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Financial Stability Report

BANCO CENTRAL DE CHILE

Financial Stability Report*

First Half 2011

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DE CHILE

* This is a translation of a document written originally in Spanish. In case of discrepancy or difference in interpretation, the Spanish original prevails. Both versions are available at www.bcentral.cl.

Contents[1/]

[1]/ The statistical closing date of this *Financial Stability Report* was 24 May 2011.

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 trade operations.

The Central Bank's focus in the area of financial stability is centered mainly on the proper functioning of the system and the Chilean economy's access to the 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, the *Report* presents the policies and measures that support the normal operation of the internal and external payments system, with the objective of promoting general knowledge and public debate with regard to the Bank's performance in fulfilling this function. The thematic chapter that closes this *Report* summarizes recent research papers generated by the Bank on topics related to financial stability.

The Board

Summary

Since the last *Report*, the external macroeconomic scenario has been stable, and the favorable funding conditions for the Chilean economy are expected to persist. Global growth expectations for 2011 are slightly above 4% and they imply that emerging economies will significantly outperform advanced countries. In this context, emerging economies have continued normalizing their monetary policy rates in response to stronger domestic demand and increased commodity prices. Thus, in the absence of any material changes in international investors' risk aversion, the external scenario favors the continuation of gross capital inflows to emerging economies.

There remain, however, some risks that might lead to a deterioration of external funding conditions and/or a contraction of the Chilean economy's external demand. This *Report* identifies three possible risk scenarios in the international economy that might cause a sharp reversal of capital supply and, depending on their severity, a substantial contraction of external demand. These are a) an aggravation of the fiscal and financial situation of peripheral European countries, b) a worsening of the fiscal situation in the U.S., and c) a deterioration of the financial-economic situation in a systemic emerging economy. In the two first scenarios —as was noted in the previous *Report*— the risks originate in the interaction of financial systems whose balance sheets still contain low quality assets, a weak fiscal situation and slow growth. The third scenario, meanwhile, is more directly linked to potential financial vulnerabilities being created in some emerging economies of systemic nature, within a context of abundant external capital.

In this *Report*'s external baseline scenario, challenges facing the Chilean financial industry are associated with the abundant supply of foreign capital. In the risk scenarios, meanwhile, threats come from a potential sudden stop. Actually, the main risk identified in the baseline scenario is the creation of vulnerabilities in the domestic financial system, via an increased indebtedness of financial firms and intermediaries, higher exposure of local agents to foreign exchange and liquidity mismatches and/or an overvaluation of key financial assets. These vulnerabilities are by themselves a source of risk and, in case any risk scenario materializes leading to a sharp reversal of the capital supply, the potential impact of the required adjustments will depend on how severe such vulnerabilities are. Therefore, the analysis in this *Report* is focused on these potential issues, and delivers as its main conclusion that there is no evidence of vulnerabilities with systemic implications. Nonetheless, this evaluation requires a continual monitoring in order to be able to identify in advance the presence of any of them.

Gross capital flows to Chile have been similar to those observed during 2010. Gross capital inflows averaged 13% of GDP during the period 2009-10, and rose to 16% in the first quarter of 2011. Gross inflows continue to be driven by foreign direct investment (FDI), and the analysis of financial flows —excluding FDI and commercial loans— shows that portfolio inflows in fixed-income securities are still a significant component of these flows. However, and despite the increase in portfolio flows, these are still limited in relation with the size of the respective local markets. On the side of external assets, a slowdown is observed in the investment abroad process by institutional investors. Accordingly, net flows have become positive recently, with annual accumulated flows of 1.6% of GDP at the first quarter of 2011.

Local debt markets have operated normally, and the liquidity pressures in the money market identified in the last *Report* have shown a sustained decline. Financing conditions in domestic currency money markets have improved since last *Report*, showing a reduction of the prime-swap spread at all maturities, though more pronounced at the longer terms. A substantial part of the dynamic of the spread is related to the reallocation of the pension funds' portfolio to the domestic market. Meanwhile, the implementation of the new rules of valuation for type-1 mutual funds was characterized by a gradual and limited adjustment of portfolios —both in terms of the assets under management and the maturity of the investment portfolio—, without introducing further pressures in this market. At the same time, dollar money markets have been characterized by less financial pressure and the return of non-resident investors to a long position of forwards in dollars, all of which have translated into spread levels consistent with arbitrage conditions.

In the corporate sector, external debt continues being the fastest growing source of funding, while no significant change is observed in indicators of currency mismatches, liquidity, payment capacity or profitability of the larger firms. Furthermore, and despite the important role that external debt plays as a source of funding, the corporate sector shows a reduction in currency mismatch indicators. A wider analysis of firms —extended to include small- and medium-sized companies— shows some marginal variations in currency mismatches since the last *Report*. At the aggregate level, the breakdown by sectors of banks' commercial loans in domestic and foreign currencies shows no major changes compared with the year 2010.

On the households' side, the debt is growing consistently with the economic recovery after the global financial crisis and the earthquake of 2010. Private consumption has shown a quick recovery, together with a consumer debt increase of 8.4% annually in the first quarter of 2011, with banking loans as the most dynamic component of overall consumer credit. The evidence suggests that, so far, indebtedness has not increased above its long-term trend. Accordingly, banking credit risk indicators for households show sustained improvement, tending to stabilize over the past year. Nonetheless, credit intermediaries must keep a vigilant attitude during this phase of the cycle.

Most recently, the financial situation of a department store deteriorated significantly. With the information available at the statistical closing of this *Report*, such deterioration is linked to its commercial and accounting practices in the provisioning of consumer credit. Though this has damaged

the confidence of its customers and investors, the implications for the domestic financial market and payment system are estimated to be limited.

Within a context of a more dynamic lending activity, the banking industry's liquidity position remains strong. The share of liquid assets has stayed above its historic average in the past year, offsetting the increase of sight obligations. Complementarily, senior and subordinated bonds issued for over US$9 billion between June 2010 and April 2011 have eased the administration of liquidity risk in the banking system. At the statistical closing of this *Report*, short-term mismatches show every bank having enough leeway to meet regulatory limits.

Increased lending activity forecasts for this year have been accompanied by announcements of substantial capital increases. The capital base of the banking industry will increase due to additional contributions and profit capitalization amounting to roughly US$2.4 billion, announced in recent months. These increases will not only favor the banks' top-quality capital indicators (Tier 1), but will also allow them to extend their supplementary capital base (Tier 2) throughout the issuance of new subordinated bonds. Finally, this increased capitalization is estimated to be consistent with the levels of credit expansion foreseen for this year, without any major changes in the system's solvency indicators, so the capital adequacy index is forecast to remain close to 14%.

The increase in external financing to banks has not translated into significant changes in currency mismatches. Although a substantial portion of the banks' external debt continues to be associated with the financing of foreign trade operations, other sources have increased their use since the last *Report*. On the other hand, and despite the aforementioned increase, the banking industry's external debt finances only 11% of credit to the private sector —a low level compared to similar countries. Foreign currency mismatches remain limited even at short maturities, a situation that could limit the exchange rate risk in case of sudden and significant changes in foreign currency positions. Meanwhile, and as it has been pointed out, currency mismatches of banking customers —corporate sector— have declined since the last *Report*.

Specific segments of the banking industry continue to face the challenges of preserving and diversifying their sources of credit. The last *Report* discussed the concern about the potential effects of the regulatory change that modified the valuation of type-1 mutual funds on those entities most dependent on this kind of funding. These banks, most of them smaller in size, have replaced the mutual funds' time deposits by non-institutional ones, causing no particular pressures on the terms or interest rates of deposits. Still, the dependence of smaller banks on this source of financing remains relatively high.

The banking system maintains its capacity to absorb the materialization of a severe risk scenario. Stress tests show that the current levels of capitalization and profitability of banks permit them to absorb an episode of GDP deceleration, an increase in the funding cost in pesos and depreciation, consistent with the external risk scenario.

The baseline scenario outlined in this *Report* assumes a favorable external context for the Chilean economy. However, some weaknesses in the global financial system persist —in the aftermath of the subprime crisis— that might lead to a significant deterioration in this setting. In particular, these concerns are related to the macro-financial developments in peripheral Europe, the U.S. and/or some emerging economies of systemic nature. The deterioration of external financial conditions and the resulting world economic slowdown would have a negative impact on the Chilean economy. Although the analysis in this *Report* suggests that the Chilean financial system is well suited to face such a negative external environment, it is important for credit users and financial intermediaries to consider these risks in their consumption, investment and funding decisions.

I. External environment and financial risks

External conditions continue to be favorable in terms of both demand and financing, although there are still doubts about the consolidation of global financial stability.

Evolution of the international financial situation

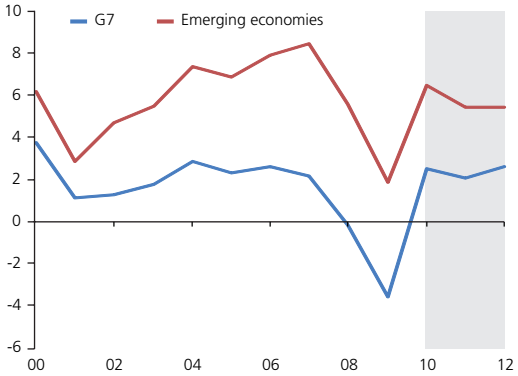
The world economy continues to grow at different speeds…

The international economic recovery following the subprime crisis continues to be characterized by strong growth in emerging economies, contrasted with a slow recovery in some of the larger advanced economies. The growth forecasts for the advanced and emerging economies in 2011 are 2.1 and 5.4%, respectively (figure I.1).

Figure I.1

Growth of GDP (*)

(real annual change, percent)



(*) The shadow area shows annual forecasts through 2012.

Sources: IMF and Consensus Forecast.

Similarly, the interest rate differentials between emerging and advanced economies will continue. While the ECB has adjusted its monetary policy rate after two years, no significant adjustments are expected in the future. The market projects that U.S. rates will be relatively stable through mid-2012[1]/. At the same time, as emphasized in the last *Report*, emerging economies have picked up the pace on increasing their monetary policy interest rates, based on the increase in current and expected inflation levels in the face of higher commodity prices and dynamic domestic demand in these economies.

…which will continue driving capital inflows to emerging economies

The empirical evidence shows that gross capital inflows to emerging economies reflect both internal and external factors[2]/. The baseline scenario for the world economy is characterized by asymmetric economic growth and expanding interest rate differentials. In the absence of significant changes in the degree of international investors' risk aversion, this baseline scenario will favor capital inflows to economies with higher relative growth in 2011. In fact, the IMF (2011a) projects that gross private inflows to emerging and developing economies will increase almost 15% between 2010 and 2011.

[1]/ Consensus Forecast, May 2011.

[2]/ González, Jara, and Olaberría (2011).

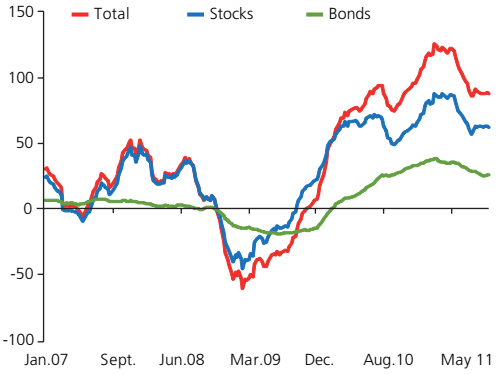
Despite the geopolitical and financial stress in the first quarter, gross portfolio flows to emerging economies are currently at levels similar to 2010 (figure I.2). Data on total inflows indicate that in the third quarter of 2010, gross capital inflows, as a percentage of GDP, exceeded the levels recorded before the global crisis in some Asian and Latin American economies, such as China, India, and Brazil (IMF, 2011a).

In the United States, the fiscal situation continues to deteriorate

The United States continues to experience problems in its real estate sector, where a large stock of unsold houses limits recovery. In December 2010, the shadow inventory reached 6 million (table I.1). At the same time, household credit risk, measured as a percentage of delinquent bank debt, remains high (4.4%). This is due, in part, to the high level of household indebtedness (121% of disposable income), as well as their high exposure to fluctuations in housing prices—the share of households that have mortgages with negative equity rose to 23%. Credit conditions remain tight, although the banking industry has managed to strengthen its capital base from 10.7 to 12.5% in two years.

Figure I.2

Capital inflows to emerging economies (*)
(US$ billion, accumulated in twelve months)

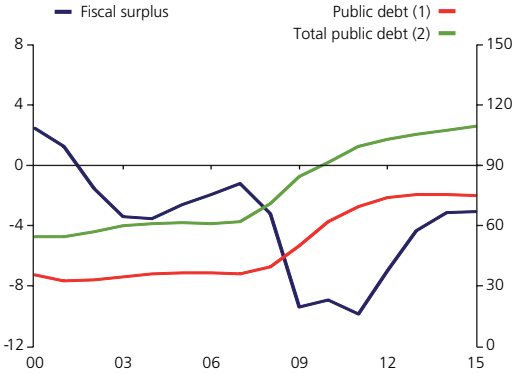


(*) Sample of investment fund portfolio inflows to Africa, Asia (excluding Japan), emerging Europe, Latin America, the Middle East, and global emerging market investments.

Source: Emerging Portfolio Fund Research.

Figure I.3

U.S. fiscal position and public debt
(percent of GDP)



(1) Published by the Congressional Budget Office; it does not include Treasury securities held by the social security fund.
(2) Published by the IMF; it includes Treasury securities held by the social security fund.

Sources: Congressional Budget Office and IMF (2011b).

