FINANCIAL STABILITY REPORT

Second Half 2017

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*/ Statistical cutoff date: 20 November 2017.

PREFACE

As established in its Basic Constitutional Act, the Central Bank of Chile must "safeguard the stability of the currency and the normal operation of internal and external payments." To carry out these tasks, the Central Bank of Chile is vested with diverse legal powers, such as extending emergency credit and determining regulations in matters affecting the financial system and international foreign exchange operations.

The Central Bank's focus in the area of financial stability is centered mainly on the well-functioning of the system and the Chilean economy's access to international financial markets. The Central Bank's tracking of financial stability is complementary to that undertaken by the specialized supervisory entities; it serves as an independent element of analysis with respect to the supervisors' powers and functions in relation to the entities subject to their oversight.

The objective of the *Financial Stability Report* is to provide information, on a half-yearly basis, on recent macroeconomic and financial events that could affect the financial stability of the Chilean economy, such as the evolution of the indebtedness of the main credit users, the performance of the capital market, and the ability of the financial system and the international financial position to adapt sufficiently to adverse economic situations. In addition, this *Report* presents the policies and measures that support the normal operation of the internal and external payment system, with the objective of promoting general knowledge and public debate with regard to the Bank's performance in fulfilling this function.

The Board

SUMMARY

Since the previous Financial Stability Report (FSR), the Chilean financial system has not recorded major disruption events and available information to date indicates that the sector continues in a strong enough position to resist the impact of stress scenarios. Internal and external payment systems have functioned normally, while the traditional credit risk indicators have remained low. However, alternative risk measures have increased in certain sectors. If the slow economic activity registered in recent years were to protract, it is possible that this situation could deepen.

External interest rates remain low, despite the less expansive bias of monetary policy in some developed economies. The U.S. Federal Reserve (Fed) raised its benchmark rate in June and signaled a future hike for December this year. Meanwhile, last November the Bank of England increased its policy rate by 25bp, after maintaining it at 0.25% for over a decade. Also, while the Fed began a gradual reduction of its balance sheet, the European Central Bank announced that it will reduce the monthly purchase of bonds starting next year. This concordance in the reduction of monetary stimuli occurs in a context of improved economic outlook for 2018 at the global level, and of relatively low levels of current and expected inflation. At the same time, volatility indices of different financial assets reached historical new lows, mirroring lower risk aversion that has pushed up prices of different markets and risk categories. Accordingly, capital flows to emerging economies showed greater dynamism in 2017 and the compression of required spreads has resulted in new bond issuances of emerging countries abroad.

Favorable external financial conditions have spread to the local economy. Short-term bank financing cost has remained at levels consistent with the monetary policy rate, while the cost of long-term debt issuances for firms and banks has declined. Furthermore, interest rates on local sovereign bonds have remained below historical averages. However, in relation to the previous FSR, an increase was observed, which is largely explained by a lower demand for local sovereign bonds by pension funds (PF) as a result of a portfolio rebalancing toward higher risk funds. This divestment, that was also observed for mutual funds (MF), was mainly absorbed by banks. Meanwhile, during the current year, non-resident investors (NRIs) doubled their share in the local market, although within low ranges if compared to other emerging economies.

Sudden hikes of external interest rates are a relevant risk to be under continuing monitoring. It is expected that the policy rates increases and the reduction of the balance sheets of central banks in developed economies decompress term premiums. This could push up the long-term local interest rate

by up to 80% of its external counterpart increase, according to internal estimates. In a baseline scenario where this process is gradual, it cannot be ruled out that unexpected news translate into abrupt changes, or of larger than originally expected magnitude. In this context, the large volume of assets managed by medium-and long-term debt mutual funds (MF3) constitutes a vulnerability to be monitored. While at the margin there is a reversal in the volume of assets managed in MF3, internal estimates suggest that a rise of 100bp in the long-term rate could induce massive short-term withdrawals of assets managed by these investors, generating thus a significant impact on the volume of instruments usually traded. This situation could become even more complex if other market participants (such as PF and NRI) were to reduce their fixed income positions in tandem. This could imply temporary disruptions in the local debt markets, exacerbating interest rate swings. Meanwhile, a normalization of levels of risk aversion would have an impact on the cost of external funding for emerging economies, Chile included, beyond the possible increases in the base rate. In particular, after this normalization, the Chilean risk premium (measured by the EMBI) would tend to increase, affecting entities that require refinancing their liabilities in the short term.

Since the last FSR, aggregate indebtedness of local firms decreased, reaching 113% of GDP in the third quarter. The reduction in one year was 0.9% in real terms, and was mainly explained by the exchange rate effect in the valuation of its external component. In turn, the increase in corporate bond issuances, observed since mid-2016, has not translated into higher debt. On the contrary, the low cash flow for investment suggests that these funds have been used to refinance liabilities, consistent with the low level of interest rates. Meanwhile, the non-payment indicators show a marginal deterioration with respect to the previous FSR, although they remain at low levels. For the services sector, this increase has been concentrated among certain real estate firms. In the case of productive sectors, there was an increase in construction, transportation and telecommunications, and utilities; while mining, retail and manufacturing have seen the term of their payment delays protract, due to the low recovery of the loans that fell into that situation and that were mentioned in the previous *Report*.

The figures of the residential real estate market have stabilized in recent quarters. After the adjustment process reported in previous FSRs, new housing sales in Santiago have remained stable for several quarters. Meanwhile, during the second quarter of 2017, different price indicators —both at a national level and for the Santiago Metropolitan Region— showed positive but low growth. Activity in the residential construction sector remains weak and different sources of information suggest a recovery remains elusive. Moreover, monitoring is required on the adjustment of the sector to the entry into force of Law 20,958 of Contributions to Public Space, which seeks to make real estate projects internalize the impacts they generate on local mobility. Finally, regarding mortgage financing, the stock of mortgage loans showed a rebound in the current quarter. The number of mortgage borrowers with more than one loan granted by a bank continues to grow, reaching 29% of borrowers at the cutoff date of this *Report.* A subset of such debtors would be retail investors, who acquire properties for leasing.

The financial indicators of households show that the risks reported for this sector in the previous FSR remain and are largely tied to the future evolution of the labor market. Since the last FSR, bank mortgage debt increased, while consumer debt from banking sources subdued its expansion rates, while it accelerated for non-banking sources. Thus, total debt of the sector reached 45% of GDP during the second quarter of the current year, placing Chile at the upper part of a sample of emerging countries but below developed economies. Nonetheless, the median of debt service has remained stable around 20% of income. In terms of financial margin, there was a greater use of lines of credit and revolving loans, which accounts for tighter conditions for some households. Regarding default indicators, they have remained relatively stable at low levels for mortgage loans and have showed increases in consumer loans. In particular, consumer write-offs in banking debt and delinquency in loans granted by retail stores have increased. Moving forward, a scenario of deterioration in the labor market would affect the sector, particularly those households that have lower financial margin to face negative income shocks. Meanwhile, a scenario of higher interest rates would have a relatively smaller direct impact on households that maintain debt —mostly because these obligations are originated at a fixed interest rate and long maturities— which would not be the case for those households acquiring or refinancing debt. However, the total impact of this scenario on the sector could be greater when taking into account the macroeconomic effects entailed by higher interest rates.

Financial figures for the banking system indicate that it remains healthy, although capitalization is lagging behind with respect to international standards. Profitability and solvency indicators have stabilized, liquidity and currency mismatches remain low, and significant changes in dividend policies have not been recorded. In terms of credit risk, there is a deterioration in the quality of the individually evaluated commercial loan portfolio, which has been covered with greater guarantees. While this strategy reduces idiosyncratic risk at the bank level, it entails a systemic vulnerability when facing events that simultaneously reduce both the payment capacity of the firms and the value of the collateral. This is a risk factor that should be monitored considering that 45% of the total bank loan portfolio belongs in this category. On the other hand, stress tests indicate that an adverse scenario, where activity slows down slightly but is protracted, would represent risks for the system that are comparable to those of a severe scenario where activity falls sharply and quickly recovers. Thus, in the adverse scenario described above, the fraction of banks that maintain their capital adequacy ratio (CAR) above 10% would represent 57% of total banking assets. While under the severe scenario, this amount would be 50%. This contrasts with what was seen in 2012, when the fraction of banks with CAR over 10% in the severe scenario represented almost all of the total banking assets. These elements point toward increasing the resilience of the sector through higher capitalization, a situation that has already been recognized by other jurisdictions. Accordingly, the new General Banking Law that modernizes the current banking legislation contributes to strengthening the capital requirements for the local banking system.

Indeed, one of the main milestones in terms of financial regulation was the sending of the bill that modernizes the banking legislation to Congress. This bill aims to incorporate international experience and standards. One of the tools that it includes is the counter-cyclical capital buffer (CCyB), which seeks to increase the resilience of the banking system to absorb potential losses and reducing volatility throughout the financial cycles. In this sense, it becomes crucial to identify local financial cycles, taking into account not only external factors but also the idiosyncrasy of the Chilean banking system; elements that are addressed in this FSR through a thematic chapter. Given that the implementation of this policy will be the Central Bank of Chile´s task, the Board will continue focusing efforts on the exploration of alternatives for its proper implementation, taking into account both its benefits and the corresponding direct and indirect potential costs.

I. EXTERNAL RISKS AND FINANCIAL MARKET TRENDS

The high external long rates could have a significant impact on local rates, causing institutional investors to sell their fixed-income instruments and driving up the cost of financing for local agents. The low global risk aversion could increase across the board, triggering a reversion of the upward trend of different asset prices both internationally and locally. Geopolitical factors are still present in the developed world, and China's high debt level continues to pose a risk for the emerging economies.

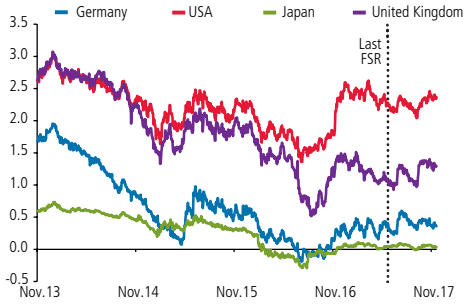
EVOLUTION OF THE INTERNATIONAL FINANCIAL SITUATION

External interest rates are still low, despite the less expansionary bias of monetary policy in some developed economies.

Financial conditions have been favorable for several years, driven by expansionary central bank policies in developed economies. However, there has recently been a change in this expansionary bias. The U.S. Federal Reserve (Fed) continued the monetary policy normalization process, increasing its reference rate at the June meeting and signaling a future hike for December of this year. In October, the Fed began a gradual reduction of its balance sheet through the mechanism of progressively not rolling over its securities holdings, which could put upward pressure on longer-term rates[1]/. The European Central Bank, in turn, announced that it will reduce its monthly bond purchases from 60 billion euros a month to 30 billion starting next year, although it held open the possibility of increasing the amount if the economic outlook turns less favorable in 2018. The Bank of England raised its policy rate by 25 basis points (bp) in November, after having held it at 0.25% for a little over a decade; the market expects the next increase in August 2018.

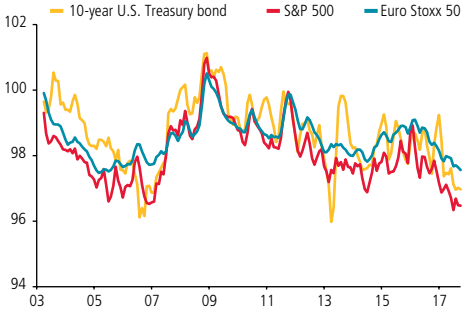
This widespread reduction in the monetary stimulus has occurred in a context in which the growth outlook for 2018 has improved at the global level, and both current inflation rates and inflation expectations have been relatively low, in some cases below the targets set by the monetary authorities[2]/. Long-term interest rates in the main developed economies remained around the levels recorded since late 2016, albeit with some variability (figure I.1).

FIGURE I.1
Interest rates on 10-year sovereign bonds
(percent)



Source: Bloomberg.

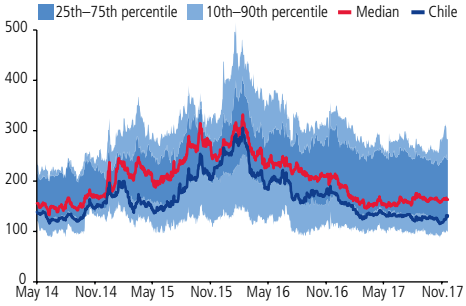
FIGURE I.2
Risk aversion measures (*)
(index: Feb.03=100, 3-month moving average)



(*) For more detail on the methodology, see Baker et al. (2016).
Source: Central Bank of Chile, based on data from Bloomberg.

[1]/ The reduction in the Fed's balance sheet consists in not rolling over its holdings of Treasuries and mortgage-related securities.
[2]/ The one exception to this trend is Japan, which has kept its policy rate at –0.1% and maintains a sovereign bond purchase program with the objective of keeping the ten-year sovereign interest rate around 0%.

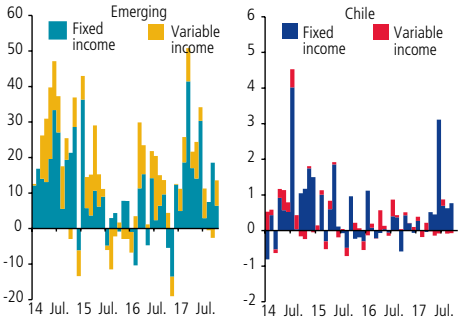
FIGURE I.3
EMBI: selected economies (*)
(basis points)



(*) Includes Brazil, Chile, China, Colombia, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa, and Turkey.

Source: Central Bank of Chile, based on data from Bloomberg.

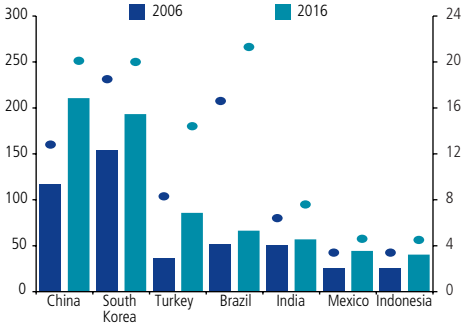
FIGURE I.4
Portfolio flows to emerging economies (*)
(US$ billion)



(*) Emerging: Brazil, Bulgaria, Chile, China, Czech Rep., Hungary, India, Indonesia, South Korea, Malaysia, Mexico, Philippines, Poland, South Africa, Taiwan, Thailand, Turkey, and Ukraine. Last datum, right panel: September 2017.

Sources: Central Bank of Chile and Institute of International Finance.

FIGURE I.5
Private debt: households and nonfinancial firms (*)
(percent)



(*) Bars (left axis): total credit to the nonfinancial private sector (households and nonfinancial firms) over GDP; dots (right axis): debt service-to-GDP ratios.

Source: Bank for International Settlements.

Given the global climate of lower volatility and less policy uncertainty, risk aversion fell, putting upward pressure on financial prices and increasing capital inflows to emerging economies.

Global indicators of policy uncertainty have declined since the last FSR, in line with the moderation of trade and regulatory reform plans in the United States and the consolidation of the political outlook in Europe. At the same time, global measures of financial stress and volatility decreased (see the statistical appendix). The latter trend has to do with a reduction in risk aversion among fixed- and variable-income investors in the main international markets (figure I.2)[3]/.

Thus, the widespread search for higher returns that has taken off in this climate of low interest rates and abundant international monetary liquidity has pushed up many financial prices in developed economies to the levels recorded before the global financial crisis (BIS, 2017; IMF, 2017a). Both lower-rated bond spreads and emerging market sovereign spreads (EMBI) have narrowed (figure I.3). In this context, capital inflows to emerging economies remained dynamic relative to past quarters; in Chile, foreign capital inflows to portfolio instruments were mainly in fixed-income securities (figure I.4 and statistical appendix).

Although the growth outlook for emerging economies improved at the margin, China's financial situation remains complex.

Short-term concerns about China's financial situation have eased, due to higher-than-expected economic growth (*Monetary Policy Report*, December 2017), tighter monetary policy, better macroprudential measures, and increased regulation and transparency initiatives for the shadow banking sector. The financial situation is still vulnerable, however. In particular, the growth of credit to households and nonfinancial firms remains dynamic, reaching 210% of GDP in 2016 and with a high debt service relative to other emerging economies (figure I.5). Although the credit growth rate in the shadow banking sector has slowed to a degree, some alternative forms of financing provided by small and medium-sized banks have increased the lack of transparency in lending, which carries risks for China's financial stability (IMF, 2017a). Moreover, the Chinese monetary authority has expressed concern regarding the importance of improving the fiscal rules that control local government financing[4]/.

[3]/ The degree of risk aversion can be approximated by the difference between an asset's implicit volatility and its actual volatility (Bekaert et al., 2013; BIS, 2017).
[4]/ See the speech by the Governor of the People's Bank of China, Zhou Xiaochuan, "Prospects of the Chinese economy – broad-based growth,", in the 32nd Annual G30 International Banking Seminar.

Emerging economies, on average, recorded a relatively better performance (IMF, 2017b). In the region, the favorable global context has allowed expansionary monetary policy in some countries, which has facilitated their financial conditions[5]/. While recent financial stability reports signal some common concerns about the worsening of the credit portfolio and less dynamic lending, in general the domestic and political vulnerability indicators for these countries have been stable or improved relative to a year ago (statistical appendix).

EVOLUTION OF THE LOCAL FINANCIAL SITUATION

The favorable international financial conditions have been reflected at the local level.

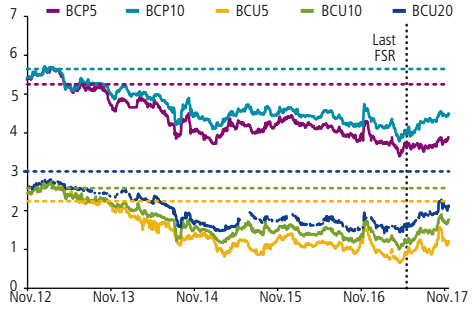
In line with the reduction in international risk aversion, local financial asset prices have trended upward, due to higher demand from both local and international investors. Thus, local sovereign rates are below their historical averages, although they have increased around 30 bp since the last FSR. This is mainly explained by lower demand for local sovereign bonds on the part of the pension funds, as the result of a portfolio redistribution toward higher-risk funds (figure I.6).

Short-term bank financing is consistent with the monetary policy rate, with no significant volatility (figure I.7). The cost of long-term debt issues for corporations and banks has narrowed recently, offsetting the recent rise in sovereign rates and thus keeping the cost of financing relatively stable for these agents. This stimulated local private bond issues, which, together with overseas issues, brought the flow of debt issues to new peaks (figure I.8). In the case of corporations, a large share of the funds raised went toward liability refinancing (chapter II). In the case of banks, the domestic issues were a replacement for both external financing and the use of time deposits by institutional investors (chapter III).

Finally, other local asset prices have also recorded a positive trend. In particular, the copper price has risen since the last FSR, which translated into a 5.5% appreciation of the peso against the U.S. dollar. The local stock market also rebounded on the order of 10% as of the cutoff date of this *Report*.

[5]/ These include Brazil, Colombia, and Peru. As mentioned in the last FSR, Mexico implemented a monetary tightening process that came to a close in the second half of 2017.

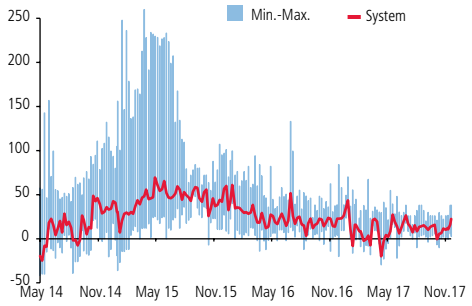
FIGURE I.6
Long-term sovereign bond rates (*)
(percent)



(*) Horizontal lines: 2004–2016 average of the respective series.

Source: Central Bank of Chile.

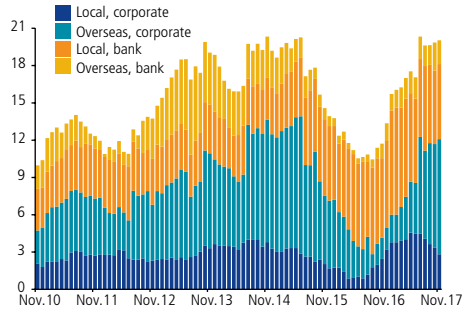
FIGURE I.7
30-day deposit rates (*)
(basis points, spread over MPR)



(*) Weekly statistics calculated based on daily data on deposit transactions on the exchange, by issuer.

Source: Central Bank of Chile, based on data from the BCS and CSD.

FIGURE I.8
Bank and corporate bond issues
(US$ billion 12-month moving sum)



Source: Central Bank of Chile, based on data from the BCS and Bloomberg.

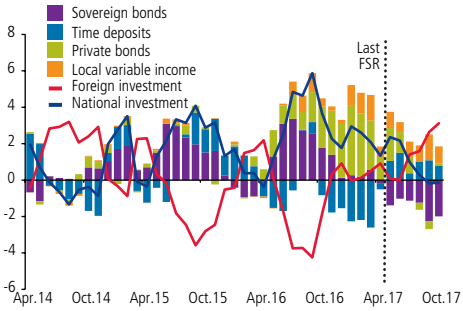
TABLE I.1
Annual transfers between funds
(US$ million)

	2012	2013	2014	2015	2016	2017(*)
Type A fund	-1.691	755	-2.696	537	-6.117	3.593
Type C fund	-1.250	-584	-321	514	-2.693	2.868
Type E fund	4.617	742	4.487	-882	12.723	-7.505

(*) Data through 20 November 2017.

Source: Superintendence of Pension Funds.

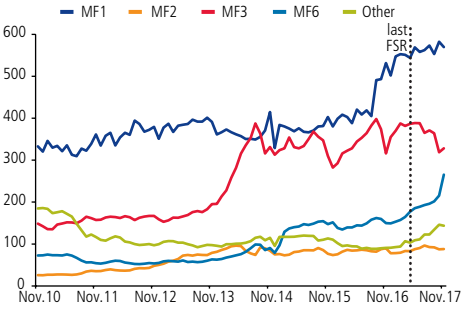
FIGURE I.9
Pension fund investment flows (*)
(US$ billion, 3-month moving sum)



(*) Net movements by instrument, including purchases, sales, redemptions, and drawings. Excludes derivative maturities, rebates, dividends, and coupon cuts.

