. In the medium term, pressure on profitability and the uncertainty about the materialization of credit risk may pose additional challenges to entities' liquidity management.

The CIs maintain stable indicators of short-term exposure that enable them to cover shortfalls in liquidity in other currencies at both individual and consolidated levels.

When the individual position and the positions by currency are analyzed, the aggregate measures of CI short-term liquidity show that indicators of individual (*IIE*) and consolidated (*ICE*) exposure[23] as well as the liquidity risk indicator (*LIR*) are holding sufficient resources to cover their liquidity net requirements, and far exceed the minimums established by regulation. These indicators, which are represented as a percentage of LRI's liquidity net requirements, have shown a stable trend since the increase registered in March 2020 (Graph 2.42).

Graph 2.42
Short-term Liquidity Indicators for CIs Acting as FXMI[a/]
(at thirty days)



a/ Foreign exchange market intermediaries.
b/ Net liquidity requirements for 30-day LRI.
Note: by construction, the regulatory limit is reached when the indicator is zero.
Source: *Office of the Financial Superintendent of Colombia;* calculations by *Banco de la República.*

In terms of structural liquidity risk, funding has been supported by larger demand deposits from stable sources.

Demand deposits, which represent 45.0% of the CI liabilities, registered a rise in March of this year and reached a real annual growth of 25.4%. This higher growth was mainly explained by high deposits from individuals and the real wholesale sector (with average deposits over 220 SMLMV), both of them considered as stable counterparties.[24] Since then, deposits have shown a slight slowdown although their balance continues to be the highest seen in the last ten years.

In the case of deposits of CIF with no permanence agreement, they shrank in March unlike the rest of the counterparties[25] and subsequently have been expanding (Graph 2.43).

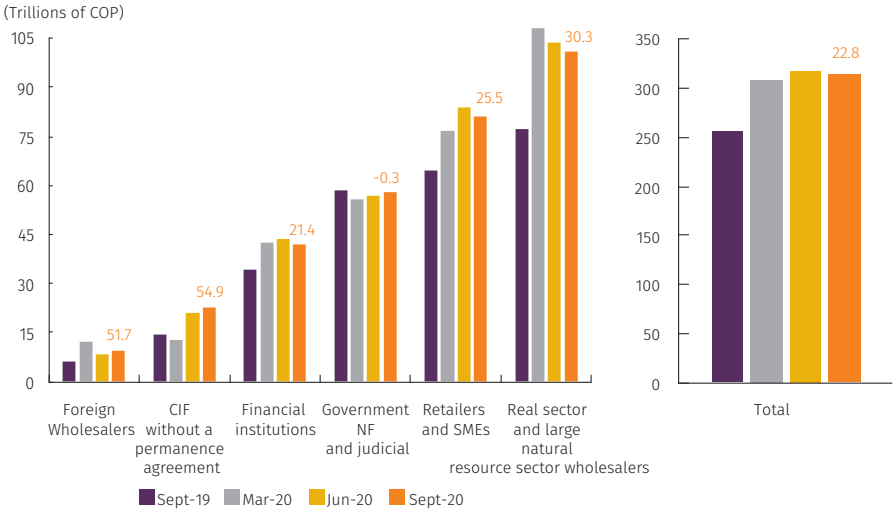
23 The IIE and the ICE indicators make it possible to measure the liquidity risk of the foreign exchange market intermediaries (FXMI) by currency over a horizon of thirty days. For more information on the calculation of these indicators see *Banco de la República*'s External Regulatory Circular DODM-361.

24 According to CBCF, Chapter VI, Appendix 1, these counterparties are considered stable given that they have a net withdrawal factor (NWF) that is inferior to the rest of counterparties analyzed.

25 The volatility in the value of financial assets seen between March and April explained a significant increase in the investors' risk aversion that appeared in withdrawals from vehicles such as CIF.

Costs in the term deposit market, the second largest component of liabilities, have shown the wide heterogeneity in the liquidity distribution among CIs in the recent past.

Graph 2.43
Distribution of Demand Deposits by Counterparty



NF: Non-financial
Note: the label represents the annual growth of deposits for each counterparty.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

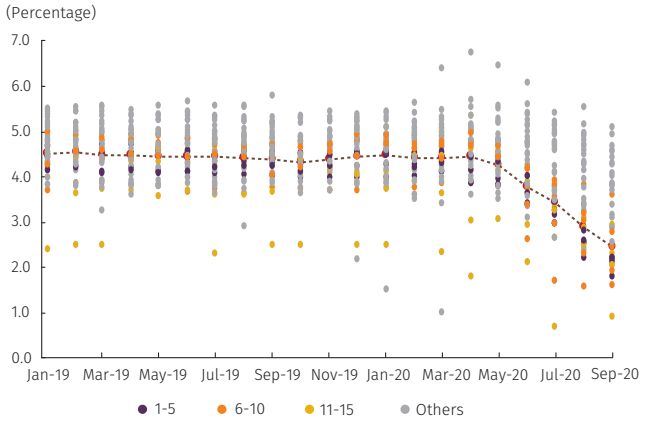
Although funding by demand deposits has grown steadily, the changes in the liquidity distribution that have taken place since the pandemic have been reflected in funding by term deposits strategies. Since April, as a result of the cuts in the central bank rate interest, the interest rates offered by CIs to take resources through these instruments have progressively decreased. However, the dispersion has increased and, in some cases, the entities have not lowered their interest rate at the same pace as the market.

Indeed, Graph 2.44 shows that the smaller institutions (gray) have assumed higher costs in this market and sacrificed their profitability in order to ensure greater resources. This trend can be seen most clearly in issuances with periods of more than six months.

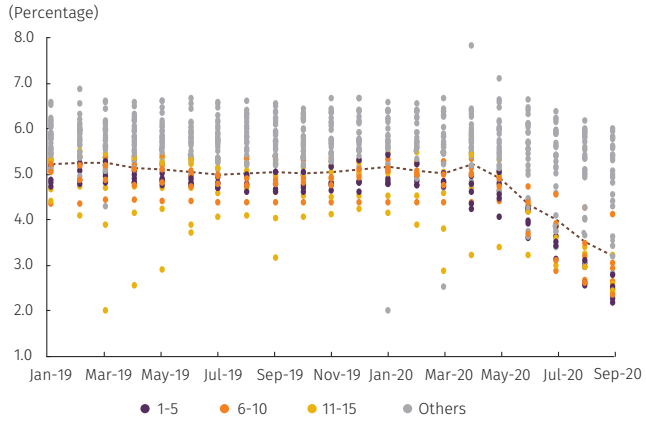
As of July 2020, the net stable funding ratio (NSFR) shows that the financial institutions greatly exceed the regulatory limits required in terms of structural liquidity.

Graph 2.44
Dispersion of CD Issuance Rates by Period

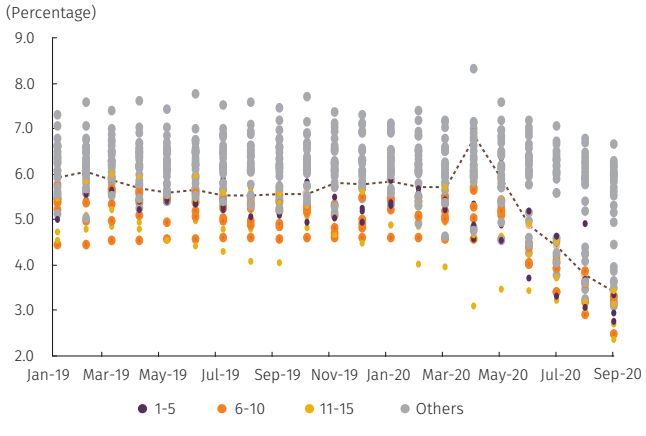
A. Issuances under six months



B. Issuances between six months and a year



C. Issuances greater than one year

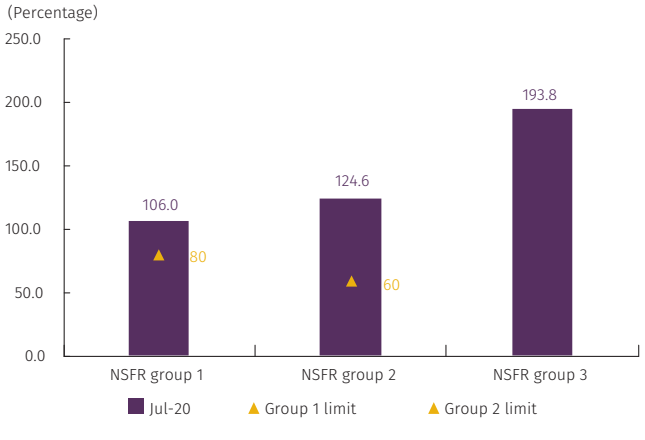


Note: the entities that are the largest by asset level are organized and separated into three equal groups and are shown in purple, orange and yellow respectively. The black line represents the average system interest rate.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

The net stable funding ratio (NSFR) is an indicator that makes it possible to identify the structure and strategic management of the CI balance in terms of their stability, in order to limit the high dependence on unstable funding sources based on illiquid assets that may exacerbate liquidity risk in the medium and long term. A detailed explanation of this measure can be found in Shaded Section 2 pg. 104. As of July 2020, the aggregate CI NSFR for the three groups of entities reflects stable structural liquidity conditions which far exceed regulatory limits (Graph 2.45).

Following the measures for providing liquidity taken by *Banco de la República* at the beginning of the health and economic crisis, the CIs have satisfactorily maintained their liquidity levels in local and foreign currency, both individually and on a consolidated basis. The expansion of funding towards sources considered stable, in turn, strengthens the structure of the balance sheet and this is confirmed by NSFR. *Banco de la República* will continue monitoring the liquidity risk of the CIs and, in this edition, is including a stress test that evaluates the liquidity needs that entities might face in the case of a

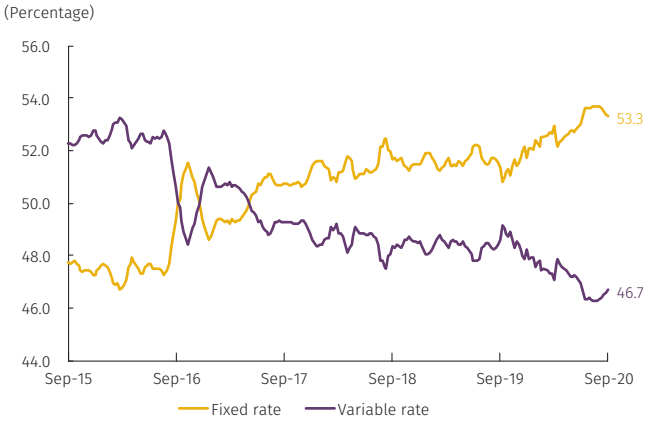
Graph 2.45
Net Stable Funding Ratio[a/]



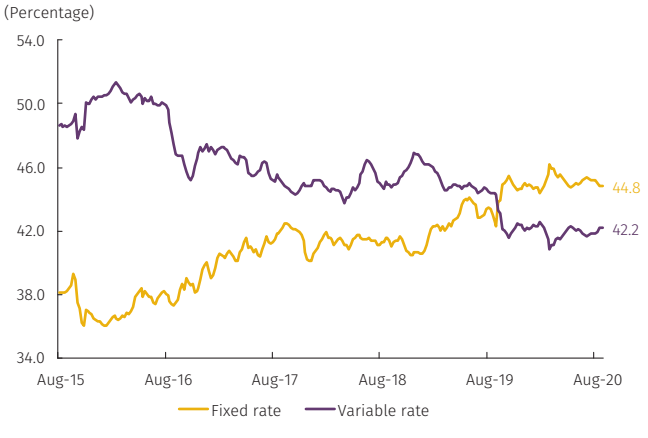
Note: the EOIs were excluded for the calculation of the indicator.
a/ The CIs with assets that are greater than 2.0% of total bank assets are in group 1. The entities that have a great portfolio loan as proportion of asset but do not qualify for group 1 are in group 2, and the remaining entities are in group 3. The regulatory limits that intermediaries must comply with based on their group will be progressively raised. Thus, starting March 2021, these will be 90% and 70% for groups 1 and 2 respectively and 100% and 80% starting March 2022. Entities belonging to group 3 have no regulatory limit and their indicator is informative for the supervisor.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Graph 2.46
Change in Breakdown of Assets and Liabilities by Type of Interest Rate[a/]

A. Assets



B. Liabilities[b/]



a/ The balances of liabilities at fixed rates and at variable rates are presented as a proportion of the total assets.
b/ The balance of liabilities at a fixed rate incorporates demand deposits of individuals while the demand deposits of legal entities and government entities are included in the liabilities contracted at variable rates.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

decrease in loan portfolio collection. The results suggest that, at the date of analysis, the aggregate system has sufficient liquid assets to deal with this situation. By entity, some CIs show heterogeneous lack of (Chapter 3).

2.4.2 Trading Book Interest Rate Risk

The structure of the interest rates of the CIs' balance sheet is analyzed in this section as is their exposure to the trading book interest rate risk.[26] The measurement of this risk seeks to estimate how changes in the interest rates for assets and liabilities affect net interest income.

The share of assets and liabilities contracted at a variable rate registered a decline in the last six months.

Between April and September 2020, the share of assets held by CIs in fixed-rate contracts gradually increased relative to variable rate assets. Similarly, fixed-rate liabilities as a share of assets rose slightly in comparison to the levels seen in April 2020 (Graph 2.46).

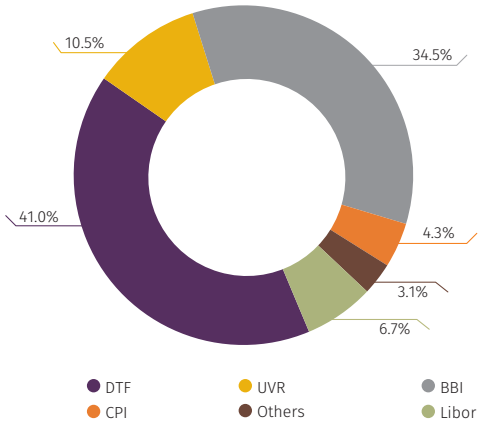
When the structure and breakdown of the balance sheet components contracted at variable rates are analyzed, it is evident that the asset positions indexed at the benchmark rates are more relevant than the ones associated with inflation, which is the opposite of what happens with liabilities contracted at variable rates (Graph 2.47). At the close of September, 75.4% of the asset positions were indexed to benchmark rates (BBI and DTF) while 47.1% of liabilities depended on inflation (CPI and UVR) and to a lesser degree, the benchmark rates (36.8%). This breakdown remains relatively stable over time. However, the BBI share in lending operations continues to become larger with respect to the share of assets tied to the performance of inflation (panel A *vs.* panel B). Between April and September, the CIs lowered the exposure of their assets to UVR by 11 pp and increased their share in instruments indexed to the BBI and the DTF. With respect to liabilities, there was a

26 The interest rate risk has two dimensions: the first is analyzed in the section on market risk and refers to the risk of devaluations of the assets in the treasury ledger in the event of interest rate movements; the second, which is analyzed in this section, corresponds to the ratio of the risk of interest rate changes to the entities' net interest income based on the information in the trading book.

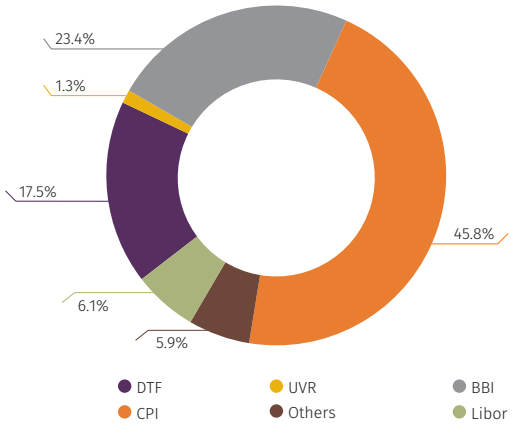
Graph 2.47
Breakdown of Balance Sheet Contracted at Variable Rates by Type of Rate

A. September 2020

i. Assets

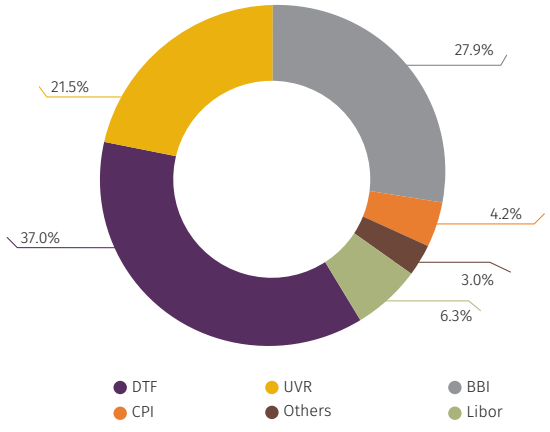


ii. Liabilities

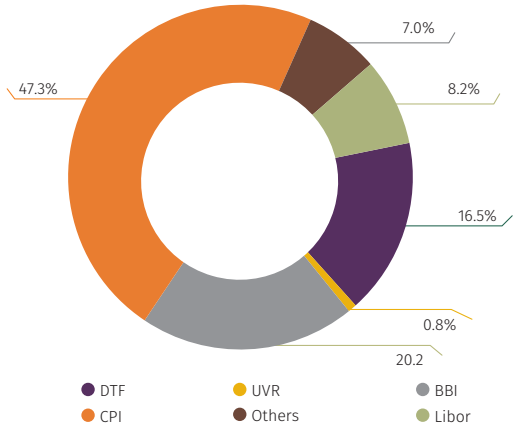


B. April 2020

i. Assets



ii. Liabilities



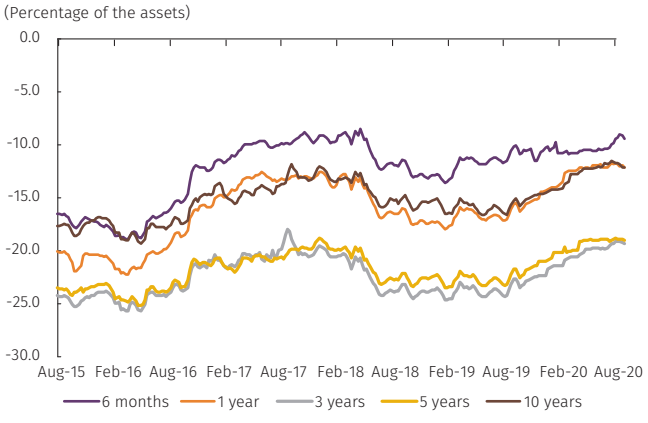
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

slight increase in the instruments indexed to the BBI and DTF and a reduction in the share held by the CPI and Libor.

The exposure to the trading book interest rate risk measured by the WATM gap has registered a lower level during the past six months that is associated with the lower exposure to variable interest rates and the reduced asset duration.

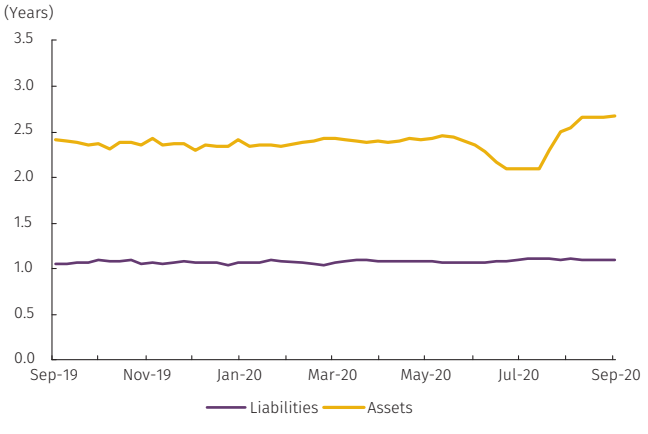
The *weighted average term to maturity (WATM) gap* was calculated in order to measure the exposure of the trading book to interest rate risk. This is defined as the difference between assets and liabilities that are sensitive to changes in interest rates for different periods. When this indicator takes on a negative value, it means that an increase of the same magnitude in lending rates and deposit rates would generate a reduction in the net interest income. In this context, a reduction in the interest rates would lead to an increase in the net income from interest.

Graph 2.48
WATM gap by Maturities[a/]



a/ Corresponds to the total value for the CIs. 4-week moving average.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Graph 2.49
Average Maturity of CI Assets and Liabilities[a/]



a/ Corresponds to the total value for the CIs. 4-week moving average.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

In Graph 2.48, the *WATM gap* is presented for five different periods. This measure remains at negative levels for all time horizons in line with the balance sheet interest rate structure. A level such as the one registered six months ago can be seen for the 6-month slot, 1 and 5-year slots, and a lower level for the 3- and 10-year slots.

The *WATM gap* depends mainly on two factors: the share of assets and liabilities contracted at variable rates and the maturity of fixed-rate assets and liabilities.[27] Graph 2.49 presents the average maturity of the CIs' assets and liabilities between September 2019 and September 2020. We observe that between May and August 2020, the asset maturity had declined 14.4% as it went from 2.45 years to 2.09 and afterwards rebounded to 2.68 years at the end of September. The maturity of the liabilities, in turn, remained relatively stable at 1.09 years.

27 For more detail on the calculation of the *WATM Gap*, see the box "Interest Rate Risk of the Colombian Credit institutions' Trading Book" in the September 2015 *Financial Stability Report*.

Box 1
Long-term Considerations Regarding Early Access to Pension Savings in Colombia

Javier E. Pirateque Niño
Daniela X. Gualtero Briceño*

In order to mitigate the economic and social consequences of the lockdowns adopted to prevent the spread of Covid-19, various policies have been proposed and approved in several countries to soften the shock to the income of the affected population. Among these measures are those that enable the early use of the money saved for one's pension. These types of policies, known as early withdrawals (EW), are part of the pension system in countries such as Australia, the United States, New Zealand, the United Kingdom and Mexico.[1] Other countries such as Chile and Peru adopted EW plans in the context of the current crisis.

Currently, several bills have been proposed in Colombia to approve partial EW from individual capitalization accounts under the defined contribution plan (RAIS in Spanish). Under this system, each contributor is assigned an individual capitalization account (CIC in Spanish) where contributions are deposited monthly based on the percentages established by law. The funds holding these accounts are managed by the pension fund management companies (PFM).

Among the initiatives that have emerged in this area is Bill 276/2020 in the House of Representatives. It proposes that those people who have stopped contributing to the pension system under the RAIS as of July 2020 may make a one-time withdrawal equivalent to 10% of the funds they would have deposited in their CICs with no reimbursement. This proposal is intended to favor the unemployed and independent workers whose income was reduced due to the Covid-19 crisis, and who were not benefited by the policies implemented by the national government such as the extraordinary monetary transfers from "Familias en Acción", the elderly, "Jóvenes en Acción", or Solidarity Income, or those focused on the population belonging to economic strata 1 and 2.

Another proposal is given in Bill 320/2020 which, on similar grounds allows non-contributing members to withdraw the sum of four monthly legal minimum wages (SMLMV in Spanish) from their CICs. This amount must be reimbursed within two years of the effective date of the withdrawal so as not to affect each member's guaranteed minimum pension.

Withdrawals without a refund would affect the income that pensioners would earn years after the withdrawal had been made. The goal of this box is to evaluate, through a simulation, how this could affect some of the pension system indicators assuming that an early withdrawal is approved without a timely return of the money saved in the capitalization account under the RAIS system. This exercise does not evaluate the possible positive effects of EW on welfare, nor the impact of these types of measures on the financial markets, but rather the potential effect that EW would have on the long-term goal of easing consumption in the life cycle.

1. Experience in Latin America

In Latin America, the two countries that allowed EW of pension savings during the Covid-19 health crisis were Chile and Peru. Table B1.1 summarizes the main characteristics of these plans.