Table I.1

Key U.S. financial variables
(percent)

	2006	2007	2008	2009	2010			
	IV	IV	IV	IV	I	II	III	IV
Real estate sector								
Shadow inventory (1)	1,153	1,932	3,823	5,823	5,945	6,209	6,257	6,291
Housing prices (2)	109.0	108.3	101.8	97.4	96.3	95.8	96.7	95.8
Mortgage foreclosures / total housing loans (3)	10.7	23.0	37.8	43.8	43.4	40.9	39.0	39.0
Household debt								
Debt / GDP	98.8	100.5	100.2	98.3	96.5	95.4	94.2	93.7
Debt / disposable income	133.0	135.2	130.3	126.2	124.4	122.3	121.7	120.9
Banking system								
Nonperforming loans / total loans (4)	0.8	1.4	3.0	5.4	5.0	4.8	4.6	4.4
Lending conditions for SMEs (5)	-1.8	9.6	74.5	16.1	3.7	0.0	-9.1	-7.1
Tier 1 / risk-weighted assets	n.a.	10.3	10.7	11.5	11.8	12.1	12.4	12.5

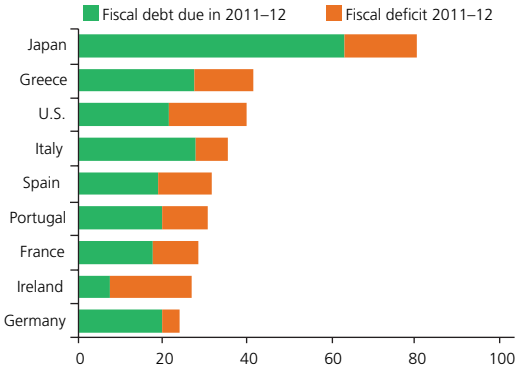
(1) Thousands of units. Includes mortgages with negative equity, mortgages that are over 60 days past due, and foreclosed mortgages.
(2) Federal Housing Finance Agency, baseline index 100 = 2005 annual average.
(3) It includes prime, subprime, and adjustable-rate subprime mortgage sectors.
(4) Data for 2006–09 are the annual average for each year.
(5) Net percent of responses. The higher the value, the tighter the conditions.
n.a.: not available.

Sources: CEIC data, IMF (2011a) and IMF.

The high public debt and fiscal deficit represent an important challenge for the United States. The current public debt is 91.6% of GDP, and the IMF projects that it will rise above 100% in the medium term (figure I.3). The projected funding needs for the period 2011–12 are equivalent to 21% of GDP given the term structure and 19% of GDP for the forecast fiscal deficit.

Figure I.4

Sovereign funding needs (*)
(percent of 2011 GDP)

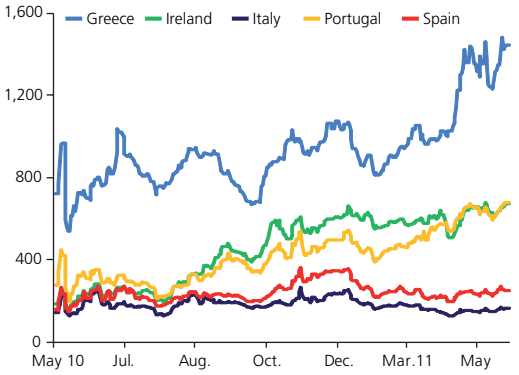


(*) Debt maturing between April 2011 and 31 December 2012.

Source: IMF (2011a).

Figure I.5

Risk premiums in peripheral Europe (*)
(basis points)

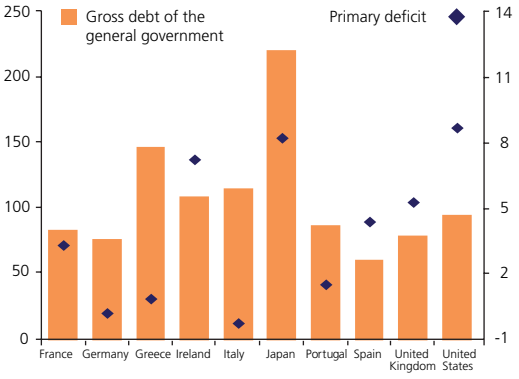


(*) Five-year sovereign spreads on German bonds.

Source: Bloomberg.

Figure I.6

Gross debt and deficit of advanced economies in 2011
(percent of GDP)



Source: IMF (2011a and 2011b).

Thus, the total funding needs of the U.S. Treasury represent around 40% of GDP in the period 2011–12 (figure I.4). This estimate is conditional on compliance with forecast fiscal adjustments and on interest rates remaining relatively low.

In the fiscal area, Congressional Budget Office forecasts imply an adjustment of approximately 6 percentage points of GDP in the coming years, which will be very difficult if unemployment remains around 9%[3]/. With regard to the cost of financing, the IMF (2011a) mentions that the country's ability to service the public debt is especially sensitive to interest rate hikes, because the U.S. tax base is relatively low. Increases in the cost of financing could potentially be caused by deterioration in the perception of the U.S. fiscal position or, in a more generalized context of financial turbulence, by possible increases in risk premiums involving the United States.

The euro area continues to be plagued by uncertainty about the public debt problems and the substantial fiscal deficits …

A year after the announcement of the EU and IMF aid package for Greece, uncertainty about the sovereign debt markets of the European periphery has increased (figure I.5). Neither explicit support to the economies in trouble—namely, Greece, Ireland, and Portugal—nor the creation of the European Financial Stability Facility (EFSF) and the future European Stability Mechanism (ESM) have managed to reestablish the financial markets' confidence in the sustainability of the public debt in these economies.

Greece and Portugal, in particular, have not complied with their announced fiscal adjustments. Greece's budget deficit in 2010 was 10.6% of GDP, which is a percentage point higher than the government's commitment for the support program in May 2010. In Portugal, the deficit reached 9.1% of GDP, well above the announced target of 8.6%. As a result of the noncompliance with the agreed fiscal adjustments, the public debt levels of the peripheral European economies will continue to rise in 2011 (figure I.6). Forecasts for 2012 suggest that even if the governments comply with the consolidation efforts proposed for 2011 and 2012, gross public debt could rise to nearly 160% of GDP in Greece, 125% in Ireland, and 115% in Portugal (OECD, 2011a). In addition, the governments of these three countries have contingent liabilities associated with explicit and implicit bank guarantees that could increase gross government debt even further.

Greece's public debt appears to have reached levels that will be difficult to sustain. The yield on ten-year Greek sovereign bonds reached 17% in mid-May and was even higher at shorter maturities[4]/. These rates, combined

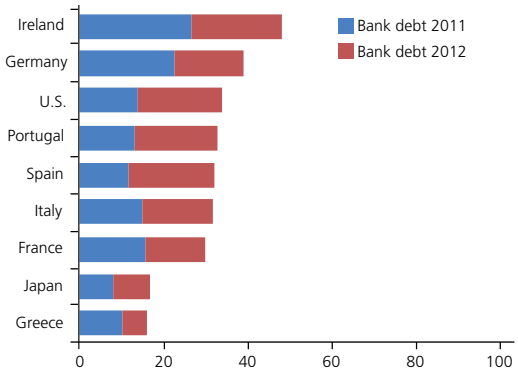
[3]/ The difficult fiscal position of the United States is evident in the Executive Office's recent rejection of a proposal from the House of Representatives to reduce public spending by US$6.0 billion, which was considered too aggressive, even though this adjustment would not solve the problem of fiscal sustainability.

[4]/ In mid-May, the interest rate on two-year Greek bonds was over 25%.

Figure I.7

Bank funding needs

(percent of total debt)

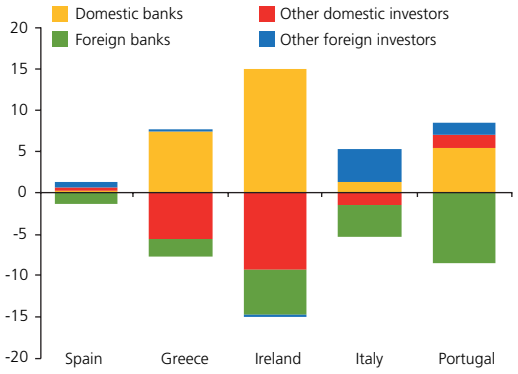


Source: IMF (2011a).

Figure I.8

Change in sovereign debt holdings (*)

(percent of total debt)



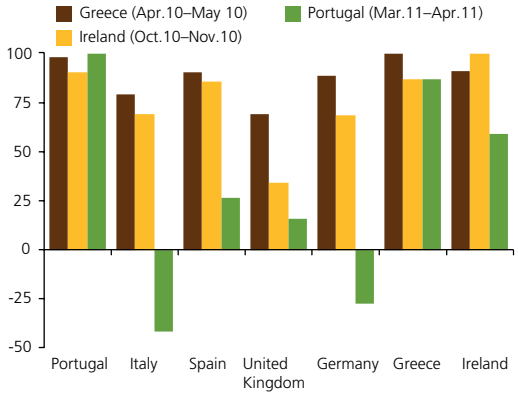
(*) Annual change in the stock in the third quarter of 2010.

Source: IMF (2011a).

Figure I.9

Risk of contagion in Europe (*)

(percent)



(*) Correlation of five-year sovereign CDS of the respective economies with CDS of Greece, Ireland, and Portugal, in a window of two months before the announcement of support by the EU, ECB, and IMF.

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

with the fact that Greece financing needs between 2011 and 2012 represent 42% of GDP, have led to negotiations for a new aid package, which does not reduce the probability of a debt restructuring.

…compromising the financial situation of the banking industry in Europe

The European banking system faces substantial financing needs in the medium term (figure I.7). Some banks in the European periphery continue to depend strongly on the ECB for liquidity, since they have limited access to the normal wholesale credit markets[5]/. In this context, the possible deterioration of the economic-financial situation of some of the peripheral European economies could increase investors' risk aversion, which would affect the cost of financing and thus have negative repercussions on the financial situation of the European banking system.

The banking system is also exposed to the risk of contagion through cross-border loans to resident banks in the peripheral economies and/or through sovereign debt holdings. Exposure to banks in Greece, Spain, Ireland, and Portugal only decreased 26% in 2010, so it remains at relatively high levels (US$1.89 trillion; BIS). With regard to holdings of European peripheral sovereign debt, nonresident banks reduced their exposure, whereas local banks tended to acquire more sovereign debt from their respective economies—mainly Greece, Ireland, and Portugal (figure I.8). In other words, the direct exposure of the European banking system to sovereign debt is lower, but its indirect exposure is higher, because banks in Greece, Ireland, and Portugal increased their sovereign debt holdings. The second round of stress tests to be published this July will support a more detailed assessment of the effects of a deterioration of the public debt in the European peripheral economies[6]/.

Spain has shown signs of decoupling from other European peripheral economies, but important risks remain

Since the last *Report*, Spain has seen a reduction in its sovereign bond spreads. The correlation between the sovereign CDSs of Spain and Portugal, in the period before the latter asked for support from the EU and the IMF, was substantially lower than a similar comparison with Greece and Ireland (figure I.9). This suggests that Spain was decoupling from the rest of the peripheral economies.

The better relative position of Spain may be explained by the implementation of a significant fiscal adjustment in 2010 (a reduction of 2.5%, versus a commitment of 1.7%), the financial restructuring being carried out by

[5]/ Greece, Ireland, and Portugal accounted for 55% of the liquidity supplied by the ECB in late February 2011 (OCDE, 2011a).

[6]/ Blundell-Wignall and Slovik (2011) perform simulations along these lines using data reported in the stress tests carried out on the European banking system in 2010.

savings banks, the increased capitalization of the banking system by almost 5% of GDP in 2008–10 (Bank of Spain, 2011), and the improvement in transparency and reporting requirements for financial institutions (especially regarding their exposure to the real estate sector), among other measures.

Economic activity in Spain shows signs of fragility, however, as reflected in the increase in the unemployment rate to 21.3% in the first quarter of 2011. Moreover, the Treasury, the banking system, and the nonfinancial private sector still have significant funding needs, and some of the public spending reductions proposed for 2012 have yet to be specified. The banking industry is particularly vulnerable to the real estate sector, given its direct exposure and the possibility that housing prices will continue to drop. The housing price level is currently above its long-term average, whether measured relative to national income or to the cost of housing rentals (figure I.10).

Consequently, despite the implementation of a series of fiscal and financial measures, the economic situation in Spain is still fragile, as it is exposed to real shocks—particularly in the real estate market—and to changes in risk perception in the debt markets.

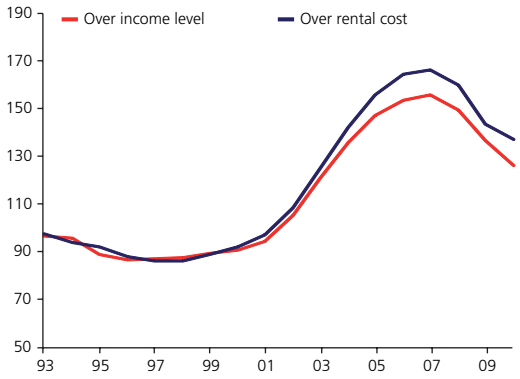
In contrast, the emerging economies are facing a highly dynamic scenario

As mentioned above, the emerging economies continue to record strong economic growth, and in some countries, inflation levels are above the central banks' targets. Growth has been particularly fast in a number of countries, and it has generally been accompanied by relatively abundant gross capital inflows. This has generated concern for the possible emergence of financial vulnerabilities, such as a deterioration in credit risk or currency mismatches (box I.1). The dynamics of credit growth observed in certain emerging economies suggests that such vulnerabilities could, in fact, be forming in this area. For example, credit has grown significantly in Turkey, Brazil, and China (figure I.11).

From a macroeconomic perspective, and as proposed in the *Monetary Policy Report*, there are still concerns about how the monetary authorities in the emerging economies will address inflationary pressures. In Asia in particular, some of the economies show signs that the output gap is closing and growth rates are above trend. There is a risk that macroeconomic policies will overreact, which would affect world GDP and commodity prices, causing a sharp reversal in currency values. Another danger is that the developed countries will intensify the pace on withdrawing the monetary stimulus, triggering higher global inflation and sharper foreign exchange tensions; this would necessitate more severe policy responses.

Figure I.10

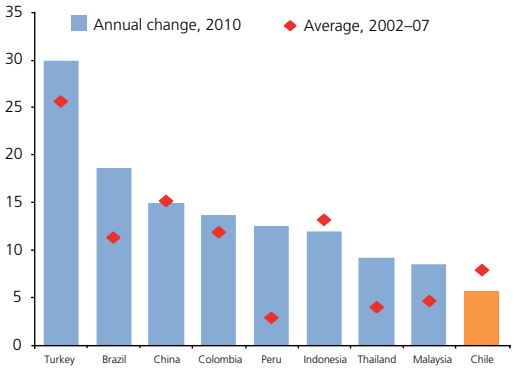
Housing prices in Spain
(long-term index = 100)



Source: OECD (2011a).