Source: Superintendence of Pensions Funds.

FIGURE I.10
Mutual fund equity (*)
(UF million)



(*) Type of fund: MF1: debt with a duration of 90 days or less; MF2: debt with a duration of 365 days or less; MF3: medium- and long-term debt; MF6: free investment; Other: type 4, 5, 7, and 8 funds.

Source: Superintendence of Securities and Insurance.

The pension funds and mutual funds have sold a significant share of their local sovereign holdings, while the share of nonresident investors has recently increased.

While the pension funds are still the primary holders of local sovereign debt, their share has decreased at the margin, as has the share of the mutual funds. This disinvestment was absorbed primarily by banks. Nonresident investors increased their share in this market through the purchase of General Treasury bonds, accounting for 7.4% in the third quarter of this year, versus 3.5% in late 2016. The increased participation of these agents has been made possible by a series of factors, including the new issue approach (larger volumes), the simplification of reporting by the Central Bank, and the recent legal and regulatory changes that have facilitated international custody operations in Chile. Even so, although the share of nonresident investors doubled in the past year, it is still low relative to other emerging economies.

The pension funds underwent a significant redistribution of their members since the last FSR, with nearly US$7 billion moving out of the most conservative type E funds and into relatively higher risk funds (table I.1), which have been earning higher returns. These transfers have been reflected in changes in the pension fund investment portfolios, which offset the resulting lower exposure to local sovereign bonds with an increase in variable-income investments, both local and overseas (figure I.9).

The equity managed by the mutual funds increased since the last FSR, mainly in money market funds (MF1), which mostly invest in short-term fixed-income instruments such as time deposits. The equity held in type 3 mutual funds (MF3) decreased 17% since the last FSR—due to lower yields deriving from the increase in medium- and long-term interest rates—but it is still relatively high by historical standards (figure I.10). In general, the MF3 are highly sensitive to changes in medium- and long-term interest rates, which could exacerbate the risks associated with a scenario involving high external rates.

The life insurance portfolios have been stable despite the higher limit on overseas investment.

The life insurance companies (LICs) have not made any major changes in portfolio composition since the last FSR. Notably, despite the 10% increase in the overseas investment limit set by the Central Bank, last March these investments were stable at around 13% of the total (table I.2). Within this category, the risk profile of their international fixed-income investments remains similar to past semesters.

MAIN THREATS TO FINANCIAL STABILITY

Sharp hikes in external interest rates continue to represent an important risk.

Monetary normalization in some developed economies could lead to larger rate increases than expected. For example, the potential effect of a reduction in the Fed's balance sheet on the term spread for ten-year U.S. Treasury rates is estimated at 20 to 40 bp in the next two years (Bonis et al., 2017). This effect could vary depending on the tone of the communication of future monetary policy decisions after the new Fed chairman takes office. In other jurisdictions, it is not clear how fast monetary policy will tighten.

According to internal estimates, this scenario could have a significant impact on local rates. One way to quantify the impact is through the pass-through coefficient, defined as the ratio between the accumulated response of the local interest rate to a shock in its external counterpart and the response of the external rate to the same, both estimated using a VAR model (McCarthy, 2007). This statistic has been somewhat variable over time, in particular in periods of higher uncertainty, so it could be as high as 80% (figure I.11).

The potential impact on the local market of the higher external long rates and greater international risk aversion could be exacerbated in the event that institutional investors start selling their bond holdings.

At the margin, there has been some reversion of local fixed-income investments (MF3 and type E pension funds), but the amount held by these investors remains high. Consequently, local interest rate hikes could induce a massive scaling back in their holdings, causing an impact on the normal trading volume and significant losses for other market participants.

Internal estimates suggest that a 100 bp increase in the local yield curve would imply a significant cutback in MF3 asset flows, which could trigger a massive sell-off in the short term. The magnitude of the impact on market volume would depend on the strategy used to sell these financial instruments. If more liquid assets are sold first (the most probable scenario), it could have a significant effect on deposit rates and sovereign bonds, thereby reinforcing the initial rate hike.

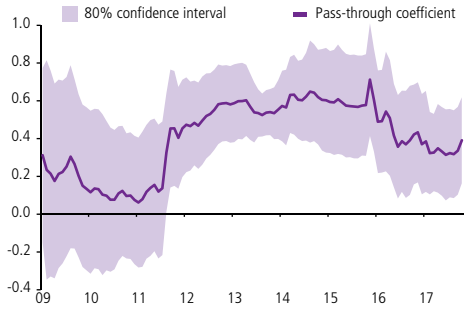
The situation would be compounded if other market agents also sold their fixed-income positions at the same time. For example, if the pension funds continued investing in variable-income assets to the detriment of fixed income, as has been the case in recent months, then the rate hike scenario described above could generate pension fund portfolio changes, either through investment decisions or through the transfer of members among funds.

TABLE I.2
Life insurance portfolios (1)
(percent)

	2012	2013	2014	2015	2016	2017
Sovereign fixed income	5.4	4.4	3.5	2.9	2.6	2.2
Private fixed income	54.1	52.4	51.0	51.4	50.0	48.9
Mortgage bonds	9.0	9.2	9.0	8.5	8.8	8.9
Real estate	12.6	13.4	14.2	14.2	15.2	15.2
Variable income	6.9	6.3	6.4	6.8	7.2	8.3
Foreign	9.5	11.3	12.7	13.1	13.1	13.7
Other (2)	2.5	3.0	3.2	3.1	3.1	3.1

(1) Percent of total investment. Data through September 2017.
(2) Includes cash, loans, syndicated loans, and other financial investments.
Source: Superintendence of Security and Insurance.

FIGURE I.11
Pass-through from 10-year T-Note to BCP-10 (*)
(coefficient)



(*) Pass-through coefficient is the ratio between the accumulated response of the local rate to a shock in its external counterpart and the response of the external interest rate to the same, both after three months. Calculated in 60-month moving windows. VAR(1) model for the following variables, in levels: 10-year T-note yield, expected exchange rate depreciation, EMBI Chile, 10-year BCP yield.
Source: Central Bank of Chile, based on data from Bloomberg.

An increase in risk aversion among foreign investors could increase the cost of external financing and cool down capital flows to emerging economies.

While there are no major concerns about global financial stability in the short term, the high asset prices, unusually compressed spreads, and historically low volatility could be incubating the risk of sharp corrections in the medium term (IMF, 2017a). In the event of an increase in risk aversion, the impact of international rate hikes on the cost of international financing would be exacerbated, causing a slowdown in foreign capital flows to emerging economies[6]/.

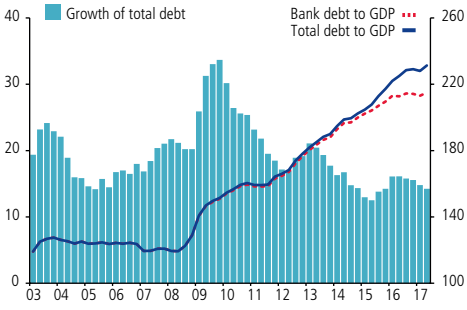
Higher local financing costs would have a limited impact on local private banks, firms, and households.

Internal estimates suggest that a rise in long rates would have a relatively limited impact for local banks and firms, given the composition of their debt. The current favorable financial scenario has allowed these entities to refinance their debt before maturity, reducing both their financial expense and their exposure to changes in short-term funding costs. Similarly, for households, the risk of changes in financing conditions are relatively low because a large share of loans are contracted at a fixed rate, reflecting a low need to refinance debt in the short term (chapter II).

China's financial situation continues to represent a risk for emerging economies.

Early warning indicators of stress in the Chinese banking system are above their critical thresholds, highlighting the sector's vulnerability. In particular, the credit-to-GDP ratio is well above its trend, at 22.1% in the first quarter of 2017, whereas the critical threshold is 10% (BIS, 2017).7 The high credit levels in China are still a concern, given that a large share is from nonbank sources (figure I.12) which, while intermediated by the banks, is conducted through off-balance-sheet activities (Ahmed, 2017). Although the authorities have taken some measures to contain the risks deriving from this lack of transparency (FSB, 2017), there is still a risk that a greater financial deterioration in China could trigger significant financial volatility in international markets, with a subsequent impact on emerging economies. Alfaro et al. (2017) establish that changes in the EMBI for China affect the EMBI for countries in Latin America, which could be exacerbated in a climate of higher risk aversion.

FIGURE I.12
Credit growth in China (*)
(percent)



(*) Total debt includes off-balance-sheet financing, trusts, and corporate issues net of debt and shares.

Source: U.S. Federal Reserve.

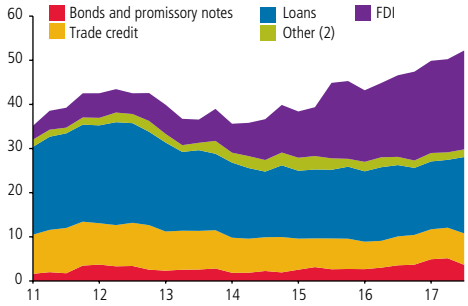
[6]/ In the most recent *Global Financial Stability Report* (GFSR), the International Monetary Fund considers a scenario in which this risk would imply a reduction in portfolio flows to emerging economies on the order of 1.5% of GDP in two years, on average.
[7]/ Chapter IV of this FSR provides background on the macroprudential policy implications of this indicator.

New political factors could give rise to a medium-term risk for international financial markets.

As mentioned earlier, indicators of policy uncertainty for the global economy have abated in the most recent period, due to a moderation of some of the factors mentioned in the last FSR. Nevertheless, new political developments could reverse this situation. The United States has communicated a number of regulatory changes and reform proposals in different areas—changes in the tax system, communication of different guidelines that relax financial system regulation, and even deep changes to the legal framework laid out in the Dodd-Frank Act—that could affect the outlook for fundamental prices in the economy and thus generate greater uncertainty, with adverse repercussions on the financial markets. In Europe, the United Kingdom's exit from the European Union continues to cause a high degree of uncertainty, and it is not yet possible to say whether the reconsideration of jurisdictional unification in some countries could result in adverse movements in financial markets in the Eurozone.

If these factors generate an increase in global uncertainty, it could lead to a decompression of sovereign spreads. This is particularly important for Chile, given the high sensitivity of its EMBI to increases in the VIX relative to other financial factors (Alfaro et al., 2017). However, Chile has a relatively favorable external position for facing such a scenario. Although residual short-term external debt has increased to 19.1% of GDP as of the third quarter of 2017, the increase is largely explained by FDI-related loans (figure I.13). If this component is excluded—which represents specific financial commitments between parent and affiliate firms—then the current level of reserves is sufficient to cover the country's short-term financing needs.

FIGURE I.13
Residual short-term external debt (1)
(US$ billion)



(1) Quarterly data. Data through third quarter of 2017.
(2) Includes currency and deposits, and money market instruments.
Source: Central Bank of Chile.

II. CREDIT USERS

The financial situation of local firms has not changed substantially since the last FSR. However, arrears indicators have increased slightly in some sectors, such as real estate and construction. In the residential real estate sector, new home sales stabilized, and prices continued to rise, albeit at modest rates, in contrast to the trend in past years. Household debt continued to grow, mainly through mortgage debt, but without increasing the financial burden.

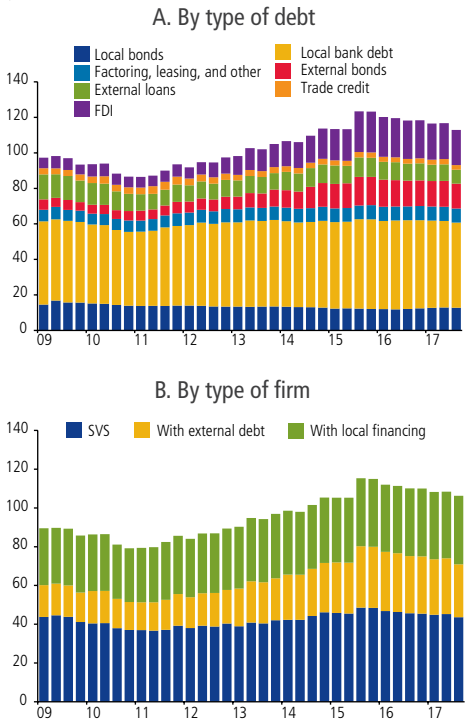
FIRMS

At the end of the third quarter of 2017, the debt of firms had decreased relative to the last FSR, to 113% of GDP (figure II.1a).

The debt of firms contracted 0.9% in real annual terms in the third quarter of the year, mainly due to the exchange rate effect on the valuation of external debt. This reduction was partially offset by the growth of local bonds, while commercial loans were less dynamic (table II.1).

By type of firm, the debt-to-GDP ratio decreased slightly for firms that report to the Superintendence of Securities and Insurance (SVS) and firms that hold external debt, while it was stable for firms with only local financing (figure II.1b).

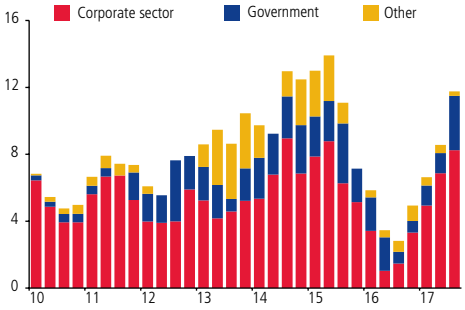
FIGURE II.1
Total debt of nonbank firms (*)
(percent of GDP)



(*) Based on firm.-level data, with the exception of factoring, leasing, and other, securitized bonds, and commercial paper. For more details on the series and methodologies, see the figure set.

Source: Central Bank of Chile, based on data from Achef, SBIF, and SVS.

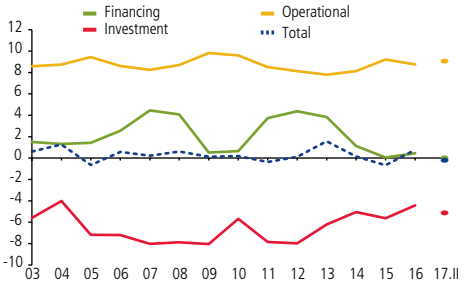
FIGURE II.2
Bond issues by nonbank firms (*)
(US$ billion, 12-month moving sum)



(*) Other includes local and overseas issues by firms in the financial services and mining sectors that report to the SVS, as well as issues by non-reporting firms.

Source: Central Bank of Chile, based on data from the BCS and SVS.

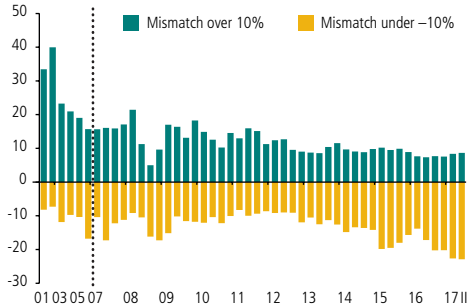
FIGURE II.3
Cash flow components (*)
(percent of total assets)



(*) Annual flows at the close of each year, before dividends, interest, and taxes, taken from consolidated financial statements of firms that report to the SVS, excluding state-owned companies and firms in the financial services and mining sectors.

Source: Central Bank of Chile, based on data from the SVS.

FIGURE II.4
Currency mismatch of firms in the corporate sector (*)
(percent of total assets)



(*) Based on a sample of firms that report their balance sheet in pesos. Annual data through 2006, quarterly data thereafter. Preliminary data for the second quarter of 2017. For more detail on the series and methodology, see the figure set..

Source: Central Bank of Chile, based on data from the SVS.

TABLE II.1
Sources of financing (1)
(real annual change, percent)

	2012	2013	2014	2015	2016	2017			Share	Contribution
	IV	IV	IV	IV	IV	I	II	III		to growth
Local debt	7.2	6.9	1.8	3.7	1.9	2.7	2.6	1.9	60.8	1.1
Bank and other loans	9.4	7.3	2.9	5.4	1.1	1.5	0.7	0.5	49.5	0.3
Commercial loans (2)	9.5	7.4	2.4	5.8	0.8	1.4	0.1	-0.4	42.4	-0.2
Factoring, leasing, and other	8.5	6.9	6.1	3.0	2.9	2.2	4.7	6.6	7.1	0.4
Local publicly traded securities	-0.8	5.3	-2.8	-3.3	5.6	8.5	9.9	8.5	11.3	0.9
External debt	9.2	26.4	27.7	22.5	-6.0	-5.4	-2.8	-5.0	39.2	-2.1
Loans	0.3	2.9	15.2	4.3	-8.1	-6.2	-5.6	-14.5	7.0	-1.2
Trade credit	-19.1	-0.7	-3.7	-1.2	-4.1	5.3	11.5	-0.4	2.3	0.0
Bonds	12.2	42.1	43.3	22.5	-7.1	-4.2	0.9	0.4	12.4	0.0
FDI-related loans	37.4	49.2	33.4	38.2	-4.4	-7.2	-5.8	-5.1	17.5	-0.9
Exchange rate	-7.7	11.0	15.8	14.9	-5.3	-3.1	-2.3	-6.4		
Total	7.8	12.7	10.5	11.0	-1.5	-0.7	0.2	-0.9	100.0	-0.9

(1) For more detail on the series and methodology, see the figure set. Shaded cells: preliminary data.
(2) Includes commercial loans to firms and individuals, foreign trade loans, and contingent loans. Excludes student loans to individuals.
Source: Central Bank of Chile, based on data from Achef, SBIF, and SVS.

Financial indicators for the corporate sector have not changed significantly relative to previous FSRs.

Since early 2017, both local and overseas bond issues have increased significantly, deriving primarily from the corporate sector (figure II.2)[1]/.Through the second quarter, however, the increase was not reflected in higher financing flows in these firms, as the issues were mainly oriented toward refinancing other liabilities. This contrasts with the dynamics of past events, when both financing and investment flows increased (figure II.3)[2]/. Given the low investment flows, corporate sector assets are around the level recorded in 2012.

According to accounting data for the corporate sector, at the end of the first half of 2017, annualized earnings, the debt level, and interest coverage were all in line with the same period of last year (table II.2). The currency mismatch was also stable relative to prior quarters (figure II.4 and statistical appendix).

Stress tests for the corporate sector[3]/ show that currency risk is relatively limited. Specifically, a scenario involving a deterioration in credit conditions, stemming from an increase in external interest rates and a peso depreciation, would not augment the share of firms with losses (figure II.5). This is explained by the firms' low financing costs, together with the large share of long-term financial debt and their limited exposure to currency risk in the event of such a scenario (figure II.4). The same tests also show, however, that a deterioration in output has significant effects on this risk measure (Espinosa et al., 2017).

[1]/ Firms that report to the SVS, are not in the financial services or mining sectors, and are not state-owned companies.
[2]/ For more details, see box II.1, FSR, First Half 2016.
[3]/ For more details, see box III.2, FSR, Second Half 2016.

TABLE II.2
Financial indicators for the SVS corporate sector (*)
(percent, times)

	2009	2010	2011	2012	2013	2014	2015	2016	Jun.16	Jun.17
Profitability										
Average	7.6	8.2	6.9	6.2	5.8	6.1	5.9	6.7	6.4	6.3
Median	6.6	7.5	7.5	6.1	6.2	5.7	5.4	5.7	5.6	5.4
Indebtedness										
Average	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Median	0.6	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.5	0.6
Coverage										
Average	3.9	4.4	3.5	3.1	2.9	3.1	3.1	3.3	3.3	3.1
Median	4.0	4.3	3.9	2.8	3.1	2.8	3.1	3.0	2.9	2.6

(*) Data as of December of each year, except the last two columns. Data for June consider twelve-month flows. Excludes financial, mining, and state-owned companies. Profitability (percent) defined as EBIT over total assets. Indebtedness (times) defined as financial debt over equity. Coverage (times) defined as EBIT over annual financial expense.

Source: Central Bank of Chile, based on data from the SVS.

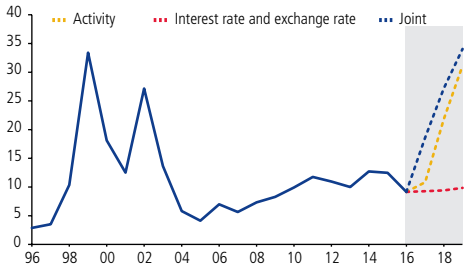
Profitability declined somewhat in 2016 relative to the previous year, at the national level (figure II.6), in line with the lower economic growth. Should this situation worsen, the effect on firms' sales could result in a deterioration of their financial behavior. Internal estimates indicate that a reduction in sales would increase the arrears rate (box II.1).

Default indicators increased for firms in both productive and service sectors.

In the most recent period, the evolution of the arrears ratio (AR) reveals a deterioration at the margin for firms in both the productive and service sectors[4/]. This is mainly explained by firms with local financing, although the levels remain low from a historical perspective (table II.3). The main sectors with an increase in new firms that have fallen into arrears are transport and telecommunications, real estate activity, construction, and EGW. The sectors with the most firms that have not been able to bring their payments up to date and have a larger share of debt that is past-due by more than a year are manufacturing and trade (figure II.7). Internal estimates indicate that a worsening of arrears is negatively correlated with the probability of paying off past-due debt (see FSR, Second Half 2015, box III.1).

[4/] The reduction in the arrears ratio in productive sectors in the second quarter of 2017 is largely explained by the exit of Rabobank from the local market.

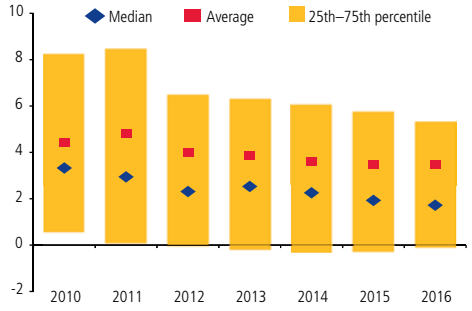
FIGURE II.5
Firms with losses, by type of shock (*)
(percent of total assets)



(*) Firms with losses have an interest coverage of less than one. Individual data for December of each year. Gray area indicates the forecast horizon.

Source: Central Bank of Chile, based on data from the SVS.

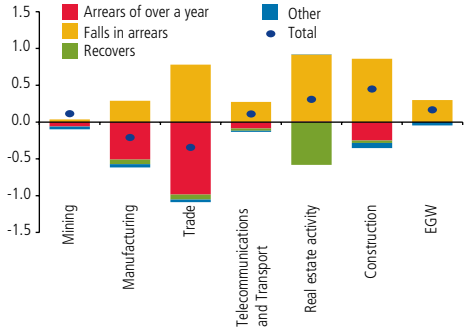
FIGURE II.6
Profitability of firms at the national level (*)
(percent)



(*) Period earnings over total assets (excluding intangible, nominal, deferred, and pro forma assets). Assets weighted by total assets. Excludes firms in the financial services and mining sectors. Data subject to revision.