Recently, another bill was approved in Peru that authorizes members of the private pension system who have not contributed to their CICs for twelve months prior to the approval of the bill to withdraw up to PEN 17,200 (approximately USD 4,700) from the balance of their CICs. In Chile, the possibility of making a second withdrawal of 10% of the balance in the CIC was also given free rein.

2. Simulation Exercise

In order to do a stress test for a representative agent who is contributing under the RAIS plan, a base scenario without EW is designed. Based on this, the effect of different EW scenarios on some performance indicators is evaluated. The EW scenarios involve withdrawals without repayment made at the beginning of each period of a specific percentage of the pension savings available at the end of the previous period.

The base scenario without EW is built with an assumed representative individual (male or female) who started

* The authors are part of the Financial Stability Department of *Banco de la República*. The opinions expressed here are the sole responsibility of the authors and do not imply any commitment on the part of *Banco de la República* or its Board of Directors.

1 According to Bosch et al. 2020 international experience shows three operational models of access to compulsory savings: i) permanent withdrawal without repayment, ii) loan and repayment and ii) feeder fund model.

Table B1.1
Characteristics of EW plans in Latin America

Country	Rule	Individual withdrawal amount[a/]	Total amount of withdrawal to date
Peru	Decree number 034/2020.	PEN Maximum 2020 (approximately USD 555)	USD 6.700 million as of 17 August 2020
	Act number 31017/1 May 2020	Maximum 25% of the balance in the CIC[b/]	
Chile	Act 21248/2020	Maximum 10% of the balance in the CIC[c/]	USD 15.060 million as of 23 September 2020

a/ Access to EW programs is not automatic. In each country there are different requirements to get access.
b/ The minimum withdrawal amount was PEN 4,300 (approximately USD 1,200) and the maximum was PEN 12,900 (approximately USD 3,600).
c/ The maximum withdrawal value is equivalent to 150 indexed unit of account (approximately USD 5.500). If there are less than the equivalent of 35 indexed unit of account (approximately USD 1,190) in the CIC, the entire amount can be withdrawn.
Source: Superintendency of Pensions of Chile and PFM Association of Peru.

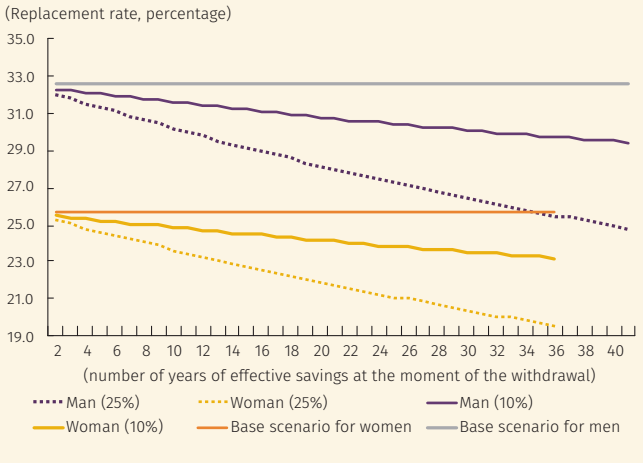
contributing at age 20 and is married to a person of the same age. The representative individual contributes continuously up to the minimum age required for retirement under the defined-benefit plan[2] (RPM in Spanish) and retires at the end of 2020 (i.e. starts working on 1 January 1979 in the case of men and 1 January 1984 in the case of women).[3] The hypothetical individual's salary level grows at a rate of 1.5% in real terms[4] until it reaches the current average monetary labor income of those who are formally employed based on their gender.[5] The method chosen for retirement corresponds to a life annuity.[6] The value of the latter is calculated on the basis of Edwards' (1997) methodology and using the mortality tables established by FSC in Resolution 1555/2010. The real interest rate used in the exercises is 3%. It should be noted that under the conditions described neither the representative individual man nor the woman is able to accumulate the necessary capital to acquire an annuity of at least one SMLMV. Therefore, they must be subsidized by the Minimum Pension Guarantee Fund at 79.6 and 130.9 SMLMV respectively.

Based on the analysis made by Altamirano et al. (2018), the replacement rate, the implicit rate of return, and the level of implicit subsidies are taken as performance indicators. The replacement rate is defined as the ratio between the pension level and the last reference wage and indicates the capacity of the plan to smooth consumption. The implicit rate of return (IRR) is the interest rate that matches the present value of the contributions with the present value of the pension that the individual will receive. This rate serves to evaluate the redistribution capability of the system. Finally, the system's implicit subsidies correspond to the level of funds that must be allocated for an individual to reach retirement with a SMLMV. This last indicator indicates the total cost of the system.

3. Results of the Simulation

EW reduces the replacement rate, and this decrease is stronger to the extent that there are a greater number of years of effective savings. This occurs because the base amount on which the withdrawal is made increases over time. Graph B1.1 shows the effect of two withdrawal scenarios: one with 25% and the other with 10%. It is clear that the men's replacement rate decreases at a faster rate than women's does. This indicates that the effect of the base amount on which the withdrawal is made is stronger

Graph B1.1
Replacement Rate under Different Withdrawal Scenarios
(excluding subsidy)



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

2 The minimum pension age in the RPM for men is 62 and 57 for women. In the RAIS, if, upon reaching these ages and having a minimum of 1,150 weeks of contributions, the contributor is not able to complete enough capital to guarantee a minimum monthly pension income, he/she may request access to the Minimum Pension Guarantee Fund.

3 For the exercise, the year 2020 is chosen as the date of retirement in order to facilitate the interpretation of monetary values and in order not to make forecasts about exogenous variables such as salary growth.

4 This value corresponds to the average growth of the SMLMV in Colombia over the last fifteen years.

5 The average employment income for employed men is COP 1,828,312 while for women it is COP 1,733,490. This average is taken from the labor market and social security information system of the Inter-American Development Bank.

6 The life annuity is a financial product that provides its member and beneficiaries with a periodic payment for life after retirement. This is usually adjusted annually with the change in the CPI.

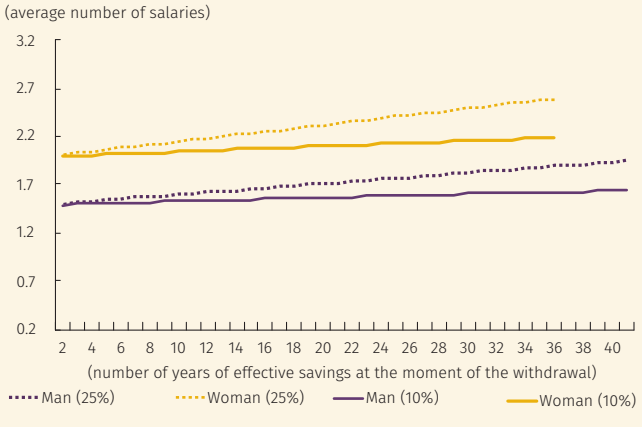
than that of the additional time available to men to make additional capitalizations in comparison to women. If the same retirement age is used for men and women, the replacement rate for women would still remain below that of men because of the higher cost of their life annuity. Note that the amount of the salary has no impact on the performance of the replacement rate in the proposed scenarios if no subsidy is assumed.

When taking into account the subsidy that the Minimum Pension Guarantee Fund would provide for those individuals whose capital is not sufficient to reach an income of one SMLMV, the replacement rate would be 48.0% for men and 50.6% for women excluding any effect from the EW. Graph B1.2 lists the number of months of average wages below which the replacement rate would not be affected by a withdrawal and the time at which the withdrawal takes place. People with incomes below that threshold would have a greater incentive to make a withdrawal. Individuals with incomes above that threshold, in turn, who make the withdrawal may have a greater incentive to switch to the RPM compared to what they would have in the base scenario.

In the 10% withdrawal scenario, depending on when the withdrawal is made, the hypothetical individual would have to make contributions for 4.3 to 66.9 additional months if a man and from 4.0 to 56.4 additional months if a woman[7] to reach the replacement rate level in the scenario without EW. This assumes that during that time the contributions made are the same value as they were during the previous period. However, all this would change if the actual interest rate were to be higher than in the base scenario. If it were to stand at 5.0%, the replacement rate would always be higher than the base scenario for both men and women regardless of the time of withdrawal. In a 1.0% real interest rate scenario, the replacement rate would fall proportionally less since the response is not symmetrical (Graph B1.3).

Under the assumptions of the base scenario and assuming a 10% withdrawal, the rate of return at which contributions must be reimbursed to achieve an SMLMV annuity is the one that is presented in Graph B1.4. Since, in each case, the implicit IRR is higher than the 3.0% rate of return assumed at the beginning, the difference between these two must be covered with subsidies. Depending on the time the withdrawal is made, these subsidies would be between a range of 80.7 and 95.7 SMLMV for men and between 131.8 and 143.7 SMLMV for women. If their wages are higher than those presented in Graph B1.2, the implicit IRR will be equal to 3.0%, and there will be no subsidies.

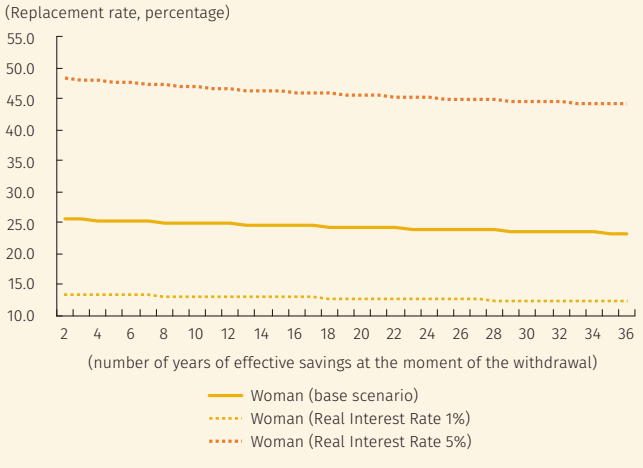
Graph B1.2
Number of Months of Average Wages Below which the Replacement Rate would not be Affected by Withdrawal.



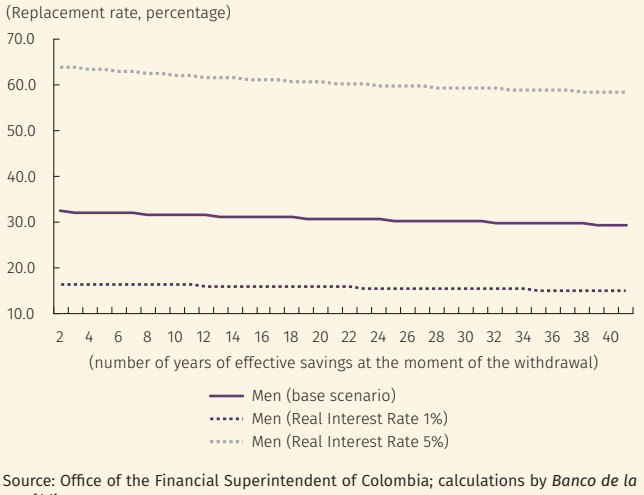
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

Graph B1.3
Replacement Rate under Different Interest Rate Scenarios (excluding subsidy)

A



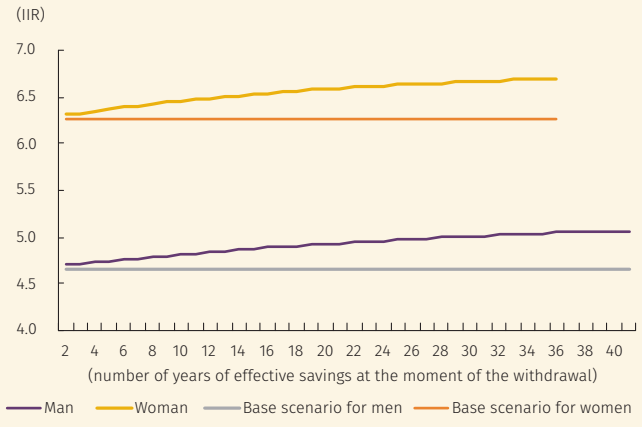
B.



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

7 The individual representative man can make the withdrawal between year 2 and year 42 and the woman between year 2 and year 37.

Graph B1.4
Implicit IIR Including Subsidies



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

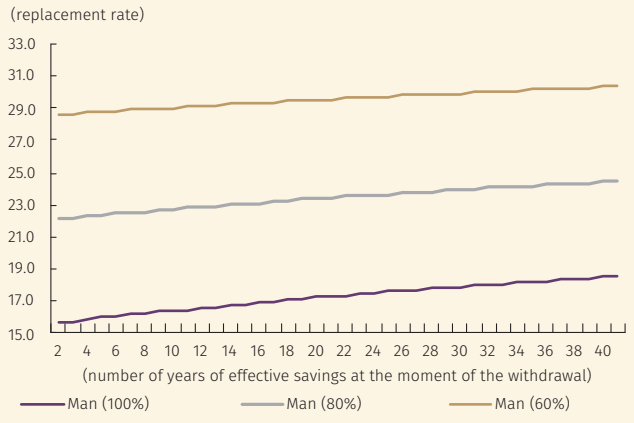
In EW scenarios where the contribution density[8] is 80% and a 10% withdrawal is made, the subsidy for the replacement rate increases by about 6.0% for men and 5.0% for women compared to the 100% contribution density scenario (Graph B1.5). Scenarios of less than 60% are not presented since, if the contribution density is less than 52.5% for men or less than 59.6% for women, it would not be possible to subsidize them, and the balances would be returned to the worker.

4. Final Considerations

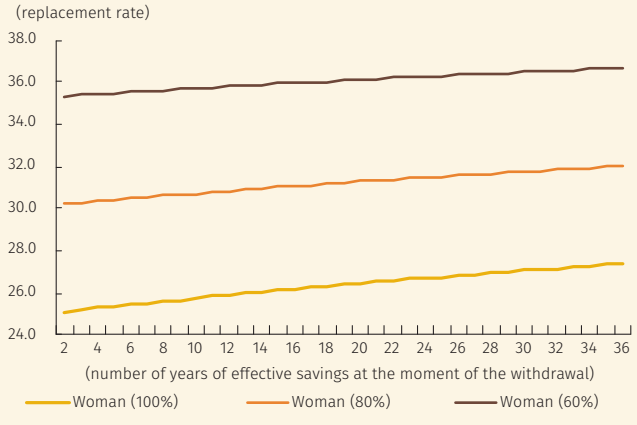
A scenario of early access to mandatory savings may have consequences for the financial and social sustainability of pension plans. That is why it is important to analyze the redistribution elements of these types of measures as well as their consequences for the markets and the financial system as a whole. This box contributes to this overall objective to the extent that it accounts for the impact that withdrawals could have on the system's ability to meet its objective of smoothing consumption and the potential costs they may have in the long term. Taking into account future scenarios of population aging, changes in labor markets, and in interest rates, it is deemed important to continue to undertake these types of exercises.

Graph B1.5
Replacement Rate Subsidy Based on Density Level

A.



B.



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

References

Altamirano, A.; Berstein, S.; Bosch, M.; García, M. G.; Oliveri, M. L. (2018). "Presente y futuro de las pensiones en América Latina y el Caribe," Inter-American Development Bank.

Arias, M.; Mendoza-Gutiérrez, J. C. (2009). "Un modelo de simulación del régimen pensional de ahorro individual con solidaridad en Colombia," Temas de Estabilidad Financiera, no. 44, Banco de la República.

Bosch, M.; Felix, C.; García-Huitrón, M.; Silva-Porto, M. T. (2020). "Acceso al ahorro obligatorio para el retiro en tiempos de Covid-19: consideraciones de política pública", Inter-American Development Bank.

Edwards, G. (1997). "Introducción al análisis de rentas vitalicias", Pontificia Universidad Católica de Chile, Instituto de Economía, Oficina de Publicaciones.

8 The contribution density represents the ratio between the number of months with effective contributions and the total number of months of the worker's active working life.

Box 2
Financial Health Indicator for Colombia

Juan Sebastián Lemus Esquivel
Laura Viviana Leon Díaz*

At *Banco de la República*, the analysis of companies' financial health is carried out in which different variables are studied individually, and each study evaluates a single accounting attribute (liquidity, indebtedness, profitability, efficiency, etc.). In recent years, some studies have focused on building an aggregate indicator that could provide a view of the companies' financial performance of in the corporate sector (see Lemus-Esquivel *et al.*, 2015). In addition, the results of the calculation of Piotroski's *F-Score* (2000) between 2007 and 2016 using the financial statements of the corporate sector that the *Superintedencia de Sociedades* (*Supersociedades*) publishes annually were presented in this *Report* in 2017 (see Lemus, 2017).

In this box, the *F-Score* calculations for the firms that report their financial statements to the *Superintendencia de Sociedades* are first updated using the most recent cut-off date, i.e., December 2019. The time span is also extended since the indicator is calculated starting with 1997 and uses all of the historical information available. Secondly, the *F-Score* methodology is applied to the corporate sector listed companies that have been part of the Colcap stock market index[1] while considering they are firms not included in the annual *Superintendencia de Sociedades*' samples and their representation is important.[2] Furthermore, their accounting information is published quarterly, which is more frequent than the *Supersociedades*' sample. With the two indicators, the idea is to build one aggregate representing the Colombian corporate sector as a whole. Subsequently, an alternative formulation of the *F-Score* is proposed for credit institutions, whose accounting information has been published on a monthly basis since 1990, in Colombia. With this indicator, the idea is to study the dynamics of the financial system's financial performance as well as to identify their determinants and compare these results with those obtained for companies in the corporate sector. Finally, it is aimed at using the *F-Scores* of the corporate and financial sectors to obtain a Colombian financial health metric.

1. *F-Score* for the Colombian Real Sector

To measure a corporate sector's company financial score, the *F-Score* adds nine accounting signals that cover different attributes (profitability, indebtedness, liquidity, capital funding, and operating efficiency).

$$F\text{-}Score^{SR} = F_{ROA} + F_{CFO} + F_{\Delta ROA} + F_{ACCRUAL} + F_{\Delta LEVER} + F_{\Delta LIQUID} +$$

$$EQ\text{-}OFFERING + F_{\Delta MARGIN} + F_{\Delta TURN}$$

The accounting signals are binary variables, and their definitions are presented in Table B2.1. Depending on which signal one is referring, it takes the value of 1 if its financial attribute improves between two consecutive periods or if it was positive in the period being evaluated. A maximum financial situation is when the indicator is at nine; if not, its value is zero.[3]

Graph B2.1, panel A shows the historical *F-Scores* for both the *Superintedencia de Sociedades*' sample and the non-financial issuers of securities.[4] When the indicators are weighted by their share of assets, the aggregate *F-Score* for the real

* The authors are officers in the Office for Monetary Operations and International Investments at *Banco de la República*. The opinions expressed in this box are the sole responsibility of the authors and do not represent nor imply any commitment on the part of *Banco de la República* or its Board of Directors.

1 The analysis is restricted to any firm that has issued securities in the past and belonged to one of the Colcap baskets since the historical median of the ratio between the stock market capitalization of the species included in the aforementioned index and the one for the Colombian stock market is around 78%. Furthermore, in general, the species in Colcap have been traded on a daily basis; this means that they are more liquid than those species that have not been included in the index.

2 As of June 2020, the assets of fourteen issuers that were members of Colcap and for which there was accounting information at the time this document was written represented 29% of the GDP. Moreover, as of December 2019, the share of the total assets of the 27,848 companies in the *Superintendencia de Sociedades*' database came to 112% of the GDP.

3 Piotroski (2000) did not define thresholds to describe financial health. He argues that companies with strong accounting fundamentals will be those scored at 8 or 9, and those with the weakest ones will be scored at 0 or 1. Given that the median or 50th percentile between 0 and 9 is 4.5, a reasonable assumption for the analyses in this box is that an average financial situation is the one corresponding to an *F-Score* level between 4 and 5.

4 For the purposes of this box, it was only possible to build, through public information sources, the historical database of financial statements for securities issuers starting with 2007. Although there is accounting information for previous periods, it was not possible to translate it into a database that was easy to use and debug.

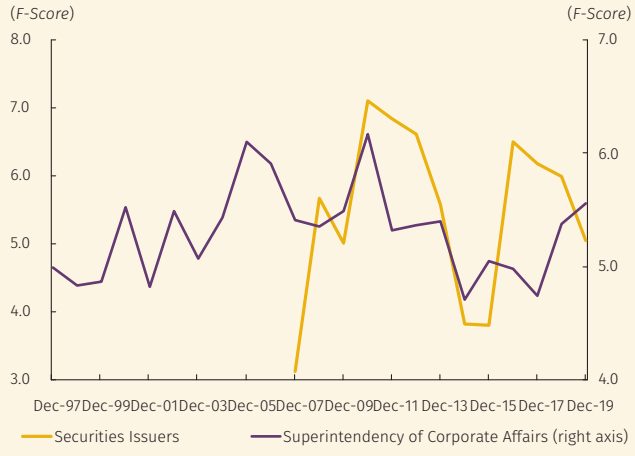
Table B2.1
Description of the *F-Score* Components for a Real Sector Company, Conditions for Them to be Equal to 1, and Intuition Regarding the Accounting Signals

Financial attribute	Name	Accounting signal	Take the value of 1 if:	Explanation
Profit	Return on assets during the period	F_{ROA}	$ROA_t = \frac{(Net\ profit)_t}{(Total\ assets)_{t-1}} > 0$	Profitability and the ability to generate cash flow measure the firm's ability to generate funds internally, specifically through operations. Moreover, a positive trend in profitability suggests the firm's ability to generate positive cash flows in the future.
	Net cash flow derived from operational activities (CFO)	F_{CFO}	$\frac{(CFO)_t}{(Total\ assets)_{t-1}} > 0$	
	Annual change in asset profitability	$F_{\Delta ROA}$	$ROA_t > ROA_{t-1}$	
	Profit and cash flow comparison	$F_{ACCRUAL}$	$\frac{(CFO)_t}{(Total\ assets)_{t-1}} > ROA_t$	The CFO measures the firm's operating cash while net income denotes the difference between the company's income and expenses during the period, but does not represent a measurement per se of liquidity, but rather of profitability. The desire is for the firm to be able to generate more cash than profits in order to maintain an uninterrupted liquidity cycle.
Leverage, liquidity, and source of funds	Annual change in long-term debt	$F_{\Delta LEVER}$	$\frac{(Long\text{-}term\ Liabilities)_t}{(Total\ assets)_t} \leq \frac{(Long\text{-}term\ Liabilities)_{t-1}}{(Total\ assets)_{t-1}}$	In general, and especially in companies with high levels of leverage, an increase in long term debt and a decrease in liquidity show evidence of greater financial risk and that the firm cannot meet its obligations in a timely manner.
	Annual change in funding	$F_{\Delta LIQUID}$	$\frac{(Current\ assets)_t}{(Current\ Liabilities)_t} > \frac{(Current\ assets)_{t-1}}{(Current\ Liabilities)_{t-1}}$	The signal penalizes a company that increases its funding with shares of stock or its own capital. In general, a company can be funded by three types of creditors: banks, suppliers, and shareholders or partners. The cost of funding with banks generates agency conflicts with shareholders and increases the probability that the company will become insolvent due to the financial burden associated with bank debt. A high dependence on suppliers, in turn, jeopardizes the company's ability to quickly convert raw materials into operational income, thus affecting the cash cycle. Thus, under the *F-Score* logic, a greater increase in funding via equity, leaving everything else constant, shows that the company does not have sufficient ability to generate its own resources to increase its free cash flow and thus carry out its investment projects and meet its obligations to creditors. Indeed, as is the case with long-term debt, the indicator penalizes the company for increasing its funding through existing or new shareholders and partners.
	Annual change in liquidity	*EQ-OFFERING*	$(Social\ Capital)_t \leq (Social\ Capital)'_{t-1}$	
Operational efficiency	Change in the gross margin	$F_{\Delta MARGIN}$	$\frac{(Gross\ profit)_t}{(Operating\ income)_t} > \frac{(Gross\ profit)_{t-1}}{(Operating\ income)_{t-1}}$	An inter-temporal improvement in the gross margin denotes an improvement in the company's production cost structure (for a manufacturing agent), inventory structure (for a service firm) or an increase in the sales price level.
	Annual change in asset turnover.	$F_{\Delta TURN}$	$\frac{(Operating\ income)_t}{(Total\ assets)} > \frac{(Operating\ income)_t}{(Total\ assets)}$	An improvement in the efficiency of the firm, from a productive point of view is ideal, in the sense that fewer assets are required to generate a higher level of sales.