Figure I.11

Real growth of private credit in emerging economies (*)
(percent)



(*) In local currency.

Sources: IMF, People's Bank of China, Central Reserve Bank of Peru, and Central Bank of Chile, based on SBIF data.

Main external threats to the financial stability of the Chilean economy

The baseline external scenario used in this *Report* retains the dual growth pattern characterized by higher growth rates and increases in the monetary policy interest rate in the economies not affected by the financial crisis. In this scenario, external financing conditions remain favorable for emerging economies, including Chile.

This scenario presents challenges associated with the possible development of vulnerabilities in the local financial system, through the increased indebtedness of financial intermediaries and firms, a greater exposure of local agents to currency and liquidity mismatches, and/or an overvaluation of key financial assets. The analysis in this *Report* focuses on evaluating these elements and concludes that, to date, there is no evidence of systemic vulnerabilities.

This *Report* identifies three possible external risk scenarios for the Chilean financial system: (a) an aggravation of the fiscal and financial situation of peripheral European countries; (b) a worsening of the fiscal situation in the United States; and (c) a deterioration of the financial-economic situation in a systemic emerging economy. In these scenarios, it is very likely that Chile would experience a weakening in both its external financing conditions and its external demand.

The further deterioration of the fiscal position of Portugal, Ireland, and/or Greece—including a debt restructuring—could set off a risk scenario in Europe. The main channel of contagion for the banking systems in the rest of Europe is through their direct exposure to sovereign, bank, and corporate debt in the affected countries, as well as their vulnerability to deterioration in global financial conditions.

The economic and financial situation in Spain, as analyzed above, shows important differences with the other European peripheral countries. Nevertheless, the funding needs of the public sector and the sensitivity of the banking system's assets to the evolution of employment and the real estate market create a financial situation that is vulnerable to a new economic downturn or to changes in the perceptions of international investors. In addition, if Spain weakens further, it could generate problems in the rest of Europe—either through direct exposure to Spanish debt or through an increase in risk aversion.

The U.S. fiscal position could deteriorate if the economic recovery is slower than expected. The main factors that could contribute to this lower growth are the still-weak situation in the real estate sector and the household deleveraging process. At the same time, the high public debt level, the estimated deficit for 2011, and the public debt refinancing needs

in the coming years make the fiscal deficit very sensitive to fluctuations in the marginal cost of financing. The interaction of these elements could cause long-term nominal U.S. interest rates to increase more than projected. This situation would most certainly be accompanied by a more generalized increase in risk aversion among investors. While this scenario is not very likely, the possible real and financial repercussions are significant.

The potential emergence of financial vulnerabilities in systemically important emerging economies constitutes a final source of risk, because it could unleash sharp reversals in the supply of capital to these economies or amplify the financial shocks described in the previous scenarios. This could generate widespread contagion across asset classes that would affect all emerging economies, causing deterioration in external financing for Chile and, considering the role that emerging economies have played in world growth, a significant contraction in Chile's external demand and terms of trade.

Box I.1: **Capital flows and financial stability**

The financial crises of the 1980s and 1990s in Asia and Latin America demonstrate that while capital flows generate benefits for the receiving economies, they also create important challenges for macroeconomic and financial stability. This box explores these challenges for financial stability in detail.

In general, the literature has concentrated on the *macroeconomic* challenges that arise from net capital flows. The empirical evidence shows that periods of large capital inflows can be associated with a currency appreciation, a risk of overheating, and an expansion of the current account deficit, which expose the economy to the risk of a sharp reversal or *sudden stop* (Cowan et al., 2006; Reinhart and Reinhart, 2008). The most notable examples are the tequila crisis in Mexico in 1994–95 and the Asian crisis of 1997–98, but sudden stops are a much more generalized phenomenon. For example, Cardarelli et al. (2010) estimate that 30% of all episodes of substantial inflows end with a sudden stop and 15% coincide with a balance-of-payments crisis.

While net flows are particularly important from a macroeconomic perspective, the composition of the flows has strong implications for financial stability. Balanced net flows can hide important changes in the level and composition of gross flows—for example, in terms of the maturity structure and currency denomination of debt. The main risks for financial stability associated with larger gross capital inflows include the generation of currency and maturity mismatches, credit booms that lead to a deterioration in loan quality, and local asset price misalignment. The following sections describe some of the mechanisms through which these vulnerabilities can arise.

(a) Currency and maturity mismatches

Banking institutions are exposed to maturity mismatches through an inherent characteristic of brokering: banking business involves the transformation of debt maturities. These mismatches are exacerbated by market failures stemming from asymmetric information and moral hazard (deposit security, partial internalization of systemic risk, and so forth), which leads banks to take on too much risk (Calvo et al., 1996; McKinnon and Pill, 1998; Rodrik and Velasco, 1999; Korinek, 2007)[7]/. In the case of firms, the main frictions that can generate excessive liquidity risk exposure arise when firms do not correctly internalize the systemic implications of their debt decisions and when there are asymmetric financing opportunities for different sectors of the economy (Aoki et al., 2009; Caballero and Krishnamurthy, 2001, 2006; Tornell and Westermann, 2002)[8]/. Currency mismatches, in turn, are often associated with an underestimation of exchange rate volatility (the so-called peso problem, for example), and, for similar reasons, they are probably more frequent in economies with a fixed or managed exchange rate (Ize and Levy-Yeyati, 2005; Levy-Yeyati, 2006).

(b) Domestic credit growth with a deterioration of credit risk[9]/

Here again, the presence of moral hazard, associated with some type of friction, is a key factor in the process through which an abundant supply of external financing generates excessive credit growth. For example, Borio et al. (2001) propose a mechanism where an underestimation of risk

[7]/ Tornell and Westermann (2002) present evidence supporting the existence of these imperfections.

[8]/ This mechanism is based on the fact that while the tradable sector has access to a variety of external financing sources, the nontradables sector depends strongly on local bank credit. Consequently, the banks are more exposed to the nontradables sector, which generates a currency mismatch.

[9]/ These risks are found not only in less developed financial markets, but also in advanced economies. For example, in Spain, or even in the United States financial system, large inflows before the crisis may have been a factor behind the deterioration in lending standards (Mendoza and Terrones, 2008; Furceri et al., 2011).

fosters a loosening of lending standards[10]/; and Lorenzoni (2008) highlights the presence of an implicit government guarantee. Excessive growth can also be driven by financial amplification mechanisms, as detailed below[11]/.

(c) Asset price misalignment

There are several market imperfections that can cause capital flows to affect financial asset prices, including adverse selection, imperfect monitoring, and externalities (Aoki et al., 2009; Krugman, 1998; Korinek, 2010; Bianchi, 2010). In each case, however, the story is the same: in economies with a low level of financial development or, more generally, with frictions that limit arbitrage between assets, capital flows can potentially lead to price misalignments relative to economic fundamentals.

The financial vulnerabilities described above are interrelated and are subject to possible feedback mechanisms. If an agent's credit limit is affected by asset prices, then the initial price rise stemming from the capital inflow will increase the credit limit. To the extent that the credit is reinvested in assets, the prices will increase even further, generating a new increase in the credit limit, and so on.

The vulnerabilities described in this box are most strongly associated with a certain type of inflow. Maturity mismatches, by their nature, are closely tied to short-term debt. Credit growth is, above all, related to inflows of both bank debt and bank bonds issued overseas (Shin, 2010). Finally, local asset price misalignment can initially be generated by portfolio flows of specific assets. For example, gross equity flows can lead to an increase in stock market prices (Olaberría, 2011). Finally, the composition of flows is also relevant in terms of triggering a sudden stop, as a capital reversal is more likely when the share of short-term flows—portfolio or bank debt—is high relative to foreign direct investment (Calvo et al., 1996; Rodrik and Velasco, 1999; Wei, 2006).

Finally, the formation of financial vulnerabilities described above constitutes a risk factor in and of itself and has the potential to magnify the impact of a sudden capital flow reversal brought on by external factors[12]/. Given the possible implications of capital inflows, it is necessary to closely and continuously analyze the factors specific to each economy that can promote the development of such vulnerabilities, together with any potential mitigating factors such as regulation and market depth.

[10]/ Delgado and Saurina (2004) present empirical evidence of this mechanism for Spain.

[11]/ Mendoza and Terrones (2008) find that credit booms are much more frequent in economies with a fixed or managed exchange rate.

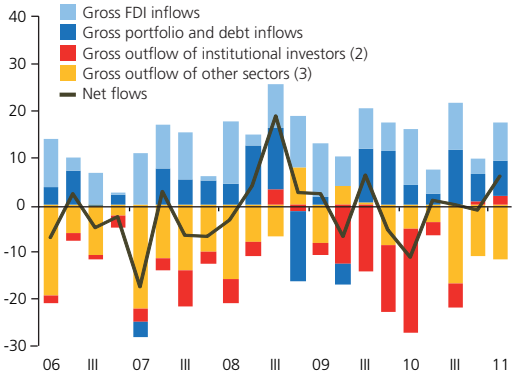
[12]/ For example, Park (2010) argues that currency and maturity mismatches are a potential source of financial instability and can magnify the impact of a sudden reversal of capital inflows.

II. External financing

Figure II.1

Capital inflows and outflows in Chile (1)

(percent of GDP)



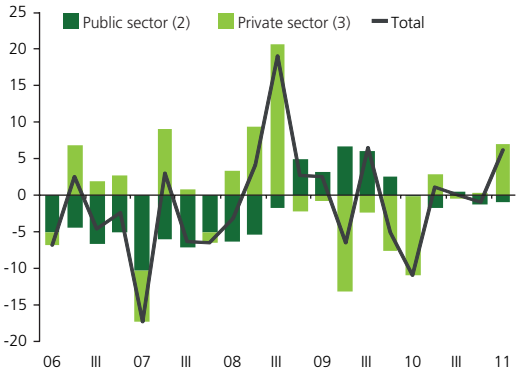
(1) Quarterly flow.
(2) Includes pension funds, mutual funds, and insurance companies.
(3) Includes firms, banks, and the central government.

Source: Central Bank of Chile.

Figure II.2

Net public and private capital flows (1)

(percent of GDP)



(1) Quarterly flow.
(2) Includes the central government and the Central Bank. Excludes reserve assets.
(3) Includes banks, firms, and institutional investors.

Source: Central Bank of Chile.

In a context of favorable external financing conditions, gross capital inflows to Chile continue to be strong, while the economy's liquidity and solvency position remains robust.

Capital flows

In the most recent period, the Chilean economy recorded net capital inflows

The Chilean economy recorded a net capital inflow of US$3.4 billion (6% of GDP) in the first quarter of 2011, which includes the effect of the earthquake (figure II.1)[1]/. This increase was due to the fact that gross capital inflows were stable at 2010 levels, while gross capital outflows decreased. The latter trend largely reflected a reduction in external asset purchases by the pension funds (chapter III).

The public sector's share of net capital flows was very limited in the first quarter of 2011. This contrasts with previous periods, when the government offset private flows (figure II.2). Firms and banks accounted for 70% of total net private sector flows in the first quarter.

Gross capital inflows to Chile continue to be dominated by FDI and portfolio debt flows

Foreign direct investment (FDI) flows were stable at almost 8% of GDP in the first quarter of 2011; they mostly corresponded to net reinvestment in the mining sector (figure II.1). In aggregate terms, these flows represented 52% of gross capital inflows and, as discussed in box I.1, tend to be more stable than debt (other investment) or portfolio flows.

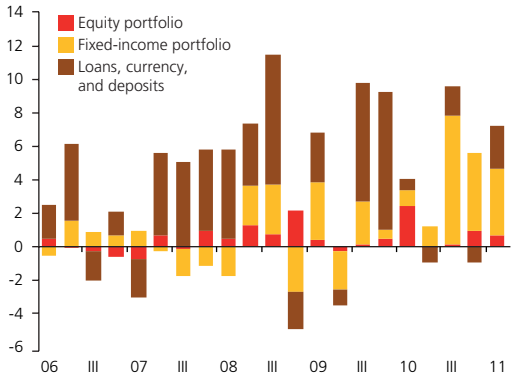
The level and composition of financial flows—that is, gross inflows not associated with FDI or commercial loans—were stable relative to the last two quarters (figure II.3). As highlighted in the last *Report*, firms and banks have issued significantly more bonds overseas since the third quarter of 2010 (chapters IV and V). These issues have displaced external bank debt

[1]/ The February 2010 earthquake generated inflows of about US$760 million in the first quarter of 2011. Additional inflows of almost US$2 billion are expected in the coming months due to earthquake reinsurance.

Figure II.3

Gross financial capital inflows to Chile (*)

(percent of GDP)



(*) Quarterly flow.

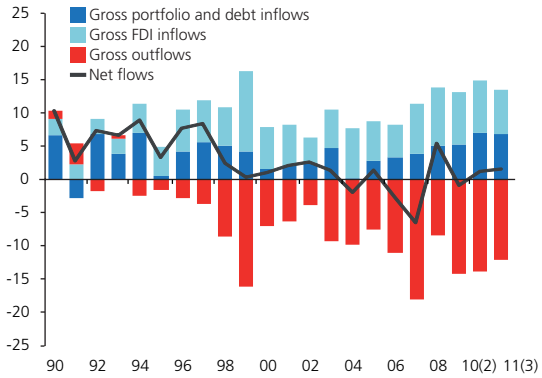
Source: Central Bank of Chile.

Figure II.4

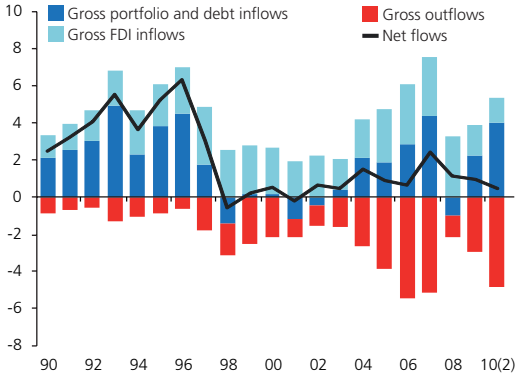
Capital inflows and outflows (1)

(percent of GDP)

a) Chile



(b) Emerging economies (4)



as a source of external financing and contributed to lengthening the average maturity of external debt. Bond issues were the main component of the portfolio debt inflows to Chile in the last quarter, accounting for double the value of flows from the purchase of local debt securities by nonresidents.