Source: Central Bank of Chile, based on data from the Internal Revenue Service (SII).

FIGURE II.7
Change in AR between March and September 2017 (*)
(1/1000 of commercial debt)



(*) Only includes payments up to one year for firms with local financing; except for Total, which is up to three years. Other includes changes not covered in the previous categories.

Source: Central Bank of Chile, based on data from INE, SBIF, and SVS.

TABLE II.3
Arrears ratio (AR) (1)
(percent of loans)

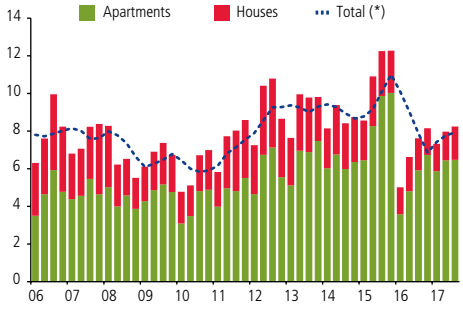
	2009	2010	2011	2012	2013	2014	2015	2016	Mar.17	Jun.17	Sept.17
Productive sector	1.6	1.6	1.4	1.4	1.7	2.0	1.7	1.5	1.5	1.5	1.6
Local financing (2)	3.0	2.7	2.1	2.4	2.7	2.7	2.5	2.5	2.5	2.4	2.6
Services sector	0.8	0.8	0.8	0.7	0.5	0.6	0.6	0.5	0.5	0.6	0.6
Local financing (2)	1.3	1.2	1.2	1.1	0.7	0.8	0.7	0.7	0.7	0.9	0.9
Total (3)	1.3	1.3	1.1	1.2	1.2	1.4	1.2	1.1	1.1	1.1	1.1
NPL	1.2	1.1	1.0	1.0	1.1	1.2	1.0	0.9	0.9	1.0	1.0

(1) Excluding contingent loans. Data are subject to revision. For more detail on the classification of economic activity, see the figure set.
(2) Firms that do not report to the SVS and do not have external debt.
(3) Includes loans with no sectoral classification and personal loans.

Source: Central Bank of Chile, based on data from INE, SBIF, IRS, and SVS.

In sum, in the third quarter of 2017, the aggregate indebtedness level of firms as a percent of GDP decreased, mainly due to the external component. The recent increase in debt issues has been focused on refinancing liabilities, which is in line with the lower investment flows of firms in the corporate sector. At the same time, although arrears indicators are low, there has been a recent deterioration in the payment behavior of firms, due to both an increase in new firms entering into arrears and an increase in past-due payments. This debt delinquency could be exacerbated in the face of a scenario involving lower economic growth and thus should be closely monitored.

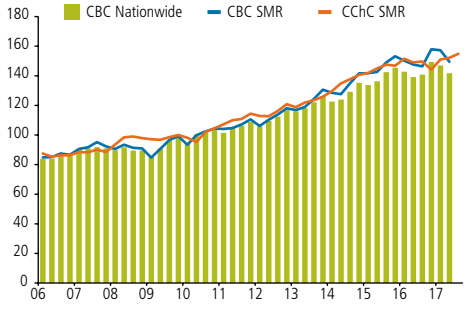
FIGURE II.8
New home sales in Santiago
(thousands of units)



(*) Twelve-month moving average.

Source: Central Bank of Chile, based on data from the CChC.

FIGURE II.9
Real house prices
(fixed-base index: 2010=100)



Sources: Central Bank of Chile and CChC.

REAL ESTATE SECTOR

Thus far in 2017, new home sales have stabilized, while home prices continued to rise, albeit at significantly lower rates than from 2010 to 2015.

As discussed in the last FSR, market indicators show that new home sales have stabilized around the level recorded before the introduction of the real estate VAT in 2016 and the associated increase in presales in 2015 (figure II.8). However, the stage of construction has changed since the last *Report:* 37% of homes sold in the fourth quarter of 2016 were completed or nearly completed, versus 52% in the third quarter of this year.

House prices have adjusted to the lower growth scenario. The growth rate of house price indicators for the Santiago Metropolitan Region (SMR) slowed relative to the period from 2010 to early 2016 (figure II.9). The house price index calculated by the Central Bank for the SMR—which includes existing transactions for new and used homes based on signed real estate contracts—increased 1.2% annually in the second

quarter of this year, versus a one-year moving average of 1.8%. The index calculated by the Chilean Chamber of Construction (CChC)—based on new homes and including letters of intent to purchase—increased 3.4% annually in the third quarter of 2017, up from a 0.9% average since the second half of 2016. Finally, Central Bank's national house price index increased 1.8% annually in the second quarter of 2017, versus an average of 1.6% since the second half of 2016. These data contrast with the growth rates recorded between 2010 and 2015.

Some firms in the sector are in a worse financial position.

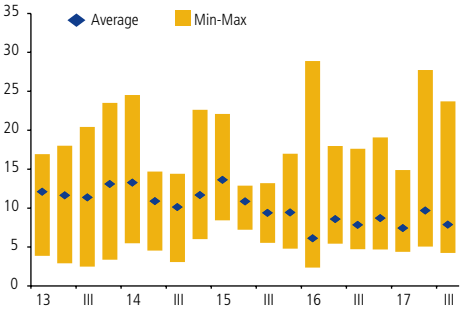
Real estate companies that report to the SVS recorded 6.5% profitability in the third quarter, marginally higher than the 6% reported at year-end 2016. However, in the second and third quarters of 2017, some companies saw an increase in contract cancellations, in line with the slowdown in the sector (figure II.10). When the sample is expanded to a broader group of firms associated with home sales (that is, firms in the construction and real estate activity sectors), the arrears index is seen to have increased (figure II.7). These developments are in line with the adjustments expected by the industry in the face of an economic downturn, and they were discussed in previous FSRs. If the weak economy continues, the deterioration of firms in the sector could intensify.

The loan-to-value ratio is concentrated around 80%.

As discussed in past FSRs, following the introduction of new regulatory guidelines on mortgage provisioning in January 2016, private banks revised their lending policies to bring the loan-to-value (LTV) ratio of mortgage loans to 80% or less (figure II.11). Even so, bank mortgage lending expanded in the third quarter of 2017, with an increase in the number of operations. This is partially associated with the presales of 2015, a large share of which were projects with delivery—and thus the deed and mortgage—scheduled for this year. Consequently, mortgage lending can be expected to slow once these presales are fully completed, in line with the evolution of the economy.

The number of debtors with more than one bank mortgage loan has increased significantly, from 20% of the stock of debt in 2010 to 30% in the third quarter of 2017 (figure II.12). This trend is consistent with the macroeconomic environment of low interest rates (chapter I), in which investment options have become scarce. Thus, as discussed in past FSRs, a subset of debtors with more than one mortgage loan are most likely retail investors. According to market data, the gross rate of return

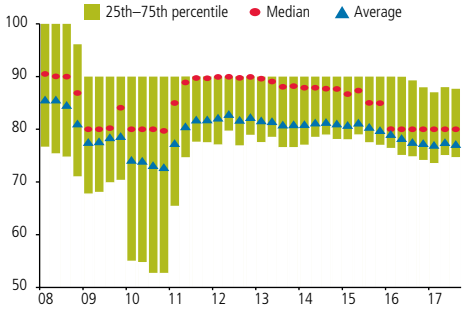
FIGURE II.10
Buy-sell agreement cancellation rate (*)
(percent of sales in the same quarter)



(*) Calculated based on the reviewed financial statements of 6 firms (of a total of 7) that report their financial statements to the SVS, as the ratio of cancellations to new agreements signed in the same quarter. Average is weighted by committed units.

Source: Central Bank of Chile, based on data from the SVS.

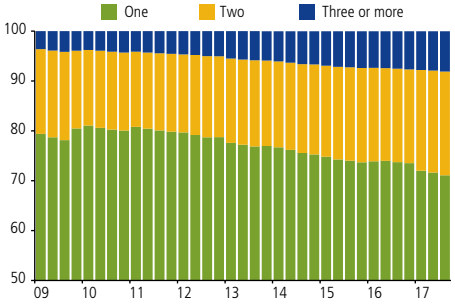
FIGURE II.11
Loan-to-value ratio (*)
(percent)



(*) Preliminary data for the third quarter of 2017.

Source: Central Bank of Chile, based on data from the IRS.

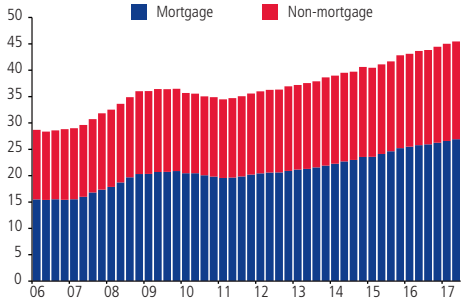
FIGURE II.12
Number of loans per debtor in the banking system (*)
(percent of total)



(*) Data weighted by debt. Preliminary data for the third quarter of 2017. Data through August 2017.

Source: Central Bank of Chile, based on data from SBIF.

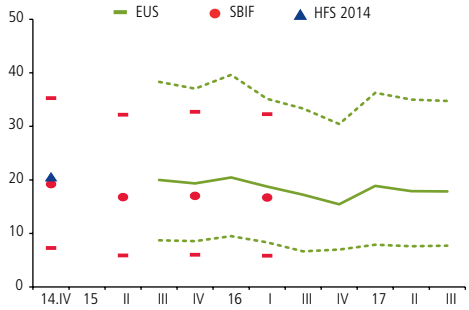
FIGURE II.13
Household debt (*)
(percent of GDP)



(*) For more detail on the series and methodology, see the figure set.

Source: Central Bank of Chile, based on data from DIPRES, SBIF, Suseso, and SVS.

FIGURE II.14
Financial burden (*)
(percent of income)



(*) EUS: Employment and Unemployment Survey. HFS: Household Financial Survey. SBIF: *Bank Debtors Report*. For the EUS data, the solid line graphs the 50th percentile; the dashed lines, the 25th–75th percentile. For the SBIF data, the circles graph the 50th percentile; the dashes, the 25th–75th percentile. For the HFS, the triangle graphs the 50th percentile.

Source: Central Bank of Chile, based on data from the University of Chile's Microdata Center and SBIF.

on buy-to-rent investments (that is, not accounting for vacancy periods, maintenance costs, taxes, or capital gains) is just under 6% in real annual terms, while the average mortgage rate in the third quarter was 3.2%. In the event that interest rates rise more than expected and are passed through to mortgage lending rates, the net return on new buy-to-rent investments purchases would drop, translating into potential real estate contract cancellations.

In the office market, vacancy rates declined in both the prime and class B segments.

The vacancy rate fell significantly in the prime office segment (A/A+), reaching 6% in the second quarter of this year after peaking at over 9% in the second quarter of 2015 (statistical appendix). In the class B segment, the vacancy rate was under 11%, declining at the margin due to increased absorption.

In sum, the residential real estate market shows signs that the period of adjustment following the introduction of the real estate VAT is coming to a close. House prices grew at low, but positive rates, in reflection of the macroeconomic scenario. Some real estate companies saw a worsening of their arrears indicators; others, an increase in contract cancellations. Mortgage loans recovered somewhat in the most recent period, consistent with the low mortgage interest rates and the natural process of converting the letters of intent signed in 2015 and 2016 into deeds. In this context, the larger number of bank debtors with more than one mortgage could be an incipient vulnerability, in particular under a possible scenario of higher long-term interest rates.

HOUSEHOLDS

Household debt levels continued to rise in the second quarter of 2017 (figure II.13).

Total household debt continued to grow, reaching 45% of GDP in June of this year, which is relatively high in a sample of emerging economies but lower than in developed countries (statistical appendix). This increase mainly derives from an increase in bank mortgage debt, although the share of debt from nonbank sources has also grown. However, different sources based on administrative data and surveys indicate that the median financial burden carried by these households is stable, at 20% of income (figure II.14). In terms of a financial cushion, the use of credit lines and revolving credit increased, revealing that at least some households are living on a tighter budget.

In the third quarter of 2017, the growth rate of the stock of mortgage debt was more dynamic. This trend incorporates a reduction in the number of debtors and a corresponding increase in average debt (figure II.15), which reflects the increase in the share of debtors carrying more than one mortgage (figure II.12). The growth rate of non-mortgage debt has been stable at just under 7%, and the share of bank credit has declined (table II.4).

TABLE II.4
Household debt
(real annual change, percent)

	2010	2011	2012	2013	2014	2015	2016	2017			Contribution to growth	Share
	IV	IV	IV	IV	IV	IV	IV	I	II	III		
Mortgage	**6.8**	**7.3**	**7.6**	**8.9**	**9.9**	**9.6**	**6.7**	**6.8**	**7.3**		**4.3**	**58.9**
Bank	9.1	8.2	8.3	9.1	10.5	10.6	6.6	6.7	7.2	8.1	3.8	53.5
Nonbank	-7.2	0.9	2.5	6.9	4.7	1.1	7.9	8.1	8.0		0.4	5.4
Non-mortgage	**8.4**	**10.4**	**6.6**	**8.4**	**3.6**	**5.8**	**6.7**	**7.1**	**6.4**		**2.6**	**41.1**
Bank consumer	9.4	14.2	9.7	9.1	3.3	3.3	5.8	5.8	5.0	4.4	1.1	21.9
Bank non-consumer(1)	4.9	-0.2	-6.7	2.4	0.7	1.0	5.5	6.8	7.0		0.6	9.0
Other (2)	12.4	19.5	19.3	14.3	8.2	17.6	9.7	10.7	8.9		0.9	10.2
Total	**7.5**	**8.7**	**7.2**	**8.7**	**7.2**	**8.0**	**6.7**	**6.9**	**6.9**		**6.9**	**100.0**

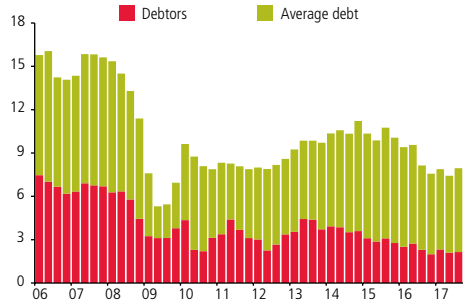
(1) Includes debt with retailers, family compensation funds (CCAF), and savings and loan associations. Starting in 2015.II, data for Cencosud are estimated based on Scotiabank's financial statements.
(2) Includes student loans (government-backed bank and General Treasury loans, private bank loans, and Corfo), leasing and insurance companies, and central government (Fonasa and other).

Source: Central Bank of Chile, based on data from DIPRES, SBIF, Suseso, and SVS.

Household financial indicators demonstrate that the risks reported in the last FSR are still present. Thus, a deterioration of labor market could imply an increase in arrears in the sector.

Default indicators for mortgage loans were relatively stable at low levels, after falling between 2013 and 2015, as reported in previous FSRs. For consumer loans, traditional default indicators were stable, but alternative measures point to an increase in the recent period (chapter III). In particular, consumer loan write-offs increased in the banking sector, as did arrears on nonbank credit from lenders such as the family compensation funds (CCAF) and retailers (statistical appendix). A scenario involving a weakening labor market could worsen the increase in arrears seen in the sector to date. Over the last five years, the increase in bank default in the different regions of the country has paralleled the dynamics of the regional unemployment rate (figure II.16). In contrast, a scenario involving higher interest rates would have a limited effect on

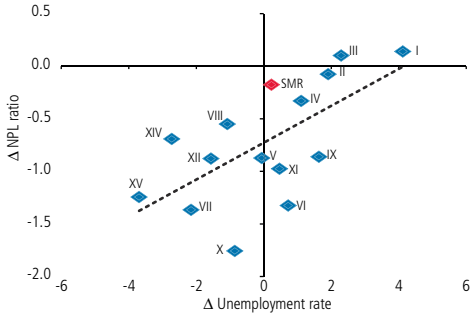
FIGURE II.15
Household mortgage debt (*)
(real annual change, percent)



(*) The first part of the sample (pre-2009) uses SBIF data on debtors and loans. After 2009, administrative data are used.

Source: Central Bank of Chile, based on data from the SBIF and SVS.

FIGURE II.16
Unemployment rate and nonperforming loan (NPL) ratio, by region (*)
(percentage points)



(*) Change in the unemployment rate from February 2012 to February 2017. Change in the NPL ratio from August 2012 to August 2017. Dashed line: linear regression of the change in the NPL ratio on the unemployment rate.

Source: Central Bank of Chile, based on data from INE and SBIF.

arrears and default among current debtors, because their loans were contracted at a fixed rate and a relatively long duration, which reduces exposure to changes in interest rates. This would not be the case, however, for households that are refinancing old loans or acquiring new ones. Madeira (2017) finds that an interest rate shock of 150 bp has a small effect on the delinquency of household consumer loans. With regard to the interest rate exposure of mortgage debt, the first factor to take into account is that although mortgage loans are indexed to inflation, the majority have fixed rates (97% of the flow in September 2017) and a long duration (22 years, on average, in September 2017). Second, the low rates between 2004 and 2005 caused a large share of the existing loan stock to be refinanced at a variable rate. Taken together, these two trends reduce the potential impact of a rate hike on household debt service payments. However, the total impact of this scenario on the sector would be greater in magnitude given the macroeconomic effects of higher interest rate. In sum, household indebtedness continues to be driven primarily by the mortgage component, although the share of non-mortgage debt is increasing. Finally, traditional indicators of household credit risk have fallen or been stable, but alternative measures show a deterioration of the consumer portfolio that should be closely monitored. In this context, a sharper weakening of the labor market could reduce households' financial cushion and potentially worsen household arrears and default.

BOX II.1
FIRM SALES AND LOAN DELINQUENCY

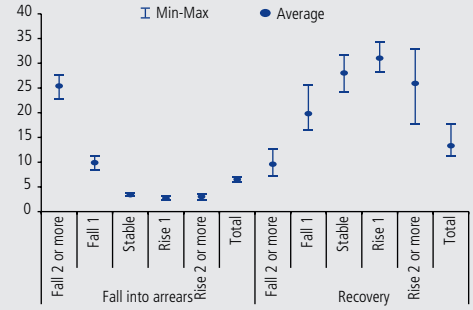
The literature highlights some stylized facts on the relation between the size of a firm and its economic performance[1]/. For example, if firm size is measured through sales volume, then (i) the probability of a firm surviving is negatively related to size; (ii) small firms grow faster than large firms; and (iii) the variance of growth is higher in small firms. However, there is little evidence—especially for emerging economies, including Chile—on the relation between changes in a firm's sales volume and its arrears position. This box contributes in this direction, studying the case of firms in the productive sectors that do not have external debt and are not registered in the SVS, whose main source of financing is bank credit.

The arrears position of firms from 2009 to 2017 is taken from the monthly records in the debtor system maintained by the SBIF; in the absence of firm-level data on sales volume, sales levels are used, available internally at an annual frequency. The data contain 12 sales categories. For the purposes of this box, a "drop in sales" implies moving into a lower category from one year to the next. A drop in sales between year t–1 and year t is then compared with the arrears position in January of year t+1, in order to evaluate the implications of a change in sales levels on the probability of entering or exiting arrears. To analyze these probabilities, the following ratios are calculated: (i) the ratio between the number of firms that became delinquent between one year and the next, relative to the total number of firms that were in good standing at the start of the year (entry into arrears); and (ii) the ratio between the number of firms that caught up on past-due payments from one year to the next, relative to the total number of firms in arrears at the start of the year (recovery).

As expected, the probability of becoming delinquent increases when firms see a drop in sales. Firms that move into a lower sales level have an arrears probability of nearly 10%, which more than doubles if the firm drops two or more levels. In contrast, there is no significant change in the probability of falling into arrears for firms that maintain or increase their sales (figure II.17, left panel).

The probability of exiting a situation of arrears is significantly lower for firms in which sales decrease by more than two levels than for firms that maintain or increase sales. Finally, the probability of settling past-due payments in the event of an increase in sales ranges from 20 to 30% (figure II.17, right panel).

FIGURE II.17
Probability of entering and exiting arrears due to changes in sales level (*)
(percent)



(*) Dots show the average probability for the whole sample. Minimum and maximum represent the range in different years.

Source: Central Bank of Chile, based on data from INE, SBIF, and SVS.

In conclusion, significant reductions in sales that cause a firm to drop into a lower sales level contribute to the probability that firms will fall behind on payments and also affect the possibility that they will be able to rectify the situation. Sales dynamics thus provide important information on a firm's risk. Therefore, in the face of a prolonged low-growth scenario, it is important to consider the sales adjustments that these firms can endure without a deterioration in their payment behavior. This is especially the case for firms that have already made margin adjustments.

[1]/ See Akcigit and Kerr (2017); Klette and Kortum (2004); Caves (1998); Sutton (1997).

III. BANKING SYSTEM

Credit has evolved in line with economic activity. The traditional credit risk indicators remain low, but alternative measures show a deterioration in the commercial and consumer portfolios. The banking system's financial indicators are healthy, although capitalization is behind international standards. Stress tests indicate that the banking sector remains in a sufficiently solid position to face the impact to stress scenarios.

RECENT EVOLUTION

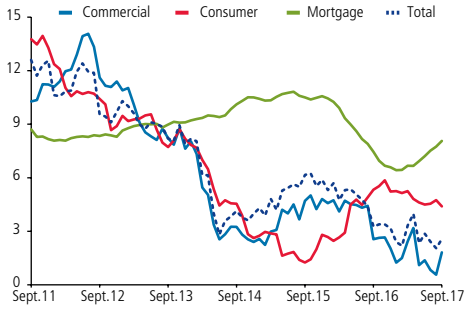
In a context of slow economic activity and low interest rates, the commercial and consumer portfolios recorded little growth. In contrast, mortgage loans were dynamic, with a marked recovery starting this year (figure III.1).

The growth of the commercial portfolio has been slightly under economic activity, relative to the historical trend (figure III.2). However, the slowdown in this portfolio reported in past FSRs has begun to ease. Firms' demand for this type of financing is perceived as being less weak, according to the results of the Bank Lending Survey (BLS) for the third quarter of this year. This is consistent with the fact that the debt of firms remains more or less aligned with GDP (chapter II).