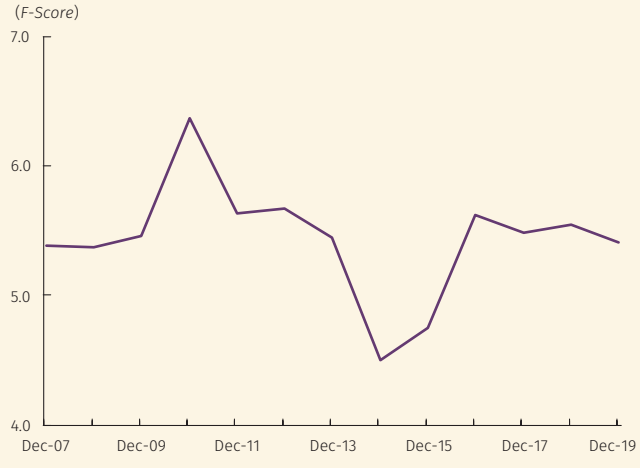
a/ From its acronym in English.
b/ Corporate capital is defined as "the total value of the initial investments and the subsequent increases or decreases that the partners, shareholders, companies or contributors make available to the economic entity by means of quotas, shares, assigned amount, or contributed value respectively in accordance with public deeds of incorporation or reforms, subscription of shares based on the type of society, association, or business with the full legal requirements". For more information, see: https://puc.com.co/31
Source: Piotroski (2000), Berck and DeMarzo (2014), Superintendency of Corporate Affairs and Lemus (2017), authors' design.

Graph B2.1

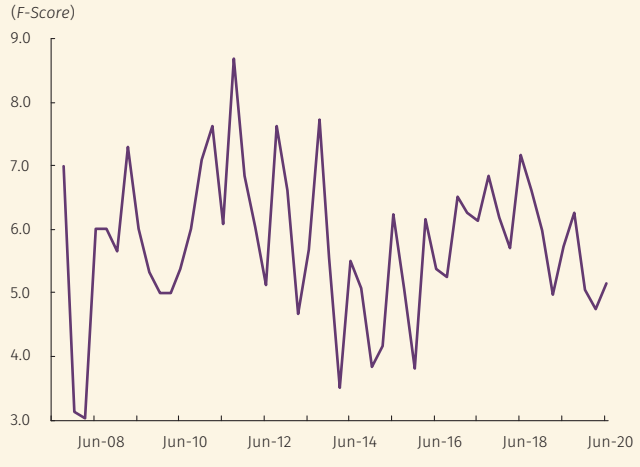
A. *F-Score* by real sector group
(annual figures, at close of each year)



B. *F-Score* (F-Score^{SR}) aggregate for the Colombian real sector
(annual figures, at close of each year)



C. *F-Score* for Securities Issuers
(quarterly frequency)



Sources: Bloomberg, Colombia Stock Market (BVC), Superintendency of Corporate Affairs (Supersocieties) and Office of the Financial Superintendent of Colombia (FSC), calculations by *Banco de la República*.

sector, *F-Score*^{SR}, is obtained (Graph B2.1, panel B).[5] In general, it is clear that the companies listed on the stock exchange have shown a better performance than their counterparts that have not sought financing in the stock market. Moreover, between 2010 and 2014, both indicators showed the same trend until 2016. This was because the *F-Score* of the securities issuers went from 3.8 to 6.5 because the indicator of one of the largest issuers in Colcap showed improvements of F_{ROA}, $F_{\Delta ROA}$, and $F_{\Delta TURN}$ in the accounting signals. As was mentioned, the indicator can be built with a quarterly frequency for securities issuers (Graph B2.1, panel C). In general, it is evident that, over time, financial health is a volatile attribute and that it has weakened since the second half of 2018. The *F-Score* for companies listed on the stock exchange was at its lowest in the third quarter of 2008 while it was highest in September 2011. Other instances where financial performance was weak for issuers were the 2013, 2014, and 2015 year-end closings.

Moreover, the downward trend of the indicator for securities issuers since 2016 is striking while the opposite is true for the *Supersociedades'* sample. While, in the first case, an unfavorable performance is seen in most of the *F-Score* components, the consistent improvement in financial health for the real non-issuing sector was mainly due to the positive performance of the $F_{\Delta ROA}$, $EQ\text{-}OFFERING$ and $F_{\Delta TURN}$ signals. Finally, the aggregate indicator of the real sector has fluctuated between 4.5 and 6.4, and this makes it possible to conclude that the financial health of companies in Colombia can be characterized as average.

2. *F-Score* for Credit Institutions (CI)

The following is the formulation of the *F-Score* for credit institutions (*F-Score*^{CI}):

$$F\text{-}Score^{EC} = F_{ROA} + F_{\Delta ROA} + \boldsymbol{F_{ROE}} + \boldsymbol{F_{\Delta ROE}} + \boldsymbol{F_{\Delta LEVER}} + \boldsymbol{F_{\Delta LIQUID^*}} + EQ\text{-}OFFERING + \boldsymbol{F_{\Delta MARGIN}} + \boldsymbol{F_{\Delta TURN}}$$

The variables in bold are different from the original formulation of the *F-Score* since they respect the intuition of the original indicator that applies to a company in the real sector, but must recognize and be consistent with the accounting nature of a credit institution (CI). Moreover, the signals of F_{CFO} and $F_{ACCRUAL}$ were replaced by F_{ROE} and $F_{\Delta ROE}$, respectively, considering the fact that there is substantial literature that argues that the cash flow statement in credit institutions lacks interpretation. The above is because the cash that the entity generates comes, in large part, from portfolio placement activities, and conceptually, this is difficult to distinguish in any of the categories of the

5 As was mentioned, the frequency of accounting information for the companies under the Superintendency of Corporate Affairs is annual while the frequency for the issuers of securities is quarterly. In visual terms, to make the *F-Score* of both samples comparable, the indicator for the Superintendency of Corporate Affairs is plotted with that of the issuers using only the results from each December in the latter case.

cash flow statement (operating, investment, or financing activities) (see Mulford and Comiskey, 2009; Ryan, 2002; FASB, 2010b). Additionally, the literature consulted also suggests that, globally, regulators and the market do not use cash flow to measure the financial performance of a CI (see Mulford and Comiskey, 2009; Ryan, 2002; FASB, 2010b). Given the above, and considering that, in the original formulation of the *F-Score*, the variables to be excluded measure the financial attribute of profitability; the substitution makes sense since, together with the *ROA*, the *ROE* is a traditional indicator for evaluating the profitability of the financial system's intermediaries.

In addition, given the CIs' balance sheet structure, where it is usual for liabilities to predominate on the right side, the decision was made to not maintain the formulation of $F_{\Delta LEVER}$ for a real sector company in calculating the *F-Score* for a CI. That being the case, we went from taking the intertemporal change in the ratio of long-term liabilities to total assets to the variation over time of the leverage indicator, the latter being measured as the ratio of total assets to equity. Furthermore, two variables are used to calculate $F_{\Delta LIQUID^{**}}$. Up to December 2011, the change over time of the ratio between liquid assets and liquid liabilities was used. After that date, the 30-day LRI ratio was used since its calculation, and regulatory limit came into effect in 2012. In addition, it is one of the variables used to measure the CIs' liquidity risk. Last of all, details on some of the *F-Score* indicators' definitions for credit institutions can be found in Table B2.2.

The *F-Score* is calculated by type of credit institution (banks, FC, CFCs, and cooperatives) and weighted by asset level (Graph B2.2, panel A). Furthermore, the four indicators are used to calculate an aggregate one for the financial system (Graph B2.2, panel B). Going by type of CI, it is evident that the historical minimum was registered in the third quarter of 2000 and that the cooperatives have generally been the lowest performers. Over time, financial health has been found to be a volatile characteristic, and it was persistent for FCs between 2005 and 2011 due to the instability of the signals associated with profitability, especially for the largest FCs. Moreover, since the third quarter of 2019, there has been a marked downward trend for all CIs in line with what has been seen in the real sector, especially for securities' issuers. Finally, the sector's *F-Score* reflects, to a large extent, that of the aggregate indicator for banks since they are the largest CIs.

Finally, it is important to mention that alternative formulations of the *F-Score* were proposed and calculated for the CIs. In these, traditionally employed variables these firm's financial health analysis were utilized. Variables were used such as the default indicator (overdue portfolio/total portfolio) which is a credit risk proxy, the ratio of portfolio to deposits as the institutions' structural funding variable, and the coverage ratio that is measured by loan-loss provisions/overdue portfolio. The *F-Scores* obtained were not substantially different from those presented in Graph B2.2, panels A and B. That is why they are not included or discussed in this box.

3. *F-Score* for Colombia

The *F-Score* calculation for Colombia uses an unbalanced panel that includes both real sector and financial companies. At each instant, the indicator is a weighted average, where each firm is weighted by the share of its assets in the total sample. The indicator was found to have reached its minimum in December 2014 (4.7) and its maximum in December 2010 (6.3), which was quite close to the one in December 2017 (6.1) (Graph B2.3, panel A). Considering the fact that the accounting information from the three samples used for the different calculations and analyses in this box (non-financial securities issuers, companies under the *Supersociedades* and credit institutions) has different frequencies, the calculation of the aggregate indicator takes the lowest frequency (annual, from the *Supersociedades'* sample) and is plotted from the date on which it can be calculated for all the groups of companies (2007, since the historical accounting information of the securities issuers has been available since that year). Taking this into account, to calculate the indicator for a longer period of time, an indicator is built to aggregate the F-Scores obtained for the sample of the *Supersociedades* and credit institutions (Graph B2.3, panel B). This aggregate indicator, which is also annual in frequency, has been calculated since December 1997 and registered a historic low of 4.5 in December 1998. As such, the two indicators show similar performance with respect to where their historical minimums stood in episodes of stress for the Colombian economy (mortgage crisis at the end of the nineties and the collapse of crude oil prices in 2014). Finally, note that in both cases, the figures in the indicators as of December 2019 were below their historical averages.

Furthermore, by looking at each *F-Score* component in the past, the percentage of times its financial signal showed an improvement (i.e., it took the value of 1), the profitability of the period for both the real and the financial sectors (F_{ROA} and F_{ROE}) was found to show consistently positive performance, while its inter-temporal change did not ($F_{\Delta ROA}$ and $F_{\Delta ROE}$). In contrast, there is an average performance in terms of the development of efficiency indicators. Last of all, the history of the two sectors shows a positive performance in that they did not prefer funding through the stock market compared to other alternatives ($EQ\text{-}OFFERING$) (Tables B2.3 and B2.4)

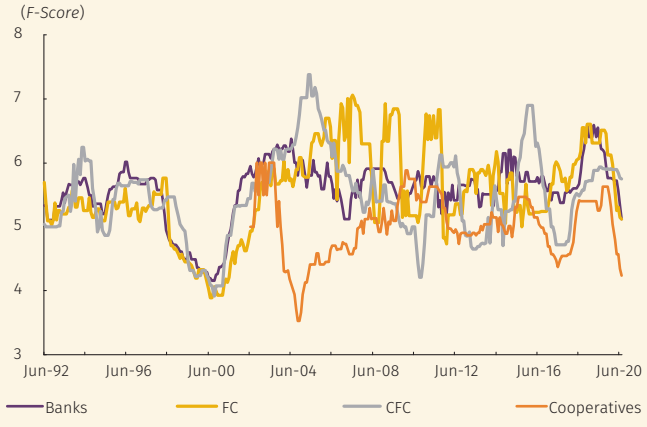
Table B2.2
Description of some *F-Score* Components for a Credit institution, Conditions for them to be Equal to 1, and Intuition Regarding the Accounting Signals

Financial attribute	Name	Accounting signal	Take the value of 1 if:	Explanation
Leverage, liquidity, and source of funds	Annual change in liquidity	$F_{\Delta LIQUID*}$	$\begin{cases} \frac{(Liquid\ assets)_t}{(Liquid\ Liabilities)_t} > \frac{(Liquid\ assets)_{t-1}}{(Liquid\ Liabilities)_{t-1}} & \text{(Between 1990 and 2011)} \\ IRL_{c,10}(t) > IRL_{c,10}(t-1) & \text{(Starting in 2012)} \end{cases}$	In order to measure changes in the liquidity that the credit institutions had, the indicator used, starting in January 2012, was the thirty-day liquidity risk indicator (LRI) of the Office of the Financial Superintendent of Colombia defined as the ratio between liquid assets adjusted for exchange rate risk and market liquidity, and the net liquidity requirements at thirty days[a/]. Prior to that date, the monthly change in the ratio of liquid assets[b/] to liquid liabilities[c/] was measured, since the *LRI* was not defined in the regulation.
Operational efficiency	Change in the gross financial margin.	$F_{\Delta MARGIN'}$	$\frac{(Gross\ Financial\ Margin)_t}{(Financial\ income)_t} > \frac{(Gross\ Financial\ Margin)_{t-1}}{(Financial\ income)_{t-1}}$	The gross financial margin for a credit institution is defined as the difference between financial income[d/] and financial expenses[e/]. When measured against financial income, this ratio should theoretically be as close to 1 as possible since it denotes a low level of expenditure. Therefore, an inter-temporal improvement in the gross financial margin for a credit institution denotes an improvement in its business model since, given its cost structure, it implies a greater generation of financial income.
	Annual change in asset turnover.	$F_{\Delta TURN'}$	$\frac{(Financial\ income)_t}{(Total\ assets)_{t-1}} > \frac{(Financial\ income)_{t-1}}{(Total\ assets)_{t-2}}$	Like a company in the real sector, an improvement in the efficiency of the credit institution is ideal in the sense that fewer assets are required to generate a higher level of financial income.

a/ For more detail on the calculation of the LRI for credit institutions, see Chapter VI of the Basic Accounting and Financial Circular of the Office of the Financial Superintendent of Colombia.
b/ Liquid assets are calculated as the sum i) of cash, ii) repurchase rights and investments given in guarantee and transactions with derivative instruments, iii) money market and related asset transactions, iv) investments at fair value with changes in the OCI (Other Comprehensive Income), and v) investments at fair value with changes in results minus the decline in the value of the investments from the previous sum.
c/ The liquid liabilities correspond to the sum of i) deposits at *Banco de la Republic*, ii) C.D.A.T. balance, iii) repurchase agreements and iv) the balance of money market and related liability operations.
d/ For the purposes of this box, they are defined as the sum of i) income derived from loan portfolio and leasing transactions (with monetary correction), ii) commissions, iii) return on investments, iv) dividends, v) net profit received from the sale of investments, vi) income from the appreciation of investments, vii) income from the appreciation of derivatives and viii) other financial income.
e/ For the purposes of this box, financial expenditures are calculated as the sum of i) expenses due to interest paid, ii) commissions paid, and iii) monetary corrections associated with deposits and receivables.
Source: authors and *Office of the Financial Superintendent of Colombia;* design by the authors.

Graph B2.2

A. *F-Score* by Type of CI
(monthly, 12-month moving average)

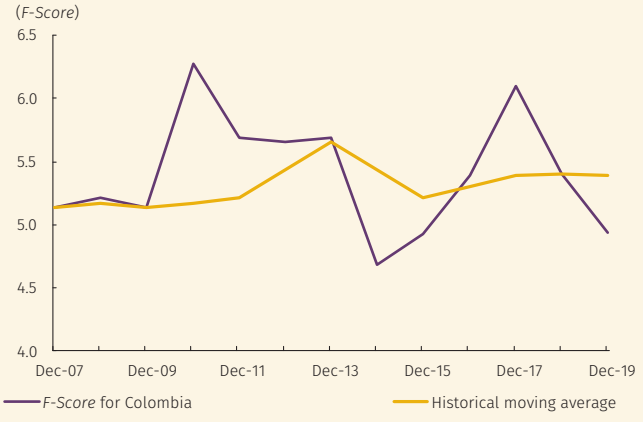


B. Aggregate *F-Score* for the CI
(monthly, 12-month moving average)

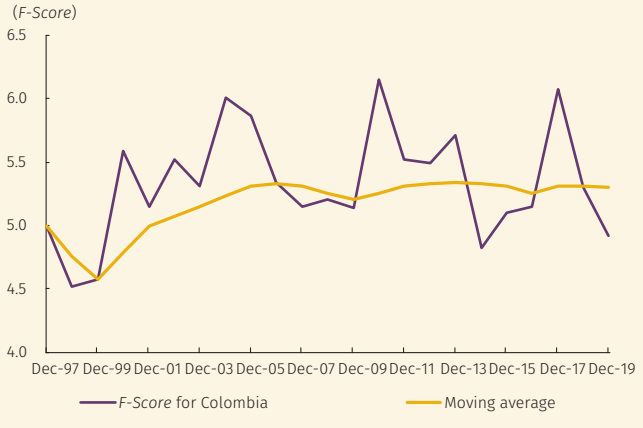
Sources: Bloomberg and FSC, calculations by *Banco de la República*.

Graph B2.3

A. *F-Score* for Colombia
(annual: issuers of securities, *Supersociedades*, and credit institutions)



B. F-Score for Colombia
(annual: *Supersociedades*, and credit institutions)



Sources: Bloomberg, FSC and *Supersociedades*; calculations by *Banco de la República*.

Table B2.3
Percentage of Times *F-Score* Accounting Signal Showed Improvement in Financial Health (i.e., it was at 1) for Real Sector Measured Over Time

Type of Entity	*F-Score* (historical 50th percentile)	*F-Score* signal								
		F_{ROA}	$F_{\Delta ROA}$	F_{CFO}	$F_{\Delta CCRUAL}$	$F_{\Delta LEVER}$	$F_{\Delta LIQUID}$	EQ-OFFERING	$F_{\Delta MARGIN}$	$F_{\Delta TURN}$
Real sector in Colombia	5.5	76.47%	44.62%	62.87%	53.63%	69.58%	49.57%	88.36%	43.11%	45.17%

Sources: Bloomberg, Colombia Stock Market (BVC), Superintendency of Corporate Affairs (Supersocieties) and Office of the Financial Superintendent of Colombia (FSC), calculations by *Banco de la República*.

Table B2.4
Percentage of Times the F-Score Accounting Signal Showed Improvement in Financial Health (i.e., it stood at 1) for the Financial Sector Measured Over Time

	F-Score (historical 50th percentile)	*F-Score* signal								
		F_{ROA}	$F_{\Delta ROA}$	F_{ROE}	$F_{\Delta ROE}$	$F_{\Delta LEVER'}$	$F_{\Delta LIQUID*}$	EQ-OFFERING	$F_{\Delta MARGIN'}$	$F_{\Delta TURN'}$
Credit institutions	5.6	78.92%	46.47%	79.27%	45.67%	50.80%	49.87%	85.43%	52.67%	51.34%

Sources: Bloomberg, Colombia Stock Market (BVC), *Superintedencia de Sociedades* (Supersociedades) and Office of the Financial Superintendent of Colombia (FSC); calculations by *Banco de la República*.

4. Final Remarks

From a financial stability point of view, periodic assessment of key agents' financial health in the economy is important as it allows more frequent detection of risks and vulnerabilities. Therefore, having high-frequency indicators is desirable, and this box attempts to fulfill this objective by building a financial health indicator for Colombia that includes monthly accounting information from credit institutions, quarterly information from non-financial security issuers, and yearly information from the *Superintedencia de Sociedades*. The new feature is that the corporate sector's financial health is aggregated in a single indicator using several sources of information and is compared to the indicator calculated for credit institutions. The results revealed the strengths and weaknesses of the balance sheets and income statements for both groups. Future studies could attempt to perform a detailed examination of alternative approaches for the indicator and its usefulness as a leading indicator if there is a desire to study the accounting's information predictive power for real variables in the future.

References

Lemus E., J. S. (2017), "*F-Score* para Colombia y su relación con el riesgo de crédito del sistema financiero colombiano", Reporte de Estabilidad Financiera, segundo semestre, Banco de la República.

Lemus-Esquivel, J. S.; Quicazán-Moreno, C. A.; Hurtado-Guarín, J. L.; Lizarazo-Cuellar, A. M. (2015). "Financial Soundness Index for the Private Corporate Sector in Colombia," Working Paper Series, no. IHEIDWP08-2015. Graduate Institute of International and Development Studies, International Economics Department.

Mulford, C.; Comiskey, E. (2009). "Cash Flow Reporting by Financial Companies: A Look at the Commercial Banks," Working Paper, Atlanta, no. GA 30332-052, College of Management, Georgia Institute of Technology.

Piotroski, J. D. (2010). "Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers," *Journal of Accounting Research*, vol. 38, pp. 1-41 (Supplement: Studies on Accounting Information and the Economics of the Firm).

Ryan, S. (2002). *Financial Instruments and Institutions: Accounting and Disclosure Rules* (first edition), Hoboken, New Jersey: John Wiley & Sons.

Financial Accounting Standards Board (FASB) (2010b). "Statement of Financial Accounting Concepts," *Conceptual Framework for Financial Reporting*, no. 8. Norwalk, CT: FASB.

03

Stress Test

Considering the vulnerabilities that have been identified throughout the Report, three exercises that are intended to measure the resilience of the financial system to face adverse scenarios in terms of credit and liquidity risk and the capacity to continue providing its basic functions over a short- and medium-term horizon are presented in this chapter.

Three exercises are presented in this chapter to assess the resilience of the financial system in the event of a hypothetical materialization of relevant sources of risks, in line with the analysis of vulnerabilities presented in previous chapters. The first exercise, which is known in international literature as a Stress Test and corresponds to the one usually presented in this chapter of the Report, is intended to measure the ability of CIs to deal with a hypothetical and adverse scenario that leads to a sharp increase in the risky portfolio, using a model that considers both capital adequacy and liquidity risks. In this edition of the report, this model is also used to: 1) perform a reverse stress test in order to determine how strong the materialization of the credit risk would have to be for reaching a high level of vulnerability in the financial system, and 2) determine the ability of the CIs to keep the flow of credit to the real sector in the short term if higher default rates are seen in the economy.

The second and third tests are intended to measure the effect that credit risk and withdrawal shocks could have on the liquidity position of CIs and CIFs, respectively. This, in order to assess the capability of these entities to meet their short-term obligations under a stress scenario.

3.1 Capital and Liquidity Stress Test for CIs

This section describes the scenario and the results of the stress test on the credit institutions (CIs) that Banco de la República carries out every six months. This test, known in the international literature as a Stress Test, seeks to measure the resilience of the CIs in the event of a hypothetical adverse scenario.

The objective of this section is to calculate the impact of a hypothetical adverse scenario on the CIs in which the growth rate of the Colombian economy declines significantly, starting in the second half of 2020 and continuing until December 2021. The scenario under consideration has been intentionally designed to reflect a recession that is deeper and more prolonged than expected.