From a historical perspective, gross capital flows to Chile remained high in the last year, whereas net flows were relatively low

In March 2011, net capital inflows in the last 12 months were 1.6% of GDP, which is similar to average inflows in 2000–07, but lower than the average net flows in the 1990s (figure II.4, panel a)[2]/. At the same time, total gross inflows were higher than the average in the 1996–99 period and close to the levels recorded in recent years.

Compared with other countries, gross capital inflows to Chile are high as a share of GDP, mainly due to the level of FDI

In the last two years, gross capital inflows to Chile have been high compared with the emerging economies of Asia and Latin America and with a sample of smaller advanced economies that have not suffered severe financial distress (figure II.4, panels b and c). An important share of these inflows, however, is due to the high levels of FDI received in this period. FDI-related capital inflows to Chile represented 57% of the total in 2009–10, versus 32% in the emerging economies and 26% in the smaller advanced economies in the same period.

The pattern of relatively high gross inflows and moderate net flows is also found in other emerging economies

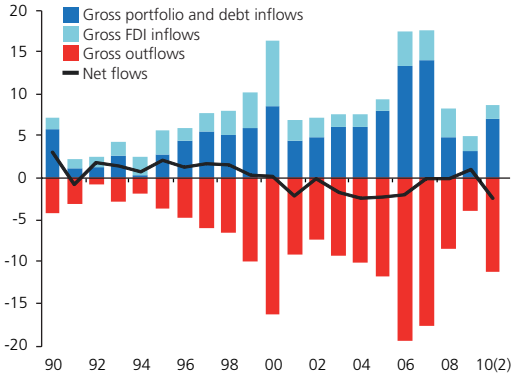
This pattern is found, in particular, in emerging economies in Asia and Latin America, where, like Chile, capital outflows played an anticyclical role in 2009–10, a phenomenon that was not seen in the 1990s (figure II.4, panels a and b). In the third quarter of 2010, non-FDI capital inflows to Chile were similar to those of a set of smaller advanced economies, but higher than emerging economies in Asia and Latin America, while Chile's net flows were lower than in the majority of the countries in the sample (figure II.5).

To date, gross portfolio equity inflows are moderate relative to the quantity of local assets

One potential risk of capital flows is their impact on financial asset prices in the receiving countries (box I.1). To size up this risk, gross inflows into equity and debt securities were normalized as a percentage of the stock of available assets for each market (figure II.6).

[2]/ The IMF (2011c) identifies three upward cycles of capital inflows to emerging economies: (a) 1995:IV to 1998:II, (b) 2006:IV to 2008:II, and (c) 2009:III to date.

(c) Smaller advanced economies (5)

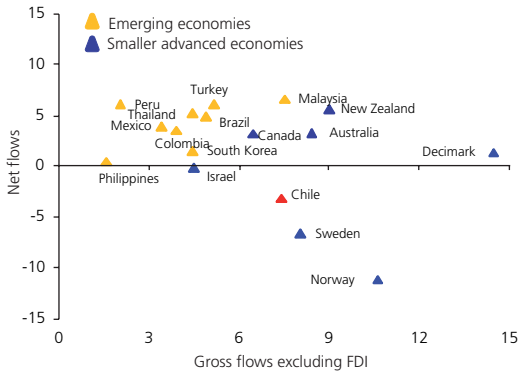


(1) Annual flows.
(2) Annual flow as of third quarter of 2010.
(3) Annual flow as of first quarter of 2011.
(4) Simple average of the following countries: Brazil, Colombia, Indonesia, Malaysia, Mexico, Peru, Philippines, South Korea, Thailand, and Turkey.
(5) Simple average of the following countries: Australia, Canada, Denmark, Israel, New Zealand, Norway, and Sweden.

Sources: Central Bank of Chile and IMF.

Figure II.5

Net versus gross capital flows (*)
(percent of GDP)



(*) Annual flow as of third quarter of 2010.

Sources: Central Bank of Chile and IMF.

In Chile, external capital inflows into equity represent a small percentage of free-float market capitalization (2.6% in 2010), which is comparable to the average for emerging economies and smaller advanced economies. Capital inflows into debt securities were somewhat higher than in other economies, at 7% of the total stock in 2010; this figure is also higher than previous inflow cycles—for example, the average for 1996–99 was 1.3%. However, almost 70% of these flows corresponded to new overseas bond issues and not the purchase of existing assets.

The cost of external financing remains favorable

The cost of short-term external bank financing has been stable since late 2009, with less dispersion among banks and an average maturity of around 10 months. The external financing conditions of the banking sector thus remain favorable.

Since the last *Report*, the levels of sovereign and corporate spreads in Chile have been similar to 2010 levels, despite periods of greater risk aversion. Spreads in Chile are low relative to other emerging economies: in the first quarter of 2011, the EMBI was 117 basis points for Chile, while it exceeded 260 basis points for the other emerging economies. A similar pattern is found for five-year sovereign CDSs and the CEMBI, with the latter at 250 basis points for Chile versus an average of 280 basis points for the other emerging economies.

While the cost of short- and long-term financing in Chile has been stable recently, it has changed significantly since the subprime crisis. The spread on bank loans was around 13 basis points before the crisis; it has averaged 60 basis points from 2009 to date. Similarly, sovereign and corporate risk premiums have increased 20 and 100 basis points, respectively, from their pre-crisis levels.

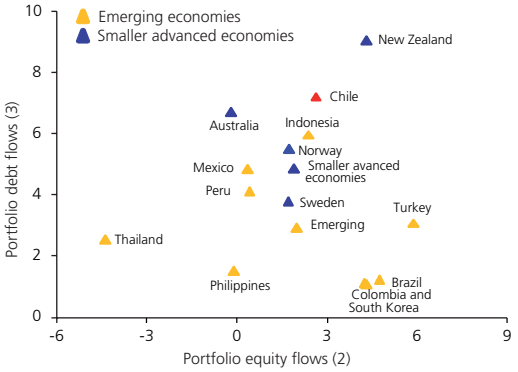
This change in the risk level has been generalized, and Chile's relative position in the distribution of international spreads has generally improved. For example, in early 2007 Chile's CDS level was around the median of the world distribution, whereas it is currently in the lowest 25% of the distribution (figure II.7)[3]/. This better relative position is consistent with the sovereign risk rating, which has improved in both absolute and relative terms since the crisis.

[3]/ Based on a sample of all countries for which CDS data are available on five-year sovereign debt.

Figure II.6

Gross portfolio inflows (1)

(percent)



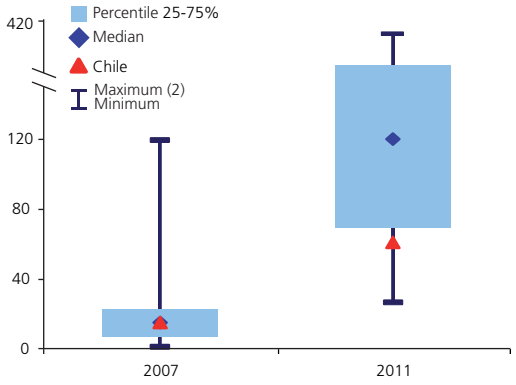
(1) Annual flow as of third quarter of 2010.
(2) Free-float market capitalization.
(3) Both local and international public and private debt stock.

Sources: Central Bank of Chile, BIS, IMF and Morgan Stanley.

Figure II.7

International distribution of sovereign spreads (1)

(basis points)



(1) Measured by five-year sovereign CDSs in the first quarter of each year for the following countries: Germany, Australia, Brazil, Chile, Colombia, France, Greece, Ireland, Italy, Japan, Malaysia, Mexico, New Zealand, Norway, Peru, Philippines, Portugal, South Korea, Spain, Sweden, Thailand and Turkey, The United Kingdom, and The United States.
(2) Maximums are the 90th percentile.

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

Liquidity and solvency

The external debt has increased since the last Report, with no significant changes in terms

External debt has grown nearly US$6 billion since the end of 2010, and it continues to be dominated by private external financial debt (PEFD), that is, private debt excluding commercial loans. Although firms and individuals account for a large percentage of PEFD (71%), there has been a progressive increase in the share owed by banks (table II.1). The implications of this greater external debt in the banking system, in terms of exposure to currency and liquidity risk, are limited thus far (chapter V). In addition, almost half of the increase in the total external debt of firms and individuals corresponds to commercial loans, and it is thus directly associated with import volumes in the past few months.

In terms of maturity, short-term PEFD represented 12% of the total, which is similar to the level recorded in late 2010 and lower than at year-end 2009. The average maturity of external debt of banks and firms has not changed significantly since the last *Report*. In March 2011, it was 2.2 years for banks and 5.6 years for firms (table II.1).

Table II.1

External debt of the Chilean economy

	2008 IV	2009 IV	2010 IV	2011 I	Change 11.I - 10.IV
			(US$ billion)		
Total external debt	64.3	74.0	86.0	91.8	5.7
Banks	13.1	15.5	19.2	21.3	2.2
Firms and individuals	47.9	54.5	61.3	64.8	3.5
Consolidated government	3.2	4.0	5.6	5.6	0.1
Short-term external debt (1)	14.6	17.5	19.1	21.2	2.0
Banks	3.1	7.5	6.8	7.4	0.7
Firms and individuals	11.5	10.0	12.3	13.7	1.4
Commercial loans	8.3	7.6	10.6	12.0	1.4
RSTED (2)	28.8	28.0	32.9	36.9	4.1
Banks	10.1	11.7	13.7	15.4	1.8
Firms and individuals	18.0	16.1	19.0	20.7	1.7
Commercial loans	8.4	7.6	13.8	15.8	2.0
Consolidated government	0.6	0.2	0.2	0.8	0.6
			(percent)		
Composition of PEFD (3)					
Banks	24.9	24.9	27.4	28.7	1.3
Firms and individuals	75.1	75.1	72.6	71.3	-1.3
Short-term PEFD / Total PEFD	11.9	15.8	12.2	12.4	0.2
Banks	23.2	48.3	35.3	34.9	-0.4
Firms and individuals	8.1	5.1	3.5	3.3	-0.1
			(years)		
Average maturity of total debt					
Banks	2.0	1.8	2.5	2.2	-0.3
Firms and individuals	5.3	5.8	5.6	5.6	0.0

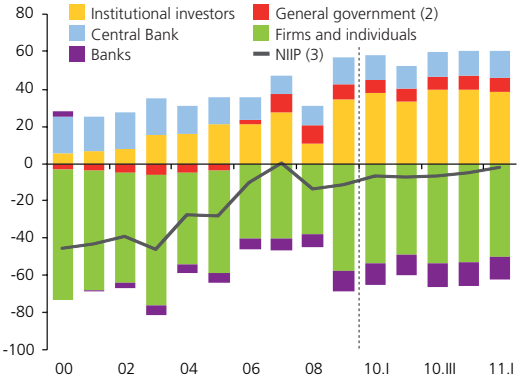
(1) Contractual maturity.
(2) RSTED: Residual short-term external debt.
(3) PEFD: Private external financial debt, excluding government debt and commercial loans.

Source: Central Bank of Chile.

Figure II.8

Net international investment position of Chile (1)

(percent of GDP)



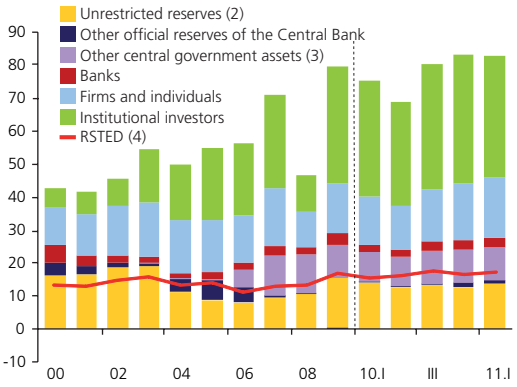
(1) GDP at constant real exchange rate (baseline index Mar.11 = 100).
(2) Central government and municipalities.
(3) Net international investment position.

Source: Central Bank of Chile.

Figure II.9

Availability of external financial liquidity for Chile (1)

(percent of GDP)



(1) GDP at constant real exchange rate (baseline index Mar.11 = 100). External liquidity includes short-term loans, currency and deposits, and portfolio investment. It does not include derivative positions.
(2) Official reserves less short-term foreign currency liabilities (maturing BCX, BCD, swaps).
(3) Consolidated government less official international reserves.
(4) Residual short-term external debt.

Source: Central Bank of Chile.

Aggregate external solvency remains stable…

Despite the higher level of external debt, Chile's net international investment position (NIIP) grew slightly in the first quarter of 2011, reaching historically high levels, and ended the quarter with a debit position of nearly 2% of GDP (figure II.8). External debt has been stable at just over 40% of GDP (table II.2).

…while the external liquidity position has improved slightly

The liquidity position, measured as residual short-term external financial debt over net unrestricted international reserves, has improved thanks to the Central Bank's reserve accumulation program. Thus, the availability of additional external sources of liquidity can more than cover the residual short-term debt (figure II.9).

Table II.2

External solvency and liquidity indicators

(percent)

	2008	2009	2010	2011
	IV	IV	IV	I
Solvency				
NIIP / GDP (1)	-13.6	-11.1	-4.9	-1.8
Current account balance (moving year) / GDP (2)	-1.9	1.6	1.9	1.1
Current account balance (annualized) / GDP (2)	-5.7	1.3	2.4	1.3
External debt / GDP (2)	37	45	42	43
External debt / exports	118	169	145	147
Liquidity (3) (4)				
Financial RSTED / NIR	86	75	84	82
Financial RSTED / (NIR + ESSF) (5)	45	52	56	57

(1) GDP at constant real exchange rate (baseline index Mar.11 = 100).
(2) Twelve-month GDP in current dollars.
(3) Financial RSTED: Residual short-term external debt excluding loans between firms and commercial loans.
(4) NIR: official unrestricted reserves, excluding short-term foreign currency liabilities (maturing BCX, BCD, swaps), Treasury deposits at the Central Bank, and others.
(5) ESSF: Economic and Social Stabilization Fund.