The growth rate of the consumer loan portfolio fell below 5%, due to lower growth of revolving credit (credit cards and lines), which nevertheless continue to increase. Consumer divisions continued to contract, as reported in past FSRs. Their share of the total stock of consumer loans decreased from 13% in 2013 to less than 9% in the third quarter of 2017.

Mortgage loans have been more dynamic since the last FSR, growing at over 8% in the third quarter of the year. In contrast to the past trend, medium-sized banks contributed significantly to the recent uptick in growth. The number of mortgage transactions has started to rise, after contracting since late 2015; this is consistent with the hypothesis that new home sales contracts signed in late 2015 are now in the process of being finalized and delivered (chapter II). Going forward, the growth rate of this type of loan is expected to adjust in

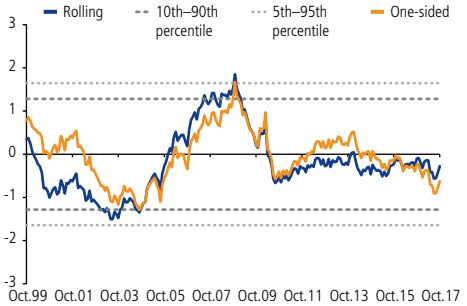
FIGURE III.1
Growth of loans (*)
(real annual change, percent)



(*) Based on individual financial statements.

Source: Central Bank of Chile, based on data from the SBIF.

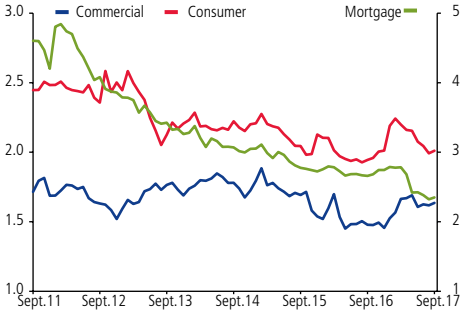
FIGURE III.2
Commercial loans-to-Imacec gap (*)
(number of standard deviations)



(*) Gap between the ratio of commercial loans to the Imacec and its long-run trend, obtained using a Hodrick-Prescott filter with a lambda of 33 million in a cumulative sum (one-sided) and ten-year moving windows (rolling) since January 1989.

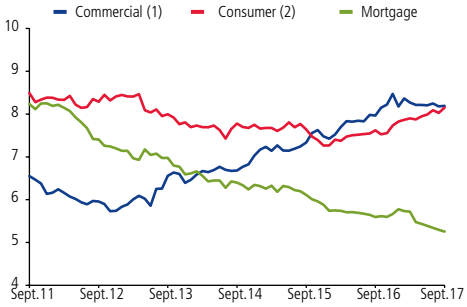
Source: Central Bank of Chile, based on data from the SBIF.

FIGURE III.3
Arrears of 90 days or more
(percent of respective loans)



Source: Central Bank of Chile, based on data from the SBIF.

FIGURE III.4
Impaired portfolio
(percent of respective loans)

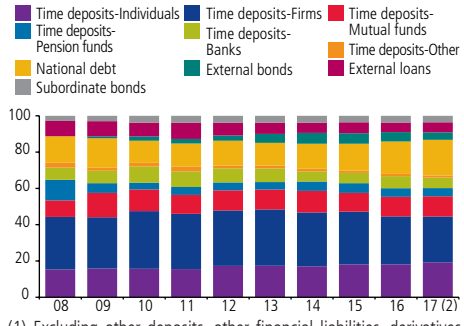


(1) The impaired commercial portfolio includes all substandard loans, excluding Rabobank.

(2) The impaired consumer portfolio corrects for the potential effects of the transfer of student loans to the commercial portfolio in January 2016.

Source: Central Bank of Chile, based on data from the SBIF.

FIGURE III.5
Composition of bank liabilities (1)
(percent of liabilities)



(1) Excluding other deposits, other financial liabilities, derivatives, taxes, provisions, and other liabilities.

(2) Data through August 2017.

Source: Central Bank of Chile, based on data from CBC, DCV, SBIF, and SVS.

line with economic activity. The results of the BLS for the third quarter reveal a strengthening of demand due to an improvement in customers' income and employment conditions and a stabilization of supply conditions, which have fully incorporated the effect of the regulatory change on provisions for the mortgage portfolio (statistical appendix).

The traditional default indicators have been stable or declined (figure III.3), but alternative measures point to higher risk in the commercial and consumer portfolios.

At the system level, commercial loans default remained stable since the last FSR. However, expected loss has increased steadily in the commercial portfolio subject to individual appraisal, due to increased exposure to debtors with a lower credit quality. In this context, the provisions on these loans were stable at around 2%, while the collateral associated with this portfolio increased (box III.1). Given that the economy has been slow for some time, firms could see a decline in their ability to meet their financial commitments under a lower growth scenario (FSR, First Half 2017, box IV.1).

In consumer loans, default has decreased since the last FSR, due to an increase in write-offs, but there was an increase in the impaired portfolio (figure III.4). The mortgage portfolio was relatively stable in terms of default and impairment. These trends point to a weakening of the household sector, whose evolution will largely depend on what happens in the labor market (chapter II). Stress tests based on an adverse scenario, in which economic growth remains low for some time, reveal that the consumer portfolio risk could increase significantly (FSR, First Half 2017, box IV.1).

In terms of bank funding, there was an increase in the issuing of local debt securities, which reduced the share of external bonds and institutional time deposits in bank liabilities (figure III.5).

Over the past year, large banks have been more active in issuing local debt securities, in a context of favorable financing conditions in the local market. A large share of these local issues were acquired by the pension funds, in response to both yields and recent pension fund portfolio shifts (chapter I). This trend was offset by a reduction in the share of overseas issues in total bank funding.

For medium-sized banks, the share of institutional deposits decreased (both mutual funds and pension funds), while the share of personal deposits and deposits from non-financial firms increased. While the increase in retail funding is favorable, these banks are still highly dependent on institutional deposits; this represents a risk due to its volatility, as highlighted in past FSRs. The capital adequacy ratio (CAR) has been stable, indicating that the banks have not increased their debt significantly relative to their risk-taking (table III.1).

TABLE III.1
Profitability and solvency indicators, by bank size (*)
(percent)

		CAR			ROE		
		Large	Medium	System	Large	Medium	System
2014	**II**	13.2	12.7	**13.5**	21.6	12.6	**17.5**
	III	12.9	12.5	**13.2**	22.1	14.0	**18.4**
2015	**II**	13.0	11.4	**13.0**	18.5	13.2	**16.0**
	III	12.6	11.1	**12.6**	17.4	12.4	**15.0**
2016	**II**	12.9	12.9	**13.5**	15.7	8.3	**12.5**
	III	13.0	13.3	**13.8**	15.5	7.6	**12.1**
2017	**II**	13.1	13.2	**13.6**	16.1	6.4	**12.1**
	III	13.2	13.1	**13.7**	15.6	5.9	**11.7**

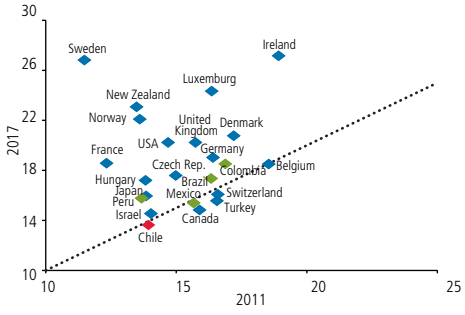
(*) CAR: capital adequacy ratio; ROE: annualized return on equity. Data through August 2017.
Source: Central Bank of Chile, based on data from the SBIF.

The banking system has stable profitability and solvency indicators, with low currency and liquidity mismatches.

The system's annualized profitability was stable at around 12% ROE and 1% ROA in September of this year. The interest margin—the main component of operating income—continued to increase, while the indexation margin decreased 10 bp of assets since the first quarter of 2017.

The system's CAR has stayed above 13.5% since mid-2016. However, in a sample of countries, the Chilean banking system is in the lower end of the CAR distribution, with very little change since 2011 (figure III.6). In a context of rising international standards, and given the need to be ready to withstand potential losses under adverse economic scenarios, it is concerning that the banks have not rebuilt the capital buffer that they had up until 2012. This issue is addressed in the new General Banking Law, which includes concrete measures to strengthen the banking system's capital base, thereby improving their ability to face a crisis.

FIGURE III.6
Capital adequacy ratio, by country (*)
(percent)



(*) Dotted line marks the 45 degree angle. Green dots are Latin American countries. Annual data.

Source: Central Bank of Chile, based on data from IMF (FSI).

RISK FACTORS AND STRESS SCENARIOS[1]/

The use of higher collateral to mitigate the deterioration of the commercial portfolio and the lag in meeting new international standards for capitalization are vulnerabilities that should be monitored.

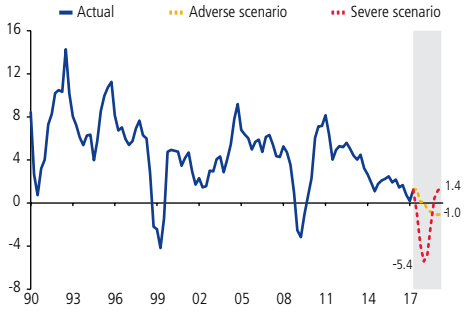
As mentioned, an adverse economic scenario or the prolongation of low growth could affect banks' commercial portfolio, due to lower income generation by firms. In terms of credit risk, the quality of the loan portfolio subject to individual appraisal has deteriorated, which has been covered through higher collateral requirements. While this strategy can reduce the idiosyncratic risk of a given bank, it represents a vulnerability at the system level, to the extent that systemic events could simultaneously reduce the payment capacity of firms and deteriorate the value of the collateral. This is a risk factor that should be closely monitored, given that 45% of total bank loans are in this category (box III.1).

Stress tests show that the risks to the system associated with a slight but prolonged decline in output are comparable to the severe scenario. Market risk remains low.

Stress tests evaluate the impact of credit and market risk under a severe but plausible stress scenario[2]/. The stress tests use macroeconomic and financial data, as well as accounting data for the banking system, as of June 2017. They also assess an adverse scenario in which persistent weak growth could represent a significant risk for lending activity (FSR, First Half 2017, box IV.1). Stress tests are an analytical tool that contribute to identifying systemic financial strengths and weaknesses in a given moment of time. Given their partial nature, and the fact that they do not take into account possible corrective actions by the banks, they do not necessarily uncover all the effects of specific risk scenarios. Consequently, they should not be interpreted as projection exercises. In this framework, credit risk is estimated using a model that relates loan loss provisions, which reflect the cost of default on the banks' portfolios, with macroeconomic and financial factors, mainly output. The calculation of market risk considers two types of exposure: currency and interest rates (broken down into valuation and repricing).

The severe stress scenario considers a sharp GDP contraction in the short term and a lower growth rate in the medium term. Output would reach -5.4%

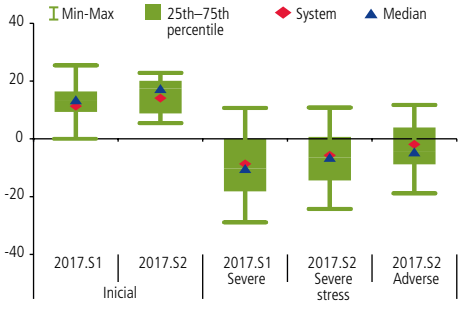
FIGURE III.7
Annual GDP growth (*)
(percent)



(*) Seasonally adjusted quarterly data. Shaded area is the test window.

Source: Central Bank of Chile.

FIGURE III.8
Impact of stress scenarios on ROE (*)
(earnings over Tier 1 capital, percent)



(*) Data are weighted by the Tier 1 capital of each institution. Calculations do not include treasury, foreign trade, and consumer banks that have left the system. Minimums are the 1st percentile.

Source: Central Bank of Chile, based on data from the SBIF.

[1]/ The analysis is based on the methodology described in the FSR Second Half 2013 and in Martínez et al. (2017a). Both the analysis and the results are regularly reported to the SBIF.
[2]/ The severe scenario is defined such that the impact is historically comparable across tests.

annual in the most critical quarter and then converge in the medium term to 1.4% in 2019. This is intended to replicate previous episodes of significant financial fragility[3]/ The adverse stress scenario is based on the 5th percentile of the distribution of the GDP forecast contained in the June 2017 *Monetary Policy Report* (figure III.7).

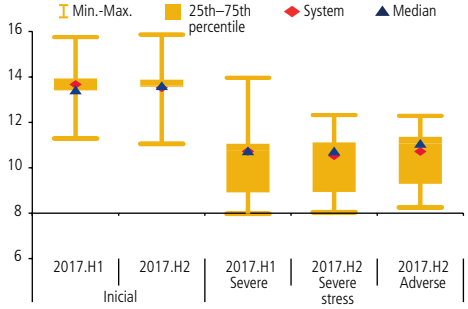
Relative to the last FSR, which used data through December 2016, the system starts with higher profitability and margins, but lower capital. Thus, the ROE is 2.8 pp higher (14.1 versus 11.3%), and the CAR is 0.2 pp lower (13.5 versus 13.7%) than in the last test. Market risk shows an increase in interest rate risk, in terms of both valuation and repricing. Credit risk, in turn, decreases slightly relatively to the last FSR, although the risk in the mortgage portfolio is slightly higher than in previous years. Thus, the potential loss on total loans under a severe scenario is around 20.5% of system capital, versus 21.2% in the last test (table III.2). Under the adverse scenario, the risks is lower, at 17.7% of capital.

In terms of profitability, the stress tests show that the system's ROE would turn negative, reaching -5.7% of Tier 1 capital under the severe scenario. Under the adverse scenario, the system's ROE falls to -1.9%. Within the system, the set of banks that would record negative profitability under both the severe and adverse scenarios together represent about 60% of the system's Tier 1 capital (versus 74% in the last FSR) (figure III.8).

Under the severe scenario, solvency decreases slightly, and persists the dispersion increases relative to the initial distribution. This is mainly due to the fact that the banks that are more exposed to the risks in the stress scenario have a lower capital base (figure III.9). Under the adverse scenario, the CAR also decreases, albeit less than under the severe scenario. Thus, under the adverse scenario described above, the share of banks that maintain a CAR of over 10% represents 57% of the system's assets; under the severe scenario, the share is 50%. This contrasts with the results in 2012, when the share of banks with a CAR over 10% under the severe scenario accounted for almost all of the system's assets (figure III.10). This shift points to the need to shore up the sector's resilience through higher capital levels, as other jurisdictions have done. In this regard, the bill modernizing the Chilean banking legislation contributes to strengthening capital requirements in the local banking system.

[3]/ To complete the configuration of this scenario, market risk includes a 20% exchange rate depreciation and a shift in the spot and forward yield curves, in both cases with a 300 bp increase in the short-term interest rate and a 100 bp increase in the long-term interest rate.

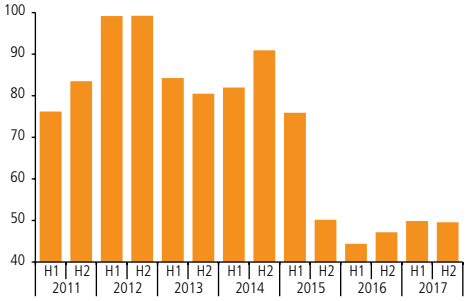
FIGURE III.9
Impact of stress scenarios on the CAR (*)
(regulatory capital over risk-weighted assets, percent)



(*) Data weighted by the Tier 1 capital of each institutions. Calculations do not include treasury, foreign trade, and consumer banks that have left the system.

Source: Central Bank of Chile, based on data from the SBIF.

FIGURE III.10
Banks with a CAR of 10% or higher under the severe stress scenario (*)
(percent of total system assets)



(*) Results of stress tests presented in respective FSRs.

Source: Central Bank of Chile, based on data from the SBIF.

TABLE III.2
Impact of stress tests on profitability
(percent of Tier 1 capital)

	2016		2017		
	H1	H2	H1	H2	
	Severe	Severe	Severe	Severe	Adverse
Initial ROE	**14.5**	**12.5**	**11.3**	**14.1**	**14.1**
Market risk	**-1.3**	**-1.2**	**-0.8**	**-1.7**	**-1.7**
Valuation	-0.8	-0.5	-0.6	-1.0	-1.0
Repricing	-0.8	-1.0	-0.6	-0.9	-0.9
Currency	0.3	0.3	0.3	0.2	0.2
Credit risk	**-21.4**	**-20.5**	**-21.2**	**-20.5**	**-17.7**
Consumer	-9.4	-7.8	-9.8	-9.6	-8.0
Commercial	-9.7	-10.3	-8.4	-8.0	-7.0
Mortgage	-2.4	-2.4	-3.0	-2.9	-2.7
Margin	**3.6**	**2.9**	**2.1**	**2.3**	**3.3**
Final ROE	**-4.6**	**-6.3**	**-8.7**	**-5.7**	**-1.9**

Source: Central Bank of Chile, based on data from the SBIF.

BOX III.1
EXPECTED LOSS AND SYSTEMIC RISK MANAGEMENT

Individually appraised commercial loans—which include all loans granted to firms that are significantly large vis-à-vis the creditor bank—represent a large share of the banking system's loan portfolio and loan-loss provisions, at 45 and 37%, respectively, in August 2017. Within this portfolio, the share of substandard and doubtful loans has increased, which constitutes an underlying risk as highlighted in past FSRs. The quality of the individually appraised portfolio, as a whole, has deteriorated since 2011. This is evident from the increase in expected loss, an alternative measure calculated based on banking regulations. This box studies the banks' provisioning of the underlying risk, its systemic implications, and the role of macroprudential policy.

Credit risk, provisions, and collateral

Individual appraisal is conducted for debtor firms whose size, complexity, or level of exposure with the banking sector requires a detailed analysis. The current regulatory framework establishes a total of 16 risk categories, grouped in the following portfolios: normal, substandard, and in default[1]/. Each category is associated with an expected loss, which is computed as the product of the respective probability of default and loss given default. These parameters, together with the loss mitigation from any associated collateral, form the basis for determining the loan loss provisions for this portfolio (table III.3).

TABLE III.3
Risk categories for individually appraised loans
(percent)

Type of portfolio	Risk category	Expected loss	Default probability	Loss given default
Normal	A1	0.04	0.04	90.0
	A2	0.08	0.10	82.5
	A3	0.22	0.25	87.5
	A4	1.75	2.00	87.5
	A5	4.28	4.75	90.0
	A6	9.00	10.00	90.0
Substandard	B1	13.88	15.0	92.5
	B2	20.35	22.0	92.5
	B3	32.18	33.0	97.5
	B4	43.88	45.0	97.5
Default	C1-C6	100	100	(E-G)/E (*)

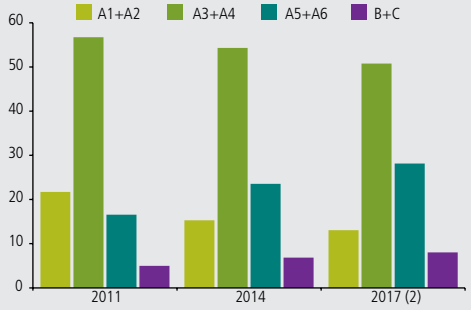
(*) For the default portfolio, the loss given default is not fixed, but rather is calculated according to the indicated formula, where E=Exposure and G=Collateral.

Source: Central Bank of Chile, based on data from the SBIF.

[1]/ See SBIF, Compendium of Accounting Regulations, chapter B-1.

From 2011 to date, the share of higher risk loans (categories B/C in the above classification) increased, while the share of less risky loans (categories A1/A2) (figure III.11) decreased. This reflects an increase in the expected loss of the individually appraised commercial loan portfolio in the period, from 4.6 to 6.0%.

FIGURE III.11
Individually appraised commercial portfolio, by classification (1)
(percent of commercial loans)

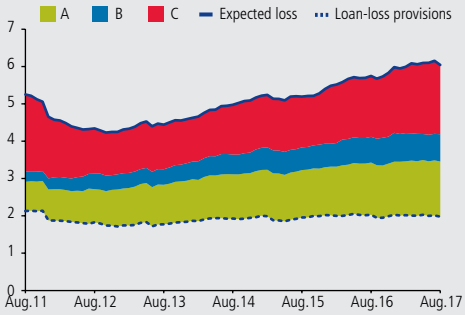


(1) Aggregate categories according to the risk level in table III.3. Excludes contingent exposures.
(2) Data through August 2017.

Source: Central Bank of Chile, based on data from the SBIF.

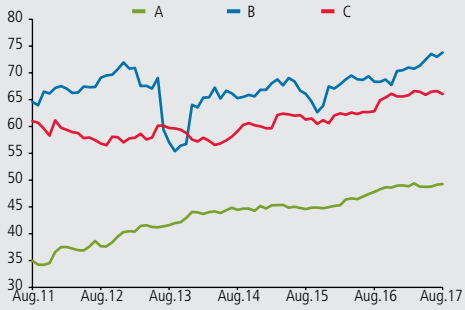
This increase in expected loss, calculated according to the current regulatory guidelines, has been accompanied by higher collateral, so it has not translated into a significant increase in loan-loss provisions. Loan-loss provisions are determined by weighting the percent of expected loss of each risk category by its respective exposure, less the value of collateral adjusted for the associated liquidation costs. Thus, the difference in constituted loan-loss provisions is explained by the higher collateral backing this portfolio (figure III.12). For the different categories, the implicit collateral, calculated according to the loan-loss provisioning regulations, has increased significantly since 2011 as a share of loans, especially for the normal portfolio (figure III.13).

FIGURE III.12
Expected loss and risk coverage
(percent of individually appraised commercial loans)



Source: Central Bank of Chile, based on data from the SBIF.

FIGURE III.13
Implicit collateral based on regulations
(percent of individually appraised commercial loans)



Source: Central Bank of Chile, based on data from the SBIF.

Evolution of the regulatory framework

The regulations on loan-loss provisions have improved the portfolio assessment process, by separating it from the use of collateral for mitigating risk. Through 2004, the classification of higher-risk debtors as normal depended on the associated collateral, which was used directly to compute loan-loss provisions. The 2004 regulatory changes required the portfolio to be evaluated independently of the associated collateral. However, for the calculation of loan-loss provisions, the collateral is deducted from expected loss. Finally, in 2010 the regulations were modified to include the normal portfolio, where previously collateral was not considered a mitigating factor, and to introduce the breakdown of the individually appraised commercial portfolio into the 16 risk categories mentioned above.