The results of this exercise do not constitute any forecast regarding the future development of the economy or the financial system, and the scenario considered is intended to reflect an adverse hypothetical situation. Therefore, these should be interpreted as a quantitative evaluation of the resilience of the CIs in the event of an adverse scenario based on their current financial conditions and under restrictive assumptions. Likewise, the exercise assumes that the economic authorities respond to macroeconomic stress. However, except for the measures derived from the FSC external circulars 007 and 014, no additional policy actions are considered in the event of deterioration of the entities' financial statements. Specifically, the model does not consider the mitigating effects that the measures recently taken by *Banco de la República* to preserve market liquidity and the government's fiscal support on different fronts could have and which could presumably lower the impact of the adverse scenario. Finally, the exercise considers the regulatory changes in capital adequacy resulting from decrees 1477/2018 and 1421/2019 going into effect in January 2021.[28]

The usefulness of the test lies in providing an estimate of the potential losses that would be seen if the adverse scenario were to materialize. Furthermore, this helps to understand the possible transmission channels by which the vulnerabilities identified could affect financial stability.[29]

---

28 In practice, entities can implement these regulatory changes before 2021. However, the model assumes that all of the CIs will adopt this regulation in January 2021 with the exception of those who had done so in the first half of 2020.

29 The technical details of the model used in this test which include a description of the performance of the entities in a hypothetical scenario and the channels through which their financial health could be affected are presented in the series *Borradores de Economía* No. 1028: "SYSMO I: A Systemic Stress Model for the Colombian Financial System", *Banco de la República*.

The results suggest that, in the adverse scenario (and only towards the end of 2021), there could be negative effects on aggregate capital adequacy ratios, although they would probably remain above the regulatory limits during the entire period of the exercise. Although the individual analysis is heterogeneous, the above implies that the system currently has a sufficient buffer to absorb potential losses due to loan portfolio deterioration.

3.1.1 Macroeconomic Scenario and Risks

The trajectories of the adverse scenario consider a recession that is deeper and more prolonged than the technical staff at Banco de la República expects.

The stress test seeks to capture the effects of an adverse and hypothetical macroeconomic context consisting of a sharp recession between the third quarter of 2020 and the last quarter of 2021. This scenario was designed based on the lower bound projection of the GDP that the technical staff at *Banco de la República* presented in the July 2020 Monetary Policy Report *but* included a slower recovery in 2021. The above could be associated with a deeper and more persistent than expected impact of the Covid-19 health emergency. Under this scenario, hypothetical trajectories of high unemployment and declines in GDP and loan portfolio will probably be seen.[30] Furthermore, to reflect an adverse scenario of great uncertainty, a gradual increase in the spreads between lending interest rates and the policy interest rate is assumed reaching their maximums since 2002 are reached[31]. This could also be associated with a context of high levels of credit risk.

In the adverse scenario, the macroeconomic deterioration will probably cause an abrupt reduction in credit quality.

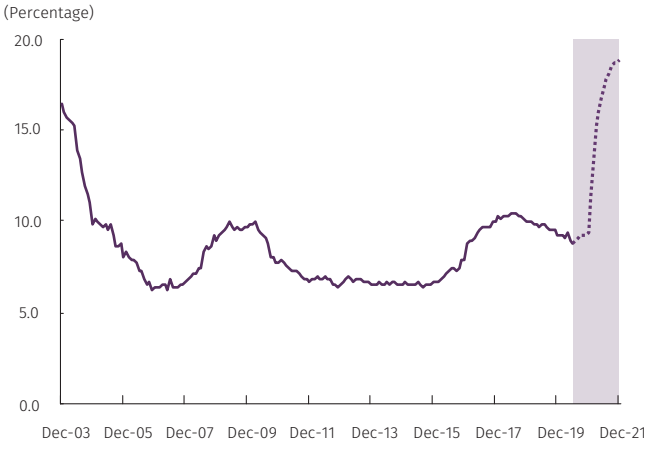
A hypothetical scenario of sustained economic slowdown and high interest rates will probably entail the materialization of credit risk for CIs during the first stage. The endogenous response of CIs to the scenario could, at a second stage, unleash the materialization of additional risks that would be likely to have a direct impact on the financial statements of each entity (financing, liquidity, interest rate, and contagion risks).

Regarding credit risk, the macroeconomic deterioration would be likely to cause a reduction in the ability of the economy's agents to make

30 This macroeconomic scenario is constructed taking into account the feedback effects between the financial sector and the real sector of the Colombian economy.

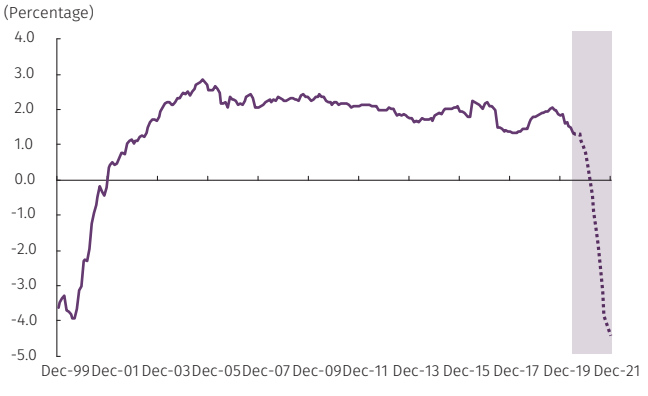
31 *The largest historical spreads in the commercial, consumer, mortgage, and microcredit loan portfolios were 7.4 pp (May 2002), 22.7 pp (June 2002), 14.7 pp (December 2002), and 33.2 pp (January 2020) respectively.*

Graph 3.1
Quality indicator by Risk (QIR)



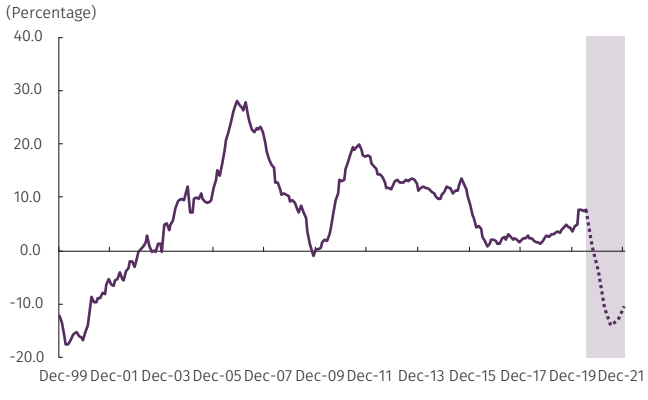
Source: Office of the Financial Superintendent of Colombia (up to June 2020); calculations by *Banco de la República* (September 2020 to December 2021).

Graph 3.2
Return on Assets (ROA)



Source: Office of the Financial Superintendent of Colombia (up to June 2020); calculations by *Banco de la República* (September 2019 to December 2021).

Graph 3.3
Real Annual Growth of the Loan Portfolio



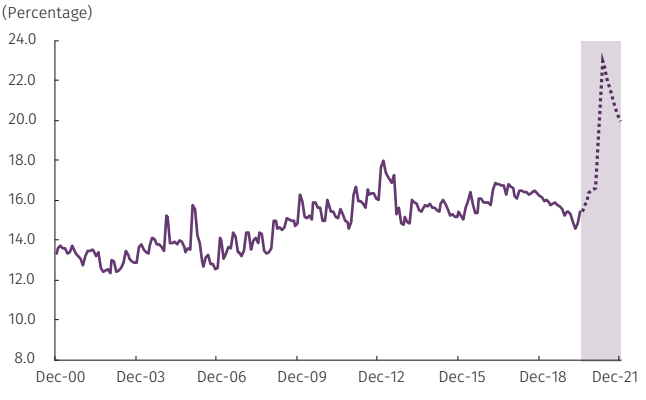
Source: Office of the Financial Superintendent of Colombia (up to June 2020); calculations by *Banco de la República* (September 2020 to December 2021).

payments and, consequently, an increase in default rates. However, that delinquency would be seen as of the first quarter of 2021, when CIs are supposed to start accounting for the effects of the materialization of credit risk after the debtors' holydays payment end.

3.1.2. Results of the Adverse Scenario

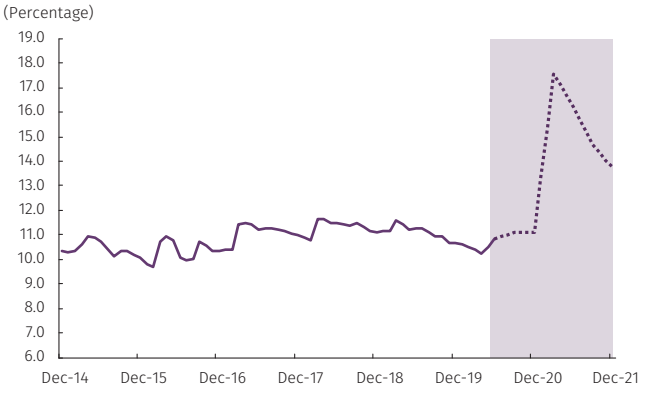
The trajectories of the aggregate CIs variables in the stressed scenarios would react in line with what is shown in Graphs 3.1 to 3.5: the shaded area corresponds to the analysis horizon of the test. In the scenario described, there would probably be a deterioration in loan portfolio quality that has not been registered since the post-crisis

Graph 3.4
Capital Adequacy Ratio



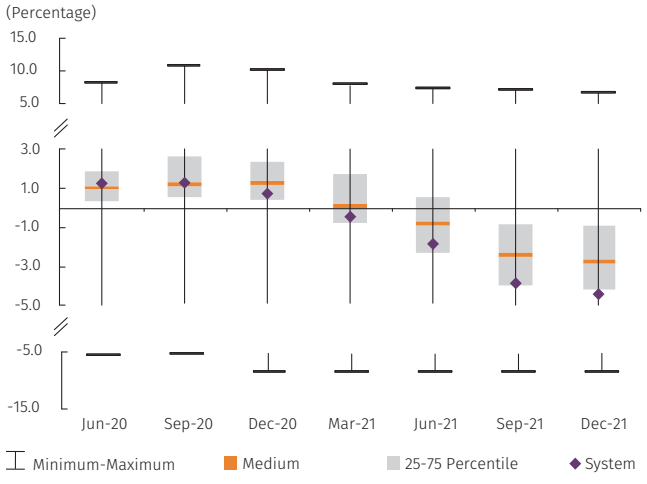
Source: Office of the Financial Superintendent of Colombia (up to June 2019); calculations by *Banco de la República* (September 2020 to June 2021).

Graph 3.5
Core Equity Tier I Adequacy Ratio



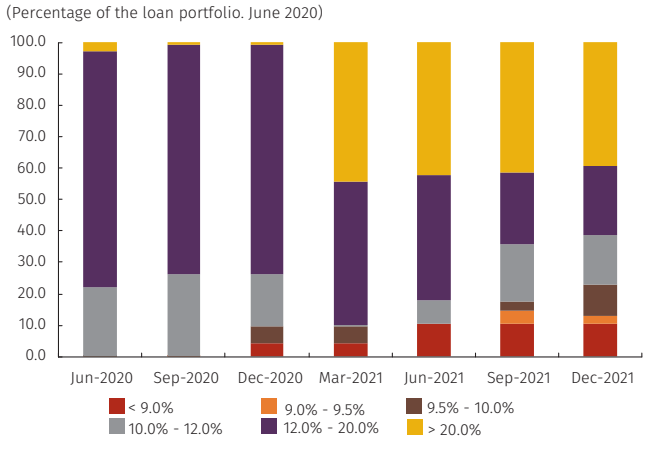
Source: Office of the Financial Superintendent of Colombia (up to June 2019); calculations by *Banco de la República* (September 2020 to June 2021).

Graph 3.6
Distribution of ROA



Source: Office of the Financial Superintendent of Colombia (up to June 2020); calculations by *Banco de la República* (September 2020 to December 2021).

Graph 3.7
Distribution of the Loan Portfolio by Capital Adequacy Ranges



Source: Office of the Financial Superintendent of Colombia (up to June 2020); calculations by *Banco de la República* (September 2020 to December 2021).

period of 1999 (Graph 3.1). Given the severity of the macroeconomic scenario, the results indicate that, with regard to profitability, the ROA would reach negative values as of the first quarter of 2021. The minimum ROA in the stressed scenario is likely to be registered in the fourth quarter of 2021 (-4.4%, Graph 3.2). With regard to real loan portfolio growth, there would be contractions similar to those registered in the crisis of the 1990s (Graph 3.3). Due to the regulatory changes for the capital of CIs that are going into effect and to the sharp slowdown in the loan portfolio, the capital and core equity Tier I adequacy ratios of the whole financial system will probably continue to rise until the first quarter of next year. As of April 2021, losses from expenditures on loan-loss provisions could lower these indicators. However, the aggregate capital adequacy ratios will probably stand at levels that are above the regulatory limits and even above the levels seen in June 2020 (Graphs 3.4 and 3.5).

Finally, even though the aggregate indicators of the CIs may have presented moderate levels of deterioration with respect to the regulatory requirements, the results between institutions are heterogenous. In terms of ROA, note that after September 2021 more than 75% of the CIs are likely to register losses (Graph 3.6). Regarding capital adequacy, the level for some entities (that accounted for 10.7% of the total loan portfolio in June 2020 but are not part of the group of systemic entities) is likely to go below 9%[32] (Graph 3.7). Based on these results, to keep the entire financial system solvent and in compliance with the capital cushions required[33] throughout the horizon of the stress test, a capital injection of COP 6.4 t could be required throughout the six simulated quarters.

32 With Decree 1477/2018 going into effect, the systemic entities must build up an additional capital cushion in accordance with the transition percentages required by the Decree.

33 This means that, during 2020, the capital adequacy ratio and the core equity Tier 1 adequacy had to remain above 9.0% and 4.5% respectively, and the ratio between equity and subscribed capital above 50%. Starting 2021, the limits, including the conservation cushion, will be 9.375%, 5.25%, and 4.875% for the adequacy ratio, additional core, and core equity tier 1 adequacy, respectively. For systemically important entities, an additional 25pb is required. In practice, non-compliance with capital buffers does not imply non-compliance with regulatory limits and, therefore, does not constitute a situation of insolvency.

3.1.3 Reverse stress test

Given the current situation, a reverse stress test is presented in this edition of the Report in order to evaluate how strong the materialization of credit risk would have to be for the system to reach a high level of vulnerability.

The above exercise uses the historical relationships between economic activity and the materialization of credit risk to determine the impact of an adverse macroeconomic scenario on the financial situation of institutions. However, the unprecedented nature of the shock imposed by the pandemic, and the policy actions to counteract its harmful effects may have altered those relationships and, thus, exacerbated the uncertainty about the materialization of risks. Furthermore, the magnitude of the losses that this shock would generate is crucial in determining the ability of CIs to provide credit to the economy.

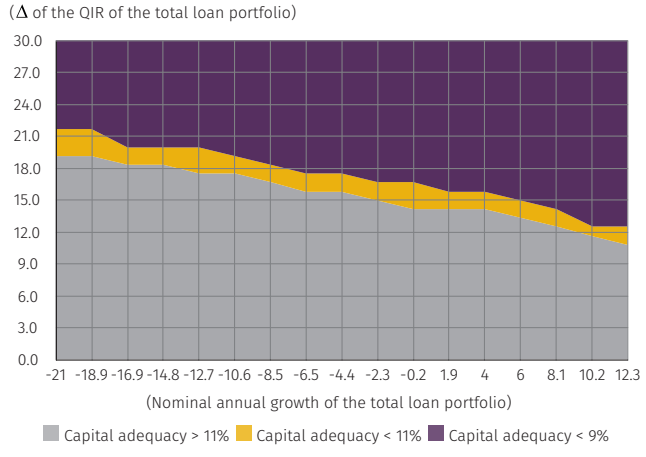
Given the above, reverse stress tests are presented in order to evaluate how strong the materialization of credit risk would have to be for the system to reach a high level of vulnerability when the capital adequacy ratio of the system is lower than the regulatory one. In these exercises it is assumed that a fraction of the debtors would stop making their payments as of March 2021 and, therefore, would accrue days of arrears in accordance with SARC instructions for each credit category for the remainder of the test. The above would be reflected in an inverted L-shaped QIR trajectory and successive displacements in the rating of that loan portfolio. This would cause an increased flow of spending on loan-loss provisions with a peak in the third quarter of 2021.

The results suggest that the aggregate quality risk indicator would have to be at levels above 28% (more than three times the level of the QIR for the total loan portfolio as of August 2020) in order for it to present a systemic vulnerability scenario like the one described. Specifically, the aggregate capital adequacy would reach 9.0% in December 2021 and the shock could generate a nominal annual growth of the loan portfolio equal to -11.1% on the same date. Although the individual analysis is mixed, the results imply that the system currently has a sufficient cushion to absorb losses due to spending on loan-loss provisions.

Finally, the ability of CIs to continue extending credit without compromising their financial soundness in the wake of various credit risk shocks is estimated.

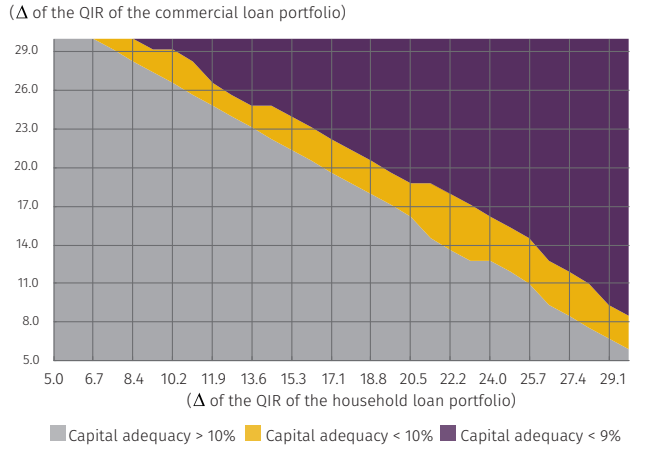
In the context of the pandemic, it is relevant to examine the extent to which CIs are able to provide an adequate flow of credit and, thus, support households and businesses in the economic recovery expected in 2021 without compromising their financial soundness. In view of this trade-off, the entities could take defensive actions by

Graph 3.8
Capital Adequacy Ratio for different Shocks of Total QIR and Portfolio Growth



Source: calculations by *Banco de la República.*

Graph 3.9
Capital Adequacy Ratio for different Shocks of QIR by Loan Portfolio



Source: calculations by *Banco de la República.*

limiting the supply of credit to the real sector in order to avoid potential damage to their capital adequacy caused by a high deterioration in the quality of the portfolio.

Graph 3.8 shows the result in terms of aggregate capital adequacy for different combinations of portfolio growth and increases in total QIR. Specifically, the vertical axis corresponds to the increase in the QIR for the total loan portfolio and the horizontal axis consists of the nominal annual growth as of December 2021. The area in purple encompasses the set of scenarios in which aggregate capital adequacy ratio reaches levels that are below 9% over the course of the exercise. The yellow region corresponds to those with levels between 9% and 11%, and the gray region to scenarios that result in a capital adequacy that is above 11%. The results indicate that, starting with the current capital available to CIs, there is sufficient scope to contribute to nominal loan portfolio growth equal to or higher than the pre-pandemic period (9.0%) without generating problems in the financial system's capital adequacy as long as the increase in the total QIR is below 10 pp.

Finally, Graph 3.9 shows the result of the aggregate capital adequacy for different combinations of increases in the QIR of the commercial loan portfolio and the household portfolio. The results show that there are multiple scenarios where the CIs would not present a systemic vulnerability based on the emergence of credit risk in the categories described. For example, if the rises in the QIR of the commercial and consumer loan portfolios are below 20 pp, i.e., if the level of the QIR does not reach values greater than 28.2%, the aggregate capital adequacy of the CIs would not be threatened during the period under analysis.

3.1.4 Final Comments

The results of the exercise suggest that the majority of the CIs would be able to keep their aggregate indicators of capital adequacy above the regulatory minimum in spite of the severity of the macroeconomic scenario and the resulting reduction in their profitability and ability to grant credit. That reflects the resilience of the entities in the short term in the event of a macroeconomic scenario like the one described above.

As has been discussed, the stress test presented in this section is built on the basis of a set of assumptions that, by incorporating various shocks that occur simultaneously, reflects an adverse situation for the Colombian economy. For one thing, it assumes that the economic authorities do not take any additional action in response to the deterioration of the CIs' financial situation. At the same time, the entities' shareholders are presumed to be excessively passive to the degree that they only capitalize the profits without taking any other kind of strategic initiative in order to face the financial stress.[34] If, however, any one of these assumptions is eliminated, the size of the losses to the system would be expected to be cushioned so that the impact of the adverse scenario would presumably be smaller. Last of all, the starting point for the analysis is the ratio of these entities' individual capital adequacy apart from any consolidated capital adequacy. Therefore, the consolidated results may differ from those presented here.

3.2 Stress Test of CI Liquidity

The current situation has been accompanied by a high level of uncertainty regarding the materialization of credit risk. Thus, a hypothetical situation of lower loan payments (inflows) n could affect the liquidity of the credit institutions and compromise their ability to respond to future contingencies.

Due to the above, a stress test is presented in this section that evaluates the impact that a reduction in inflows associated with loan payments within a ninety-day horizon would have on the liquidity of credit institutions[35] through a cash flow indicator called net liquidity position NLP_{90}. In this exercise it is assumed that the entities face a 50% decrease, derived from the payment of interest and portfolio amortization, in their loan inflows at ninety days. Therefore, in the event that they do not have sufficient liquid funds to cover their outflows, they may register a shortfall in liquidity. Thus, the NLP_{90} is calculated as[36]:

$$NLP_{90} = Cash - Reserve\ requirements + IALAC + OAL + FIVC_{90} - FEVC_{90}$$

Where,

34 Specifically, the shareholders do not inject outside capital into the business operations, they do not seek synergies or mergers between the entities, nor manage them in order to increase the efficiency of their operations.

35 This static exercise evaluates the decrease in inflows of loan payments statistically. The horizon mentioned refers to the fact the income and expenses used correspond to those expected by the entities in the next ninety days.

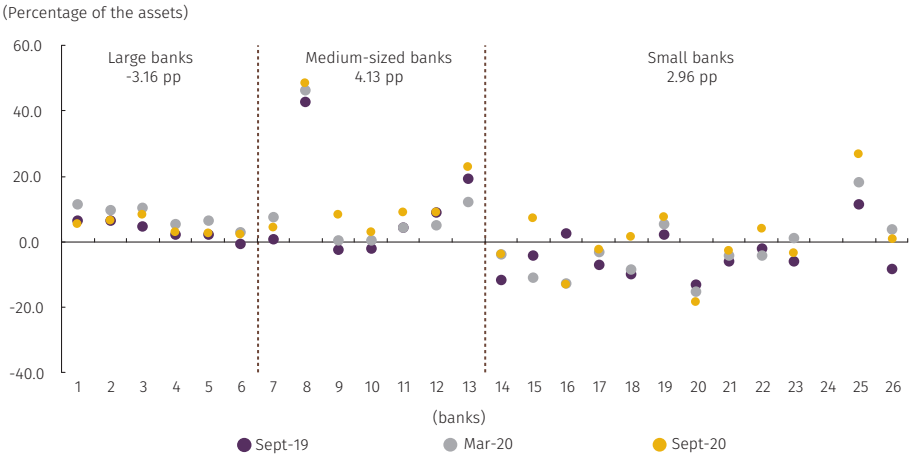
36 Each of the accounts that the NLP were calculated by following the guidelines of the IRL (see Chapter VI and its appendices in the Basic Accounting and Financial Circular). Since the reserve requirement resources are secured for a specific purpose, they are not considered in this exercise.

$IALAC$: investments in high quality liquid assets
OAL: other liquid assets
$FIVC_{90}$: *inflows* with 90-day contractual maturities assuming a 50% reduction in loan payments inflows
$FEVC_{90}$: outflows with 90-day contractual maturities

The expansion of liquidity registered since March 2020 has been received in different ways by the banks. As of September, the majority of these entities registered a positive net liquidity position which made it possible for them to mitigate the risk from lower loan payment inflow.