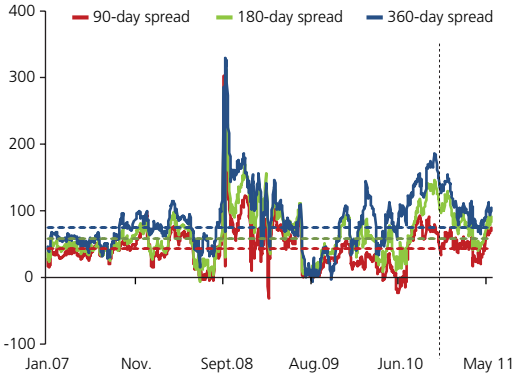
Source: Central Bank of Chile.

III. Local financial markets

Gráfico III.1

Liquidity pressures in the peso money market (*)

(basis points)



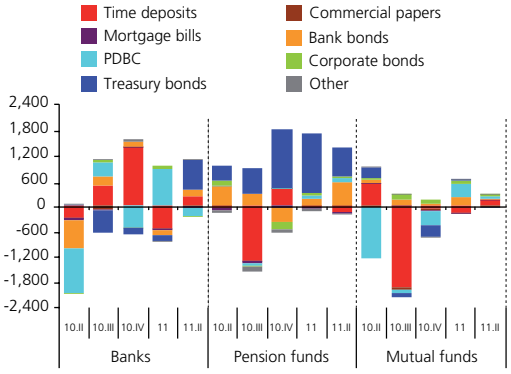
(*) Measured by the average prime-swap spread. The horizontal dashed lines indicate the 2005–11 average for each series. The vertical dotted line marks the statistical closing date of the last *Report*.

Source: Central Bank of Chile.

Gráfico III.2

Financial intermediation and fixed-income portfolio management (*)

(change in stock, Ch$ billion)



(*) Data through 20 May 2011.

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

The peso and dollar money markets have operated normally since the last Report.

Fixed-income and money markets

Liquidity pressure has eased in the peso money market

Financing conditions have improved in the money market relative to the last *Report*, with a marked reduction in the prime-interbank swap spread at the longest maturities (180 and 360 days) (figure III.1). On the statistical closing date of this *Report*, the 90-, 180-, and 360-day spreads were 77, 91, and 105 basis points, respectively, which are not significantly different from their historical averages (2005–11).

To a large degree, the spread dynamics have been linked to a reorientation of the pension fund portfolio toward the local market[1]/. In fact, the reduction in spreads seen in late 2010 coincides with the recovery of time deposit positions held by these agents in the period, and these holdings have not changed significantly in the current year (figure III.2). In the same direction, since late 2010 there has been an increase in direct deposits from nonfinancial firms and individuals, as well as interbank deposits, which is consistent with the monetary policy normalization process underway this year (figures III.2 and III.3).

New regulations on the valuation of type 1 mutual funds did not have a strong impact on the money markets

SVS administrative directive N° 1990 entered into effect on the 1st of March, establishing new requirements in the valuation of type 1 mutual funds (MF-1)[2]/. As discussed in the last *Report*, this regulatory change brings the valuation of MF-1 portfolios closer to mark-to-market value. In

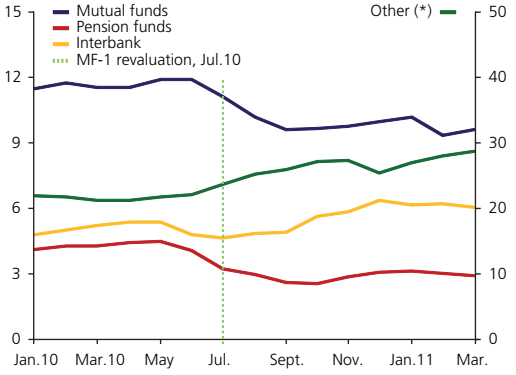
[1]/ See box III.1 in the *Financial Stability Report, Second Half 2010*.

[2]/ Mutual funds invested in short-term debt instruments, with a maturity of 90 days or less.

Gráfico III.3

Time deposit holdings

(Ch$ trillion)



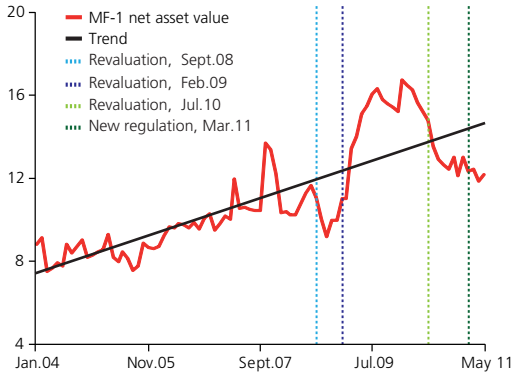
(*) Ii includes households, firms, and other agents.

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

Gráfico III.4

Type 1 mutual fund net asset value

(percent over M2)

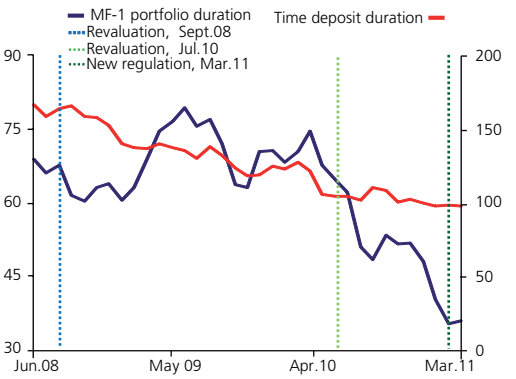


Source: Central Bank of Chile, based on data from the SVS.

Gráfico III.5

Sensitivity of MF-1 valuation to changes in interest rates (*)

(days)



(*) Average duration of nominal instruments.

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

principle, this should reduce the probability of sharp, significant portfolio adjustments due to the revaluation of the underlying assets. The possible consequences of this regulation include a reduction and/or a shortening of asset under management. These changes are positive from the perspective of financial stability, although to the extent that the adjustments are made suddenly and in economically significant magnitudes, they could generate transitory, but relevant, fluctuations in the prices of instruments traded on the money market.

As of the close of this *Report*, three months have passed since the regulatory change entered into force, and there have not been any significant changes in assets under management. Furthermore, the assets managed by the MF-1 increased 1.6% relative to the values recorded when the regulation became effective. Nevertheless, the growth trend with respect to the M2 monetary aggregate has not yet recovered to values observed before the financial crisis nor regarding the increase of late 2008, which largely coincided with the greater liquidity in the corporate sector in that period (figure III.4)[3]/.

Portfolio maturities have decreased, but the trend began several months before the new regulation became effective. This suggests that the industry started its adjustment to the new valuation procedure in advance, thereby mitigating the potential impact on the functioning of the monetary market (figure III.5). The average duration of the MF-1 dropped from 65 to 36 days between June 2010 and April 2011, which contrasts with the relative stability of the average maturity of bank deposits currently in the market.

Since the fourth quarter of 2010, the pension funds have increased their investments in the local market and slightly reduced their overseas investments

At the close of this *Report*, the pension funds have mainly invested in fixed-income state instruments in the local market, increasing their position by around US$6.91 billion since the end of October 2010. Almost 70% of this increase corresponds to UF-denominated instruments, most of which were purchased in the primary market (figure III.2). In the same period, overseas investment decreased US$780 million, with some degree of substitution of fixed-income instruments with variable-income instruments: the former contracted US$2.19 billion between February and April 2011, while variable-income instruments increased US$1.77 billion.

A series of factors could explain the increase in pension fund investment in the local market

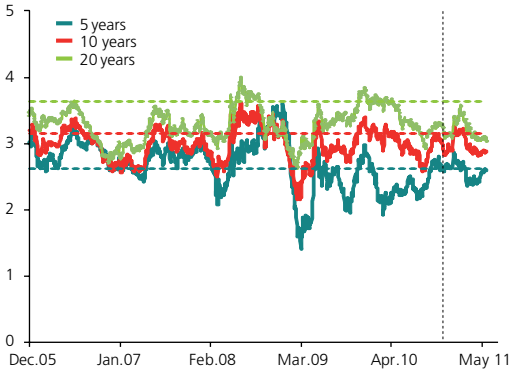
First, the external uncertainty regarding the sustainability of the public debt in advanced economies (chapter I), could have caused the pension funds to prefer less risky assets in the local market. Second, the increase in

[3]/ M2 basically includes cash and demand and time deposits.

Gráfico III.6

Interest rates on UF-denominated government bonds (*)

(percent)



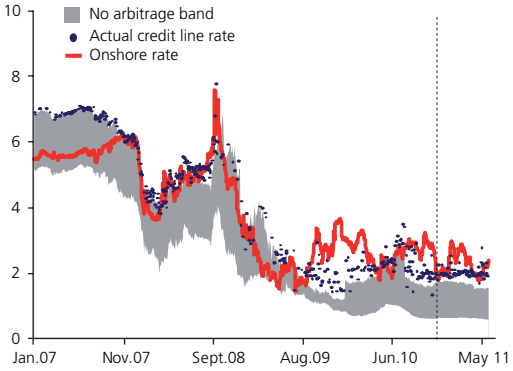
(*) The horizontal dotted lines indicate the 2002–11 historical average for each series. The vertical line marks the statistical closing date of the last *Report*.

Source: Central Bank of Chile.

Gráfico III.7

Liquidity pressures in the dollar money market (1) (2)

(percent)



(1) One-year maturity. The dots represent the maximum rates recorded in the financing of local banks that use external credit lines. See Opazo and Ulloa (2008).

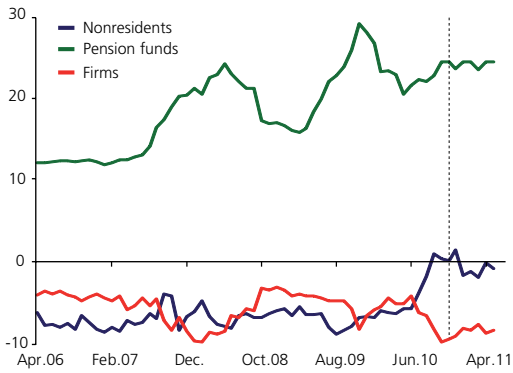
(2) The dashed line marks the statistical closing date of the last *Report*.

Sources: Central Bank of Chile and Bloomberg.

Gráfico III.8

Forward dollar derivatives holdings by agent (1) (2)

(US$ billion)



(1) A positive number indicates a net short position; a negative number indicates a net long position.

(2) The dashed line marks the statistical closing date of the last *Report*.

Source: Central Bank of Chile.

local long-term rates in response to the announcement of the international reserve accumulation program made national fixed-income investment more attractive (figure III.6). Third, the higher inflation expectations in early 2011 could have generated a greater appetite for long papers denominated in UF, with the goal of reducing the portfolio's inflation risk. Finally, the introduction of the new pension fund investment regime could have triggered a portfolio recomposition toward domestic instruments.

The new pension fund investment regime incorporated high-yield bonds into the restricted instruments category and changed the definition of indirect investment

On 18 January 2011, through resolutions N°4 and N°5, the Superintendence of Pensions modified the Pension fund investment regime. The main changes to the regime were as follows: (i) instruments considered risky by the Supervisor were reclassified; (ii) indirect investment was redefined; and (iii) the treatment of internal and external issuers was made more consistent (chapter VI). With regard to the first change, the restricted instruments category was expanded to incorporate representative securities from financial indices that include, for example, high-yield bonds and emerging market bonds, which are now subject to the structural limits set by the Central Bank. As mentioned in the last *Report*, investment in these instruments grew steadily over the last two years, reaching US$13.40 billion in January 2011 (9.3% of the total value of the funds).

As indicated, the change in the investment regime could result in adjustments in the pension fund portfolios. However, there is uncertainty regarding the type of adjustment (for example, portfolio substitution among external assets versus between external and internal assets) and the rate at which it will be implemented. Scenarios involving local asset transactions in sufficiently high magnitudes and rates could lead to transitory fluctuations in some asset prices.

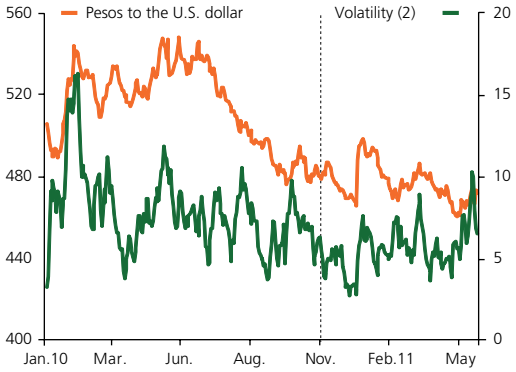
The dollar money market has also been operating under normal conditions

As of the close of this *Report*, the onshore rate has not fluctuated much relative to the last *Report*, staying near the arbitrage band. This indicates that there are no important restrictions on the functioning of the local dollar market (figure III.7). Since the second quarter of 2009, the onshore rate has averaged 2.5%, with a variability of 48 basis points. On the statistical closing date of this *Report*, the rate was 2.4%.

Gráfico III.9

Evolution and volatility of the nominal exchange rate (1)

(level, percent)



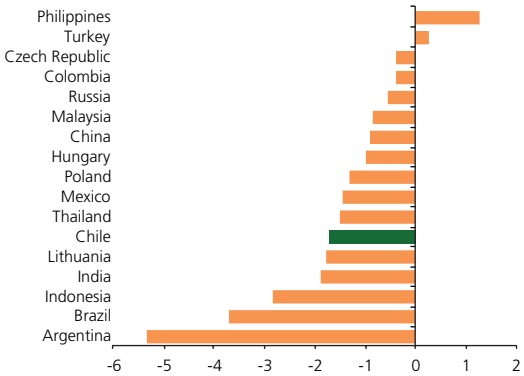
(1) The dashed line marks the statistical closing date of the last *Report*.
(2) Five-day moving average of annualized daily volatility, calculated according to Alfaro and Silva (2008).