Implications for financial policy

The increased use of collateral in mitigating the risks of the individually appraised commercial portfolio is a development that should be carefully monitored. Although the use of collateral aligns the incentives of debtors and banks in individual lending relationships (Holmstrom and Tirole, 1998), collateral—unlike capital or provisions—increases the banking system's exposure to systemic risks, even when it correctly covers the portfolio risks of individual banks. This stems from an increased dependency on (mainly real) asset price fluctuations, which are related to macroeconomic cycles. This vulnerability is especially significant during episodes of financial turbulence, when it could exacerbate the deterioration triggered by the economic cycle (Fisher, 1933). It is therefore important to maintain a balance between the different risk mitigators—capital, provisions, and collateral—to cover the portfolio in the event of worse economic scenarios.

IV. FINANCIAL CYCLES AND MACROPRUDENTIAL POLICY

This chapter examines the key factors for the identification of the financial cycle in Chile and provides background on the application of the countercyclical capital buffer proposed in Basel III—a policy tool that aims to mitigate the potential impacts associated with the stages of financial fragility. The discussion covers benchmark indicators for evaluating its implementation and the challenges for calibrating the optimal buffer, the estimation of its potential impacts, and the establishment of an appropriate institutional coordination.

INTRODUCTION

Financial booms, characterized by systematic increases in asset prices under favorable financing conditions, are usually accompanied by greater risk taking which, when excessive, can lead to the build-up of vulnerabilities and distortions. When the general economic conditions change, the financial situation can deteriorate, putting at risk the stability of the banking sector and the smooth functioning of the economy[1]/. This pattern was seen in the countries affected by the global financial crisis (GFC) in the late 2000s, which was characterized by excessive credit growth—in a context of deficient risk management, regulation, and supervision—which triggered sharp recessions during the downturn[2]/.

The challenge for financial policy is to identify the build-up of financial stress and to distinguish healthy financial expansion from growth that could be excessive. This is not an easy task or one with definitive answers. For example, in emerging economies, where financial system development has been associated with a process of increasing access to credit, it is more difficult to dissect how much of the growth could reflect an incubation of risks. Consequently, much of the international debate and research agenda has been dedicated to studying financial cycles and, in an applied sense, establishing the indicators that best illustrate their behavior. In this line, international standards on the implementation of macroprudential policy have been revised substantially since the GFC (BCBS, 2010; IMF, 2011). The Basel

[1]/ This is in line with evidence indicating that during macroeconomic booms, risk perception is distorted, and agents tend to over-leverage (Minsky, 1972, 1982; Shin, 2010). See Moore (1914), Gourinchas et al. (2001), Harding and Pagan (2002) on the cyclical and synchronized behavior of the macroeconomic and financial variables. See also Borio and Drehmann (2009), Reinhart and Rogoff (2009), Miller and Stiglitz (2010), Claessens et al. (2011), Borio (2013), Grintzalis et al. (2017), Juselius and Kim (2017).

[2]/ Borio (2017) summarizes the two hypotheses for explaining the recent economic fluctuations: secular stagnation and financial cycle drag. The latter focuses on the inability to contain financial booms that have a strong and lasting economic impact.

TABLE IV.1
Countries with CCyB monitoring

Framework	Description	Countries
Indicator	Monitors 1 to 30 indicators	European Union
	Monitors over 15 indicators	Germany, France, United Kingdom, Russia
	Prior identification of indicators (including qualitative indicators)	Australia, Singapore
	A main index + complementary indices	Switzerland
	Limited set of indicators + complementary indices	Spain, Hong Kong
	A set of quantitative and qualitative indicators	Canada, United States
Credit measure	Domestic bank credit	Australia, Belgium, South Korea,Hong Kong, Switzerland
	Domestic bank credit and total credit	Germany, Denmark, France, Italy
	Domestic bank credit, total credit, and other definitions of credit	Luxemburg, Russia
Filter	Adjusted for historical deviations	Italy
	Traditional + econometric models	Spain
	Adjusted for the reduction in GDP	Germany
	Adjusted for forecasts	Norway
	Smoothing parameter range	Denmark
	One and two tails	Japan
	Rolling	South Korea
	Adjusted for monetary fluctuations	Brazil, Russia

Source: Central Bank of Chile, based on data from multiple publications (see references).

Committee on Banking Supervision (BCBS), in the Basel III Capital Accord, has put forth a number of proposals aimed at improving bank regulation throughout the world, in order to anticipate, prevent, and prepare for future episodes of financial fragility in banking systems.

Today, bank regulators at the international level have several macroprudential policy options for limiting excessive credit growth. This is the case of limits on growth or eligibility, such as the debt-to-income ratio or the loan-to-value ratio, which focus on mortgage loans. Other policies, such as reserve and liquidity requirements, can also affect credit dynamics, although they are oriented toward other specific objectives. Finally, capital requirements that adjust to the cycle are more general than the former, but more credit-focused than the latter (Dell'Ariccia et al., 2012).

One of the instruments proposed by the BCBS is the countercyclical capital buffer (CCyB), whose main objective is to increase the resilience of the banking sector during periods of stress through the build-up of additional capital in credit growth phases that are accompanied by an increase in systemic risk and thus to help maintain the credit supply in contraction phases. This measure is applied by the banks through a capital accumulation rule, which is activated depending on the phase of the financial cycle (Borio, 2014; ESRB, 2013, 2014). In this context, the financial cycle is identified, in general terms, based on fluctuations in the debt ratios of economic agents relative to historical trends or patterns. It thus differs in nature, amplitude, and frequency from the economic cycle, which is usually analyzed for the implementation of monetary policy.

The international consensus on the importance of the CCyB as a macroprudential policy instrument has led several countries to evaluate its adoption, with different emphases on the definition and monitoring of the associated indicators (table IV.1). It is widely recognized that applying the buffer will require balancing the potential costs—in terms of credit market development and economic activity, especially in emerging countries (Moreno, 2011)—with the optimal timing for activating and deactivating the capital buffer. It is also important to coordinate the buffer mechanism with the set of policies that address the crisis management and resolution phases (BCBS, 2017). In the case of Chile, application of the buffer is included in the proposed bill modifying the General Banking Law (GBL), and the Central Bank will be charged with implementing it[3]/.

The rest of the chapter describes the methodological aspects of identifying financial cycles and how these are applied in Chile and discusses some criteria for activating and deactivating the CCyB. These elements could be inputs for a future implementation of the policy, if they are included in the banking legislation.

[3]/ See the presentation by the Governor of the Central Bank of Chile, "Proyecto de Ley General de Bancos" (General Banking Law Reform Bill), to the Finance Committee of the House of Representatives on 20 June 2017.

DEFINITION AND CHARACTERIZATION OF FINANCIAL CYCLES

The most commonly accepted definition of financial cycles in the literature establishes that they are the result of interactions between perceptions of value and risk, attitudes toward risk, and financial restrictions, which translate into periods of boom and bust (Drehmann et al., 2012; Borio, 2013). For advanced economies, the evidence shows that financial cycles (i) are usually associated with changes in credit growth, asset prices, access to external financing, and other financial developments; (ii) have a lower frequency than traditional business cycles;[4]/ (iii) have peaks that tend to coincide with episodes of systemic financial stress and leading indicators of banking crises; and (iv) depend critically on policy regimes[5]/.

Studies on the pattern of financial turbulence in emerging economies find similarities with the advanced economies, as well as other characteristics such as current account deficit and capital outflows (Claessens et al., 2008; Claessens and Kose, 2013; Calderón and Fuentes, 2014; Borio et al., 2016). In general, for small open economies like Chile, external factors play an important role in local economic fluctuations, so their financial cycles can be expected to correlate, in part, with fluctuations in advanced economies or the larger emerging economies. An additional problem in the case of emerging economies that are growing at a relatively fast rate is determining how much of the evolution of these variables is the result of natural convergence in income and development and how much is due to "excessive" growth that could contribute to financial instability. In this sense, the correct identification of a country's financial cycle requires the early identification of external or idiosyncratic events that manifest as periods of greater financial fragility at the local level.

PERIODS OF LOCAL FINANCIAL FRAGILITY

The identification of episodes of fragility, stress, or crisis, in both the real and financial sectors of the economy, is an important factor in the characterization of the respective cycles, since this is precisely what the policy tries to anticipate. These episodes provide the benchmarks for detecting the bust phase of the cycle—the contraction will be sharper in a crisis than in a fragility event. That is, not all busts imply fragility, and not all fragility events have the intensity of a crisis.

Financial fragility is associated with system states in which a small disturbance can have a big impact (Allen and Gale, 2004). However, the simultaneous existence of states and triggers makes it difficult to identify vulnerabilities in the absence of

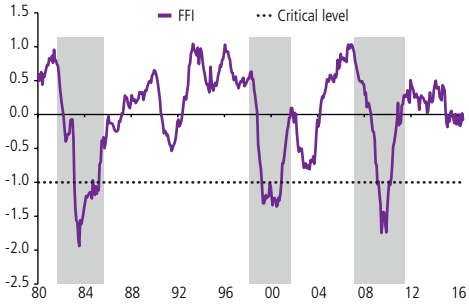
[4]/ See also Schüler et al. (2015), who find, for a group of European countries, that financial cycles are longer than their respective real cycles.
[5]/ See Borio and Drehman (2009), Jorda et al. (2011), Ng (2011), Borio (2012), Claessens et al. (2012), Drehmann et al. (2012), and Borio (2013).

TABLE IV.2
Financial fragility events in Chile

Period	Event	Characteristics
1982	Local banking and financial crisis	Insolvency of several institutions Increase in credit risk Reduction in profitability Balance sheet effects Credit restriction
1998	Asian crisis	Increase in credit risk Reduction in profitability Absorption/exit of financial institutions Credit restriction
2008	Global financial crisis	Increase in credit risk Liquidity restriction Credit restriction

Source: Central Bank of Chile, based on data from Martínez et al. (2017b).

FIGURE IV.1
Financial fragility indicator for Chile (*)
(number of standard deviations)



(*) The FFI is constructed as the simple average of the component variables, standardized in a 10-year rolling window. A critical level is defined as one standard deviation for the identification of fragility events. The start and end dates (gray areas) are defined according to changes in the FFI trend around its critical values. Starting in 2012, calculations are provisional since the window is centered.

Source: Central Bank of Chile, based on data from Martínez et al. (2017b)

significant shocks, which represents a challenge for financial policy. In this regard, Goodhart et al. (2006) propose a working definition of system fragility based on the evolution of banking sector indicators. Specifically, they suggest that financial fragility correlates with an increase in default, bank insolvency, liquidity and credit constraints, and balance sheet effects.

While part of the literature focuses on identifying crisis events in a broad set of countries,[6]/ in some cases—generally emerging economies that lack historical financial data—the identification of cyclical movements is less precise. For example, in the case of Chile, numerous papers highlight the crisis of the 1980s, possibly because it was the most significant event, due to both its size and the resulting government intervention and fiscal impact. However, the local economy has undergone other periods of financial fragility that were less intense than the 1982 banking and financial crisis, namely, during the Asian crisis (around 1998) and the global financial crisis (from 2008 on). Some key characteristics of these periods are summarized in table IV.2.

In view of the scarcity of studies for Chile,[7]/ Martínez et al. (2017b) compile a monthly database of credit and risk in the banking sector, which can be used to analyze financial fragility events in the local banking system since 1970. Based on these data, the authors calculate a financial fragility indicator (FFI) that synthesizes the behavior of credit growth (to capture system activity), the nonperforming loan ratio (which measures credit risk), and the ROA (a measure of profitability). They then define the start and end dates of each period of financial fragility based on the presence of a significant change of trend in the FFI. The results suggest that in the period under analysis, Chile underwent significant episodes of financial fragility from July 1981 to August 1985; February 1998 to September 2001; and March 2007 to June 2011 (figure IV.1).

FINANCIAL CYCLE INDICATORS IN CHILE

In its macroprudential policy proposal, the BCBS presents a series of leading indicators for monitoring the financial cycle (e.g., BCBS, 2010; Drehmann et al., 2011; Drehmann and Tsatsaronis, 2014). These include the credit-to-GDP gap, defined as the difference between the credit-to-GDP ratio and its long-run trend, which is the indicator that best captures known crisis events for a broad sample of (mostly developed) countries (Detken et al., 2014; ESRB, 2013, 2014). Specifically, the proposal uses data on credit from all sources to the private nonfinancial sector,

[6]/ For example, Laeven and Valencia (2008, 2010, 2012) construct a banking crisis database for a wide set of emerging and developed countries. Reinhart and Rogoff (2009) provide a comprehensive review of events using aggregate data since 1800 to explain the origins of currency and financial crisis.
[7]/ Held and Jiménez (1999) review the causes of the 1980 financial crisis, which they mainly attribute to the bank liberalization process in the mid-1970s. Ahumada and Budnevich (2002) study the stylized facts of the Asian crisis; De Gregorio (2009) focuses on the period around the GFC.

and calculates the credit-to-GDP trend using a one-sided Hodrick-Prescott filter with a smoothing parameter of 400,000. The choice of this parameter is based on the assumption that the typical financial cycle lasts around 20 years; this is in line with recent studies for developed countries, which find that the duration of financial cycles can fluctuate between 8 and 20 years (Schüler et al., 2015; Galati et al., 2016; Rünstler and Vlekke, 2016).

Based on this indicator recommended by the BCBS, the Chilean financial system could be showing signs of misalignment in the recent period (figure IV.2). According to the Basel III Accord, the current levels of this indicator suggest the activation of the CCyB[8]/. However, the evidence compiled to date indicates that this measure alone does not adequately characterize the financial cycle in Chile. In particular, the recent misalignment of the credit-to-GDP gap relative to its long-run trend derives, first, from the growth of loans related to foreign direct investment (FDI) and, second, from corporate bond issues, which in the local context are issued by firms that historically have a minor relationship with the banking sector (figure IV.3).

As indicated in past FSRs, FDI-related loans represent a low risk for financial stability because they are parent-affiliate contracts. Overseas bond issues, in turn, have largely been accompanied by an increase in the firms' overseas investments, which generates an increase in the debt level when measured against assets instead of GDP.

The insufficiency of the BCBS indicator is not unique to Chile. To address this issue, several countries complement their financial cycle analysis with other indicators, such as credit growth, house price growth, measures of external imbalances (such as the current account deficit), private sector debt service/financial burden, and the loan-to-deposit ratio (Castro et al., 2016). Moreover, when considering the application of any international policy recommendation, the authority charged with evaluating the proposal must take into account the particular characteristics of the local economy in question. To this end, the historical bank database constructed for Chile was used to select and test a set of additional indicators, in order to identify measures that better capture the phases of the local financial cycle[9]/.

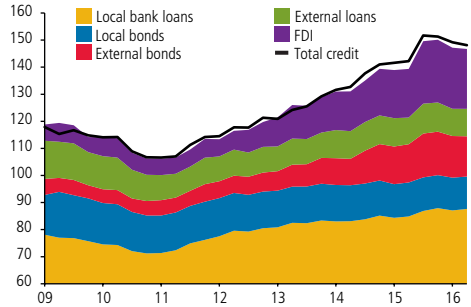
One such measure is the credit-to-GDP ratio using only data for the local banking sector. This indicator suggests that in the recent period, the gap is narrow, in line with the perceived risk of the local banking system. It thus does not point to a need to activate the CCyB in the current context (figure IV.4).

FIGURE IV.2
Credit-to-GDP gap relative to trend (*)
(percent)

(*) The gap relative to the long-term trend, calculated following Drehmann et al., (2012). Includes all sources of credit to the private nonfinancial sector as a share of annual GDP. Horizontal dotted line indicates the limit for the full application of the CCyB suggested by Basel III.

Source: Central Bank of Chile, based on data from the BIS.

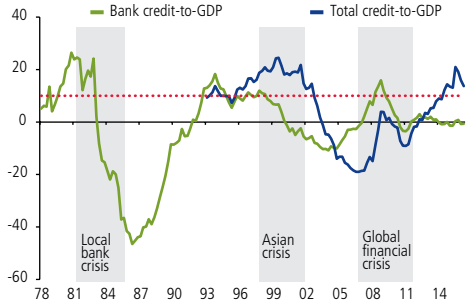
FIGURE IV.3
Share of components in total credit (*)
(percent of GDP)



(*) Excluding other local credit such as nonbank leasing and factoring and retail credit. Differences with external data are attributable to the exchange rate.

Source: Central Bank of Chile, based on data from Achef, SBIF, and SVS.

FIGURE IV.4
Total and bank credit-to-GDP gap relative to trend (*)
(percent)

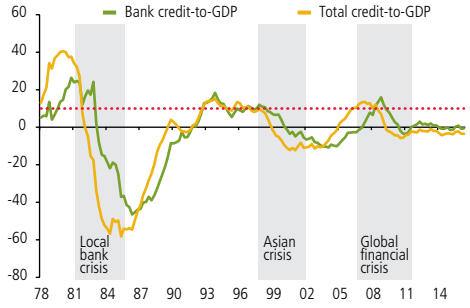


(*) Gray areas: periods of financial fragility. For more detail on the methodology, see the figure set. Data through the second quarter of 2016.

Source: Central Bank of Chile, based on Martínez et al. (2017b) and Martínez and Oda (2017).

[8]/ The BCBS proposal in the Basel III Capital Accord suggests that the CCyB should be activated if the credit-to-GDP gap exceeds 2% and that the buffer should be fully established at 10% (horizontal dotted line in figures IV.2, IV.4, and IV.5). According to this proposal, the aforementioned indicator is not the only indicator to take into account in assessing the activation of the CCyB.
[9]/ For more details, see Martínez et al. (2017b) and Martínez and Oda (2017).

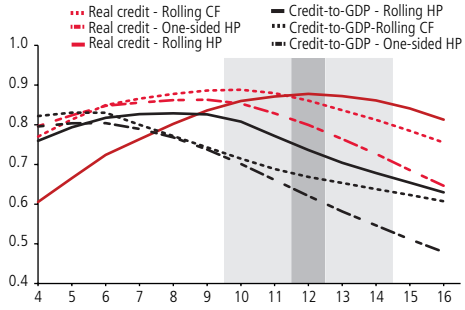
FIGURE IV.5
Total credit-to-GDP gap and real bank credit gap relative to trend (*)
(percent)



(*) Gray areas: periods of financial fragility. For more detail on the methodology, see the figure set. Data through the second quarter of 2016.

Source: Central Bank of Chile, based on Martínez et al. (2017b) and Martínez and Oda (2017).

FIGURE IV.6
Discriminatory power of the indicators at different lags (*)
(index)



(*) The indicators' ability to identify periods of financial fragility based on total bank credit. Horizontal axis: number of quarters ahead of fragility periods.

Source: Central Bank of Chile, based on Martínez and Oda (2017).

Additionally, the gap between real bank credit and its long-run trend is calculated as a complementary indicator, to try to reduce the effect of the variability of GDP and thus improve its predictive power. With this change in the data used, the indicator sends more precise signals on financial fragility events, ahead of the gap between bank credit-to-GDP ratio and its long-run trend (figure IV.5).

In comparison with the other indicators analyzed, this measure has better discriminatory power around twelve quarters ahead (figure IV.6)[10]/. Finally, indicators were also tested disaggregating bank credit by type of portfolio. The results suggest that the consumer component could lead the fragility events identified in the previous section. Intuitively, this occurs because in principle, given the current regulatory framework, lending, provisioning, and write-off policies are more sensitive to aggregate shocks. The disadvantage of this series is its short history.

POLICY CONSIDERATIONS

There is evidence on the significant contribution of macroprudential policies in terms of smoothing the cycle (Boar et al., 2017). In particular, countercyclical policies, such as dynamic provisioning and CCyB, promote the accumulation of reserves in the event of shocks that imply an increase in risks (Gambacorta and Murcia, 2017; Jiménez et al., 2017), and they are more effective when they are coordinated with other policies, especially monetary policy (IMF, 2013; Agénor et al., 2017).

Although the CCyB is, in principle, a valuable macroprudential policy for offsetting the cyclical effects and externalities generated by banking intermediation, it implies some challenges in terms of implementation. In the Chilean economy, these are threefold: (i) the definition of appropriate benchmarks for activating and lifting the CCyB rule; (ii) the optimal calibration of the capital buffer, taking into account an estimate of its potential impacts; and (iii) the establishment of an adequate government framework for implementation. The estimation of metrics that support the decisionmaking process for the CCyB does not imply a major transformation of existing methodologies, given that they are adapted from well-established statistical and econometric techniques that can be applied to the Chilean economy with minor adjustments. A greater effort is required, however, in terms of compiling data that will enhance the historical depth of the analysis, in order to more precisely characterize the dynamics of the underlying risks of the financial system in relation to the cycle.

[10]/ The area under the receiver operating characteristic curve (AUROC) (which measures the ratio between informative signals and total information) is compared for the different filters used—Hodrick-Prescott (HP) and Christiano-Fitzgerald (CF)—in a cumulative sum (one-sided) and 10-year moving windows (rolling), with lags between 4 and 16 quarters. The larger the AUROC, the greater the discriminatory power of the indicator.

Martínez et al. (2017b) and Martínez and Oda (2017) provide some background for the discussion of the Chilean financial cycle, to be taken into account prior to the implementation of the CCyB in the local economy. In particular, these two papers provide an extension of the key financial data series from 1970 onward, examine a set of indicators that characterize the financial cycle in Chile, and list some practical considerations for the implementation of the CCyB in the local economy.

Despite these contributions for the local economy, measuring risk is, by nature, an adaptive process. It is therefore important to include a larger number of dimensions in order to accurately characterize the system's fragility. For example, the analysis can be deepened with a breakdown by portfolio, credit users, and specific sectors, as well as a study of the financial and economic relationship between local agents and the rest of the world.

Calibration of the policy and its impacts

One of the challenges for implementing the CCyB is the calibration of the buffer and its potential impacts. While shoring up the capital base should have a positive effect on economic activity through financial stability (Martynova, 2015; Admati et al., 2010; Admati, 2014; Kashyap et al., 2010), practical experience on the application of the CCyB is still scarce (BCBS, 2017); and recent studies confirm the difficulty of estimating the macroeconomic impact of this tool (Drehmann and Juselius, 2014; Kohn, 2016; Gerdrup et al., 2013). This is especially important for countries that do not yet have any experience with this type of policy, as is the case in Chile. In this context, it is necessary to use counterfactual scenarios to assess the potential effects of the application, which is particularly difficult given that there are few observations of the measure being activated[11]/. At the same time, the synchronization of the activation and lifting of the buffer and the calibration of the associated additional capital buffer are fundamental for avoiding possible undesirable consequences of the CCyB, such as exacerbating credit contractions or increasing the risk.