Graph 3.10 presents the NLP_{90} for banks, broken down by size, as a share of their assets for three particular dates in order to analyze the trend of the NLP_{90} before, during, and after the beginning of the pandemic. In September 2019, the measurement for the largest banks was at positive levels while some smaller banks already had an insufficient liquid asset base to cover their net cash outflows. In March 2020, the uncertainty and the measures taken by the authorities to provide liquidity in the context of the onset of the pandemic generated diversity in the liquidity positions: the NLP_{90} of the big banks improved, while the small entities saw a downward trend.

Graph 3.10
Net Ninety-Day Liquidity Position for Banks

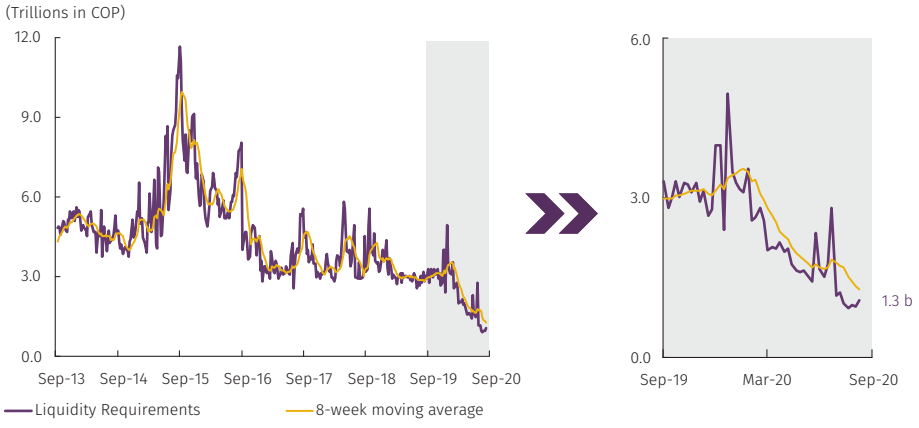


Note: The classification of the banks by size was done randomly. The values below the size of the banks represent the average change in NLP (asset percentage) in percentage points between March and September 2020.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

Subsequently, the NLP_{90} of the big banks has returned to the levels registered last year while the position for the majority of the medium and small entities has registered increases.[37]

37 From March to September of this year, big banks had a 14% decline in their cash while total liquid assets of medium and small banks rose 28.0%.

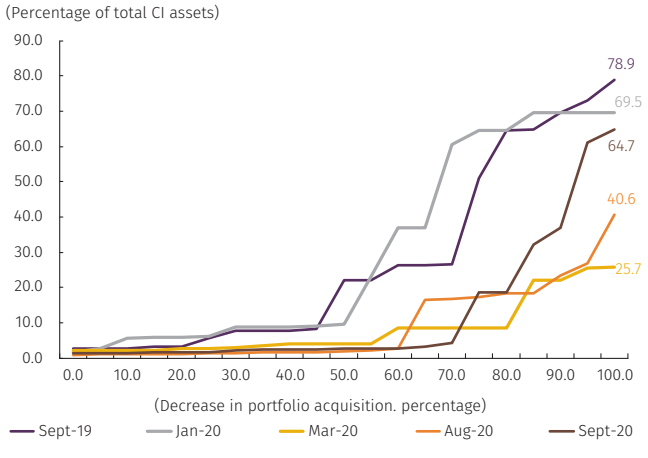
Graph 3.11
Credit institutions' 90-day Liquidity Requirements



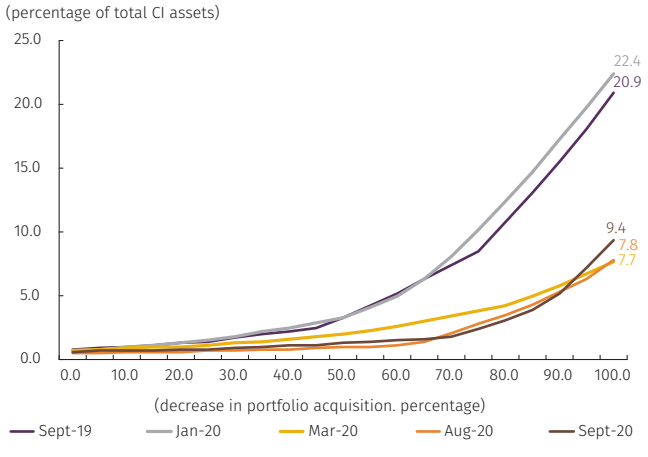
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

Graph 3.12
Systemic Importance of Credit Institutions with Liquidity Requirements

A. By size of asset



B. By amount of liquidity needs



Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República.*

Aggregate liquidity needs, understood as the sum of NLP_{90} below zero, came to COP 1.3 t towards the end of September 2020 and stood at the lowest levels seen since 2013 (Graph 3.11). Over the course of 2020, this measure has registered a tightening which has been associated with a decrease in contractual expenses.

The trend of the credit institutions liquidity needs is analyzed below in relation to the various scenarios of reduced loan payment income.

Graph 3.12, panel A presents the assets of the entities that registered a lack of liquidity on five specific dates as a share of the total CI assets (vertical axis) versus the sequence of decline in acquisitions (horizontal axis).

For the pre-pandemic dates, note that starting with a 45% decline in loan payment income, more than 10% of the aggregate assets could be facing liquidity shortages. This contrasts with the most recent information (September 2020) where, based on a 73% decrease, this percentage of assets of entities with liquidity needs is obtained (45%). Moreover, the curve for September from the previous year had a steeper slope compared to what was seen in March of the current year. This suggests that once the pandemic began, exposure to this risk decreased.

When the most stressed scenarios of the curves are analyzed based on information as of September

2020, it is clear that the amount of aggregate liquidity needs would not be likely to exceed 10% of total credit institutions assets (Graph 3.2, panel B). These results suggest that even when the hypothetical shock is strong, liquidity shortages are not systemically representative and, furthermore, are lower than those registered the previous year when, in amount, they represented more than 20% of the total credit institutions' assets.

3.3 Stress Test of CIF Liquidity

The collective investment funds have a greater percentage of liquid resources, thus they are better prepared for a withdrawal shock in comparison to what was seen in mid-March.

In mid-March, the market for open-ended collective investment funds without permanence agreement (FIC) managed by TC, SBF, and IMC were affected by the nervousness in the international and local markets. This was mainly reflected in a sudden increase in withdrawals by their investors who withdrew COP 24.6 t during March. Therefore, the total assets decreased 32%, and the CIF indicators reflected the pressures on liquidity that arose.

After the shock, the CIF experienced a recovery in their assets, and registered a total of COP 82.8 t as of September 2020. However, despite this performance, and given the relevance of these types of financial vehicles, it is important to monitor the risks and stress situations to which these funds are exposed. In that way, a stress test has been designed to monitor the solidity of the funds belonging to this market under a withdrawal scenario.

Based on information about the cash level of each of the funds,[38] different withdrawal shocks were simulated in order to calculate the LRI that the CIFs would probably present under each scenario. For each level of withdrawal, the CIFs that would be likely to default[39] on their liquidity indicator were identified, and their share of total assets was calculated.[40] Therefore, higher values correspond to a greater impact of the withdrawals on the CIF market (Graph 3.13).

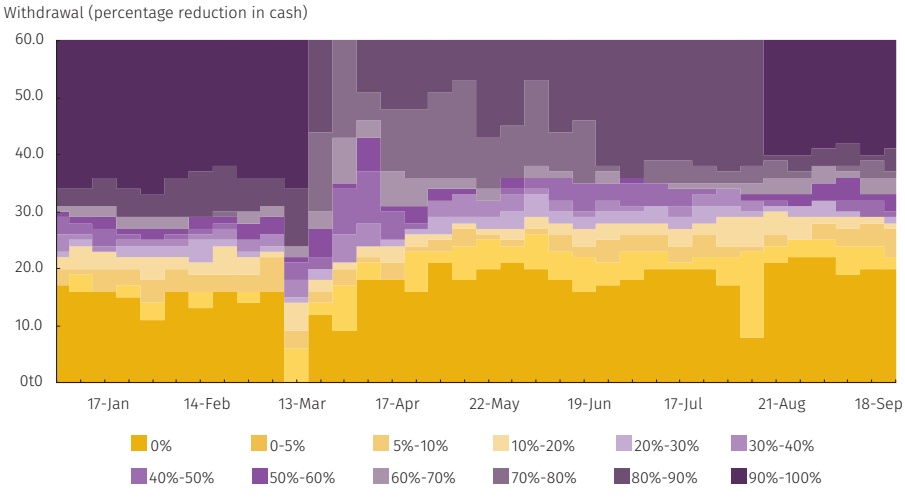
The results indicate that, since the liquidity shock, the funds have strengthened their positions in liquid assets, and this will make it possible for them to face a withdrawal shock more easily. Specifically,

38 The information on cash is obtained from FSC's Form 519.

39 A default corresponds to a LRI value of less than 100% which is the regulatory limit according to the FSC.

40 The information on assets is obtained from FSC's Report 19.

Graph 3.13
Results of CIF Stress Test



Note: each color represents the share of the assets of open-end CIFs with no permanence agreement that could be affected by non-compliance in their LRI.
Source: Office of the Financial Superintendent of Colombia; calculations by *Banco de la República*.

during the shock in March, withdrawals of 15% would have likely led to non-compliance of the LRI by CIFs with a share greater than 30%. In turn, by 25 September, this percentage of withdrawals would have to reach 28% to produce the same effect.

Box 3
Stress Testing in the Time of Covid-19

Angélica Lizarazo Cuéllar
María Fernanda Meneses*

In the context of the Covid-19 pandemic, several central banks and regulatory authorities decided to adjust the approach to implement stress tests. These types of prospective exercises were developed after the 2008 global financial crisis as a prudential tool for assessing the resilience of the financial system in crisis, estimate the suitability of capital buffers in such scenarios, and, if necessary, validate capital distribution policies. The pandemic constitutes the first widespread economic recession since the creation of these tests, and this has entailed different challenges for its implementation. On one hand, during a crisis the initial shock has already materialized and, therefore, the starting point of the stress scenarios is economic recession. On the other, measuring the impact of the pandemic and the transmission channels of the shocks is particularly difficult because the source of the recession lies outside the economy and the financial system.

Although the capital and liquidity cushions that the CIs had prior to the pandemic have contained the initial shock from the crisis, the medium- and long-term impact is likely to weaken these entities' capital ratios, and they might take excessive risks in order to recover the profitability levels seen before the crisis. As an immediate response, stress tests have been useful for estimating such impacts on the financial system at an aggregate level. As the crisis continues and its characteristics are understood with less uncertainty, the tests have been adjusted to obtain more granular results and to define the optimal balance between : 1) keep the financial system safe and healthy, and 2) ensure an appropriate flow of credit to the real sector in periods of crisis. The objective of this box is to do a brief international review of the role of stress tests in times of crisis and to examine how regulators have adjusted some features such as objectives, design, methodology, and communication of results.[1]

In normal times, stress tests generally focus on assessing the individual resilience of banks and their ability to absorb losses. In times of crisis this tool have taken particular relevance as a macroprudential tool estimating the aggregate impact on the financial system, assessing the systemic risk that the crisis may generate, and measuring the conditions under which CIs can continue to grant credit without affecting their soundness. Hence, it is a tool that can help authorities find a balance between the risk of a deep and prolonged economic recession and the risk of weakening the soundness of the financial system. Indeed, some central banks such as the Bank of England (BOE) and the European Central Bank (ECB) have even used stress tests during the Covid-19 crisis to encourage banks to extend credit[2] and to measure the impact of policy measures taken during this period.

Regarding the methodological implementation of the tests, different central banks considered necessary to adjust the design of the stress scenarios and some features of the models due to the particular nature of the pandemic shock, which differs from the traditional macroeconomic shocks used in stress tests. In general, the authorities have chosen to design a base scenario that incorporates the contraction already observed in the first half of 2020 and an adverse scenario with assumptions about the depth and duration of the shock to the economy. Given the high level of uncertainty generated by Covid-19, authorities have evaluated multiple scenarios to obtain a range of possible outcomes. Furthermore, social distancing measures affected different economic sectors asymmetrically, and this required adjusting models to account for the heterogeneity in banks exposure to the most affected industries.

An additional aspect that increases the complexity in times of crisis is incorporating policy actions taken by governments and economic authorities into the models. In normal times stress tests do not usually consider possible policy measures taken in response to adverse scenarios (except for the monetary policy response that is inherent in these scenario design) in order to quantify the total impact of shocks to the financial system. However, in the case of the pandemic governments quickly took extraordinary fiscal, monetary, regulatory, and supervisory measures to address the crisis. Although incorporating these actions may not be aligned with the international framework for stress tests, bringing models closer to the reality of the

* The authors are members of the Financial Stability Department of *Banco de la República*. Their opinions do not imply a commitment on the part of the entity nor its Board of Directors.

1 The first part of this box is based on the document published by Patricia Baudino (2020) for the FSI Briefs at the Bank for International Settlements (BIS).

2 These banks have authorized the use of capital buffers and have explicitly communicated that, according to their estimates, there is a low probability that banks will face a real threat to their financial strength given the growth forecasts.

pandemic context has been a common practice during this crisis. However, this has involved making strong assumptions about the effectiveness of the policies, their duration, and the state of the variables once the measures are withdrawn.

Finally, the use of the results and their communication to the public have also been adjusted during Covid-19. Given the high level of uncertainty in the crisis, the credibility of the tests could be questioned if they were used to take any particular action regarding banks' capital. Instead, the results have usually been used as an initial diagnosis of the aggregate impact on the financial system and, as such, the publication of the test generally addresses the variables of interest at an aggregate basis and some indicators of the banks' capital ratios distribution without including results at the individual basis.

Table B3.1 presents a review of the particular features of stress tests (ST) implemented during the Covid-19 pandemic by different central banks and regulatory authorities around the world.

References

Bank of Canada (2020). "Financial System Review: The impact of Covid19 on the Canadian Financial System," May.

Bank of England (2020). *Financial Stability Report*, The Financial Policy Committee, August.

Baudino, P. (2020). "Stress-testing Banks during Covid-19 Pandemic," FSI Briefs, no. 11, Financial Stability Institute, BIS.

Czech National Bank (2020). *Financial Stability Report*, July.

Knowles, J.; Nicholls, K.; Bloor, C. (2020). "Outcomes from a Covid-19 stress test of New Zealand Banks," *Bulletin*, vol. 83, no. 3, Reserve Bank of New Zealand, September.

Oesterreichische Nationalbank (2020). *Financial Stability Report*, 39, July.

The Federal Reserve (2020). "Assessment of Bank Capital during the Recent Coronavirus Event", June.

The Federal Reserve (2020). "Supervisory Scenarios for the Resubmission of Capital Plans in the Fourth Quarter of 2020," September.

Table B3.1
Stress Tests done by Various Central Banks in Times of Covid-19

Authority	Objective	Scenarios	Additional Elements in the Pandemic	Results
Bank of England (BoE)	Following the counter-cyclical regulatory framework implemented after the global financial crisis, the bank announces that capital buffers accumulated in normal times must be employed in this crisis in order to keep the supply of credit to the economy. A reverse stress test is done to estimate how strong the economic downturn would have to be for the losses to deplete regulatory capital buffers.	'Illustrative' adverse scenario of the Monetary Policy Report with a horizon of up to March 2023: -14% GDP growth and 8.0% unemployment at the end of 2020.	-*Top-down* exercise only -Maintains the levels of the ST scenario trajectories in normal times, so that the shocks applied decrease as the economy enters a period of recession. -It incorporates the fiscal, monetary, and regulatory policy response.	The results show that banks are resilient to a wide range of macroeconomic scenarios and have the capacity to support businesses and households during the pandemic, so it would be costly to the economy if banks to take defensive action. Banks are encouraged to support credit and warned that, otherwise, there is a risk of a deeper and lasting economic contraction. Defensive actions by banks should only be taken if there is a real threat to their resilience and loss absorbing capacity.

Table B3.1 (Continued)
Stress Tests done by Various Central Banks in Times of Covid-19

Authority	Objective	Scenarios	Additional Elements in the Pandemic	Results
European Central Bank (ECB)	Use the stress test to assess the impact of Covid-19 on banks and identify possible vulnerabilities at an early stage. Given that the banking sector may face pressure to maintain currently established regulatory capital ratios and buffers, the supply of credit could decrease at a time when households, businesses, and governments will need more financial support. The ST is intended to give reassurance in order to prevent this kind of action as it points out the low probability that banks will face a real threat to their financial soundness given the growth forecasts.	Two scenarios with a two-and-a-half-year horizon going up to December 2022: -'Baseline: GDP growth of -8.7% in 2020. -'Severe': GDP growth of -12.6% in 2020.	-*Top-down* approach only. -This incorporates supervisory and monetary policy measures taken in response to the pandemic. -A number of regulatory authorities in the euro zone have announced some measures to facilitate the use of capital buffers to absorb losses and reduce incentives to restrict credit. This complements fiscal and monetary policies to facilitate the transmission of the measures to the real economy.	The results indicate that the capital accumulated in recent years is sufficient for absorbing the projected losses in both the baseline and severe scenarios. Banks could even withstand much greater losses if they use their capital buffers. The ECB emphasizes that the pandemic has been the first test for the macroprudential framework created after 2008. Beyond the general level of bank capital, buffers are important for providing sufficient margin to ensure the provision of credit in a recession.
Bank of Canada	The Bank carries out the ST exercise in order to evaluate banks' capacity to contribute to an economic recovery that will have multiple challenges. Warns that the unprecedented nature of the pandemic shock makes the uncertainty surrounding the results of the test exceptionally high.	Range of scenarios with a three-year horizon: the most optimistic one corresponds to a scenario where the containment measures are lifted in May 2020, while the lower bound of the range corresponds to a scenario where containment measures are extended until August 2020.	-The exercise incorporates the impact of monetary, fiscal, and regulatory policy actions. -It estimates the results 'with policy' and a counterfactual 'without policy' to quantify the impact of the measures taken. -*Top-down* approach only.	The results suggest that the accumulation of a capital buffers in recent years was very helpful in dealing with the impact of this crisis and allowed banks to continue granting loans. The capital adequacy level in the most pessimistic scenario remains above the regulatory minimum of 9%. Without aggressive policy responses, banks could have faced much more adverse consequences, with significant negative effects on the availability of credit for households and businesses.
Reserve Bank of New Zealand	Uses the ST exercise to understand the risks that the pandemic may cause to the financial system, assess the resilience of banks, and improve industry's risk management capabilities. Scenarios include positive credit growth to assess whether banks are able to continue providing sufficient credit to support the real sector of the economy during the crisis.	Two scenarios with a two-year horizon ending in June 2022: -'Pessimistic ': GDP growth of -12% at the close of the first year and a maximum unemployment of 13.4%. -'Severe': GDP growth of -18% and unemployment at 17.7%. This assumes a reduction in the net interest margin due to pressure on funding markets.	-The pandemic has highlighted the importance of considering more severe 'black swan' type scenarios. -The exercise starts from a period of crisis and, therefore, the 'base' scenario is similar to the adverse scenarios of previous ST, except that the economic shock happens suddenly. -*Top-down* approach for the entire banking system and *bottom-up* one for the five largest banks.	The ST results show that the banking system has a healthy level of resilience and is in a good stand to continue lending to support the economy.

Table B3.1 (Continued)
Stress Tests done by Various Central Banks in Times of Covid-19

Authority	Objective	Scenarios	Additional Elements in the Pandemic	Results
US Federal Reserve System (Fed)	This entity has done an extraordinary sensitivity analysis in order to assess the impact of three economic slowdown scenarios on the capital ratios of the largest banks. The Fed expects to perform a second stress test under the traditional methodology, in which a scenario that is more in line with the health crisis will be evaluated. These results will be published at the end of 2020 and the horizon will extend into 2023.	-V-shaped: quarterly GDP growth drops 31.5% (annual) and unemployment is 19% in the second quarter of 2020. -U-shaped: more persistent recession given the extension of control measures. Unemployment at 15.5% and GDP recovery in 2021. -W-shaped: quarterly GDP growth of -37% (annual) in the second quarter of 2020 with recovery six months later. A second round of contagion is expected at the end of 2020 and, thus, in the first quarter of 2021 the GDP will be reduced again though not as severely.	-For the sectors most affected by the pandemic (retail, tourism, and food industries) a one-letter decrease in the credit ratings for the loans is assumed. -Temporary changes to the tax code to allow for corporate tax returns. -No results were published at the individual basis as is usually done with the traditional stress test. The results of the second stress test are expected to be available at the end of 2020 and information will be published by entity.	In the aggregate, the capital indicators in all three scenarios remain above the regulatory minimum. The Fed implemented the following measures for banks in order to preserve capital: a) Restrict stock buybacks. b) Limit the payment of dividends to shareholders. c) Re-evaluate plans for capital.
National Bank of Austria	Evaluate the impact on the banking system of the contracted economic activity resulting from the Covid-19 control measures.	-GDP growth of -7.2% in 2020, and a rebound in 2021 and 2022. -The scenario is based on the Central Bank's current economic outlook. -The scenario is evaluated with and without the government's mitigation measures.	-Corporate insolvency model to simulate company balance sheets in order to determine insolvency rates by sector. -Some of the measures included in the analysis were: credit guarantees, tax deferral, subsidies to specific sectors, and the temporary relaxation of Austrian law on company insolvency.	Government mitigation measures can only partially alleviate the Covid-19-induced shock. Without the government's relief measures, the insolvency rate at the end of 2020 would be likely to rise well above the level observed in 2019. By including these measures, this rate could be reduced by almost half. No individual bank is likely to end up with a core capital adequacy ratio below the regulatory minimum.
Czech National Bank	*Capital adequacy stress test:* measures the resilience of banking industry' capital by taking a scenario of lower economic growth into account. *Liquidity stress test:* assesses the ability of banks to respond to idiosyncratic pressure on liquidity arising from the pandemic over a six-month horizon.	*Capital adequacy stress test:* Two scenarios with a horizon up to 2022: -'Base': -8.0% GDP growth in 2020 and 4.2% in 2021. -'Severe': -13.5% GDP growth in 2020 and -0.9% in 2021. -The base scenario in 2020 is the adverse scenario of previous years. *Liquidity stress test:* withdrawal of unstable deposits and asset devaluation.	-The authorities' stabilization measures in the context of the pandemic are included. -A haircut of 50% in income from the repayment of the loan portfolio for households and companies and a larger provision of credit to certain debtors were included in the liquidity exercise.	In the base scenario, the results of the ST suggest that banks are well capitalized. In the adverse scenario, capital adequacy ratio is reduced by half due to an increase in spending on loan-loss provisions. In the liquidity stress test, only one entity is likely to register a negative liquidity gap. Overall, the level of liquid assets and the volume of stable deposits fully cover net outflows.