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

Gráfico III.10

Variation of the price-earnings ratio in emerging economies (*)

(times)



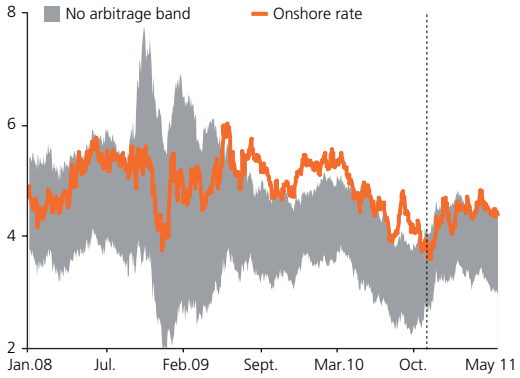
(*) Variation between December 2010 and May 2011.

Sources: Central Bank of Chile and Bloomberg.

Gráfico III.11

Long-term dollar financing rate (1) (2)

(percent)



(1) Synthetic return in dollars on a ten-year BCU. No arbitrage band for local long-term government instruments relative to similar instruments in the U.S. See Álvarez and Opazo (2009).
(2) The dashed line marks the statistical closing date of the last *Report*.

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

In the foreign currency derivatives market, nonresident investors have returned to a long dollar position, although they are still below the levels of the first half of 2010

In the second half of 2010, there was a sharp closing of the traditionally long position in dollar forwards held by nonresident agents, which was temporarily reversed to a short position (figure III.8). This dynamic may have been influenced by expectations of an exchange rate appreciation in that period. After the announcement of the reserve accumulation plan by the Central Bank, these agents returned to a long position. The pension funds have not altered their short position in this market, so these adjustments have not put pressure on the onshore rate.

Asset prices

The exchange rate continued to strengthen in line with the persistent weakness of the dollar at the international level

Between the close of this and the last *Reports*, the exchange rate trend was characterized by an increase of 7% in the first week of the reserve accumulation plan, followed by a drop in line with other parities, for a total drop of 2% for the period as a whole (figure III.9). Exchange rate volatility has been stable since the last *Report*. It increased slightly in the most recent period and averaged 5.6%, which is lower than the average from 2004 to date (7.8%).

The local stock market trended downward in the first two months of the year and then reverted its performance starting in March

Since the last *Report*, the Chilean stock market fell 3.6% measured in pesos. This performance, combined with the increase in the profits, implied that the price-earnings ratio decreased from 19.5 to 17.4 times in the same period, in line with the drop in other emerging economies (figure III.10). This represents a scenario of greater domestic activity. Thus, stock index volatility increased to 20% in mid-February and then dropped to 7.6%, well below its historical average (11.4% for the period 2003–11).

The local fixed-income market remained within the arbitrage ranges determined by external long rates

Since the last *Report*, the synthetic dollar rate of fixed-income instruments issued by the Central Bank and the Treasury has remained in line with equivalent U.S. Treasury instruments (figure III.11). This suggests that there are no significant arbitrage opportunities between these long-term instruments. In terms of the components of the cost of exchanging UF rates for dollar rates, the most important factors are a stable country risk premium, at around 70 basis points, and a decreasing cost of exchanging fixed UF rates for variable rates, which fell from 100 to almost 40 basis points, starting in the fourth quarter of 2010.

IV. Credit users

The debt of firms has continued to grow, driven by external debt and bank loans. However, the currency mismatch has not increased significantly, and the financial position of the corporate sector has not deteriorated. The growth rate of household debt is picking up again, but credit risk indicators remain at moderate levels.

Firms

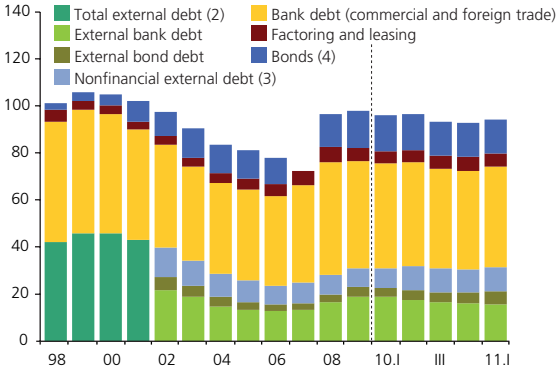
During the first quarter of 2011, business debt grew in line with economic activity

The Chilean economy grew 9.8% between the first quarter of 2010 and the first quarter of 2011, with an annualized increase in investment of 19.3%. This increase, which was mainly driven by investment in machinery and equipment, followed on a slowdown in the first quarter of 2010 due to the earthquake. The debt of firms grew 9.4% in annual terms in the first quarter of 2011, which is higher than the growth rates recorded in the third and fourth quarters of 2010 and also higher than the same quarter of the previous year (table IV.1). Business debt was thus 94.4% of GDP in the first quarter of 2011, which is lower than this ratio in the previous year (figure IV.1).

Figure IV.1

Total debt of nonfinancial firms

(percent of GDP) (1)



(1) GDP for 2010–11 is the moving year ending in each quarter.
(2) Converted to pesos using the average exchange rate from Mar.02 to Mar.11. It includes FDI-related loans.
(3) FDI-related loans and commercial loans.
(4) Corporate bonds (excluding Codelco), securitized bonds with nonbank underlying assets, and commercial papers.

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

Table IV.1

Sources of financing

(real annual change, percent)

Indicator	2008 IV	2009 IV	2010 I	2010 II	2010 III	2010 IV	2011 I	Contribution to growth (1)	Share in debt
Local debt	12.1	2.0	3.0	5.1	4.5	4.5	7.6	5.1	66.5
Bank and other loans	11.5	-2.3	1.2	5.1	5.2	5.2	8.2	4.2	51.0
Commercial loans	8.5	7.7	6.7	6.5	4.8	2.8	4.8	1.9	38.9
Foreign trade loans	35.3	-40.1	-23.8	7.1	0.9	12.5	23.4	1.3	6.4
Factoring and leasing (2)	4.2	-11.1	-3.0	-6.1	12.8	15.9	17.9	1.0	5.8
Bonds (3)	14.7	18.3	9.2	5.2	2.1	2.3	5.5	0.9	15.4
External debt (4)	9.5	15.0	12.7	19.0	16.6	10.0	13.4	4.3	33.5
Bank loans	19.1	20.1	7.4	2.1	0.8	-4.8	-6.9	-1.4	16.7
Commercial loans	-13.9	-8.1	14.7	46.3	44.4	33.0	48.1	2.6	7.2
Bonds	20.0	21.2	15.9	31.1	17.6	31.1	49.7	2.1	5.7
FDI-related loans	9.6	28.8	47.4	80.1	82.0	37.0	32.2	1.0	3.9
Total	**11.4**	**5.8**	**6.0**	**9.3**	**8.2**	**6.2**	**9.4**	**9.4**	**100.0**

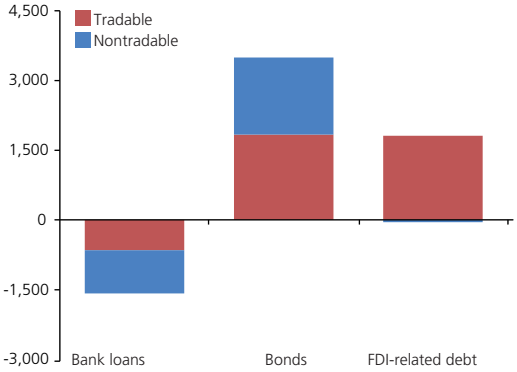
(1) Percentage points.
(2) Factoring includes bank and nonbank institutions.
(3) Corporate bonds (excluding Codelco), securitized bonds with nonbank underlying assets, and commercial papers.
(4) Includes loans associated with FDI. Converted to pesos using the average exchange rate for the period from March 2002 to March 2011.

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

Figure IV.2

External debt of firms (1) (2)

(US$ million)



(1) Change in external debt between March 2010 and March 2011.

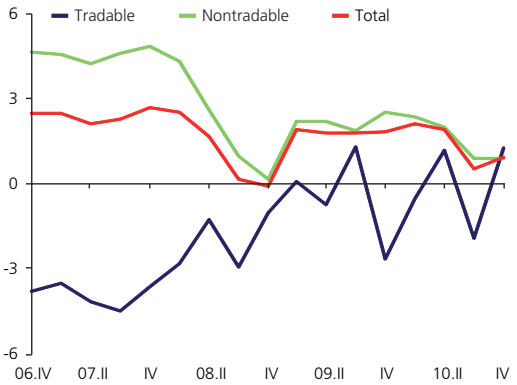
(2) Estimates for each sector based on a representative sample of firms.

Source: Central Bank of Chile.

Figure IV.3

Currency mismatches (1) (2)

(percent of total assets)



(1) Dollar liabilities less dollar assets, less the net derivatives position over total assets.

(2) Asset-weighted average of an average sample of 190 firms.

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

Local bank loans continue to grow moderately

Local bank loans grew 8.2% in annual terms in March 2011, after three quarters of growth around 5% (table IV.1). Given its relative importance, the local bank market explains a large share of the total increase in business debt—around 4.2 percentage points. The local financing sources with the strongest growth were foreign trade loans (23.4%) and factoring and leasing (17.9%). Commercial loans grew moderately (4.8%), which, while higher than the last quarter of 2010, is still lower than in past years.

External financing continues to be an important source of the debt expansion

External debt continues to explain an important share of the expansion of total business debt, with an annualized growth rate of 13.4% in the first quarter of 2011. This represents more than four percentage points of the total growth of debt. In terms of composition, and excluding trade credits[1]/, the increase in external debt is mainly explained by bonds and loans associated with foreign direct investment (FDI), which posted annualized growth rates of 49.7 and 32.2%, respectively, in March. In terms of the sectoral composition, bonds were issued by firms in both the tradable and nontradable sectors, while FDI-related loans were concentrated in the tradable sector—mostly export firms in the mining sector (figure IV.2)[2]/.

The financing structure of firms registered with the Superintendence of Securities and Insurance (SVS) that issued bonds overseas in 2010 shows a moderate increase in the share of external debt in total financial debt, from 35.1 to 41.2% between December 2009 and December 2010. Their debt-equity ratio increased from 0.41 to 0.48 times in the same period, which is above the historical average (0.42). This has not had a significant effect on the term structure of debt, however, as the short-term portion has been stable at around 15% of total financial debt.

The currency mismatch in the corporate sector has shrunk…

Despite the importance of external debt as a source of financing, the corporate sector reduced the currency mismatch on its balance sheet (figure IV.3). For an average sample of 190 firms[3]/, the currency mismatch was 0.92% of total assets in December 2010, well below the average of the last four years (1.71%).

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[1]/ Trade credits have a less financial character than the other liabilities that make up external debt.

[2]/ An analysis of a sample of firms that issued bonds overseas in the last few months does not reveal any significant differences between the real issue rate in dollars on these instruments and the rate that would have been obtained on the local market. As mentioned in the last *Report*, this result suggests that there are other reasons for the behavior of these firms, probably related to the diversification of the liability portfolio and expectations of an increase in the cost of external financing.

[3]/ The analysis is based on a sample of firms for which there are available data on dollar assets and liabilities and on total assets at the individual level.

An analysis of the currency mismatch increase in the tradable sector during the fourth quarter of 2010 indicates that it reflects changes in the dollar asset and liability positions of two relatively large firms. When these two firms were excluded, the mismatch was within its historical ranges[4]/. The nontradable sector, which is more sensitive to a depreciation of the local currency, recorded a mismatch of 0.87% in December 2010, which is below the levels recorded in the previous three quarters and significantly lower than the average of the past few years (2.7%).

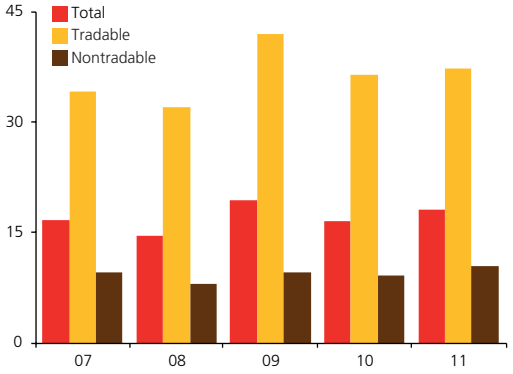
…and the SMEs have not recorded significant changes

Based on a large sample of firms, and using an alternative measure of foreign currency exposure with information of external indebtedness and the net derivatives position, there is evidence that the average mismatch in dollars of small and medium-sized firms (SMEs) did not fluctuate significantly between 2009 and 2010, and it held steady at around the 2007 level (table IV.2)[5]/. This evidence is similar from firms in both the tradable and nontradable sectors. With regard to firms that are more exposed to a depreciation in the peso-dollar exchange rate, there were no important changes for the 75th percentile of the sample.

The above indicator is partial, because it does not consider local bank debt in foreign currency at the firm level. At the aggregate level, however, the composition of commercial loans in local and foreign currency has not changed substantially relative to 2010 (figure IV.4). While this does not entirely compensate for the lack of firm-level data, it does suggest that firms' exposure to foreign currency has not deteriorated significantly, at least from an aggregate perspective.

Figure IV.4

Foreign currency debt (*)
(percent of total bank debt)



(*) Data updated to February of each year.

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

Table IV.2

Currency mismatch of SMEs (1) (2)
(percent)

	2007	2008	2009	2010
Tradable				
25th percentile	0.10	-0.40	0.07	0.09
50th percentile	0.31	0.13	0.24	0.29
75th percentile	0.63	0.40	0.53	0.57
Number of observations	298	198	259	346
Nontradable				
25th percentile	-0.30	-145.00	-2.32	-0.55
50th percentile	0.25	-0.71	0.17	0.20
75th percentile	0.68	0.21	0.81	0.94
Number of observations	51	55	55	73

(1) Sample of firms that use currency derivatives and/or external debt.
(2) Currency mismatch = (external debt – net derivatives position) / (exports – imports).