Another consideration for the application of the CCyB policy is that the object (the financial cycle) could reflect a variety of phenomena that do not necessarily require the application of the CCyB. In particular, when analyzing the evolution of the credit market, we need to be able to distinguish between supply and demand shocks. If, for example, the excess credit growth is caused by a relaxation of lending conditions, then there is more room for policy action. If, on the other hand, the shock derives from demand, it may be a symptom of actual financing needs in a growth phase of the economic cycle. Thus, it is necessary to monitor variables that reveal the economy's exposures or vulnerabilities. For example, a current account deficit could contribute to exacerbating the contribution of external shocks and amplifying fluctuations in the local credit cycle.

[11]/ An alternative is to develop theoretical models for estimating the effects of different measures and policy regimes in different macroeconomic contexts (Borio, 2014).

Institutional coordination

Depending on the institutional arrangement of the monetary authorities and banking supervisors, there are many corporate governance options for organizing the implementation of the CCyB policy. Regardless of the system of coordination among the authorities, international practice suggests that the decision to activate the CCyB should be made within a framework similar to monetary policy (BCBS, 2017). That is, specialized staff should provide background information, and a Board should make the decisions. As in other jurisdictions, once the policy decision scheme has been defined, it is necessary to prepare the required documentation within the policy framework, based on theoretical analysis and the international experience, and an empirical study of financial and banking phenomena in the regulatory and financial policy context of the Chilean economy.

The GBL bill under discussion in Congress specifically grants the Central Bank the power to apply the CCyB with input from the SBIF. However, given the potential impacts on the market, an efficient coordination of the authorities will be needed. In this sense, the local economy has several channels of coordination, which will foster an adequate implementation of the CCyB. First, the Financial Stability Board coordinates regulatory and supervisory entities in the financial arena[12]/ Second, the forthcoming banking legislation reform considers a Financial Market Commission, a collegiate financial supervisory entity focused on individual entities, which would offer additional benefits in terms of the coordinated application of macro- and microprudential policies (chapter V).

Final comments

As discussed above, the CCyB constitutes a useful tool to have available when necessitated by the financial cycle conditions. The Board will therefore continue to explore alternatives for an adequate implementation, taking into account both the benefits of the policy and the direct and indirect costs. Special emphasis will be placed on coordination with monetary policy and the optimal balancing of the twin objectives of price stability and financial system stability.

[12]/ Established in 2011, the Financial Stability Board monitors the development of risks to the stability of the Chilean financial system. It is chaired by the Finance Minister and includes the participation of all the financial supervisors and the Central Bank—the latter in an advisory role with the right to speak.

V. FINANCIAL REGULATION

This chapter reviews the most important issues in the debate on financial regulation at the local and international levels in the second half of 2017.

NATIONAL REGULATIONS

REGULATIONS ISSUED BY THE CENTRAL BANK

New regulations on pension fund investment

Through a regulatory modification, the Central Bank broadened the external formal secondary markets that are eligible for investment by the pension funds, incorporating jurisdictions with a sovereign rating of A and BBB that are also on the list of recognized markets maintained by the Superintendence of Securities and Insurance (SVS), in accordance with the applicable regulations (NCG N°352).

To meet the provisions of the Productivity Act (see FSR, Second Half 2016), the Central Bank established the upper limits on investment in alternative assets by the pension funds and the unemployment solidarity fund, as follows: 10%, 8%, 6%, 5%, and 5%, for Type A, B, C, D, and E pension funds, respectively, and 5% for the Unemployment Solidarity Fund.

The legal modification aims to expand the universe of investments available to the pension funds, to promote greater diversification, higher expected yields, and commission savings, all of which should contribute to providing members with better pensions (box V.1).

Public consultation on regulatory changes on derivative settlement

The Central Bank developed a proposal to harmonize, systematize, and improve the regulatory framework on the Recognition and Regulation of Master Agreements for Derivative Contracts, in order to align the local regulations with international recommendations and best practices.

The proposal establishes that the parties to a so-called master agreement covered under the new regulatory regime can agree that the early termination and settling of the respective contract (close-out netting) can be enforced in

response to other specific critical situations, prior to forced liquidation, that could affect a bank or other investment institution, provided that the contract acceleration is enforced solely under the express requirement of the non-defaulting counterparty and following a period of two bank business days after the occurrence of the respective event.

The public consultation was accompanied by an explanatory statement detailing the nature and objectives of the regulatory improvement. This statement and the draft regulation are available on the Central Bank's website.

Coin rounding rule

The Productivity Law authorized the Central Bank to cease issuing $1 and $5 peso coins starting on 1 November. To this end, the Law established a price rounding rule to be applied to cash payments of amounts ending in 1 to 9.

Studies conducted by the Bank demonstrate that these coins are not considered useful by the general public. At the same time, the cost of producing the $1 and $5 coins in recent years was $6 and $17 per unit, respectively; and the cost of continuing production for the next 20 years was thus estimated at US$60 million.

The rounding rule establishes that cash payments ending in 1, 2, 3, 4, or 5 will be rounded down to the nearest 10, while those ending in 6, 7, 8, or 9 will be rounded up. The criteria established for this mechanism was not determined by the Central Bank, but rather is contained in the Productivity Law.

Finally, the $1 and $5 coins are still freely circulating as legal tender.

REGULATIONS ISSUED BY OTHER SUPERVISORY ENTITIES

Entry into force of new regulations on the Issue and Operation of Payment Cards.

On 28 November, following a public consultation, the SBIF published the definitive version of its guidelines for the implementation of the new regulatory framework on the Issue and Operation of Payment Cards.

The main regulatory modifications for entities that participate in the retail payment system are discussed in the last FSR. In this context, the new SBIF communications complement the regulations issued by the Central Bank and impart specific instructions for their oversight.

In particular, the new rules address loss provisions and the accounting treatment of doubtful accounts by issuers of nonbank credit cards. In this regard, the SBIF requires these issuers to constantly maintain an updated assessment of their total loan portfolio, so as to quickly constitute the necessary provisions to cover

expected losses. Until a standard regulatory methodology has been established for this process, the methodologies used must be governed by safe practices in credit risk management.

Financial Education Guidelines

The Advisory Commission for Financial Inclusion, created in 2014, approved the National Financial Education Strategy, which establishes a series of good practices for institutions that implement financial education programs. These include making the program objectives transparent; prioritizing public objectives; teaching content such as regulation, saving, investment, and credit; developing financial competencies; and taking into consideration the need for program assessment. In this regard, the SBIF issued a statement outlining principles and guidelines that can serve to orient financial education initiatives developed or implemented by its supervised entities.

These guidelines include using simple language; ensuring that course leaders have adequate knowledge and training; and avoiding the use of corporate logos or trademarks. With regard to content, key areas include saving and investment, planning a family budget, and the responsible use of debt. Workshops are offered on how to monitor and assess the programs, with an emphasis on objectivity, periodic monitoring, and participant-based assessment. All financial education initiatives and programs must be reported annually to the SBIF, submitting a separate form for each activity and providing a description and internal assessment of the main principles established by the SBIF for such programs.

LEGAL INITIATIVES AFFECTING THE FINANCIAL SYSTEM

Bill to modernize banking legislation

The bill reforming the General Banking Law (GBL) was sent to Congress in June this year. The bill, which represents the biggest modification of this legal framework since 1997, incorporates international experience and standards that have guided advanced countries (G20), in particular after the global financial crisis of the late 2000s. The bill modernizes the legislation in three core areas: the supervisory framework, solvency, and critical situation management.

In terms of the institutional framework, banking supervision will incorporate a Financial Market Commission (FMC). Other countries have undergone similar processes of integrating their financial supervisors, to reflect the deepening of their financial systems, with increasingly complex and interconnected entities. The challenges underlying the design and implementation of this new institutional framework are large and will require the collaboration and efforts of all the actors involved.

Bank solvency, in turn, will remain subject to regulatory guidelines in line with the Basel III Capital Accord. The adoption of these standards in Chile is critical to secure the ongoing integration with the rest of the world and to contribute to ensuring that the banking system maintains and consolidates the strong solvency position exhibited in recent years.

Strengthening critical situation management requires that the supervisor be given the tools to act in a timely manner. Having the appropriate tools can make the difference between an isolated crisis in one particular bank versus one with systemic consequences that generates material losses for a broad segment of depositors and other financial system participants and may even require the commitment of public resources.

Advancing in these three areas will provide the foundation for developing the next generation of financial policies. For example, the proposed new supervisory framework will allow the structuring of a more advanced and consolidated supervision scheme in the future. A less prescriptive legal framework will support the incorporation of international solvency standards; and strengthening critical situation management will permit the gradual implementation of additional, more sophisticated tools in the medium term based on the international experience.

INTERNATIONAL REGULATION

Initial Coin Offerings (ICO)

An ICO is a mechanism that some developers are using to raise capital through the issue of new virtual currencies or digital tokens. For example, to fund the development of a given technological platform, they offer new virtual coins or tokens that can either be used on the technological platform once it is launched or resold on a secondary market. In exchange for the tokens, the developer obtains resources in either legal currency or cryptocurrency,[1]/ such as bitcoin or ethereum. Thus, ICOs have some similarities with both crowdfunding (where a lot of individuals fund a specific project) and initial public offerings (IPOs) of securities, and they may come to be considered securities. Internationally, ICOs have proliferated, and the amount of resources invested in these projects is large.

While ICOs can be used to finance legitimate projects, many are scams. Consequently, several authorities have issued statements or taken action to address the use of ICOs.

[1]/ Cryptocurrencies are a set of virtual currencies, or digital assets, that use cryptography to control the issue of additional units and to verify the transfer of funds.

In the United States, the SEC has called on potential ICO investors to be cautious and has issued a list of warning signs of possible fraud. In addition, the SEC filed fraud charges against two specific ICOs. The Monetary Authority of Singapore has taken a relatively similar approach, signaling that ICOs will be regulated if the tokens constitute products regulated under the Securities and Futures Act, for example if it represents an ownership share in the corresponding issuer's investment project.

The People's Bank of China took a tougher stance on ICOs, signaling that they are essentially unauthorized and illegal funding mechanisms that are suspicious of involving criminal activities, such as illegal securities issues and pyramid schemes. Consequently, all ICO activity was banned in China as of September, and any funds obtained were to be returned to investors.

International regulatory agenda

In the framework of the international adoption of reforms, the last impact assessment report issued by the BIS in June positively assesses the incorporation of the new regulations, the level and progress on the recommended capital ratios, and the limited impact of the requirements on financial activity and economic growth.

Two factors could affect international reform adoption: regulatory proposals for the financial markets by the U.S. government and the impact of the Brexit negotiations on financial regulation in the United Kingdom and Europe.

In the United States, the Treasury published three documents this half with proposals for reforming the current financial regulation, under the title "A Financial System that Creates Economic Opportunities": Banks and Credit Unions (12 June), Capital markets (6 October), and Asset Management and Insurance (27 October)[2]/. Additionally, in November, the first of two reports was published in response to Executive Orders from President Donald Trump to review the authority and operation of the Financial Stability Oversight Council (FSOC);[3]/ the second report, which is pending, will review the structure, powers, and financing of the Orderly Liquidation Authority (OLA). The first Treasury report on Banks and Credit Unions proposes reforms aimed at adjusting and adapting the current bank legislation (Dodd-Frank) to the size and complexity of financial institutions, modifying existing thresholds and exempting smaller institutions. It also recommends a reduction in the frequency and thresholds of exemption from living will requirements and banking system stress tests, as well as exemption from the Volcker Rule (the ban on proprietary trading by commercial banks that receive deposits from the public) for smaller banks or banks with little trading activity.

[2]/ The publication of an additional document was announced for the end of this year, bring the total to four, on Nonbank Financial Institutions, Financial Technology, and Financial Innovation.

[3]/ for more context on the these measures and proposals, see FSR, First Half 2017, chapter V.

In Europe, the evolution and potential results of the negotiations between the United Kingdom and the rest of the European Union (EU) on the bilateral regulation of financial services has a direct impact on financial agents and supervisors. Given London's importance as a financial center, the two economies are highly interdependent. For example, CCPs in the United Kingdom clear approximately 90% of rate swaps and 40% of euro-denominated CDSs for banks in the Eurozone. It is not yet clear how the negotiations will end, but a scenario in which there is no formal agreement on financial services (a "hard Brexit") cannot be ruled out, leaving the United Kingdom with third-country status, where its relationship with the EU would depend on each Directive and Regulation. For example, under the second Markets in Financial Instruments Directive (MiFID II) and its respective regulation (MiFIR), which regulates investment activities and services in the EU, third-country status is left to the discretion of each member country and applies only within that country.

TABLE V.1
Main regulations issued in the second half of 2017

Date	Organization	Regulation	Material and objectives
30-Jun-2017	CBC	New Chapters III.J.1 and III.J.2, *Compendium of Financial Regulations*	Provides a comprehensive review of the regulation of retail payment means, so as to update and systematize the current regulatory framework, bringing it in line with market developments and safeguarding the security and efficiency of these payment systems.
18-Jul-2017	SBIF	CIRCULAR N° 1 Payment Card Issuers and Operators	Establishes instructions for companies that issue and operate payment cards, other than banks, bank affiliates, bank management companies, or supervised S&Ls, to obtain authorization to operate as a special-purpose corporation and register in the new payment card issuers and operators registry.
03-Aug-2017	SVS	Exempt Resolution 3668 Approving the operating rules of ComDer Central Counterparty	Incorporates in the operating rules of ComDer the separation of collateral and positions by type of contract and the inclusion of new over-the-counter derivatives.
17-Aug-2017	CBC	Modification of Chapter III.F.3, *Compendium of Financial Regulations*	Modifies the definition of external formal secondary markets in which pension fund administrators can invest.
07-Sept-2017	SVS	Exempt Resolution 4345 Approving the operating rules of CCLV Central Counterparty	Incorporates in the operating rules of CCLV option contracts for central counterparty services.
29-Sept-2017	CBC	BANK CIRCULAR 588	Communicates the Board Resolution on overdrafts associated with the application of the legal rules on rounding for cash payments.
02-Oct-2017	SBIF	CIRCULARS Banks: 3-2017; S&Ls: 1-2017; Card issuers: 2-2017; Affiliates: 1-2017; Support companies: 1-2017	Establishes the scope and measures based on the application of the rounding rule for cash payments for banks, S&Ls, credit card issuers and operators, bank affiliates, and bank support companies.
11-Oct-2017	CBC	Modification of Chapters III.F.4 and III.F.7 *Compendium of Financial Regulations*	Sets structural limits on alternative investments for pension funds and the unemployment solidarity fund.
16-Oct-2017	SVS	NCG 420	Establishes the self-assessment of basic principles and good practices in market conduct for the insurance industry.
25-Oct-2017	SP	Investment regimes for Pension Funds and Unemployment Solidarity Fund	Modifies the investment regimes to allow investment in alternative assets by pension funds and the unemployment solidarity fund, in compliance with the Productivity Act passed in October 2016.
03-Nov-2017	SBIF	CIRCULARS Banks: 4-2017; S&Ls: 2-2017; Bank support: 2-2017; Card issuers: 3-2017	Promotes the institutional development of a solid basis for financial education that helps raise awareness on the rational use of resources, the responsible use of debt, financial planning, and budgeting, promoting confidence in the system and enhancing financial stability.
28-Nov-2017	SBIF	New Chapter 8-41 RAN; CIRCULAR 1 (Nonbank issuers); CIRCULAR 1 (Operators); CIRCULAR 2 (Issuers and operators)	Implements Law 20,950 on payment means and the respective CBC regulations, updating compulsory instructions for issuers and operators of credit and debit cards and issuing instructions on the issue and operation of prepaid cards.

TABLE V.2
Main regulations published for public consultation in the second half of 2017

Date	Organization	Regulation	Material and objectives
13-Jun-2017	FINANCE MINISTRY	Bill to modernize the banking legislation	Strengthens the corporate governance of the regulator and creates a harmonized institutional framework for financial supervision and regulation; increases the resilience of the banking system; and gives the regulator tools for preventing bank liquidity and solvency problems.
21-Aug-2017	SBIF	*Public Consultation Closed Regulations on Outsourcing Services through Cloud Computing*	Establishes minimum conditions that must be met by financial institutions for the outsourcing of services via cloud computing, which can be used by financial institutions to increase productive efficiency.
26-Oct-2017	CBC	Public Consultation Recognition and Regulation of Bilateral Derivative Master Agreements	Harmonizes, systematizes, and improves the Central Bank's guidelines on the recognition and regulation of master agreements for derivative contracts in accordance with international recommendations and best practices.

TABLE V.3
List of documents reviewed

Document	Title	Organization	Prudential regulation	Financial infrastructure	Resolution	Other
1	Final Guidelines on Identification and Management of Step-in Risk Issued by the Basel Committee	BIS - BCBS	*			
2	Discussion Note: Reducing the Risk of Wholesale Payments Fraud Related to Endpoint Security—Consultative Document	BIS - CPMI		*		
3	Thirteenth Progress Report on Adoption of the Basel regulatory Framework	BIS - BCBS	*			
4	Implications of Fintech Developments for Banks and Bank Supervisors—Consultative Document	BIS - BCBS				*
5	Implementation Monitoring of the PFMI: Fourth Update to Level 1 Assessment Report	BIS - CPMI		*		
6	Chairs' Report on the Implementation of the Joint Workplan for Strengthening the Resilience, Recovery, and Resolvability of Central Counterparties	BIS - CPMI		*	*	
7	Range of Practices in Implementing the Countercyclical Capital Buffer Policy	BIS - BCBS				*
8	Capital Treatment for Simple, Transparent, and Comparable Short-Term Securitisations—Consultative Document	BIS - BCBS	*			
9	Simplified Alternative to the Market Risk Standardised Approach—Consultative Document	BIS - BCBS	*			
10	EBA and US Agencies Conclude Framework Cooperation Arrangement on Bank Resolution	EBA			*	
11	The Bank of England's Approach to Resolution	BoE			*	
12	Guidance on Continuity of Access to Financial Market Infrastructures (MFIs) for a Firm in Resolution	FSB		*	*	
13	Guiding Principles on the Internal Total Loss-Absorbing Capacity of G-SIBs ('Internal TLAC')	FSB	*		*	
14	Guidance on Central Counterparty Resolution and Resolution Planning	FSB		*	*	
15	Reforming Major Interest Rate Benchmarks	FSB				*
16	Ten Years On: Taking Stock of Post-Crisis Resolution Reforms	FSB			*	
17	A Financial System That Creates Economic Opportunities: Banks and Credit Unions	U.S. Department of the Treasury	*	*	*	*
18	A Financial System That Creates Economic Opportunities: Capital Markets	U.S. Department of the Treasury	*	*	*	*
19	A Financial System That Creates Economic Opportunities: Asset Management and Insurance	U.S. Department of the Treasury	*		*	*

Source: Website of each institution.

BOX V.1
CONSIDERATIONS FOR SETTING ALTERNATIVE INVESTMENT LIMITS FOR PENSION FUNDS

The Productivity Act,[1]/ passed late last year, incorporated so-called alternative assets (or alternatives) as eligible for investment by the pension funds (PFs) and the Unemployment Solidarity Fund (USF). These assets are defined as instruments, operations, and representative contracts on real estate, private equity, private debt, infrastructure, and other types of assets that could be specified in the investment regime.

The objectives of the Executive Branch in promoting this legal modification is mainly to improve portfolio diversification and increase yields through the "illiquidity premium" offered on this class of assets.

According to the legislation, the Superintendence of Pensions (SP) must define the types of alternative assets in which the PFs can invest, through the investment regime. The Central Bank must define the investment limits applicable to alternatives, within a range of 5–15%.

The SP published the corresponding investment regime on 25 October 2017, and the Central Bank established the corresponding investment limits in its regulatory guidelines,[2]/ which entered into force on 1 November. This box reviews the resolution adopted by the SP and the Central Bank's considerations in determining the limits.

Types of alternative assets eligible under the investment regime

The investment regime published by the SP defines eight types of alternative assets eligible for investment by the PFs and the USF:

1. Foreign private equity assets.
2. Foreign private debt.
3. Co-investments in foreign private equity and debt.
4. Investment of Chilean closed companies, through shares or limited partnerships, including shares in infrastructure concessions and real estate companies.
5. Negotiable mortgage-backed loans (except residential loans).
6. Chilean nonresidential real estate, subject to a rental contract with an option to buy (leasing).
7. Chilean nonresidential real estate for rent.
8. Participation in credit agreements (syndicated loans).

To ensure the safety of these investments, the SP established, through the investment regime and other specific guidelines, special regulations on the particular nature of the asset class, such as valuation, conflicts of interest, de investment policy requirements for each type of asset in which the fund invests, investment safety, limits by instrument and issuer, and treatment of excess investment.

Prior to the publication of the modifications to the investment regime, indirect investment in alternatives in Chile as of August 2017 by the PFs was 2.85% of the total value of the funds. The most important asset class was foreign private equity, which accounted for 2.2% of the total. This preference for private equity is in line with the international trend, where the preferred alternative investments of pension funds are private equity and real estate assets (Towers Watson, 2015).

Considerations by the Central Bank in setting the limits on alternative investments

Although the new legal framework allows the Central Bank to establish alternative investment limits within a range of 5 to 15% of the total value of the corresponding fund, the limits were ultimately set below the upper limit of the range for all types of funds, as follows: 10, 8, 6, 5, and 5% for Type A, B, C, D, and E pension funds, respectively, and 5% for the USF.

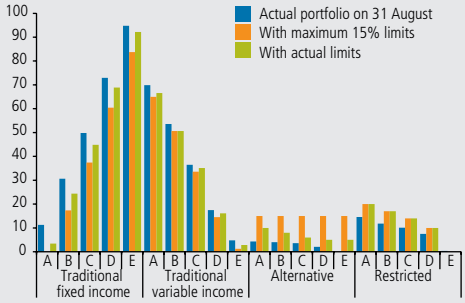
[1]/ Through Law 20,956, on 26 October 2016, the Finance Ministry introduced changes to Decree Law 3500 on the Pension System and Law 19,728 on Mandatory Unemployment Insurance.
[2]/ Chapters III.F.4 and III.F.7 of the Central Bank's *Compendium of Financial Regulations*.