Table B3.1 (Continued)
Stress Tests done by Various Central Banks in Times of Covid-19

Authority	Objective	Scenarios	Additional Elements in the Pandemic	Results
Banco de la República (Colombia)	*Capital and liquidity Stress test:* the traditional test is done to measure the resilience of CIs in a pessimistic scenario. An additional reverse ST is done in order to: i) determine how strong the credit risk shock would have to be to reach a high level of vulnerability, and ii) estimate the ability of CIs to continue granting loans without jeopardizing their financial soundness when faced larger credit risk shocks. *Liquidity stress tests:* measure the effect that credit risk shocks and withdrawals could have on the liquidity position of the CIs and the CIFs, respectively.	*Capital and liquidity Stress test :* Lower bound of the growth projections in the Monetary Policy Report: GDP growth of -10.3% and 18.2% unemployment at the end of 2020. The starting point of the reverse ST are the central projections of the same report. *Liquidity stress test:* 50% reduction in the expected 90-day income from loan portfolio of CIs.	-Supervisory measures implemented in response to the pandemic are incorporated. -Monetary and fiscal policy actions are considered at the starting point of the exercise, but not in the dynamics of the model.	The results show that negative effects will probably be seen on the aggregate indicators of capital ratios towards the end of 2021, but they are likely to remain at levels above the regulatory limits. The reverse ST exercise suggests that the aggregate risk quality indicator would have to reach three times the current level for a systemic vulnerability scenario to occur. The liquidity stress test shows that CIEs have sufficient liquid resources to address the decline in income in the adverse scenario. However, the individual results are heterogeneous.

Source: authors' elaboration.

04 Financial Regulation

Table 4.1 below presents the main legal changes with respect to financial regulation between April and October 2020. Regulations marked with an asterisk have an additional explanation at the end of the table.

Table 4.1
Compendium of Main Standards Issued in the Area of Financial Regulation

Entity	Rule	Topic	Date of issue
BDBR	Banrep Regulations*	Decisions made by the BDBR	June, July, August, September, and October 2020
MFPC (MHCP)	Decrees 562 and 685*	Measures were taken to create a temporary mandatory investment in public debt securities called Solidarity Securities (SS). The issuance of SS up to the amount of COP 9,811,300,000,000 through the MHCP was ordered and the amount of the mandatory investment was established. The resources from this operation will be used to reduce the economic and social consequences of the events that led to the declaration of a State of Economic, Social, and Ecological Emergency.	15 April and 22 May 2020
	Decree 581	Between 15 April and 31 December 2020, Findeter may grant direct loans to official, mixed and private domestic public service companies supervised by the Superintendency of Domestic Public Services in order to provide them with liquidity or working capital to implement the measures adopted by the national government to alleviate the effects of the Emergency.	15 April 2020
	Resolution 0951	The MFPC (MHCP) may make an additional award in the Class B TES auction for as much as 30% of the amount initially called (previously it was 20%), provided that the ratio indicator of the amount offered versus the amount initially called is greater than 2 (previously this requirement was 2.5).	15 April 2020
	Resolution 1064 and 1220	Instructions were given regarding the implementation of the grace periods set forth in SFC external circulars 007 and 014 for loans for the acquisition of housing or for housing leasing contracts that incorporate the benefits of Frech III and non-LIH Frech. The Frech programs cover a percentage of the interest rate on the loan (the coverage is granted by the national government and administered by *Banco de la República*).	29 April and 8 June 2020

Table 4.1 (Continued)
Compendium of Main Standards Issued in the Area of Financial Regulation

Entity	Rule	Topic	Date of issue
MFPC (MHCP)	Decree 816	Decree 492/2020 defined the state entities that should make contributions to the FNG to reinforce its equity in the context of the State of Emergency. Decree 816/2020 stipulated that these contributions will be used to support the participation of FNG as guarantor or underwriter of all types of active operations of financial or other institutions that are carrying out lending operations with individuals or legal entities that have suffered adverse effects in their business activity due to the Covid-19 pandemic along with other related instructions.	4 June 2020
	Decree 817	This Decree stipulated that, starting on 4 June 2020 and continuing for up to two calendar years, the debt securities issued by simplified stock companies on the secondary market may be registered in the National Registry of Securities and Issuers (RNVE in Spanish) and traded on a stock exchange. The maximum maturity of these issues will be up to 5 years and may be guaranteed by the FNG.	4 June 2020
	Decree 1207*	A book is added to Decree 2555/2010 that defines and structures the operations of voluntary pension funds in the country. It sets out management and asset selection criteria, minimum requirements to be met by the managers of these funds, and other related aspects.	1 September 2020
	Decree 1233	This decree modifies Decree 1068/2015 (Treasury and Public Credit Sector Unified Decree) to establish the guidelines for coverage of and application for the new subsidies from the Frech non-LIH program.	14 September 2020
	Decree 1234*	A title was added to Decree 2555/2010 on the regulation of a controlled test environment (regulatory sandbox), which allows testing of innovative technological developments in the provision of services by entities supervised by the FSC.	14 September 2020
	Decree 1235	As mentioned above, Legislative Decree 817/2020 established special conditions for the issuance of securities by simplified stock companies. In view of this, Decree 1235 modified Decree 2555/2010 in relation to the requirements that simplified stock companies must accomplish in order to issue securities on the stock market through the secondary market.	14 September 2020
	Decree 1280	Decree 2555 of 2010 was amended with respect to provisions that modify and add to the prudential regulatory regime of the FNG and the Agricultural Guarantee Fund (FAG) regarding the treatment of guarantees, calculation of AWRL, etc.	23 September 2020
	Decree 1286	Findeter was authorized to create a line of rediscount in pesos with a compensatory rate[a/] allocated to finance totally or partially the most representative items of the operation of public or private higher education institutions, which offer incentive plans, scholarships or discounts to tuition for retention of students in order to prevent students from dropping out as a result of the economic crisis caused by the Covid-19.	24 September 2020
	Decree 1291	This decree modified Decree 2555/2010 regarding the classification of investors and the private equity funds system. The modifications include a new definition of the professional investor and a modification to the limits of participation in FCP for these investors.	28 September 2020
	Decree 1320	Under this decree, lines of credit with compensatory rates issued with resources from the Emergency Mitigation Fund (FOME in Spanish) were authorized and regulated along with other related aspects.	1 October 2020
	Decree 1393*	In the context of the implementation of the recommendations made by Capital Market Mission 2019, Decree 1393 modifies Decree 2555/2010 regarding investment regulations for mandatory pension funds and severance pay, insurance companies and capitalization societies along with other provisions by replacing the approach based on rules, installments, and limits with one in which the risk management faced by the aforementioned entities in the course of their resource management activities takes precedence.	26 October 2020
	Decree 1398*	This decree modified Decree 2555/2010 regarding the operating conditions for the real estate annuity along with other related aspects.	26 October 2020

a/ The territorial entities allocate resources equivalent to the amount necessary to offset the value of the difference between the average Findeter acquisition rate plus the costs incurred by Findeter during the duration of the rediscounts granted.

Table 4.1 (Continued)
Compendium of Main Standards Issued in the Area of Financial Regulation

Entidad	Norma	Tema	Fecha de expedición
SFC	External Circular 016*	Instructions were given with respect to the treatment of structural investments in the exchange rate module of the market risk models. Entities may exclude the value of the uncovered portion of their managed investments abroad under specific conditions.	14 April 2020
	External Circular 018	By means of Decree 1349/2019, the national government modified the regulations related to the system of proper equity for insurance companies as part of the process of alignment with international standards of the prudential requirements for these companies.[a/] External Circular 018 establishes the instructions for the implementation of the provisions contained in the aforementioned decree. In relation to the treatment of extreme claims, an adjustment was made to the capital requirement calculation formula to include a component for when atypical events occur. It also establishes that if an insurer reinsures their risks, they must put up capital to cover the risk of non-payment by the reinsurer and thus consider the probability of default. The components of the technical equity which now have three levels are also established: basic ordinary equity, basic additional equity, and additional equity. It also provides an information transmission format for monitoring compliance with the new regulatory framework. By 26 July 2020, the entities had to comply with the Appropriate Equity Regime based on the modifications.[b/]	15 May 2020
	External Circular 019	Instructions are given on the calculation of the amount of the mandatory investment in SS set forth in Decrees 562 and 685/2020.	23 May 2020
	External Circular 020	Instructions were given on the reporting of information related to repo transactions with loan portfolio securities as collaterals with *Banco de la República*. Among the measures taken to report this information are: the entities that carry out these operations will report the information from the instruments used to the FSC by means of formats 401 and 402, and 2) the inclusion of new accounts and sub-accounts in the CUIF so that the supervised entities register the rights and obligations derived from the transfer of the loan portfolio in the portfolio repo operations.	2 June 2020
	External Circular 021	In order to apply the provisions of Article 1065[c/] of the Commercial Code and in accordance with the decline of the insured risk due to the effects of the preventive isolation ordered by the Decrees 457, 531, 593, 636, 689, and 749/2020, the insurance companies must establish internal policies and methodologies in order to 1) identify the products for which there is a decrease in the insured risk as a result of the preventive quarantine measures, and 2) quantify the decrease in risk and the corresponding reduction in the premium in order to reimburse it through the return of sums of money, the extension of insurance coverage, or any other contractually defined mechanism.	5 June 2020
	External Circular 022*	Instructions were given for the definition of the Debtor Assistance Program (PAD in Spanish), and supplementary prudential measures regarding credit risk were incorporated.	30 June 2020
	External Circular 024	This Circular included new aspects in the legal framework for the provision of prices and valuation of investments of supervised entities, those aspects include: 1) special obligations for both those providing prices for valuation and for valuation committees; 2) response mechanisms for the monitored entities in the event of calculation errors or failures in the provision of information by the official supplier, and 3) contingency assessment protocol in the event of failure to provide the service of providing prices, etc.	6 July 2020
	External Circular 025*	Instructions are given on calculating the value of the CIs' operational risk exposure and the formats for transmitting the information to the FSC are adjusted.	7 July 2020
	External Circular 026	Instructions are given for calculating the general loan-loss provisions for UAI for the housing loan portfolio regulated by the External Circular 22/2020 (over PAD). Specifically, the provision will be equal to the difference between 1) individual loan-loss provisions for UAI using the provision for the guaranteed portion and taking a displacement of at least two ratings into account and 2) the individual provision of UAI.	24 July 2020
	External Circular 027	Some definitions related to Sarlaft (Anti-Money Laundering and Counter Terrorism Financing Risk Management System), its stages, etc., were modified.	2 September 2020

a/ The territorial entities allocate resources equivalent to the amount necessary to offset the value of the difference between the average Findeter acquisition rate plus the costs incurred by Findeter during the duration of the rediscounts granted.
b/ Based on the calculations done with numbers as of September 2018, the Financial Regulation Unit (URF in Spanish) estimated that by implementing the changes in the calculation of technical equity, 5 insurance companies would see their technical equity reduced below their proper equity (they would not be able to meet the capital adequacy requirements). For more information, see the technical document of the decree published by the URF.
c/ Article 1065 of the Commercial Code. Reduction of the Premium due to Decreased Risk: In the event of a decrease in risk, the insurer shall reduce the stipulated premium based on the corresponding rate for the remaining time of the insurance except for the policies referred to in article 1060, final paragraph.

Table 4.1 (Continued)
Compendium of Main Standards Issued in the Area of Financial Regulation

Entidad	Norma	Tema	Fecha de expedición
FSC	External Circular 028	Instructions were issued regarding the minimum information that must be included in the prospectus for green bond issues such as the use of the funds; the process, selection, and evaluation of projects; policies and/or processes for the management of the funds, etc.	7 September 2020
	External Circular 029	Instructions were issued with regard to the conditional interest rate hedging for the financing of new non-LIH urban housing in accordance with the following provisions in Decree 1233/2020 and MHCP – Frech non-LIH Resolution 1783/2020.	18 September 2020
	External Circular 030*	Instructions were issued related to the links and limits of exposure and risk concentration of financial conglomerates.	1 October 2020
BVC	BVC Regulations 015, 016, and 017	The Stock Exchange General Regulations and Single Circular are updated with respect to the application for registration and renewal as a liquidity provider along with other provisions.	8 and 14 April 2020
	MEC Newsletter 064	The eligible and admissible species for simultaneous transactions and TTS on securities other than TES are presented. In addition, the information required to calculate the percentage of the basic guarantee is published.	8 April 2020
	Derived regulations 013 and 020	The conditions for compliance with the Indicator of Minimum Requirements for the Derivative Market Creator Program for TES Futures were relaxed.	29 May and 17July 2020
	BVC Regulations 032	The TTS and spot transactions on variable income securities entered into in the trading system managed by the BVC began to be offset and liquidated at the CCRC starting 18 Aug 2020 rather than starting 6 July 2020 as had been stipulated.	23 June 2020
	Derived regulations 016 and 017	The requirements to join the derivatives liquidity provider program, formerly called derivatives market makers, were modified.	13 July 2020
	BVC Regulations 045	With respect to the provisions of BVC Regulation 032, a stabilization period for migration to clearing and settlement at the CCRC is established which will be extended until 31 December 2020. During this period, and in the event of operational or technological incidents, the BVC is empowered to: 1) modify, extend, or reduce schedules for the completion or registration of TTS and OTC operations and the cancellation of transactions; 2) annul or correct transactions before they are completed; and 3) use the contingent module for compliance in Deceval.	25 August 2020
Fogafín	Resolutions 002 and 003	Some instructions related to the system for refunding the premiums and additional premium for deposit insurance are amended and instructions are given on calculating the premium value to be paid under deposit insurance applicable to companies specializing in electronic deposits and payments (Sedpes).	20 August 2020
	External Circular 003	The methodology for obtaining the qualification for determining the refund or additional deposit insurance premium charge and for calculating the deposit insurance premium of banks, finance companies, and financial corporations was specified.	14 October 2020
MinCIT	Decree 1154	The electronic circulation of electronic sales invoices as securities is regulated. The existing regulations are adapted to the electronic context. Thus, electronic invoices are legally valid. The conditions for trading the invoices on the market are also determined.	21 August 2020
FNG	External Regulatory Circular 050	The characteristics of the new line of guarantees under the United by Colombia program to support the issuance of ordinary bonds on the secondary securities market by private companies are defined. The amount available for this line is COP700 billion, and it will provide coverage for 70% of the issue value.	26 August 2020
	External Regulatory Circular 065	Adjustments were made to the operating requirements of the collateral for ordinary bonds in the secondary market in accordance with External Regulatory Circular 050/2020.	16 October

d/ A liquidity maker is an SBF that is permanently and simultaneously committed to providing buy and sell prices for species in order to increase the liquidity and depth of a market.
Sources: MHCP, FSC, BVC, Fogafín, FNG, MinCIT, and press releases and internal technical documents from *Banco de la República*.

Decisions made by the BDBR during the June-October Period

- Fogafin was exempted from the capital adequacy requirement to act as an OMO counterparty (OPA).
- The clearing and settlement of sales contracts for dollar futures through a financial compliance forward from *Banco de la República* was allowed through a CCRC.
- CCRCs were allowed access to overnight temporary contraction operations through repo transactions and remunerated-time deposits.
- Differentiated reserve requirement percentages were established for CDATs[41]. Those percentages depend on the period the CDATs are issued for and whether they are redeemable before the period established in the contract.
- The requirement that at least 30 days have passed since the first placement of the issue was eliminated from the eligibility criteria for public debt securities[42] to be used in expansion and temporary contraction operations.[43]
- The deadline for compliance with margin calls in TLS operations was extended.
- The additional cost applicable to repo transactions with bank loans as collateral was eliminated in the case where the replacement of loan portfolio securities (promissory notes) is required because grantors or subscribers appear on *Banco de la República*'s Sarlaft (Anti-Money Laundering and Counter Terrorism Financing Risk Management System) list.
- The constant 7% haircut applicable to Agricultural Development Securities (TDA) was changed. This is now given by: max (7.0%, maximum haircut applicable to TES).
- The CCRC was authorized to carry out the clearing and settlement as counterparty of peso-dollar spot purchase and sale contracts.
- The maximum time for registering foreign currency exchange transactions subject to this obligation was extended from 15 to 45 minutes until 31 December 2020.
- The requirement to inform *Banco de la República* every time there are changes in the conditions of eligibility and quality of the loan portfolio securities (promissory notes) or prepayments of capital during a TLS was eliminated.
- The implications of not transmitting the monthly update of the information on the promissory notes to *Banco de la República* in a TLS were established.

41 Term Savings Certificate of Deposit (CDAT in Spanish). Just like CDs, CDATs are investment or savings tools. Unlike CDs, CDATs have no minimum term for redemption (the minimum for CDs is 30 days) and cannot be traded like a security.

42 These securities are: TDA, SS with a maturity of more than one year, securities issued by the BR with a maturity of more than one year, Security Bonds, Peace Bonds, national foreign debt securities, and securities issued by Fogafín.

43 This requirement did not apply to SS, securities issued by the BR, or TES Class B issued with a maturity of one year or less.

- An additional 1.0% cost to the repo rate was eliminated in transactions with bank loans as collateral when there was a substitution of securities.
- The procedure to be followed when an entity does not transmit the monthly update of the information on the loan portfolio securities (promissory notes) as collaterals in repo transactions to *Banco de la República* was specified.
- Some of the derivative transactions carried out by the Foreign Exchange Market Intermediaries (FXMI) and other entities supervised by the FSC in the over-the-counter market were excluded from the information report to *Banco de la República*. Specifically, those negotiated with authorized foreign agents, or that have foreign currencies or interest rates underpinning them, and are registered in the currency trading and registration systems are excluded.
- Changes were incorporated into information that had to be sent daily to the Trading Systems and Foreign Exchange Registration Systems (SNR in Spanish) to *Banco de la República*.
- It was stated that the managers of the SNR must send a daily report to *Banco de la República* about spot foreign exchange transactions negotiated, registered or modified on the immediately preceding business day.
- For spot market transactions that are part of the calculation of the representative market rate as stipulated in External Regulatory Circular DOAM-146, it has been established that their registration and modifications may be made at 1:25 p.m. at the latest.

Decrees 562 and 685/2020 of the Ministry of Finance and Public Credit (MHCP): Creation, Issuance, and Mandatory Investment in Solidarity Securities (SS).

The entities that are required to underwrite SS in the primary market are credit institutions with the following percentages: 1) up to 3.0% of the total number of demand deposits subject to reserve requirements after deducting the reserve requirement, and 2) up to 1.0% of the total deposits and term requirements subject to reserve requirements after deducting the reserve requirement.

The SS are freely negotiable, internal transferable public debt securities[44] and have a maturity of one year from the date of their issue. It may be extended automatically in part or totally, for equal periods at the request of the MHCP until 2029. They are dematerialized instruments administered by *Banco de la República* through a trust management contract, and their interest will be recognized annually. Special Official Institutions (IOE in Spanish) are exempted from the mandatory investment in SS.

44 Transferable securities are issued in favor of a specific holder, with the latter having the possibility of designating other holders.

The SS will accrue the lesser of the following rates: 1) the cut-off rate resulting from the auction of the short-term TES immediately prior to the date of issue or to that of each extension; or 2) the average of the cut-off rate resulting from the four auctions of short-term TES immediately prior to the date of issue or that of each extension.

Decree 1207/2020 of the MFPC (MHCP): Legal Status of Voluntary Pension Funds

Act 1955/2019, article 336 repeals the legal regime for retirement and disability pension funds (also known as voluntary pension funds) that have been in force since 1987 as of 25 May 2021. Decree 1207/2020 establishes the new legal regime that will apply to these funds and adds a new book in Decree 2555/2010 that contains more efficient management and asset choice criteria as well as minimum requirements to be met by the managers of these funds.

According to this decree, the Voluntary Pension Funds (VPF) constitute a mechanism or vehicle for collecting or managing sums of money or other assets integrated with the contributions of the participants and their sponsors as well as the income from them to be managed as a whole and obtain collective economic results in order to comply with one or several retirement and disability pension plans.

Among the main instructions regarding the operation of the funds that were issued in Decree 1207 are:

- The VPF may be managed by trust fund companies, pension and severance pay fund managing companies, and insurance companies.
- The managing companies must have management capabilities and technological and operational infrastructure to manage the VPF under their responsibility.
- In order to facilitate the procedures related to establishing and authorizing a VPF, the submission of the requirements applicable to CIFs is provided for. Thus, the requirement to file a public document and its corresponding commercial register disappears.
- The FSC could authorize a company to manage several VPF when the nature of the pension plans requires it.
- The voluntary pension plans must be based only on a defined contribution, that is, their purpose is to set the amount of the sponsors' and the participants' contributions to the plan.
- Based on the type of membership, voluntary pension plans may be open or institutional. The former correspond to those that any individual who expresses his or her willingness to adhere to the plan may join as a participant. The institutional ones are those that only workers, contractors, or members of the sponsoring entities may participate in.
- The investment policy of the VPF must be previously and clearly defined in the operating regulations and in the respective portfolio

prospectuses in such a way that it can be understood by the participants and the general public.

- The previous regulatory framework did not provide limits or ranges for the commissions charged by the VPF management. Thus, Decree 1207/2020: i) establishes that the only basis for fixed commissions must be the amount of assets managed. Likewise, the variable commissions will be based exclusively on the returns generated for the fund. ii) the operating regulations will establish the general description of the methodology for calculating the fund's fixed and variable commissions and how to convert the variable commissions actually charged in each period, iii) the portfolio prospectus will include the detailed list of fixed commissions and variable commissions to be charged for the respective portfolio and iv) the management company must publish a comparison table with detailed information on the commissions charged on all the portfolios offered by the VPF on its website and provide this to clients prior to membership.

The Decree will go into effect as of 25 May 2021.

Decree 1234/2020 of the MFPC (MHCP): Regulatory Sandbox

Title 7 was added to Decree 2555/2010, Part 2, Book 35 in order to regulate a controlled test environment (regulatory sandbox[45]) through which the entities supervised by FSC may request a temporary operating certificate to implement innovative technological developments or where new supervised entities may be created. In any case, the prudential requirements established by FSC must be complied with and the temporary operating certificate may not exceed two (2) years and may be revoked at any time.

The implementation of innovative technological developments should have one of the following purposes: i) increase efficiency in the provision of services or offer of financial products, ii) solve a problem for financial consumers, iii) facilitate financial inclusion, iv) improve regulatory compliance; and v) develop financial markets or improve their competitiveness.

Once the time established for the temporary operating certificate is completed and the objectives of the innovative technological development are met, the entities monitored in the controlled test environment and those monitored by SFC that tested activities that were not part of their license, may apply for the financial entity license (stock market, insurance or adjustment to the regulated activity), corresponding to the development of the tested activity. If, however, they do not intend to make the transition to a financial entity license, the dismantling plan defined in the temporary operating certificate must be activated.

45 The regulatory sandbox is a public innovation tool that strengthens the capability of the State to adjust the regulatory framework to the new market demands and promote safe and sustained financial innovation.

Decree 1393/2020 of the MFPC (MHCP): Investment Regulations for Mandatory Pension and Severance Pay Funds, Insurance Companies, and Capitalization Societies

Decree 1393/2020 makes the investment system of the aforementioned entities more flexible without modifying the rules related to the investment limits on entities linked to the resource management entity. Among the most important changes implemented by Decree 1393/2020 regarding the investment regime of the aforementioned entities, are

- The Board of Directors of each entity will define the investment limits by type of alternative asset, considering the factors necessary for the adequate calibration of the risk/return.
- A limit is placed on the total alternative assets[46] abroad that entities can invest on. The following are some of the characteristics of the alternative assets: the use of leverage, the non-obligatory nature of being registered in trading systems that provide liquidity, the difficulty of finding benchmarks, the level of complexity of valuation procedures and information disclosure standards.
- The existing limit for the sum of investments in domestic and foreign non-real estate private equity funds was eliminated along with the existing limit for investments in private equity funds that allocate at least two-thirds of investors' contributions to finance infrastructure projects under the plan for Public-Private Associations (PPA) as well as investments in productive real estate by insurance companies and capitalization companies.
- CIFs will be considered "transparent" vehicles for the purposes of calculating limits for restricted assets.[47]
- Securities issued in the secondary unrated market were eliminated from the category of investments in restricted assets. Furthermore, the rating is no longer an eligibility criterion.
- The regulatory limit on the amount of mandatory pension resources in which the negotiation of foreign currency purchase and sale transactions in the spot exchange market or through derivative financial instruments could not be greater than 2.5% of the value of the respective fund for the transactions carried out during the last five working days, was eliminated.
- The 30% investment limit per issue applicable to institutional investors, provided for in Decree 2555/2010, articles 2.6.12.1.13 that are applicable to Pension and Severance Fund pay Managers (PFM&S) and 2.31.3.1.10 applicable to insurance entities and capitalization

46 Alternative assets are understood to be the instruments described in Decree 2555/2010, article 2.6.12.1.2, numerals 1.10, 1.11, 2.7, 2.8, 2.9, and 2.10 for Mandatory Pension and Severance Pay Funds and Decree 2555/2010, article 2.31.3.1.2, numerals 1.9, 1.11, 2.7, 2.8, 2.9, 2.10 and 3.10 for insurance companies and capitalization companies.