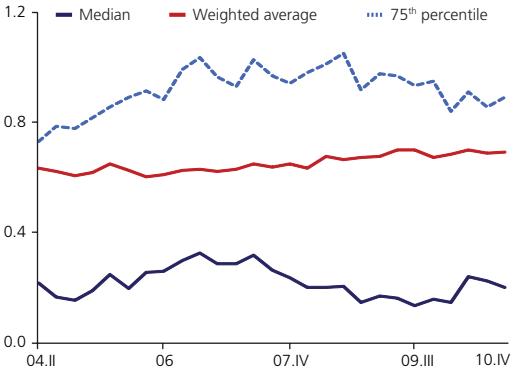
Source: Central Bank of Chile.

[4]/ Given that these firms receive the majority of their income in dollars and have a liability position in the same currency, it is not surprising that this indicator was negative throughout much of the period. However, very negative values could leave these firms exposed to an appreciation of the peso.

[5]/ The comparison using the test of equality of means between 2007 and 2010 and between 2009 and 2010 show that the differences are not statistically significant at 1% in both cases.

Figure IV.5

Indebtedness (1) (2)
(times)

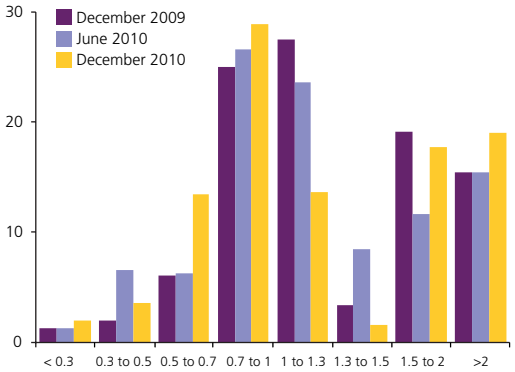


(1) Financial debt divided by equity.
(2) Consolidated financial statements of firms registered with the SVS, excluding mining.

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

Figure IV.6

Financial debt and liquidity ratio (1) (2)
(percent, times)

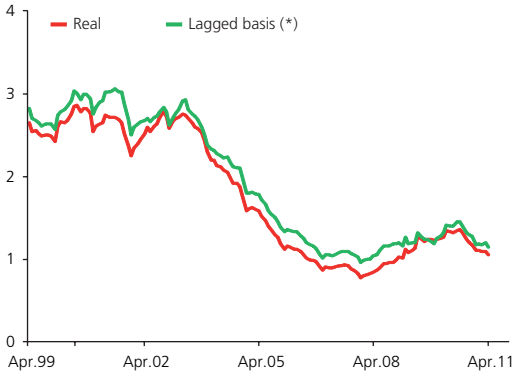


(1) Percent of financial debt in firms by acid test range (current assets minus inventories, divided by current liabilities).
(2) Consolidated financial statements of firms registered with the SVS, excluding mining.

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

Figure IV.7

Commercial nonperforming loan index
(percent of commercial loans)



(*) A lag of 12 months for the comparative basis, average maturity of the segment. See Matus et al. (2009).

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

The debt ratio of firms that file financial statements has been relatively stable

The evidence for the corporate sector indicates that the debt level remains moderate. The debt ratio was 0.69 times equity at year-end 2010, versus 0.67 times one year earlier (figure IV.5). Moreover, the ratio did not increase among firms with a higher debt level (75th percentile). These results are robust to calculating debt over market value. Total debt as a share of GDP was also stable (figure IV.1).

Other financial indicators for the corporate sector did not change significantly

At year-end 2010, the financial indicators of SVS-registered firms improved slightly, although with some variation among firms. Return on assets (ROA) improved between June and December 2010, rising from 4.2 to 4.7%, which is similar to the historical average. The interest coverage ratio stayed around 3.4 times in the second half of 2010, slightly below the historical average (3.6)[6]/. However, interest cover fell slightly among the firms in the upper part of the distribution (75th percentile), though not among firms with a low coverage level (25th percentile).

Firms' liquidity, measured through the acid test, continued to recover, with a ratio of 1.32 times in December 2010, which is above the historical average (1.18). However, there was an increase in the share of financial debt held by firms that have a liquidity indicator of less than 1.0, putting it above the average before the crisis (figure IV.6).

The credit risk of firms did not change substantially relative to the last Report

Credit risk indicators remain low and stable. After following a downward trend since mid-2010, nonperforming commercial loans tended to stabilize at around 1.06% in April 2011 (figure IV.7). Given that default indicators are calculated as a fraction of the current portfolio of each segment, it is possible that a credit expansion (an increase in the denominator) could hide the real behavior of the portfolio. One way to control for this problem is to recalculate nonperforming loans over lagged loans, using the average maturity of the loans as a reference (12 months). The evolution of this indicator is similar to the traditional nonperforming loan measure, confirming that the credit risk of firms is currently at a low level.

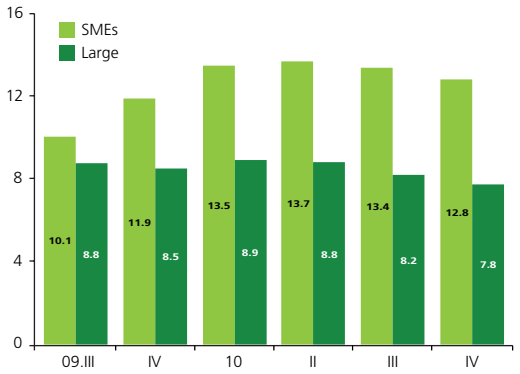
The aggregate impaired portfolio indicator has also been stable in the past few months, with a slight decline that persisted throughout much of 2010 for large firms and SMEs (figure IV.8). The sectoral analysis also shows a persistent reduction of the impaired portfolio in the tradable sector, which is offset by a slight increase in the nontradable sector between the first and

[6]/ The interest coverage ratio is defined as operating flows over financial expense.

Figure IV.8

Impaired commercial loan portfolio, by firm size (1) (2) (3)

(percent of the commercial portfolio for each segment)



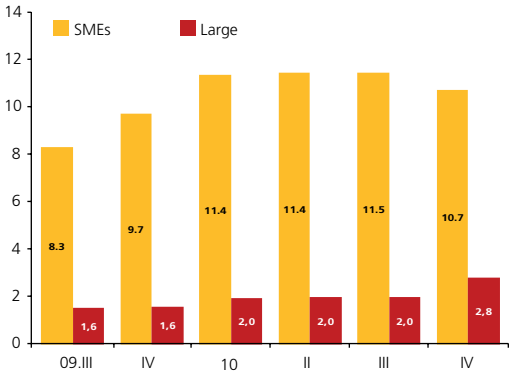
(1) Loans to borrowers about whom there is evidence that they will not be able to meet their contracted liabilities, regardless of the possibility of recovery.
(2) Sample of approximately 190,000 firms.
(3) SMEs: firms with annual sales up to UF100,000. All others are considered large.

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

Figure IV.9

Impaired commercial loan portfolio of the nontradable sector (1) (2) (3)

(percent of the commercial portfolio for each segment)



(1) Loans to borrowers about whom there is evidence that they will not be able to meet their contracted liabilities, regardless of the possibility of recovery.
(2) Sample of approximately 76,000 firms.
(3) SMEs: firms with annual sales up to UF100,000. All others are considered large.

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

fourth quarters of 2010 (5.4 to 5.8%). Large firms in the nontradable sector were the main source of increase in the impaired portfolio, although their level is still relatively low (2.8%) (figure IV.9).

The risk scenario for firms includes an interest rate hike and a contraction in external demand

In a context of higher interest rates associated with worsening external financing conditions, one source of concern is the maturity mismatch in the financial debt of firms. The corporate sector recorded an increase in short-term debt over total assets, from 5.4 to 7.8%, between 2009 and 2010, but this increase was limited to firms that do not have a high level of debt[7]/.

Depending on the severity of the potential risk scenarios described in chapter I, external demand could contract, causing a deterioration in the terms of trade. This type of scenario, by its nature, could have repercussions on sectors linked to external demand.

Households

Household debt grew in the first quarter of 2011

Total household debt grew 8.4% in annual terms in first quarter of 2011, with a sharper increase in consumer debt (9.5%) than mortgages (7.6%). The most active component of consumer debt was bank debt (11.8%). In nonbank debt, the fastest growing segment was retail credit (table IV.3). However, all these growth rates are still below the rates recorded in the period leading up to the external financial crisis (the average for 2002–07).

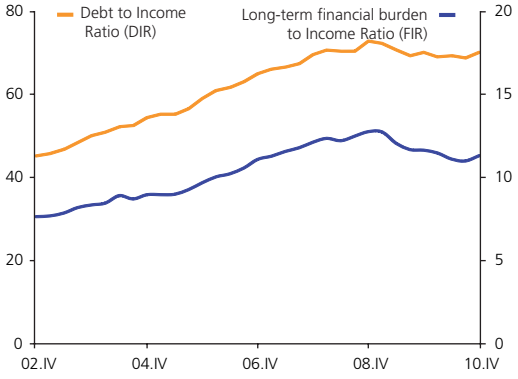
The growth of consumer debt has been consistent with the recovery of household consumption, following the financial crisis and the earthquake in early 2010. In 2010, household consumption grew 10.9%, thus exceeding the annual average for the 2002–07 period (5.9%). The greater indebtedness also appears to be in line with increases in disposable income. This has translated into relatively stable post-crisis debt indicators (DIR), while the aggregate indicators show a reduction in the household financial burden (FIR) (figure IV.10).

[7]/ As of December 2010, firms that have recorded an increase in short-term financial debt over total assets, and that have a financial leverage ratio of more than 2 times, represent less than 17% of total financial debt.

Figure IV.10

Debt and financial burden

(percent of disposable income)

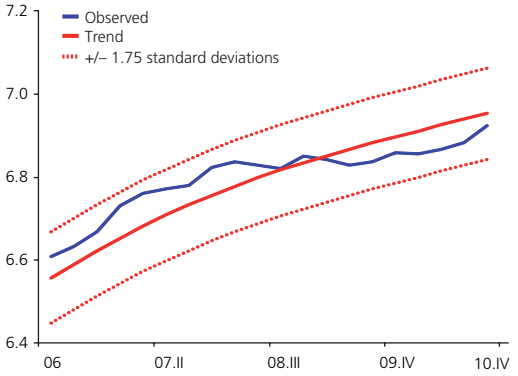


Source: Central Bank of Chile, based on data from SBIF, SuSeSo, and SVS.

Figure IV.11

Total consumer debt

(credit per capita on a logarithmic scale)

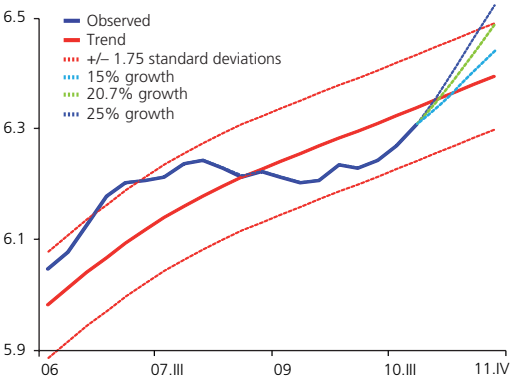


Source: Central Bank of Chile, based on data from SBIF, SuSeSo, and SVS.

Figure IV.12

Bank consumer debt forecasts

(credit per capita on a logarithmic scale)



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

Table IV.3

Household debt

(real annual change, percent)

	2002-2007 (1)	2008 IV	2009 IV	2010 I	2010 II	2010 III	2010 IV	2011 I	Contribución to growth (2)	Share in debt
Mortgage	14.1	12.9	7.3	7.7	8.6	9.0	7.0	7.6	4.2	55.8
Bank	15.3	13.1	8.6	9.2	10.0	10.4	9.0	9.3	4.5	49.3
Nonbank (3)	8.2	11.7	-0.5	-1.6	-1.0	-0.5	-6.0	-4.3	-0.3	6.3
Consumer	17.9	3.9	1.8	2.3	4.7	5.8	8.1	9.5	4.2	44.5
Bank	16.0	-0.3	2.2	2.7	5.1	7.5	8.6	11.8	2.8	24.3
Nonbank	20.7	9.1	1.4	1.9	4.3	3.8	7.6	6.8	1.4	20.2
Casas Retailers	27.6	9.3	-7.9	-6.4	-1.2	3.6	11.9	10.4	0.7	7.0
FCF (4)	19.9	9.6	8.3	7.5	6.9	1.3	2.9	6.2	0.3	4.4
Cooperatives	25.2	11.6	5.6	3.3	9.5	5.2	1.9	0.8	0.0	2.6
Other (5)	13.5	7.6	6.7	7.6	6.8	5.2	8.8	6.1	0.4	6.3
Total	**15.8**	**8.7**	**4.8**	**5.3**	**6.8**	**7.6**	**7.5**	**8.4**	**8.4**	**100.0**

(1) Average.
(2) Percentage points.
(3) Includes securitized mortgage debt.
(4) FCF: Family compensation funds.
(5) Includes car financing, university loans, and insurance company loans.

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

The evidence suggests that, thus far, the debt level has not risen above its long-term trend

The different components of household debt were analyzed using the methodology developed by Mendoza and Terrones (2008) to identify periods of credit expansion (box IV.1). All the components are below or near their long-term trend. This includes total consumer debt per capita, which is not significantly above its long-term trend value (figure IV.11)[8]/.

To analyze the outlook for the growth of consumer debt, debt per capita was forecast using a baseline scenario of 15% growth of bank consumer debt and two scenarios featuring an acceleration of the growth rate[9]/. The results show that only in the case of a 25% growth rate in 2011 would household debt rise slightly above the upper limit of the deviation range of its trend (figure IV.12). The magnitude of this growth rate, however, is higher than the rates recorded in the entire last decade.

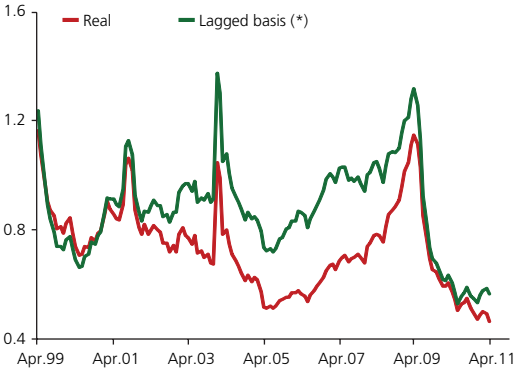
[8]/ A significant deviation was defined as a variation of more than 1.75 times the historical standard deviation of the difference between the observed value and the trend. The ratio of debt to disposable income was used as a robustness test, and the results were similar.