In making this decision, the Board considered that the pension funds' portfolio adjustments should be carried out without affecting the normal functioning of the financial system.

To address this issue, the potential effects on local markets deriving from a substitution of traditional investment with alternative assets were analyzed.

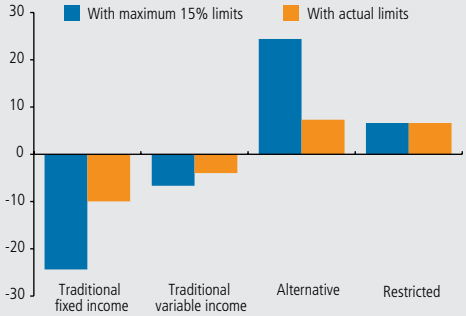
The analysis estimated the pension fund portfolio changes as a percent of each fund (figure V.1) and the total system redistribution by type of asset (figure V.2) under two scenarios: (i) with an upper limit of 15% for all funds; and (ii) with the limits ultimately chosen by the Central Bank (cited above). For the estimation, the pension funds were assumed to invest the maximum allowed in alternative assets, private equity, relatively higher risk assets, and variable-income assets.

FIGURE V.1
Potential changes in the PF portfolios
(percent)



Source: Central Bank of Chile, based on data from the SP.

FIGURE V.2
Total redistribution of system investment
(US$ billion)



Source: Central Bank of Chile, based on data from the SP.

In the scenario with the limits set at the maximum of 15% for all funds, the disinvestment in traditional assets was significant, totaling almost US$31 billion, of which US$6.6 billion was variable income and US$24 billion was fixed income and financial intermediation. In reality, the PFs would probably adapt their portfolios more gradually over a longer period, and a large share of the disinvestment would involve international assets, given their greater relative liquidity. Nevertheless, this analysis is useful for estimating the amounts involved.

In the exercise using the limits that were ultimately chosen by the Central Bank, disinvestment came to US$4 billion in variable income and US$10 billion in fixed income and financial intermediation. A comparison of the results using the two different scenarios shows that with the lower limits, the potential disinvestment falls by half in the variable-income market and by nearly two-thirds in the fixed-income market, vis-à-vis the 15% limit. The latter trend is especially important given the role of the pension funds in terms of retail bank funding sources and prices in the fixed-income and financial intermediation markets[3]/. Finally, given the international experience, the PFs will probably use their additional alternative investment margins to invest in foreign private equity, which should curb the undesirable effects on other markets.

In sum, based on the factors reviewed in this box, it was considered important to move forward gradually toward the maximum limits on alternative investments established in the law. From the perspective of the Central Bank's mission, it is essential to ensure that the increase in alternative investments by the PFs is implemented while minimizing the potential disruptions that could affect the stability of the financial system as a whole.

[3]/ Time deposits account for almost 11% of the pension funds' fixed-income investment portfolios.

BOX V.2
POSSIBILITIES FOR IMPROVING THE REGULATORY AND SUPERVISORY FRAMEWORK OF SAVINGS AND LOAN ASSOCIATIONS IN CHILE

This box reviews the international experience on the participation of savings and loan associations (S&Ls) in the financial system, which can imply significant economic and social benefits provided that there is appropriate prudential regulation.

In this context, improvements to the regulatory and supervisory framework applicable to S&Ls in Chile are recommended so as to effectively contain the financial stability risks that can underlie the functioning of this type of entity.

Successful international experience in the development of financial cooperatives

The interest of multiple jurisdictions in promoting cooperative systems is primarily founded on the benefits of corporate structures that allow the development of business ventures under collaborative economic principles (mutual help). For example, in cooperatives, every member has a vote in decisions at meetings of the assembly or governing body.

In the case of cooperatives whose objectives include financial intermediation, the benefits further include financial inclusion, to the extent that they provide intermediation services (for example, credit and payment means) to people who do not necessarily have access to the banking system.

This model has been developed successfully in numerous countries. It first emerged in Germany over a century ago. Today, financial cooperatives in that country operate under commercial bank standards as "cooperative banks." They have assets of nearly a billion dollars, 18 million members, and 30 million customers.

In the United States, credit unions offer services to broad segments of the economy. They have over 108 million members and assets of approximately 1.3 billion dollars. In Canada, credit unions are a major part of the financial system, with assets of around 150 billion dollars, over 10 million members, and a market penetration of 45% of the economically active population (Armbruster and Arzbach, 2009).

Characteristics of S&Ls in Chile that could represent financial stability risks

In Chile, S&Ls are smaller than banks and provide a narrower range of financial intermediation services and other transactions. They do, however, have some similarities with banks that could affect financial stability.

i. S&Ls are authorized to receive deposits from members and other parties

The financial function of accepting deposits from individuals constitutes a particularly sensitive commitment in terms of the public trust, and it therefore motivates the implementation of regulatory and supervisory systems similar to those applied to the banking industry. This is the case of the legal framework governing mutual banks and credit unions in Australia, Canada, the United States, and other advanced financial systems.

Unlike all other nonbank credit institutions in Chile, S&Ls can accept deposits in transaction accounts, savings accounts, and time deposits, from both members and nonmembers. These deposits account for approximately 1% of the banking system. They differ from the subscribed and paid-in shares held by members, which constitute the institutions' capital.

ii. S&Ls have a significant impact on individuals

While S&Ls are not systemically important by traditional measures (for example, they only account for about 5% of total consumer loans), they currently have around one and a half million registered members. This is equivalent to about 15% of the country's economically active population.

iii. The financial problems of S&Ls can generate contagion effects

The valuation of S&L assets (credit) is complex. In the event that members and other depositors lose confidence in management, they may choose to withdraw their deposits and shares. A

massive withdrawal would increase the financial fragility of the S&Ls and could potentially trigger problems in other financial institutions.

The current regulatory and supervisory framework governing S&Ls in Chile needs improvement

Historically, there has been a public interest in developing cooperative systems in Chile, as in the rest of the world. Local legislative initiatives in this regard have focused on promotion, however, and have not incorporated sufficient prudential regulatory and supervisory tools, which are essential for protecting the individuals who entrust their resources to S&Ls (members and other depositors).

The lack of adequate tools becomes apparent periodically, when S&Ls experience financial problems. In most cases, such situations have been unexpected and were not detected in advanced, and managing the situation and resolving the problems proved difficult.

The General Law on Savings and Loan Associations (GLSL)[1]/ and chapter III.C.2 of the Central Bank's Compendium of Financial Regulations govern the operations of all S&Ls[2]/. This framework establishes a wide range of prudential safeguards, including capital requirements, asset-liability ratios, reserves, provisions, and capital stability.

However, according to the GLSL, only S&Ls with equity over UF400,000 are supervised by the SBIF, while smaller institutions are supervised directly by the Ministry of the Economy, through the Department of Cooperatives (DeCoop)[3]/. Some operations are restricted to S&Ls that are supervised by the SBIF, such as issuing bonds, letters of credit, and payment means. However, all S&Ls can receive deposits from members and the general public.

The application of this legal and supervisory framework is complex. The Central Bank has expressed concern for improving the supervision of S&Ls in the past (for example, box V.1, "Regulation and Supervision of Nonbank Consumer Credit Providers," FSR, Second Half 2015; and institutional presentations).

The identified weaknesses of the current scheme are as follows:

a. Inherent complexities in the equity-based segmentation criterion

The Ministry of the Economy has historically pursued objectives oriented toward economic development, especially financial inclusion, through the promotion of S&Ls. This orientation has sharpened since 2014, when the DeCoop created a special division for cooperatives (*División de Asociatividad y Economía Social,* DAES) (both S&Ls and productive cooperatives) and other entities performing collaborative economic functions.

The vast majority of S&L assets fall under SBIF supervision (90%), but over 90% of S&Ls are supervised by the DAES. That is, the supervisory perimeter of the DAES encompasses a large number of small, mostly regional S&Ls. As a result, the available data on S&Ls is inconsistent, given the differences in the reporting practices of the DAES and the SBIF. Moreover, the absence of specialized prudential oversight logically contributes to increasing the financial fragility of these institutions, which could be reduced through more intrusive supervision.

This supervisory scheme also presents difficulties for the SBIF due to the complexity of supervising S&Ls that come within its perimeter—when their equity exceeds UF400,000—without having previously been subject to equivalent supervisory criteria.

b. Imperfections in resolution systems

In general, the management of troubled financial institutions is challenging. S&Ls that are supervised by the SBIF are subject to the same resolution system applicable to banks (Title XV, and Articles 20 and 24 of the GBL), with some exceptions. This scheme confers special powers to the SBIF for the possible resolution of an S&L, and it establishes bankruptcy proceedings that give preference to depositors over other creditors.

[1]/ Decree with force of law 5, modified in January 2016 by Law 20,881, defines the general legal framework for all cooperatives; chapters 86 to 90 establish specific regulations for S&Ls.
[2]/ The Central Bank has the authority to regulate the operations and functioning of all S&Ls, in accordance with the provisions of Sections 34 and 35 of its Basic Constitutional Act; Articles 19, 19 bis, and 86 of the GLSL; and Article 7 of Decree Law 1638 of 1976.
[3]/ In Decree Law 1097 of 1975 (the charter of the SBIF), Article 2 directs the SBIF to supervise all S&Ls without distinction. This was modified by DL 1618 of 1976, which limited SBIF supervision to S&Ls with deposits over an amount defined by the Monetary Board. These functions were later assumed by the Central Bank, which would set the threshold at UF10,000. Subsequently, Law 18,576 of 1986 repealed the regulations on S&Ls contained in DL 1097, indicating in transitory Article 5 that S&Ls that were supervised by the SBIF on the date the law entered into effect would continue to be subject to that supervision as long as they held deposits received from their members or the general. However, Law 19,832 of 2002 completely reformed the supervisory framework for S&Ls, setting the limit of UF400,000 for the perimeter of the SBIF.

In the case of S&Ls that are supervised by the DAES, there is no special mechanism for resolution. Instead, the supervisor would apply the same mechanisms for forced liquidation that are available for insolvent firms in the real sector. Consequently, the DAES has had difficulty managing S&Ls with solvency problems[4]/.

There are currently two open judicial processes involving a single troubled S&L (Financoop). The DAES filed a suit in a civil court requesting the application of precautionary pre-filing measures, including intervention and withdrawal restrictions, which could ultimately result in the court-ordered liquidation and dissolution of the institution. At the same time, the S&L itself filed for bankruptcy reorganization in another court.

c. Differentiated access to state guarantees

S&Ls that are supervised by the SBIF are backed by the state deposit guarantee that covers banks[5]/. In contrast, there is no deposit insurance for S&LS that are supervised by the DAES.

d. Fragility in corporate governance standards

The very dilute corporate structure of S&Ls increases the likelihood of principal agent problems. In particular, the managing boards of S&Ls tend to have a low level of expertise and low turnover, which reduces the probability that they comply with minimum standards of corporate governance (Niederkohr and Ikeda, 2005).

An important issue in this regard is that the DAES has an exclusive role in supervising aspects of the corporate structure and governance of all credit unions, which limits the role of the SBIF in supervising the S&Ls within its perimeter[6]/.

e. Insufficient transparency

Although the quality of the information published by the SBIF on the S&Ls it supervises was improved in 2017[7]/, the standards of information reported to members are heterogeneous.

In the case of the S&Ls supervised by the DAES, the supervisor does not publish any public, financial, or corporate information on these entities. Furthermore, many of these entities do not publish their financial statements either on their websites or in other media.

Reflections

The potential impact of S&Ls on financial stability, especially in relation to their deposit-taking operations, requires that they be subject to an appropriate specialized regulatory and supervisory framework. This includes improving the regulatory framework for managing troubled financial institutions.

Although the last modification of the GLSL incorporated some changes aimed at improving the supervisory scheme, in practice they have not proven sufficient[8]/.

The applicable supervision must, at the very least, safeguard solvency, risk management, transparency, and the corporate structure and governance of these institutions. This is the case of countries such as Germany, Canada, and the United States, which have a specialized supervisor focused on prudential regulation.

A balance between economic development and prudential supervision is certainly achievable, as these objectives are not mutually exclusive. Thus, it is feasible to design minimum prudential standards for credit unions that solve the problems described above without restricting their operations. In this sense, the available international experience can serve as a useful guide for what reforms should be considered in Chile.

[4]/ In recent years, two S&Ls—ABAMCOOP in Talca and Antártica in Valparaíso—have been liquidated following long judicial processes.
[5]/ Up to 90% of the amount of the liability, with a cap of UF120 (Articles 144 and 145 of the GBL).
[6]/ The S&Ls under the SBIF are subject to a dual supervisory scheme. Article 87 of the GLSL establishes the supervisory scope of the SBIF, while Articles 108 and 109 of the same law establish that of the DeCoop.

[7]/ Starting in January 2017, S&Ls supervised by the SBIF report in IFRS and in accordance with a new accounts manual.
[8]/ The SBIF can apply early dissolution and forced liquidation measures, in case of noncompliance with instructions to address observations made when the S&L entered its supervisory perimeter. There is also a voluntary option for S&Ls with equity of less than UF400,000 to request a prior review (Articles 87 bis and 87 ter).

VI. PAYMENT SYSTEMS

This chapter presents the main statistics on the payment systems and describes developments in financial infrastructure at the local and international levels[1]/

LARGE-VALUE PAYMENT SYSTEMS

In Chile, the large-value payment systems (LVPS) are the real-time gross settlements (RTGS) system, which is managed by the Central Bank[2]/ and the large-value payment clearing house, which is operated by Combanc. The RTGS system settles gross transactions in the accounts of each bank immediately upon receiving payment instructions, whereas Combanc nets the transactions for each bank at the end of the day and then clears them through the RTGS system.

CREDIT AND LIQUIDITY RISK MANAGEMENT IN THE LVPS

The main risk in the RTGS system is liquidity, given the use of gross settlement. The RTGS system has a number of mechanisms and instruments to mitigate this risk, such as a central queue for payment orders with insufficient funds, the assignment of payment priorities, and the intraday liquidity facility. When the liquidity facility is used, the Central Bank assumes the credit risk of the system participants, Therefore, the intraday liquidity facility is collateralized through intraday repurchase agreements.

In the Combanc system, participants are exposed to credit risk deriving from the possibility that one or more counterparty will be unable to pay the net balance due after the multilateral end-of-day netting. This risk is mitigated through the use of limits set by both the participants themselves and the operator and through funds constituted by the participants as collateral in the RTGS system at the start of the day. The latter reflects that fact that, as mentioned, Combanc settles the net balances through the RTGS system.

In both systems, the larger the amounts settled, the more robust the safeguards need to be to mitigate their respective risks.

[1]/ More statistics are available on the Central Bank's website, in the Payments Systems section.
[2]/ Its operations are governed by the regulations contained in Chapter III.H.4 on the Real Time Gross Settlement System, of the Central Bank's *Compendium of Financial Regulations*.

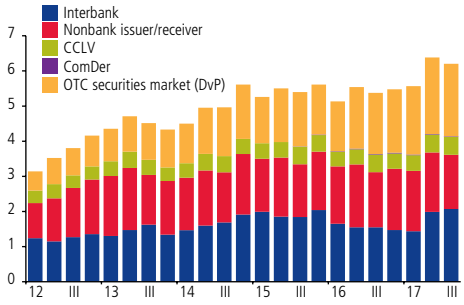
TABLE VI.1
Amounts cleared and processed in the large-value payment systems (*)
(Ch$ billion)

	Third quarter	
	2016	2017
Payments settled in the RTGS	**11,384**	**11,686**
Interbank	1,549	2,070
Nonbank issuer/receiver	1,569	1,541
Securities market	2,259	2,592
CCLV	501	513
ComDer	18	15
OTC securities market, DvP	1,740	2,063
Clearing houses (net)	287	282
Checks	54	53
ATMs	19	18
Combanc	214	211
Central Bank of Chile	5,721	5,202
Payments processed in Combanc	**4,420**	**4,949**
Interbank	1,146	1,178
Nonbank issuer/receiver	1,933	2,057
OTC securities market, DvP	1,341	1,714
Total cleared in LVPS	**15,804**	**16,635**

(*) Daily averages for each quarter.

Sources: Central Bank of Chile, CCLV, Combanc, and ComDer.

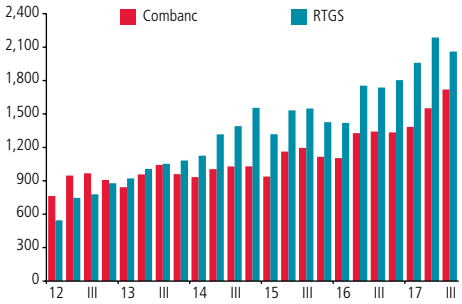
FIGURE VI.1
Payments settled in the RTGS system (*)
(Ch$ trillion)



(*) Daily average for each quarter. Excludes cash clearing houses and CBC payments.

Source: Central Bank of Chile.

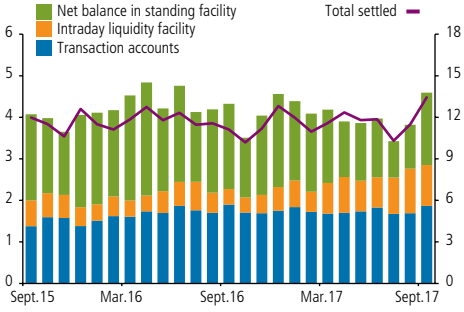
FIGURE VI.2
Settlement of OTC transactions (*)
(Ch$ billion)



(*) Quarterly averages.

Source: Central Bank of Chile.

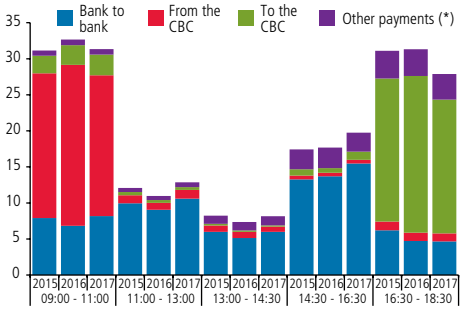
FIGURE VI.3
RTGS system: Liquidity (*)
(Ch$ trillion)



(*) Monthly average.

Source: Central Bank of Chile.

FIGURE VI.4
RTGS system: Distribution of payments over the course of the day
(percent)



(*) Payments associated with clearing houses, that is, the cash, check, and large-value clearing houses and CCLV and ComDer.

Source: Central Bank of Chile.

The total amount of payments settled in the LVPS increased, mainly due to an increase in interbank transactions and in the over-the-counter (OTC) securities market operations.

In the third quarter of 2017, the LVPS cleared a daily average of $16.6 trillion, an increase of 5.3% relative to the same period last year. The increase was mainly due to payments processed in Combanc, which grew 12% in twelve months (table VI.1). By type of payment, the expansion is mainly explained by a larger amount of interbank transactions settled through the RTGS system, up 33.7% relative to September 2016, and by an increase in payments from OTC securities market operations, which rose 18.6% in the RTGS system and 27.8% in Combanc, as of September 2017 (figures VI.1 and VI.2). The increase in payments deriving from the OTC securities market could reflect greater purchases of sovereign securities by banks.

The intraday liquidity facility has contributed to mitigating the liquidity risk intrinsic in the RTGS system, and its use is expected to increase with the regulatory change allowing the use of Treasury securities as collateral.

Banks can settle their payments in the RTGS system using their own funds, either from their transaction accounts or from maturing deposits held at the Central Bank, or they can use the intraday liquidity facility established for that purpose. In 2017, the banks used the Central Bank's intraday liquidity facility extensively (figure VI.3).

The Central Bank is currently implementing the second phase of the modernization of its Open Market Operations System. This includes a regulatory modification that allows banks access to the intraday liquidity facility and the standing liquidity facility, through the opening and use of collateralized lines of credit, using Treasury debt securities issued in series as collateral on these operations[3]/, wherein the securities are pledged to the Central Bank as collateral for the liquidity. This will facilitate the banks' liquidity management by allowing them to use a wider range of securities to access the Central Bank's liquidity facilities.

In compliance with the constitutional and legal framework governing its operations, the Central Bank will not purchase securities issued by the Treasury, nor receive payments on maturity, but will sell off the securities in the event of realization of collateral.

[3]/ The intraday liquidity facility and the standing deposit facility allow the use of "special collateral," incorporated into Law 18,876 in 2016, through Law 20,956 on Measures to Promote Productivity.

OPERATIONAL RISK MANAGEMENT IN THE LVPS

Payment systems must identify their sources of operational risk, both internal and external, and develop measures to contain or mitigate their impact via adequate systems, policies, procedures, and controls. The Principles for Financial Market Infrastructures (PFMI), published by the BIS and IOSCO in 2012, establish a series of standards applicable to payment systems. The principle on operational risk specifically requires that these infrastructures have defined operational security objectives. The objectives established by the Central Bank include increasing the security and efficiency of the RTGS system, which is reflected in its main performance indicators.

In the RTGS system, 50% of payments are completed before 14:00.

With regard to its own transactions with banks, the Central Bank settles payments first thing in the morning and charges later, which provides the system participants with liquidity during the day. In 2017, over 50% of the interbank transactions settled in the RTGS system were completed four hours before closing time, which reduces the potential impact of service interruption on the financial system (figure VI.4). The time at which 80% of the value of transactions has been cleared (before 17:30) has been stable over time (figure VI.5).

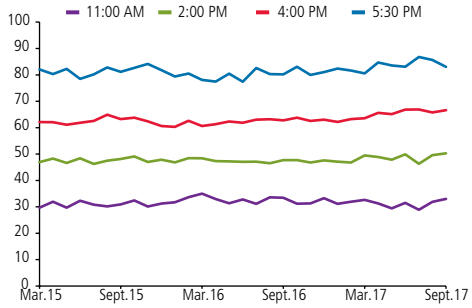
As in past years, system availability was 100%.

The operational availability of the RTGS system was at least 99.8%, and the time required to resume operations following the verification of a service interruption event is at most two hours. These performance levels have been maintained over time, to the point that there has been a total absence of service interruption events in the RTGS system for the last three years (figure VI.6).

The Central Bank has developed initiatives to strengthen the cybersecurity of the RTGS system.