47 The restricted assets depend on the investment policy established in the regulations of each CIF. In any case, mechanisms may be implemented to determine the CIF's actual exposure to investments that are considered restricted, in which case, the calculation should be made based on this mechanism.

companies was eliminated. Hereafter, in the issuance of PFM&S securities with the value resulting from the combined resources of all the types of mandatory pension funds managed by the same PFM&S, this entity shall not invest a percentage higher than the one approved in the Investment Policy by the Board of Directors as the maximum limit for issuance processes. In the issuance of securities by insurance companies and capitalization companies with the resulting value of the combined resources that support the technical reserves, a percentage higher than the one approved in the Board of Directors' Investment Policy as a maximum limit for issuance processes may not be invested either. The above is without prejudice to the limits accounted for by issuer (Decree 2555/2010, articles 2.6.12.1.12, 2.6.12.1.14 and 2.31.3.1.9).

- In conjunction with the previous point, limits on investment in the assets of closed-end collective investment funds (CIFs) and private equity funds (PEFs) were eliminated. Currently, based on Decree 2555/2010, articles 2.6.12.1.13 and 2.31.3.1.10, the PFM&S, insurance companies, and capitalization companies with the total resources of all the types of mandatory pension funds may not hold a share that exceeds 50% of the equity of a CIF or PCF.
- The Board of Directors of each PFM&S will have the power to approve the maximum limit of investment in any company's outstanding BOCEAS (convertible bonds). There used to be a 10% limit on investment in BOCEAS (convertible bonds).
- The limit for productive real estate was repealed and since the Board of Directors is the body with the overall duty of defining strategy, supervising relevant issues, and establishing the control architecture, they will be responsible for approving the maximum limit on this type of asset.

Decree 1398/2020 of the MFPC (MHCP): Operating Conditions of the Real Estate Annuity

The Real Estate Annuity (REA) is an instrument designed to achieve the purpose of a reverse mortgage operation. This allows Colombian households to use their real estate assets to increase an elderly person's normal income. The main guidelines established by Decree 1398/2020 regarding REA are given below:

- Participating entities: REAs must be offered by life insurance companies. CIFs and other collective investment plans may acquire the real estate portfolios of insurance companies.
- The branch in which the insurance companies will offer the REA corresponds to Voluntary Income.
- The product is intended for people who own real estate property and wish to leverage their real estate assets to receive a supplementary income.

- In the option chosen by the rentier, the insurance company will guarantee the payment of a monthly income in favor of the beneficiaries established in the contract in exchange for the payment of a premium by the policyholder which will be made in kind through the transfer of the ownership of the property without usufruct. In addition, in this type of transaction, the beneficiaries will have the use and enjoyment of the property until their death.
- A set of rules is enacted to develop the appraisals for REA operations in Colombia.
- Prudential Regulation of the REA: for the development of the REA, the real estate that is part of the transaction, given the transfer of the ownership without usufruct to the insurance companies, will be admissible as investment of the required technical reserves.
- Real estate risk was incorporated as another market sub-risk that will be calibrated in accordance with the guidelines of the Solvency II standard. The real estate sub-risk corresponds to possible losses due to the volatility of real estate market prices.
- The measurement of the capital requirement for real estate risk will be based on the methodology proposed by the Solvency II framework. In this respect, for the measurement of real estate risk, Solvency II stipulates that it will be equal to a loss in assets in the proprietary position due to an instantaneous 25% decrease in the value of the real estate.

External Circular FSC 016: Measurement of Market Risk

The FSC identified the need to recognize the nature and rationale of structural investments in the calculation of market risk. Therefore, a change was ordered in the calculation of the market risk (MR) measurement of the exchange rate module that applies to credit institutions, the EIOs, higher-grade cooperative bodies, and the one that is derived from proprietary account transactions with proprietary resources carried out by stock brokerage firms.

This also applies to TC, PFM&S, the administrative entities of the average premium solidarity regime, insurance companies, capitalization companies, and collective portfolios managed by stock brokerage firms and other funds or trusts listed in Chapter XXI, numeral 5.2.1, literal e) of the Basic Accounting and Financial Circular (CBCF).

First of all, the standardized methodology for measuring MR consists of five modules that are calculated separately: interest rate risk, foreign exchange rate risk, stock price risk, collective portfolio investment risk, and credit default swap risk.

The instructions given in this circular were:

- To calculate the exchange rate module, entities may exclude the value of the uncovered portion of their investments managed abroad from the positions in the trading book.
- Exclusion or any change in the amount excluded shall require the duly substantiated approval of the Board of Directors.
- The decision must be reported to FSC within ten standard days of its approval and indicate the date on which the decision will take effect.
- With respect to exclusion: 1) the amount defined by the entity for exclusion cannot exceed the difference between the value of the controlled foreign investments abroad and the value of the derivatives and other obligations designated by the entity's competent authority as hedging instruments for controlled foreign investments;[48] 2) exclusion from the calculation must be sustained for at least six months, and 3) when the entity plans to partially or totally liquidate the managed investment abroad, it must include its value in the calculation of the exchange rate module at least six months in advance.

The above provisions are in line with the recommendations of the Basel Committee on Banking Supervision (BCBS)[49] among which it stipulates that "institutions that have an uncovered structural position in foreign currency may exclude it from market risk in order to reduce the effect on the capital adequacy ratio in the event of exchange rate movements with the approval of the supervisor."[50]

External Circular FSC 022: Debtor Assistance Program (PAD)

Credit institutions (CI) must adopt a program that makes it possible to establish structural payment solutions by redefining the terms of the loans owed by those debtors whose income or ability to pay has been affected as a result of the situation created by Covid-19 under conditions of financial viability for the debtor.

The loans with grace periods or extensions in force, agreed upon in accordance with Circulars 007 and 014/2020 will remain under the terms established by the financial institution and the debtor.

In order to adopt differentiated measures for each of the segments defined in the program that the CIs design, at least three groups of debtors must be established:

48 Other conditions specific to the calculation of this difference are described in detail in CBCF, Chapter XXI, Appendices 1 and 2.

49 Basel Committee on Banking Supervision (2006 [2017]). "International convergence of capital measures and standards", numeral 718, literals xxxvii and xxxviii, Bank for International Settlements.

50 For more information, see Box 6: "Proprietary Position and Capital Adequacy Ratio" (Tatiana Venegas) from the Financial Stability Report for the first half of 2019.

- Debtors for whom the financial entity has objective information that allows them to infer that they can continue to make the regular payment on their loans.
- Debtors whose income or ability to pay has been partially affected and with respect to whom the entity has reasons that allow it to infer that through a redefinition of the terms of the loan, the debtor will be able to continue to meet this obligation.
- Debtors who are temporarily facing a substantial or total disruption to their income or ability to pay and with respect to whom entity has reasons to infer that the debtor will be able to overcome this disruption.

For debtors in the second and third group, financial alternatives should be defined and include at least: 1) a reduction in the value of the installments, and 2) the maintenance of the interest rate that was initially agreed upon for the debt. Furthermore, for those in the third group, the alternatives should include periods of grace or extension (this is optional for those in the second group).

Interest and other charges such as management fees, commissions, and insurance generated during grace periods and extensions that were granted under external circulars 007 and 014 will retain their status of not being capitalized.

On credit risk management:

- The implementation of the measures defined by each CI within the framework of PAD will not cause the reversal of loan-loss provisions except in cases where the exposure decreases, or the risk rating improves based on the particular client analysis.
- Loans which are subjected to redefinition or implementation of measures under the program will not be considered as modified or restructured.
- Entities must make general provision for interest on uncollected accrued interest (UAI) during grace periods and extensions that have been granted.
- The credit institutions must do an analysis that includes a prospective estimate of the potential deterioration in the loan portfolio associated with debtors' economic activity. An additional general provision may be made during 2020 and 2021 as a hedging mechanism.
- The CUIF is modified to include additional categories for the general provision and the general interest provision.
- The entities specified in the circular may continue their decumulation of loan-loss provisions under the parameters specified therein.
- Starting 1 July 2021, the process of reconstituting the countercyclical component of the individual loan-loss provisions for

the consumer and commercial loan portfolios and of the general loan-loss provisioning of the housing and microcredit portfolios will be initiated and run for a maximum of two years.

External Circular FSC 025: Instructions related to CI Operational Risk

Operational risk is defined as the possibility that the entity will incur losses due to deficiencies, failures or inadequate functioning of processes, technology, infrastructure, or human resources as well as the occurrence of external events associated with them. It Includes the legal risk.

Under External Circular 25, and following the guidelines of Decree 1421/2019, the following is defined:

- Exposure to operational risks must be calculated by CIs and other entities specified as described in the CBCF, Chapter XXIII, Appendix 1.
- The TC, PFM&S, SBF, IMC and insurance companies must calculate the value of the operational risk exposure as described in CBCF, Chapter XXIII, Appendix 2.
- In CBCF, Chapter XXIII, the other requirements that the operational risk management system must comply with and that all entities subject to FSC inspection and oversight must adopt are described.
- The calculation of operational risk is included in the minimum levels of capital adequacy the CIs must meet as follows:

$$Core\ capital\ adequacy = \frac{PBO}{APNR + \frac{100}{9}(VeR_{RM}+VeR_{RO})} \geq 4{,}5\%$$

$$Additional\ core\ capital\ adequacy = \frac{(PBO + PBA)}{APNR + \frac{100}{9}(VeR_{RM}+VeR_{RO})} \geq 6\%$$

$$Leverage\ ratio = \frac{(PBO + PBA)}{Leverage\ value} \geq 3\%$$

$$Total\ capital\ adequacy = \frac{PT}{APNR + \frac{100}{9}(VeR_{RM}+VeR_{RO})} \geq 9\%$$

Where:

VeR_{RO} = value of operational risk exposure
PBO = ordinary core equity (OCE in English)
PBA = additional core equity
PT = technical capital
$APNR$ = assets weighted by risk level (AWRL in English)

- The capital conservation buffer will now correspond to 1.5% of the value of the AWRL and of market and operational risks that must be retained in the OCE at all times (operational risk was not previously included).

- The capital buffer for systemically important entities is now 1% of the value of the AWRL and of market and operational risks that must be retained in the OCE at all times (operational risk was not included previously).
- As specified in Decree 1421/2019, as of 1 January 2021, the CIs must comply with the above provisions. In the case of the additional core capital adequacy ratio and the conservation and systemic buffers, there will be a gradual implementation over a period of four years.

FSC External Circular 030/2020: Linkages and Limits of Exposure and Risk Concentration of Financial Conglomerates

Decree 1486/2018 has set the criteria for determining who is linked to a financial conglomerate and the regulations regarding the transactions and exposure limits between the entities that the financial conglomerate (FC) and its affiliates are made up of. External Circular 030/2020 provides instructions to enable entities to comply with the regulatory framework. The main instructions are listed below:

- Part I, Title V, Chapter II of the Basic Legal Circular (CBJ in Spanish) was created and called "Linkages and limits of exposure and risk concentration." The criteria for determining whether special purpose vehicles and private equity funds belong to FC and the operations that are calculated to control the limits of aggregate exposures with related parties and between FC entities are defined in this new chapter. Information is provided on control and supervision of transactions between entities in the financial conglomerate, between them and their related parties, on the rules regarding exposure limits, and risk concentration between FC entities and between them and their related parties. Additionally, penalties are imposed for non-compliance.
- Numeral 2 was modified and numerals 2.2.4. and 2.3.2. were created in the CBJ, Part II, Title III, Chapter IV in order to incorporate instructions related to investment policies, strategic asset allocation, and the functions of the risk and investment committees of the Pension and Severance pay Fund Administrators (PFM&S) that are part of a financial conglomerate.
- The first official input of information related to the transactions carried out between the entities that conform a financial conglomerate and between them and their related parties must be submitted with information as of the cut-off date of 31 March 2021 by transmitting the 406 format.
- The first official input of information related to exposure limits and risk concentration among entities of a financial conglomerate and between them and their related parties must be submitted with information as of the cut-off date of 31 March 2021 by transmitting the 403 format.
- To ensure the correct input of the information in the two preceding points, financial holdings must carry out mandatory tests between 1 and 20 February 2021 using information as of the cut-off date of 31 December 2020.

Box 4
Key Measures taken by some Central Banks to Channel Credit to the Real Sector during the Pandemic

Daniela X. Gualtero Briceño*

The purpose of this box is to explain the key measures that different central banks have implemented as a response to the pandemic, specifically measures related to 1) granting liquidity to the financial system institutions under the condition that they contribute in various ways to the financing of the private sector (known in the literature as funding for lending) and 2) providing loans directly to the real sector. To this end, first, the characteristics of some of the measures of this type that other central banks have adopted are set forth, and after that, the conditions of the current legal framework are reviewed to briefly analyze the possibility of implementing them in Colombia.

1. International Experience

European Union

Since June 2014, the European Central Bank (ECB) has been implementing a program called Targeted Longer-term Refinancing Operations (TLTRO), the first series of which was announced on 5 June 2014, a second one on 10 March 2016 (TLTRO II) and a third one on 7 March 2019 (TLTRO III). In general, TLTROs are operations under which commercial banks can borrow from the ECB by means of a repurchase agreement, and in which the amount granted and the interest rate of the loans depends on the amount of credit granted to real non-financial sector companies and households.

Specifically, for the period from 24 June 2020 to 23 June 2021, the interest rate for these transactions will be 50 basis points (bp) lower than the average rate that applies to the main refinancing transactions in the *Eurosystem*. For counterparties whose net eligible loans are equal to or greater than the minimum established by the ECB, the interest rate will be 50 basis points less than the average interest rate of the deposit facility during the same loan period. The TLTRO rate in this second case cannot be higher than -1%.

Although TLTROs were implemented before Covid-19 appeared, the parameters for the TLTRO III program were modified as of March 2020 in order to encourage commercial banks to offer more credit to the real non-financial sector. To be specific, the maximum amount that can be lent to each bank (under the program as a whole) went from 30% to 50% of their total eligible loans to the real non-financial sector as of February 28, 2019.

England

In May 2020, the Bank of England (BoE) implemented the *Term Funding Scheme with Additional Incentives for SME* (TFSME) program. This program offers financing through collateral loans to banks and building societies at rates close to the policy rate. Additional funding is provided for banks that increase their lending, especially to small and medium-sized enterprises (SME). Financial entities participating in the program must report data to the BoE quarterly on their differentiated net lending[1] (NL) to non-SMEs and SMEs.

Institutions can apply for loans from 15 April 2020 to 21 April2021. The amount to be lent per entity is initially 10% of the stock of loans made to the real economy (not to financial institutions) as of 31 December 2019. An additional amount may be awarded depending on the number of NLs to SMEs and non-SMEs, with a larger amount being granted for NLs going to the former. Thus, the additional funding will be the sum of 1) the number of NLs that each bank grants to non-SMEs, and 2) five times the NLs granted to SMEs.

If the participants' NLs are negative from the time the loan is applied for up until 31 December 2020, they will be penalized with a fee at the interest rate of the loan that will be calculated at the end of 2020.

* The author belongs to the Financial Stability Department of *Banco de la República*. The opinions expressed here are the sole responsibility of the author and do not imply any commitment on the part of *Banco de la República* or its Board of Directors. The collaboration of Javier Pirateque in the preparation of this box is gratefully acknowledged.

1 In the context of the TFSME, net loans are defined as new loans granted after repayment of a loan (new loans granted minus loans paid) during the benchmark period (December 2019-December 2020).

Furthermore, the BoE implemented a lending facility in March 2020 called the *Covid Corporate Finance Facility* (CCFF) which is intended to contribute to liquidity among larger firms: it consists of purchasing real sector corporate bonds with maturities ranging from one week to twelve months directly from companies. Companies wishing to participate must demonstrate that they were in sound financial health prior to the Covid-19 health emergency shock. The trades for purchasing these bonds are held every working day between 10:00 and 11:00 a.m., and the companies must declare their intention to participate during the five working days prior to the sale.

As of 14 October 222 firms had been approved to purchase bonds under the CCFF category. Of these, 59 still have outstanding bonds held by the BoE.

United States

The Federal Reserve (Fed) has implemented at least three programs related to the group of measures analyzed in this box: *Primary Market Corporate Credit Facility* (PMCCF), *Secondary Market Corporate Credit Facility* (SMCCF) and the *Main Street Lending Program* (MSLP). All three programs are expected to continue until 31 December 2020.

The first two are intended to support credit for employers and provide the market in outstanding corporate bonds with liquidity. Programs are implemented through a special purpose vehicle (SPV). Under the PMCCF, the Fed lends the funds to the SPV[2] and the SPV makes loans (by purchasing loans granted to companies by financial institutions) and purchases corporate bonds on the primary market from investment grade firms. The loans have a maturity of up to four years and interest payments can be deferred for six months. The interest rate under this facility will be informed by market conditions.

Under the SMCCF the Fed lends funds to the SPV to purchase investment grade corporate bonds on the secondary market. The idea behind the program is to be able to strengthen the secondary market for these bonds to encourage banks to grant companies more loans.

The MSLP program is designed to encourage the flow of credit to eligible SMEs and non-profit organizations that showed financial soundness before the COVID-19 pandemic, and who were unable to get access to the *Paycheck Protection Program* (PPP).[3] Under the MSLP, the Fed purchases 95% of the loans granted to SMEs by commercial banks through an SPV. The latter retain 5% of the loans. The Fed will buy up to USD 600 billion in loans under this program. Of this amount, the Fed had only allocated USD 2.5 billion under the program by the beginning of October. This is because, although banks only retain 5% of the loans, the businesses applying for them were severely impacted by the pandemic, and this made them ineligible to receive any.

Mexico

The Bank of Mexico authorized the provision of funds to banking institutions (BIs) to channel credit to SMEs and individuals affected by the pandemic. Financing from the Bank of Mexico has two sources: 1) the BIs may make withdrawals based on the amount available in the monetary regulation deposit[4] (MRD) held at Banco de México, and 2) when the full amount in the MRD has been exhausted, BIs may enter into repo transactions with eligible securities for which the interest rate is the average interbank interest rate determined by the Governing Board of the Banco de Mexico as the target rate for monetary policy purposes and the term is from 18 to 24 months. At the time the call for proposals is made, the BIs must specify what portion of the loans they receive under this facility they will grant to SMEs and what share they will grant to individuals by completing a form. The BI was required to report to the Bank of Mexico by 7 September 2020 at the latest, on the amount of credit granted to the non-banking private sector between 31 March and 31 August 2020.

Peru

In order to ensure continuity in the payment chain of the economy and respond to the liquidity needs faced by companies due to the impact of Covid-19, the Reactiva Peru program was created. Under this program the Central Reserve Bank of Peru (BCRP in Spanish) grants financing to entities in the financial system through portfolio repo operations under the condition that these resources are channeled to the guaranteed loan portfolio. The loans included in this portfolio are granted to SMEs and large companies and are guaranteed by the national government of Peru (GNP) via the Ministry of Economy and Finance. The guarantee covers a percentage between 80% and 98%, depending on the amount of the loan.

Under this program, financial institutions (FIs) turn to repo auctions (repos with loan portfolio securities as collaterals) with applications for loans to SMEs and large

2 The Fed does not make direct loans nor purchase assets directly. It does so through SPVs capitalized by the Treasury, which would assume any losses in the first place.

3 A program run by the Small Business Administration (SBA) through which forgivable loans are made to SMEs so that they do not lay off workers.

4 MRDs are mandatory long-term deposits that domestic credit institutions are required to make in the central bank. Generally, MRDs are for an indefinite term, i.e., they have no maturity date and, therefore, cannot be withdrawn by banks. They are an instrument similar to the legal reserve requirement implemented by other central banks.

companies that have not yet been approved. At the auction, funds are allocated depending on the interest rates that the FI will charge for these loans. After the auction, the FIs approve the loans and then get access to the GNP guarantee based on the amount of the loan granted. Under this program, PEN 25.282 billion (approximately USD 7.000 billion) were placed at an average interest rate of 1.73% for FI clients between 30 June and 20 October 2020.[5] The period for the repo transaction under this program is 3 years and the fixed interest rate is 0.5%.

Chile

The Central Bank of Chile (BCCh in Spanish) implemented the Conditional Credit Facility for Increasing Bank Placements (FCIC in Spanish), which is intended to foster the granting of loans to households and businesses, especially smaller ones. Like the BoE's TFSME, the FCIC provides four-year collateralized loans to banking companies (BC). The program has an initial and an additional line of loans. To define this, the BCCh takes into account the total commercial and consumer loans granted that each BC reported to the Financial Market Commission at the end of February 2020. The initial line of loans granted by the BCCh corresponds to 3% of this base loan portfolio, and the amount of the additional line depends on the increase seen in placements and the fraction of the loan that the bank allocates to small business loans. In any case, the credit limit for the additional line is 15% of the base loan portfolio of each BC. The interest rate under this facility will be the lowest monetary policy rate that has been in effect for the period between 30 March 2020 and 31 October 2020 for the facility's first round (FCIC ONE) and between 1 July 2020 and 1 March 2021 for the second round (FCIC TWO). These dates correspond to the so-called availability periods of each round.

Likewise, the BCCh activated the liquidity credit line (LCL) which was allocated to the collateralized two-year loans for the BCs, and which also had an initial and an additional line. Access to and use of the LCL is subject to the same conditions associated with the increase in the placements established for the FCIC, the only difference being that the limit for the additional line is the reserve requirements for each BC.

Japan

Before the crisis caused by Covid-19, the Bank of Japan (BoJ) had two credit plans with terms ranging from 1 to 4 years for banks called *Loan Support Program I* and *Loan Support Program II*. Under these programs the BoJ awards the amount requested by each bank plus an additional amount. This additional amount is proportional to the increase in the number of loans to firms and households made by the bank applying for the credit. The interest rate established for these programs in 2012 was the non-collateralized overnight call rate stipulated on the day each loan was offered.

Furthermore, between March and May 2020, the BoJ implemented the *Special Funds-Supplying Operations to Facilitate Financing in Response to the Novel Coronavirus* program. In this program, the BoJ grants collateralized loans for a maximum of one year at a 0% interest rate to financial system institutions and grants an additional amount equal to the sum of the loans made to SMEs.

India

The Reserve Bank of India (RBI) implemented a program called *Targeted Longer-Term Repo Operations* similar to the ECB's TLTROs in April 2020. Under this program, the RBI carries out repo transactions with banks for a term of up to three years at a rate equal to the policy rate[6] plus a fee (440 to 640 bp). The banks must allocate the funds they receive to investments in corporate debt. To be specific, they must keep the equivalent of the amount granted by the RBI in their held-to-maturity securities book until the term of the repo is met. If the investment is not made with the specified characteristics, the RBI will implement a penalty with an additional fee on top of the repo interest rate.

Hungary

In 2013 the Central Bank of Hungary (BCH) launched a program called *Funding for Growth* in order to support SMEs after the financial crisis of 2008. In April 2020 and on the occasion of the crisis generated by the Covid-19, the BCH began to implement a new phase of the program called *Funding for Growth Go!* (FGS Go!). This program offers loans at an interest rate of 0% to banking institutions that, in turn, must use these funds for loans to SMEs at interest rates that cannot exceed 2.5%. SMEs can use the loans to finance a new investment project, to refinance an existing loan, or to finance working capital.

New Zealand

Since April 2020, the Reserve Bank of New Zealand (RBNZ) has been operating a term loan facility that provides funds

5 Furthermore, the BCRP implemented new repo operations that entities in the financial system can get access to on the condition that they undertake to modify the terms of their clients' loans or of the portfolio purchased from other financial institutions for an amount that is at least equivalent to what was made available in the repo transaction.

6 On 18 November 2020, the RBI presented a policy interest rate (*bank rate*) of 4.35%.

to banks for an amount equivalent to that loaned by the entity under the Government's lending plan known as *Business Finance Guarantee Scheme* (BFGS). Initially the duration of the facility was three years; however, this period was extended to five years during the month of August. The rate offered for this facility corresponds to the monetary policy rate. The RBNZ will operate this facility until February 2021.

According to the latest monetary policy statement, the RBNZ plans to launch a new conditional *funding-for-lending* facility in early December 2020. This will be a collateralized line of credit by means of which the commercial banks will be able to get access to direct financing at the RBNZ policy rate over a period of 3 years. The initial loan amount for each participant will be 4% of their total eligible loans (loans and advances to households, private non-financial companies, and non-profit institutions). The participants can then get access to an additional 2% of eligible loans on the condition that they increase the amount of credit that they supply to the economy.

Australia

In April 2020, the Reserve Bank of Australia (RBA) established a repo-based term loan facility called the *Term Funding Facility* that provides three-year funding to deposit taking institutions that offer credit to Australian businesses and households. Initially, the counterparties that are eligible will be able to resort to this facility for an amount equal to 3.0% of the average portfolio balance for the last three months. In addition, these entities may request an amount equivalent to the increase in the portfolio granted to large companies plus five times the increase in the portfolio granted to SMEs.[7] The interest rate was originally set at 25 bp, but it has been set at 10 bp as of 4 November 2020. This facility will be available until 30 June 2021.

Singapore

In April 2020, the Central Bank of Singapore (MAS) created a facility known as the *MAS SGD Facility for ESG Loans* which provides funding for banks and finance companies that give loans under government financing plans.[8] The amount that eligible counterparties have access to is equal to the amount granted under such plans. The interest rate, in turn, is 10 bp while the period is two years. This facility will be available until 30 September 2021.

Taiwan (implemented by the Central Bank of the Republic of China)

In March 2020, the Central Bank of the Republic of China (CBC) decided to adopt a facility called the *Special Accommodation Facility to help SMEs* (SFA) in Taiwan. Under this facility, the CBC grants collateralized loans to banking institutions at a rate that is one percentage point (pp) lower than the policy rate. Banks must allocate these funds to loans to SMEs at a rate not exceeding the SFA rate plus one pp.

Sweden

The Central Bank of Sweden (CBS) implemented the *Corporate Loan Programme* between March and April 2020 under which collateralized loans are offered to banking institutions at a rate of 0% with a term of 2 years. The CBS does regular monitoring to ensure that banks use the funds granted to give loans to non-financial companies. If loans to non-financial companies do not increase by at least one fifth of the amount granted by the CBS, the interest rate on the loan will increase by 0.20 pp.

Republic of Korea

The Central Bank of Korea (BoK) has been implementing a program called *Bank Intermediated Lending Support* since before the arrival of Covid-19. Under this program, BoK offers loans to banks for a period of one month and at a rate of 0.25% per annum. The latter was lowered due to the Covid-19 crisis (it had previously been between 0.50% and 0.75%). The amount of the loans depends on the ones that each banking institution has made to *start-ups* and SMEs with creative technology.

Saudi Arabia

The Saudi Arabian Monetary Authority (SAMA) implemented the *Private Sector Financing Support Program* in March 2020 which contains a subprogram under the heading of '*funding for lending*' that seeks to support SME finances. Through the latter, SAMA grants loans to banking institutions and finance companies so that they can offer loans to SMEs.

United Arab Emirates

In March 2020, the Central Bank of the United Arab Emirates (CBUAE) implemented the program called *Targeted Economic Support Scheme* (TESS). The TESS consists of several facilities including one categorized as *funding for lending* called Tess Zero Cost Facility (TZCF). Under the TZCF, the CBUAE offers collateralized loans to banks and

7 The baseline for calculating the increase is all the loans granted during November 2019, December 2019, and January 2020. These will be compared to the loans granted during February, March and April 2021.

8 The loans must be granted through the *Enterprise Financing Scheme* (SME), *Working Capital Loan* (EFS-WCL) and *Temporary Bridging Loan Programme* (TBLP) programs.

finance companies at a rate of 0% and with maturity dates that should be between 15 March 2020 and 30 June 2021. The banks and finance companies must provide CBUAE with evidence that they are granting the SMEs and individuals affected by the Covid-19 crisis with temporary relief from interest payments on outstanding loans.

2. Analysis of the Implementation of this Type of Measures in Colombia

Although the national government has already implemented various programs to counteract the effects of the crisis generated by Covid-19 on the income of private sector companies and households such as the Support Program for Formal Employment (PAEF in Spanish) or the implementation of extensions and grace periods granted by credit institutions (for more information, review FSC External Circulars 007, 014, and 022/2020), a review of alternative policies implemented by some central banks in support of these types of measures and revising them with respect to the Colombian legal framework offers a possible set of tools for the future.

The Constitution of Colombia establishes in article 373 that "Banco [de la República] may not set credit limits, nor grant guarantees in favor of individuals except in the case of intermediation of foreign credit for placement through credit institutions, or temporary liquidity support for them" (Constitution of Colombia, art. 373). Thus, *Banco de la República* cannot grant direct loans to companies in the real sector or to individuals, cannot make direct transfers or provide subsidies, nor direct loans to specific sectors.[9]

Based on the above:

- The types of measures presented in which loans are granted or corporate bonds are purchased directly from legal entities such as the programs implemented by the Fed (through an SPV), the BoE, and the BCCh could not be implemented under the current Colombian legal system.

- In Colombia, although there exist the facility of repos with loan portfolio securities as collaterals guaranteed by the FNG (with a small *haircut*[10]), they are not conditioned to the loans being channeled as in the case of Peru and Mexico.

- Measures such as those implemented in Mexico, which consist of allowing the withdrawal of the MRD or participating in repo operations under the condition of offering loans to SMEs and individuals could not be implemented in Colombia. Legally, *Banco de la República* has a limited set of powers to direct loans to the real sector and these include maximum limits on credit growth and the intermediation of foreign credit for placement through credit institutions. In this respect, monetary transactions are not used as a direct instrument to channel credit to the real sector.

- For the same reason explained in the previous point, plans such as those implemented by countries other than Mexico (those previously reviewed) where financing is granted through repos or collateralized loans conditioned to the granting of credits, would not be implemented in Colombia either.

- *Banco de la República* as the monetary, exchange, and credit authority has instruments that allow it to stimulate aggregate demand and the flow of credit to the economy indirectly. Among these tools are the reserve requirements and changes in the policy interest rate. If economic conditions are appropriate, changes in these instruments have balancing effects on the performance of loans in the economy.

References

Banco de la República (2020). ¿Qué puede y qué no puede hacer el Banco ante la coyuntura actual?, taken from https://www.banrep.gov.co/es/puede-y-no-puede-hacer-el-banco-ante-coyuntura-actual

9 For more information see https://www.banrep.gov.co/es/puede-y-no-puede-hacer-el-banco-ante-coyuntura-actual

10 The haircut depends on the percentage of the credit guaranteed by the FNG: 15% for loans with coverage greater than or equal to 80% and less than 90% of the FNG and 12% for those that have coverage that is greater than 90% of the FNG.

Shaded section 1:
Effects of the Relief Granted to Debtors within the Framework of the Covid-19 Emergency

Eduardo Yanquen*

Within the context of the Covid-19 pandemic emergency, the Office of the Financial Superintendent of Colombia (FSC) gave instructions that would provide the credit institutions (CIs) with tools to manage debtors whose cash flow/revenues would be impacted by the preventive mandatory isolation measures. Specifically, External Circular 007 made provision for the possibility of granting grace periods to address the client's situation, without this being considered a risk factor, for those "credits that, as of 29 February 2020, did not present arrears greater than or equal to 30 days (including modified and/or restructured loans). In such cases, they would be able to set up grace periods that provide for the client's particular situation without this being considered a major risk factor. In these cases, the entity could continue to generate interest and other charges during this period." Subsequently, this window for loans in arrears was extended with External Circular 014 and it indicated that "The instructions given in External Circular 007/2020 may also be applied to loans that, on 29 February 2020, were more than or equal to 30 days and less than or equal to 60 days delinquent." This circular also defined the characteristics of the measures including: no increase in the interest rate, no charging of interest on interest, nor any charging of interest on management fees, commissions, nor insurance, etc.

The growth of NPL for all categories of loans was relatively stable in late 2019. However, starting in the first quarter of 2020, a negative growth rate was seen for most of the categories which could have been due to the instructions given by FSC in conjunction with the measures taken by the CIs to alleviate the situation their clients were in. This could be because, when they met the criteria announced in the circulars, some debtors saw a modification in the default days they had.

The objective of this shaded section is to determine what the influence of the measures has been on the CI risk indicators. To this end, this shaded section, focuses on the minority group of debtors that had days of arrears greater than zero and differentiates between those debtors that registered a default of less than three months and those that registered a default for a longer period. Specifically, the growth of the past-due portfolio for each of these two groups of debtors is compared under the understanding that only the first group includes some debtors subject to credit risk management measures. Therefore, to the extent that the two groups of debtors are in arrears and the only difference is the presence of debtors under risk management in the first group, the difference between the growth of the two groups in the NPL portfolio could be interpreted as the effect of management measures on the NPL portfolio.

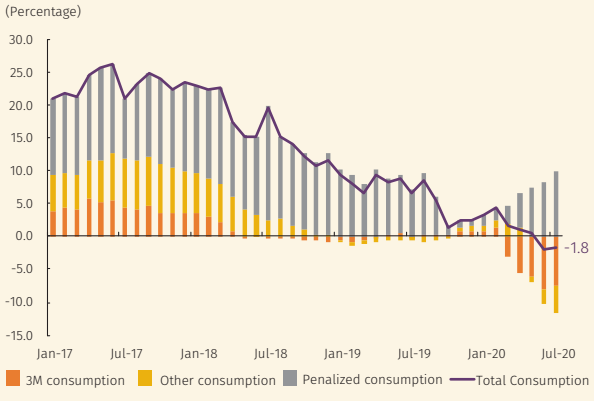
In the household sector, there were declines in the growth of the NPL portfolio that had less than three months of arrears. For the category of consumer, this decline has been accompanied by a decrease in the growth of the past-due portfolio at other levels of default (Graph S1.1, panel A). The outstanding balance of penalties in this category has been increasing since March. Overall, the interaction of these two effects has led to a 7.4 pp decrease in the NPL portfolio and, as a result, it stood at -1.8% by July. To the extent that the difference between the growth of the NPL portfolio at 3 months and one with a higher level of default is slight, the effect of management measures on this loan portfolio is presumably lower in magnitude.

For the housing loan portfolio, the influence of the external circulars is relatively greater since there is a wide difference between the 3-month growth of the past-due portfolio and the greater than 3-month growth of the same portfolio (Graph S1.1, panel B). As

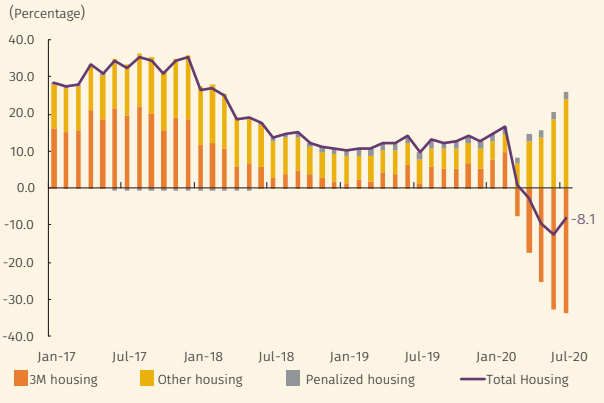
* The author is a member of the Financial Stability Department. The opinions expressed here are the sole responsibility of the author and do not imply any commitment on the part of *Banco de la República* or its Board of Directors.

Graph S1.1
Growth of the NPL Portfolio

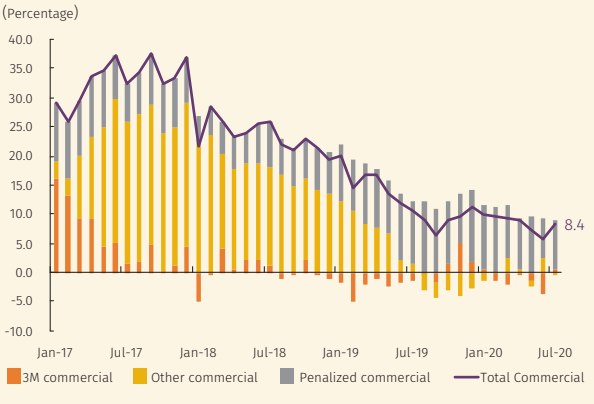
A. Consumer



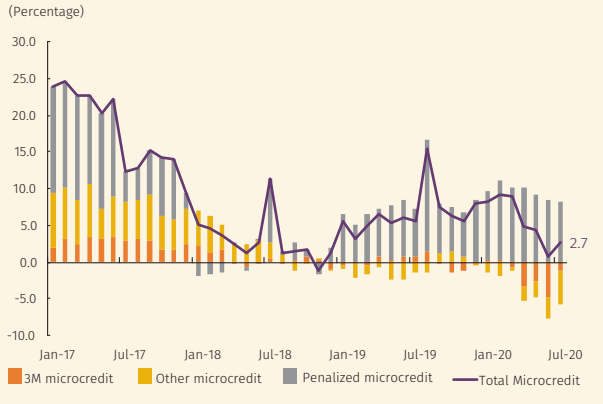
B. Housing



C. Commercial



D. Microcredit



Source: *Banco de la República.*

of July, there was a total of four months of this performance, and it caused the penalized past-due portfolio to register a decrease of -8.1% at the end of that month.

The effects have not been the same in the corporate sector. On the one hand, the relief seems to have had a minor effect on the commercial loan portfolio in the sense that there is no significant growth in the non-performing loan portfolio that is under three months nor in the one that is greater than three months. In the most recent period, the growth of the commercial loan portfolio mainly corresponds to the penalized commercial loan portfolio (Graph S1.1, panel C). On the other, the situation for the non-performing microcredit portfolio with penalties has been different in that there has been a decrease in this NPL portfolio with 3-month defaults which is greater than the decrease for the portfolio with more than 3-month defaults (Graph S1.1, panel D). Thus, the effect of the measures on the non-performing microcredit portfolio seemed to be a little more significant.

In conclusion, the first stage measures in FSC External Circulars 007 and 014 have had the desired effects on the past-due portfolios in the different portfolio categories. The effects of the measures appear to have been stronger in the housing and microcredit categories and slightly lower in the cases of commercial and consumer loan portfolios.

Shaded section 2:
Measurement of Credit institutions' Structural Liquidity: The Net Stable Funding Ratio

Daniela Rodriguez-Novoa
Camilo Sánchez
Santiago Segovia

1. Introduction

As an inherent part of the financial intermediation process, credit institutions (CIs) are exposed to liquidity risk when they transform the short-term resources from the public into long-term loans. The materialization of this risk could generate difficulties for the entities insofar as they could be forced to liquidate their assets seeking to reduce their lack of liquidity. The latter, further the potential losses for the institution, could lead to an episode of systemic risk due to the effect on market liquidity and public perception of the financial system's stability.

During the 2007-2008 Global Financial Crisis this situation became evident, and shortcomings in liquidity risk management as well.[1] In response, the Basel Committee on Banking Supervision (BCBS) introduced a short-term liquidity (*liquidity coverage ratio*; LCR[2]) and a structural liquidity (*net stable funding ratio*; NSFR[3]) measure into their new regulatory framework (Basel III, 2010).

Regarding the monitoring of short-term liquidity, the liquidity risk indicator (LRI) [4] was introduced in Colombia in 2008 by regulation. This indicator establishes a minimum level of liquid assets that entities must hold in order to meet their financial obligations within a 30-day horizon. On the contrary, a regulation for a net stable funding ratio coefficient (NSFR) was issued just until 2019.[5] Similar to the NSFR, the regulation requires entities to have stable funding sources to support illiquid assets and their off-balance sheet exposures.

Since the NSFR regulatory limits came into effect in March 2020, this shaded section will present and explain this measure for Colombia. Later, the NSFR will be analyzed along with the loan-to-deposit ratio (LDR) which is used as a proxy for funding stability.

2. Net Stable Funding Ratio (NSFR)

The NSFR is calculated as the ratio between the available stable funding (ASF) and the required stable funding (RSF). The ASF corresponds to the weighted sum of the funding components (liabilities and equity) and considers the obligations term and the stability of the counterparts. While the RSF is the weighted sum of the funded assets on the basis of their liquidity risk profile:

$$NSFR = \frac{Available\ Stable\ Funding\ (ASF)}{Required\ Stable\ Funding\ (RSF)}$$

* Los autores son integrantes del Departamento de Estabilidad Financiera del Banco de la República. Las opiniones expresadas en este documento son las de los autores y no comprometen al Banco ni a su Junta Directiva.

1 See Basel Committee on Banking Supervision's Principles for the Sound Management and Supervision of Liquidity Risk (2008) (BCBS).

2 See Basel III: *Liquidity coverage ratio and liquidity risk monitoring tools* (2013) of the BCBS.

3 See *Basel III*: BCBS *Net stable financing ratio* (2014)

4 See external circulars (EC) 016 and 018/2008 of the Office of the Financial Superintendent of Colombia (FSC) Relevant modifications to the indicator were given with EC 044 and 045/2011, and EC 009/2018.

5 See FSC External Circular 019/2019:

Where:

$$ASF = \sum_i (book\ value\ of\ the\ item_i \times factor\ ASF_i)$$

$$RSF = \sum_i (book\ value\ of\ the\ item_j \times factor\ RSF_j)$$

For all the *i*-items of liabilities and equity corresponding to the ASF, and j-items of assets and off-balance sheet positions corresponding to the RSF.

In the case of ASF, the weights are measured in terms of the stability of the funding sources, while in the RSF, these are intended to approximate the amount of asset that would have to be financed by stable sources either because it will be renewed, or because it could not be easily liquidated.[6] Thus, the indicator makes it possible to identify the structure and strategic management of the CIs' balance sheet in terms of their stability in order to limit the heavy dependence on unstable or illiquid sources of funding that could exacerbate liquidity risk in the long term.

According to international standards, the regulatory limit for this measurement is 100%. In Colombia, based on the FSC Basic Accounting and Financial Circular (CBCF) Chapter VI, this limit will be applied gradually while bearing in mind the classification of CIs into three groups (Table S2.1).

When the NSFR of an entity is less than the minimum established for its group, it will have a maximum period of six months to raise the indicator five percentage points above the regulatory limit. If the entity does not achieve the above, then this will not be able to carry out active operations in the money market, neither portfolio loan placements or disbursements, nor purchase of investments, nor raise the limits granted on credit cards.

3. Comparison between the NSFR and the loan-to-deposit ratio (LDR)

A measurement to quantify the stability of funding of the CI is the loan-to-deposit ratio. An indicator above 100% means that the portfolio is being funded with sources other than those classified as stable.

Based on information as of July 2020, a comparison between the NSFR and the LDR shows that entities fund their assets with resources that could be classified as stable. It is worth mentioning that the NSFR for groups 1 and 2 has the wider margin concerning its limit. In contrast, as entities that belongs to group 3 does not have a loan portfolio, there is no LDR (Graph S2.1, panel A). Finally, even though the aggregate indicators of group 1 are around 100%, the measurements by entity suggest a high level of dispersion (Graph S2.1, panel B).

All in all, this suggests that the NSFR is a complementary tool with the advantage of considering the

Table S2.1
Transition Periods in the Application of Regulatory Limits, NSFR

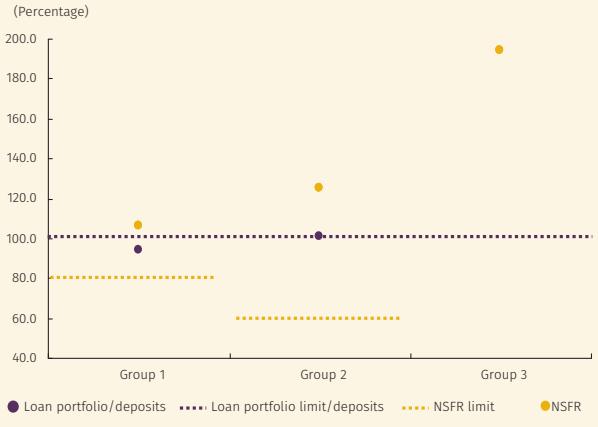
Classification	Criteria	Mar-20	Mar-21	Mar-22
Group 1	CIs with assets greater than 2% of total bank assets	80%	90%	100%
Group 2	CIs that have a loan portfolio as a significant asset and do not belong to Group 1	60%	70%	80%
Group 3	Other CIs whose significant assets are not a portfolio	Informative	Informative	Informative

Source: FSC, calculations by *Banco de la República.*

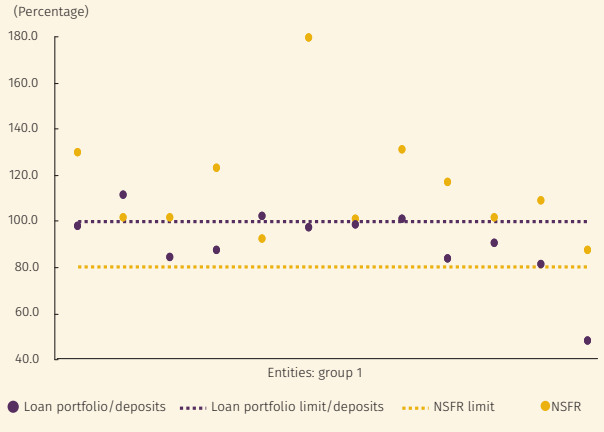
6 For example, in the ASF, technical assets and retailer deposits, which are classified as stable sources of funding, have a weighting of 100%. In the case of the RSF, cash has a weighting of 0% while a loan in arrears is weighted in its entirety. The list of components and their respective weights for the ASF and RSF is available in the FSC Basic Accounting and Financial Circular (CBCF), Chapter VI, Appendix 4.

Graph S2.1
NSFR and Loan-to-Deposit Ratio

A. By group of entity



B. Group 1 Entities



Source: FSC, prepared by *Banco de la República.*

maturities of the liability and its counterparties. Therefore, it is able to identify the funding structure of the entities better since considers the entire balance sheet of the CIs. In that way, the NSFR seeks entities to internalize the costs associated with an asymmetry in periods and stability of their balance sheet structure, and requires them to maintain a stable funding profile concerning the breakdown of their assets.

References

The Basel Committee on Banking Supervision(2008). "Principles for the Sound Management and Supervision of Liquidity Risk," Bank for International Settlements.

The Basel Committee on Banking Supervision(2013). "Basel III: Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools," Bank for International Settlements. The Basel Committee on Banking Supervision (2014).

"Basel III: Net Stable Financing Ratio," Bank for International Settlements.

This Report was coordinated, edited, and designed by the Publishing Management Section of the Administrative Services Department, with font Fira Sans, 11.

Printed by Nomos

December 2020