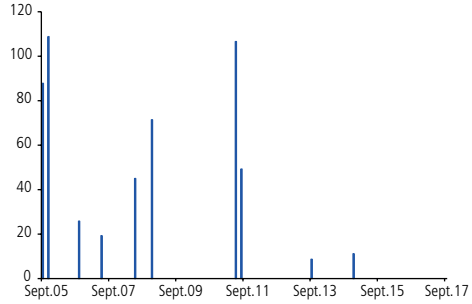
Cybersecurity is a fundamental aspect of the operational continuity of the payment systems. The Central Bank has therefore implemented a number of security controls and response protocols against possible cyber attacks on the RTGS system. The effectiveness of these controls is continually monitored, with support from third-party assessments. In 2017, the Central Bank carried out training exercises with the entire staff to raise awareness on cybersecurity risks, which is critical for risk mitigation. Finally, in September of this year, the Cybersecurity Committee was created, which is made up of the Bank's upper management and which reports directly to the Board.

FIGURE VI.5
RTGS system: Transactions by time of day (*)
(percent of total transactions, by hour)



(*) Monthly average.
Source: Central Bank of Chile.

FIGURE VI.6
RTGS system: Service interruption
(minutes per month)



Source: Central Bank of Chile.

FINANCIAL INFRASTRUCTURE

The Financial Stability Board (FSB) has committed to a joint project to strengthen the operational continuity of the main financial system infrastructures.

At the November meeting of the FSB, the member authorities agreed to implement measures to preserve the operational continuity of the main financial system infrastructures, including the RTGS system managed by the Central Bank. This work will focus on four action areas: risk analysis, regulatory developments in line with international standards, supervisory processes, and contingency protocols.

Higher guarantees and new products were incorporated for central counterparties in 2017.

In the second half of 2017, the SVS approved modifications to the operating rules of the two central counterparties (CCPs) in Chile: CCLV and ComDer. Both modifications were previously approved by the Central Bank through a favorable report by the Board, in accordance with current legislation.

ComDer Contraparte Central S.A. started operations on 30 July 2015, offering clearing and settlement services for OTC non-deliverable peso-dollar and peso-UF forward contracts (inflation insurance). The main adjustments for this infrastructure, approved on 3 August 2017, are to allow the separation of collateral and positions based on the risk of the underlying asset by type of contract and the incorporation of new OTC derivatives (interest rate swaps and cross-currency interest rate swaps).

The separation of financial guarantees by type of derivative product in the case of the CCPs is essential for reducing the probability of contagion between financial markets in the event of default or insolvency of a participant. The structure submitted by ComDer is very similar to the structure used by other CCPs around the world, and it is in line with the international regulatory framework, including the European Market Infrastructure Regulation and the PFMIs.

CCLV Derivados began operations on 3 August 2015, offering clearing services for exchange-traded futures contracts on the IPSA, the observed dollar, the UF, the average interbank rate index, and UF-denominated Central Bank and Treasury bonds. The modifications made for CCLV, approved on 7 September 2017, allow the incorporation of options contracts to the central counterparty system, for the following underlying assets: stock indices, financial intermediation and fixed-income instruments, interest rates or interest rate indices, foreign currencies, the CPI, the UF, fixed-income securities issued by the Central Bank or the Treasury, investment fund shares, and futures contracts eligible to be netted and cleared in CCLV.

The modifications to the operating rules of these infrastructures represent a major stride toward converging with international standards and promoting the development of the derivatives market in Chile, in terms of both OTC markets and exchanges.

RETAIL PAYMENT SYSTEMS

Consumers continue to have a strong preference for electronic payment means.

Bank credit cards, debit cards, and Internet transactions have been very dynamic over the past several years (table VI.2). In particular, debit card transactions have doubled since 2014, which could be explained by the increased penetration of transaction accounts with a debit card. In contrast, the use of checks has decreased, although the average amount continues to rise; this could reflect a trend toward use for large payments between firms. It may also stem from a substitution effect between checks and Internet payments and transfers, which are subject to limits on the amount of the transaction (figure VI.7).

TABLE VI.2
Main retail payment means
(Ch$ billion)

	2013	2014	2015	2016	2017 (*)
Checks	279,699	291,322	280,881	300,078	287,082
ATMs	21,333	20,780	23,730	25,299	25,430
Nonbank credit cards	5,913	6,169	5,410	5,872	5,954
Bank credit cards	8,758	11,381	13,849	16,082	17,501
Debit cards	6,252	7,683	11,350	13,450	15,139
Internet transfers	27,505	32,648	39,123	46,551	52,253

(*) Annualized data. For more detail on the series, see the figure set. Data through June 2017.

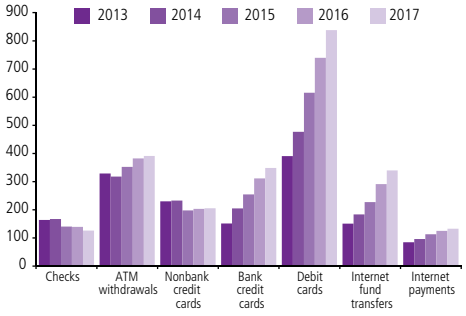
Source: Central Bank of Chile, based on data from the SBIF.

The use of payment cards has increased.

The volume of card transactions as a share of household consumption continued to follow the upward trend reported in the FSR for the second half 2016, rising to over 30% of total household consumption. This breaks down as 20.9% with credit cards (5.3% nonbank and 15.6% bank) and 13.2% with debit cards (figure VI.8).

The composition of payments made with bank versus nonbank credit cards was affected by industry events in 2013 and 2015, when two large nonbank credit card issuers were bought by or merged with banks. Consequently, payments made with bank credit cards increased as a share of total credit card transactions, from 60% in early 2014 to 74% in July 2017 (figure VI.9).

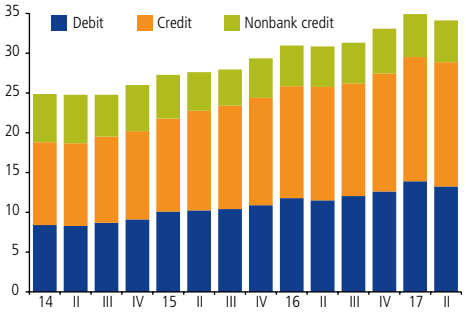
FIGURE VI.7
Retail payment means (*)
(millions of transactions)



(*) Data through June 2017. For more detail on the series, see the figure set.

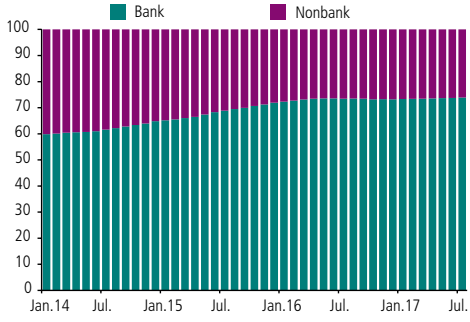
Source: Central Bank of Chile, based on data from the SBIF.

FIGURE VI.8
Total payment card expenditures
(percent of total household consumption)



Sources: Central Bank of Chile and SBIF.

FIGURE VI.9
Credit card payments
(distribution of annual payments)



Source: Central Bank of Chile, based on data from the SBIF.

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GLOSSARY

Absorption: Number of the square meters of office space effectively rented or purchased.

Arrears rate (AR): Also called portfolio in arrears. A measure of credit risk calculated as the ratio of loan installments that are past due by over 90 days to the total debt. For commercial loans to firms, the delinquent installments are past due by up to three years; for commercial loans to people, up to one year; for consumer loans, up to 180 days.

Banks, large: Banks with a large market share and wide diversification of operations (loans and derivative and nonderivative financial instruments).

Banks, medium-sized: Banks with a smaller market share but equally diversified operations as the large banks.

Basel III: A set of new capital and liquidity requirements for the banking industry, developed by the BIS with the aim of substantially strengthening the Basel II capital framework. The objectives include the following: raise the quality, consistency and transparency of the capital base; strengthen risk hedging; introduce leverage limits; promote a countercyclical capital framework; and introduce a global liquidity standard. These requirements will be implemented gradually through 2019.

Brexit: The term used for the result of the referendum establishing that the United Kingdom will withdraw from the European Union, held on 23 June 2016.

Capital adequacy ratio (CAR): A measure of a bank's financial soundness, measured as the ratio of regulatory capital to credit-risk-weighted assets.

Central counterparty (CCP): An intermediary that acts as the buyer for all sellers and as the seller for all buyers in a given market.

Central securities depository: A financial organization that provides securities accounts and central custody services and plays an important role in guaranteeing securities trade.

Close-out netting: The process of early termination and settling, in the event of insolvency of one of the counterparties to multiple OTC derivative contracts under a single master agreement, through which all the contracts are reduced to a single net liability for one of the parties.

Credit risk: The possibility that a bank borrower or counterparty will fail to meet its contractual obligation, whether in interest or capital.

Currency mismatch: The difference between foreign currency liabilities and foreign currency assets, less the net position in derivatives (the difference between buy and sell positions in derivatives contracts). An alternative measure is calculated as the difference between external debt and the net derivatives position, scaled by exports minus imports.

Debt service ratio (DSR): Measures the payments that households must make to fulfill their consumer and mortgage loan commitments, as a percentage of their disposable income.

Debt-to-income (DTI) ratio: Measures the debt held by households with different financial and nonfinancial entities as a percentage of their disposable income.

Default of 90 days or more: The total amount of a loan that is past due by 90 days or longer, even if only some of the monthly payments are past due.

Default rate (DR): The ratio between the number of debtors with arrears of over 90 days and the total number of debtors in the corresponding portfolio.

Delinquent loans: Loans with arrears of over 90 days from the maturity date. The full amount of the loan is considered delinquent for accounting data, versus the total debt for administrative data.

Emerging Market Bond Index (EMBI): An indicator calculated by JPMorgan that measures the return on government bonds issued by emerging market countries (sovereign bonds), with a specific structure and liquidity.

Euro Stoxx 50: Stock market index created by the Deutsche Borse Group and the Six Group, designed to cover the 50 most important stocks from different countries in Europe, thus representing the leading companies in the "super sectors" of the Eurozone. The countries included in the index are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, and Spain.

External formal secondary market (EFSM): Market in which the financial instruments that are eligible for overseas investment by the pension funds must be traded, together with other investments that are made in international markets, without detriment to the pension funds' trading of securities from foreign issuers on a national formal secondary market, in accordance with the Securities Market Law.

Factoring: A financing operation in which accounts receivable are transferred to a financing company (the factor). These accounts are typically part of a firm's current operations.

Federal funds rate (FFR): Monetary policy rate of the U.S. Federal Reserve.

Federal Reserve System (Fed): U.S. Federal Reserve, the central bank of the United States.

Financial indebtedness: Ratio of financial indebtedness, measured as financial debt/(Equity plus minority interest).

Financial infrastructures: Institutions that enable the effective operation of financial markets, including payments systems, central counterparties, securities clearing systems, central securities depositories, and trade repositories.

Foreign private equity assets: an investment in a firm whose shares are not traded on the exchange, but rather are sold directly to investors.

Formal Exchange Market (FEM): A group of banks and currency exchange houses authorized by the Central Bank of Chile, to which they report all transactions.

G20: An international forum for cooperation and consultation among developed countries and emerging economies, on issues related to global economic stability. Members include the seven most industrialized countries in the world (G7), Russia, the European Union, and a group of other economies, including Brazil, India, China, and South Africa.

House price index (HPI): Estimated using a stratification or mixed adjustment method, based on anonymized administrative records from the Chilean IRS on actual transactions on new and used residences at the national level.

Interest coverage ratio: A measure of repayment capacity, defined as the ratio of EBITDA to financial expense.

Interest rate risk: Exposure to losses caused by adverse changes in interest rates, which affect the value of the instruments, contracts and other transactions recorded on the balance sheet.

International custodian: Custodian or securities depository with primary residence overseas.

Intraday liquidity facility: Financing granted by the Central Bank of Chile to banking entities through the RTGS system. This facility operates daily through

the purchase of financial instruments with a repurchase agreement. The terms and conditions of these operations are contained in the Central Bank's financial regulations.

Leverage: Measure of the banks' debt level over equity; used as a complementary tool to capital adequacy requirements.

Liquidity ratio: Official reserves in foreign currency over short-term liability financing needs in foreign currency.

Loan-to-Value (LTV) ratio: The ratio of a given loan to the value of the underlying asset purchased, usually a home.

Loans in default: Debtors and their loans for which there is little chance of recovery, due to a weak or null capacity to pay. This portfolio includes debtors who must undergo a forced debt restructuring, as well as any debtor with arrears of 90 days or more in the payment of interest or principal on a loan.

Market risk: The potential loss in value of the net positions held by a financial entity, as the result of adverse changes in market prices.

Markets in Financial Instruments Directive (MiFID): The framework of European Union (EU) legislation on financial instrument markets.

Markets in Financial Instruments Regulation (MiFIR): EU regulation on financial instrument markets in member countries.

Master agreements for derivative contracts: Standardized contracts that allow the counterparties to establish the general terms and conditions for derivative transactions, establishing standard protocols, for example for defining default and transaction settlement procedures.

MF1: Type 1 mutual funds, which invest in short-term debt instruments with a duration of 90 days or less. This mutual fund invests in short-term debt securities and medium- and long-term debt securities. The duration of a Type 1 fund's investment portfolio must be 90 days or less. Shares are invested in short- medium- and long-term debt instruments.

MF2: Type 2 mutual funds, which invest in short-term debt instruments with a duration of 365 days or less. This mutual fund invests in short-term debt securities and medium- and long-term debt securities. The duration of a Type 2 fund's investment portfolio must be 365 days or less. Shares are invested in short- medium- and long-term debt instruments.

MF3: Type 3 mutual funds, which invest in medium- and long-term debt instruments, with a minimum duration of over 365 days. This mutual fund invests in short-term debt securities and medium- and long-term debt securities. A minimum and maximum duration are defined for the investment portfolio. This information must be contained in the definition adopted by the fund, and it must be longer than 365 days. Shares are invested in short- medium- and long-term debt instruments.

MF6: Type 6 mutual funds, which can be freely invested. These funds are not classified under the definitions of types 1 through 5. The investment policy is unrestricted, but while they are not subject to regulated guidelines, they must establish internal regulations.

Nonperforming loans (NPL) ratio: A measure of credit risk, calculated as the ratio between nonperforming loans and total loans.

Nonperforming loans: Bank loans, or a fraction thereof, that are past due by up to 90 days from the maturity date. On loans with fixed monthly payments, only the amount of the past-due payment is considered, although the full amount of the loan could be transferred to the nonperforming portfolio if acceleration clauses are enforced.

Normal loans: Loans to debtors with the payment capacity to meet their obligations and commitments, for whom there is no sign that this condition will change, based on an evaluation of their economic-financial situation.

Office class (A+, A, B, C): Classification used to categorize offices according to their characteristics, from high to low. The characteristics considered

are location, access, floor plan size, absence of pillars, ceiling height, access control, closed-circuit TV, security equipment, fire detectors and extinguishers, air conditioning, elevator speed, structured cabling and whether the building has Leadership in Energy and Environmental Design (LEED) certification.

Open Market Operations System (SOMA in Spanish): Trading platform through which the Central Bank of Chile (CBC) interacts with authorized financial institutions, to implement monetary operations to increase or decrease bank reserves.

Operational risk: Exposure to losses deriving from deficient internal processes, personnel and systems or external events, including legal risks but excluding strategic and headline (or reputational) risk.

Over-the-counter (OTC): A term used to describe the trading of financial instruments directly between two parties, without going through the organized securities exchanges.

Pension fund investment regime: Regime regulating specific investment issues for the pension funds, which by nature require more flexibility and detail, and setting investment limits that promote adequate fund diversification. The Regime is elaborated by the Superintendence of Pensions and approved by the Technical Investment Board and the Ministry of Finance.

Prepaid debit cards: A physical, electronic, or computer device that has a unique identification system, tied to a fund provision account opened by the card issuer for the purpose of crediting sums of money deposited therein by the purchaser; and whose utilization as a payment instrument amounts to a financial liability for the issuer vis-à-vis the public or affiliated commercial establishments or services.

Regulatory capital: Tier 1 (core) capital plus Tier 2 (supplementary) capital. The latter mainly includes subordinate bonds and additional provisions.

Residual short-term external debt (RSTED): External debt coming due within 12 months of a given date (that is, short-term external debt plus the current portion of long-term external debt).

Return on Assets (ROA): Measured as the ratio of earnings after taxes, amortizations, and extraordinary items to total assets.

Return on Equity (ROE): Measured as the ratio of earnings after taxes, amortizations, and extraordinary items to shareholders' equity plus minority interest. It is the shareholders' return.

Risk-based capital: The higher capital level derived from a comparison of the capital necessary for maintaining debt ratios, the solvency margin, and the minimum capital required by Law.

Risk-weighted assets: Bank assets weighted on the basis of five risk categories, set forth in Article 67 of the General Banking Law. The ratio of capital to risk-weighted assets serves as a measure of capital adequacy (known as the Basel ratio), which is internationally accepted as a measure of bank solvency.

Shadow banking: Financial intermediation conducted outside the banking system.

Standing liquidity facility: Overnight liquidity window, where the Central Bank of Chile purchases eligible financial assets in exchange for an amount in pesos, equivalent to the present value of the assets discounted at the current market rate for the day of the operation, less haircuts and margins. All operations include a repurchase agreement to buy back the instrument on the next bank business day. The Central Bank charges interest on the amount initially loaned in pesos.

Tier 1 capital: Paid-in capital plus bank reserves and period earnings, net of provisions for the distribution of dividends.

Traditional assets: Fixed- and variable-income financial instruments, such as bonds and stocks, respectively.

Treasury note (T-note): Fixed-income securities issued by the U.S. Department of the Treasury, with maturities of 2, 3, 5, or 10 years.

Vacancy rate: Square meters available for rent or sale, calculated over the current stock.

Virtual currencies: Also known as digital currencies. A virtual or digital (not physical) token that has some, but not all, the characteristics of a currency and can also have the characteristics of a commodity or other asset. Called cryptocurrencies when their issue and transaction validation require cryptographic mechanisms.

VIX: Chicago Board Options Exchange (CBOE) stock volatility index, based on S&P 500 index options contracts (at one month).

ABBREVIATIONS

Achef: Asociación Chilena de Empresas de Factoring (Association of Chilean Factoring Firms).

AR: Arrears rate.

BCBS: Basel Committee on Banking Supervision.

BCP: Central Bank bonds denominated in Chilean pesos.

BCS: Bolsa de Comercio de Santiago (Santiago Stock Exchange).

BCU: Central Bank bonds denominated in UFs.

BIS: Bank for International Settlements.

BLS: Bank Lending Survey.

BOE: Bank of England.

bp: Basis points.

CAR: Capital adequacy ratio.

CBC: Central Bank of Chile.

CChC: Cámara Chilena de la Construcción (Chilean Chamber of Construction).

CCL: Collateralized credit lines.

CCLV: Contraparte Central S.A.

CCP: Central counterparty.

CGFS: Committee on the Global Financial System.

CNCI: *Compendio de Normas de Cambios Internacionales* (Compendium of Foreign Exchange Regulations).

CNF: *Compendio de Normas Financieras* (Compendium of Financial Regulations).

ComDer: ComDer Contraparte Central S.A.

COMEX: Foreign trade.

CPMI: Committee on Payments and Market Infrastructures.

CSD: Central securities depository.

DIPRES: Budget Division.
DR: Default rate.
DTI: Debt-to-income ratio.
DvP: Delivery versus payment.
EBA: European Banking Authority.
EBIT: Earnings before interest and taxes.
ECB: European Central Bank.
EMBI: Emerging Market Bond Index.
EPU: Economic Policy Uncertainty Index.
FDI: Foreign direct investment.
Fed: U.S. Federal Reserve System.
FFR: Federal funds rate.
DSR: Debt service ratio.
FOMC: Federal Open Market Committee.
FPD: Facilidad Permanente de Depósito (standing deposit facility).
FSB: Financial Stability Board.
FSI: Financial Soundness Indicators.
FSR: Financial Stability Report.
FTD: Fixed-term deposit.
G20: Group of Twenty.
GBL: General Banking Law.
GDP: Gross domestic product.
GFSR: Global Financial Stability Report.
HPI: House Price Index.
Imacec: Monthly Indicator of Economic Activity.
IMF: International Monetary Fund.
INE: Instituto Nacional de Estadísticas (National Statistics Institute).
IOSCO: International Organization of Securities Commissions.
IPoM: Monetary Policy Report.
IPSA: Selective Stock Price Index.
IRS: Internal Revenue Service.
ITL: Income Tax Law.
LIC: Life insurance company.
LOC: Basic Constitutional Act of the Central Bank of Chile.
LTV: Loan-to-value ratio.
LVPS: Large-value payment system.
MC: Markets Committee.
MF: Mutual fund.
MiFID: Markets in Financial Instruments Directive.

MiFIR: Markets in Financial Instruments Regulation.

MINDHA: Ministry of Finance.

MPR: Monetary policy rate.

NCG: Norma de Carácter General (General Regulation) of the SVS.

OECD: Organization for Economic Cooperation and Development.

OTC: Over-the-counter.

PF: Pension fund.

PFA: Pension fund administrator.

pp: Percentage points

RAN: Recopilación Actualizada de Normas (SBIF banking regulations).

ROA: Return on assets.

ROE: Return on equity.

RTGS: Real-time gross settlement system.

RUT: Chilean tax identification number.

RWA: Risk-weighted assets.

S&Ls: Savings and loan associations.

SBIF: Superintendencia de Bancos e Instituciones Financieras (Superintendence of Banks and Financial Institutions).

SEC: U.S. Securities and Exchange Commission.

SMR: Santiago Metropolitan Region.

SOMA: Open Market Operation System.

SP: Superintendencia de Pensiones (Superintendence of Pensions).

SUSESO: Superintendencia de Seguridad Social (Superintendence of Social Security).

SVS: Superintendencia de Valores y Seguros (Superintendence of Securities and Insurance).

T-Note: U.S. Treasury Note.

TGR: General Treasury of Chile.

UF: Unidad de Fomento, an inflation-indexed unit of account.

VAT: Value added tax.

VI: Variable income.

VIX: Chicago Board Options Exchange Volatility Index.

WEO: World Economic Outlook.

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