[9]/ The baseline scenario of a 15% growth rate is consistent with forecasts by the banking institutions and with the loan growth model used in the stress tests. The first accelerated growth scenario uses a growth rate that is around the pre-crisis rate (20.7%). The second uses a rate of 25%.

Figure IV.13

Nonperforming loan index for bank consumer debt

(percent of consumer loans)



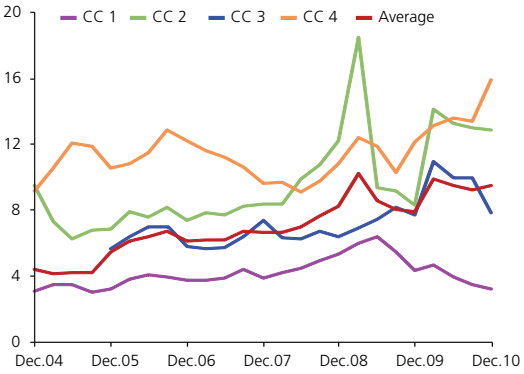
(*) A lag of 22 months for the comparative basis, average maturity of the segment. See Matus et al. (2009).

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

Figure IV.14

Provisions index for retailers

(percent of loans)

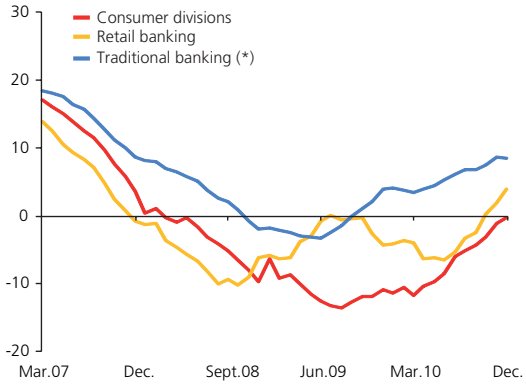


Source: Central Bank of Chile, based on data from SVS.

Figure IV.15

Growth of consumer loans

(real annual change, percent)



(*) Multibanks without consumer divisions.

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

Credit risk indicators for bank consumer debt have improved steadily and tended to stabilize in the last year

The banking industry's credit risk indicators have improved steadily since mid-2009. Nonperforming bank consumer loans have fallen below the levels recorded in the period before the financial crisis (figure IV.13). Using a procedure analogous to that described for the commercial portfolio, nonperforming consumer loans were also calculated over lagged loans (22 months)[10]/. In the past year, the results for this adjusted indicator are somewhat higher than the original, but the evolution is similar. This indicates that the drop in the index is not being driven by the higher growth rates of consumer loans.

The evidence on credit risk is different, however, for a sample of four retailers that report to the SVS. Average loan loss provisions for December 2010 were higher than before the crisis, and some retailers even increased provisions toward the end of 2010 (figure IV.14)[11]/.

Most recently, the financial position of one retailer in particular deteriorated significantly. Based on the data available at the close of this *Report*, this situation is associated with the retailer's commercial and accounting practices in providing consumer credit. This has had an impact on the confidence of the company's clients and investors, but the implications for the local financial market and the payment system are considered limited.

The recent evolution of bank consumer debt does not indicate any relevant changes in composition toward riskier segments

Consumer loans in the traditional banking industry were less affected by the crisis, and they have grown more strongly than either the consumer divisions or retail banking after the crisis (figure IV.15). This implies an increase in the share of consumer loans in higher-income segments, which should be associated with a lower credit risk.

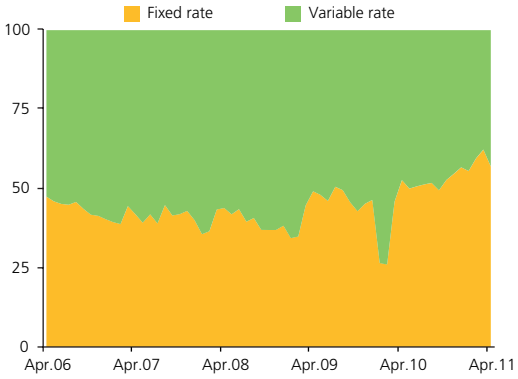
With regard to the type of interest on consumer loans, approximately 60% of loan flows were contracted at a fixed rate. This share has grown since early 2010, which, in practice, reduces the financial vulnerability of households to rate shocks (figure IV.16). In addition, there have not been any significant changes in loan maturities (over or under one year) or currency (peso and UF).

[10]/ See Matus et al. (2009).

[11]/ In contrast to bank consumer debt, loan loss provisions are reported because the nonperforming loan series for retailers is only available since 2009. Given that the retailers have their own policies on constituting provisions, the individual estimates may not be comparable with each other.

Figure IV.16

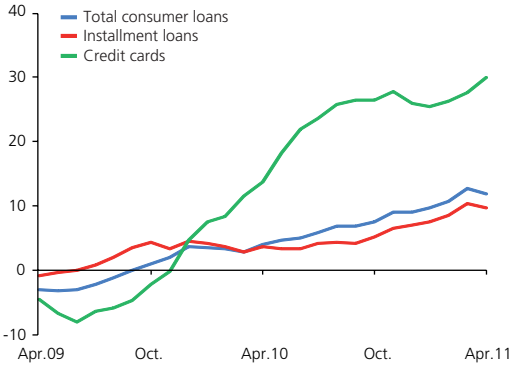
Monthly bank consumer loan flows
(percent of total)



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

Figure IV.17

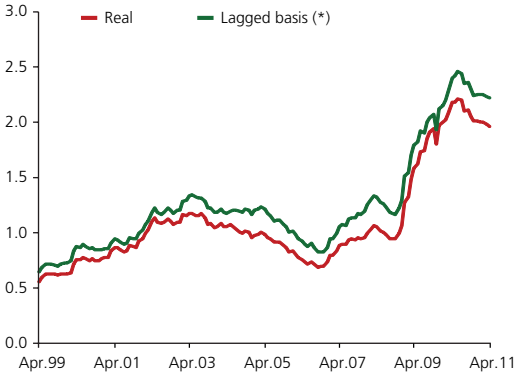
Bank consumer debt
(real annual change, percent)



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

Gráfico IV.18

Nonperforming loan index for bank mortgage debt
(percent of mortgage loans)



(*) A lag of 12 months for the comparative basis.

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

One potential risk highlighted in the last *Report* was the strong growth of credit card debt. Although part of this debt is at a fixed rate or even a zero rate, the possibility of missing a monthly payment can generate vulnerabilities in a context of higher interest rates. The recent evidence shows that this type of debt continues to expand at around 30%, and it is strongly concentrated in the traditional banking sector (figure IV.17).

Credit risk has also evolved favorably in mortgage debt

Nonperforming mortgage loans continue to decline, thereby reversing the steady increase recorded since late 2008 (figure IV.18). As discussed in the last *Report*, this increase was primarily explained by the quality of the mortgage portfolio of the state-owned bank, *BancoEstado*. For the rest of the banking industry, nonperforming mortgage loans have continued to decline, and by March 2011 they had almost reached their historical average (1.01%).

The banking industry's mortgage lending standards have also been stable. According to SBIF data, the loan-to-value ratio (LTV) was constant, on aggregate, in 2010. The LTV increased in the larger mortgage segments, but by a fairly small degree. In contrast, the LTV tended to fall slightly in smaller mortgage segments (up to UF450)[12]/.

A more negative scenario for household credit risk could arise as a result of high interest rates and a slowdown of economic growth…

An economic downturn and its potential negative effects on employment could increase household credit risk. As highlighted in previous *Reports*, however, the effect of these shocks on unemployment has been moderate, as shown in an earlier analysis of the Household Financial Survey (Fuenzalida and Ruiz-Tagle, 2009). It will be important to continue monitoring the evolution of employment, as well as the prevailing conditions and debt levels of the segments that are most vulnerable to employment shocks.

…as well as a possible loosening of lending standards

Considering the positive outlook for the growth of consumer loans this year, the credit expansion could have lagged effects on credit risk indicators. International evidence indicates that this is due to the fact that lenders tend to relax their lending standards during credit expansions, increasing the risk on their portfolios (Asea and Blomberg, 1998; Jiménez and Saurina, 2006[13]/.

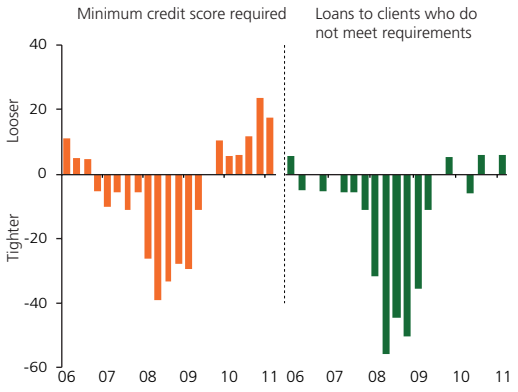
Currently, there is no evidence that the banking institutions have made any major changes in their minimum income policies for obtaining credit. However, in net terms, the requirement of a minimum credit score has

[12]/ In the debt segments over UF10,000, the LTV ratio increased from 85.7 to 88.4%, and in the UF350 to 450 segment, it fell from 61.01 to 60.2%.

[13]/ See Sagner (2011) for evidence on Chile.

Figure IV.19

Bank lending conditions (*)
(net percent of responses)

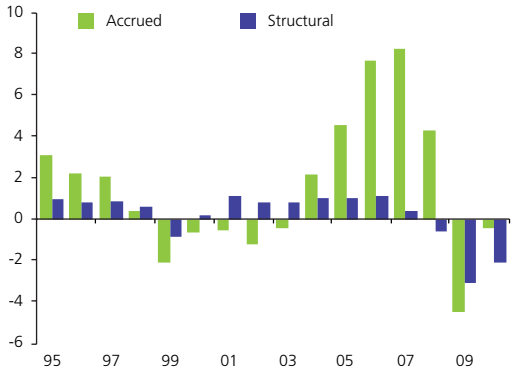


(*) Difference between the number of tighter and looser responses, divided by total responses.

Source: Central Bank of Chile.

Figure IV.20

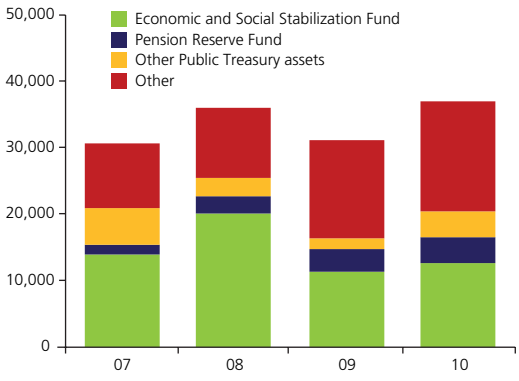
Accrued and structural balances of the central government
(percent of GDP)



Source: Ministry of Finance.

Gráfico IV.21

Financial assets of the central government
(US$ million)



Source: Ministry of Finance.

recently been relaxed somewhat, and loans have been granted to clients who do not meet the minimum requirements (figure IV.19). Although this trend has not been generalized across all banks, it does point to the need to monitor the evolution of these standards in the credit growth cycle.

In sum, household indebtedness is growing at higher rates again, but credit risk indicators remain moderate. The continued increase in consumption and debt, together with a more adverse scenario for economic growth and with substantially looser credit standards in this expansive part of the cycle, could have important implications for the financial vulnerability of households. It is therefore important for financial intermediaries to remain vigilant in this phase of the cycle.

Consolidated government[14]/

The 2010 budget performance resulted in a somewhat smaller deficit than projected by the authority toward the end of the year

The accrued and structural global balances for 2010 were –0.4 and –2.1% of GDP, which represent a somewhat smaller deficit than projected by the Ministry of Finance toward the end of last year (–1.0 and –2.3%, respectively) (figure IV.20). The lower deficit was mainly due to the better performance of the economy and lower general expenditures than announced.

At year-end 2010, the net financial assets of the central government were 7.5% of GDP, while total financial assets were 16.7% (figure IV.21). In the first quarter of 2011, the consolidated assets of the Public Treasury increased by approximately US$4.00 billion, with the ESSF closing at US$12.94 billion, the PRF at US$3.90 billion, and other assets of the Public Treasury at US$7.48 billion[15]/.

Reductions in public spending, a higher copper price, and the growth of domestic demand point to a larger surplus than forecast for 2011

Toward the end of last year, the Ministry of Finance projected accrued and structural global balances of –0.8 and –1.8% of GDP, respectively, for 2011. However, the improved macroeconomic outlook and the announcement of US$750 million in spending cuts should contribute to a larger surplus. This does not in any way overturn the Ministry of Finance's commitment to converge to a structural deficit of 1% of GDP in 2014.

The composition of the public debt has changed significantly in recent years…

At year-end 2010, the public debt was 9.2% of GDP. The increase in gross debt (of approximately US$7.56 billion) was within the range authorized by

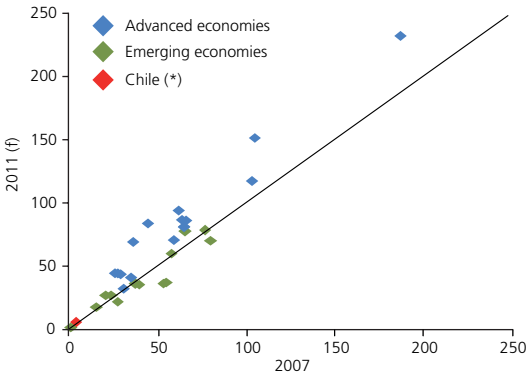
[14]/ The consolidated government comprises the total central government and the Central Bank of Chile.

[15]/ The consolidated assets of the Public Treasury include the ESSF, the PRF, and Other Assets of the Public Treasury. They do not include the "Other" component of the central goverment's financial assets.

Figure IV.22

Public debt

(percent of GDP)



(*) It includes the central government.
(f) Forecast.

Source: Moody's (2010).

the 2010 Budget Law (US$7.80 billion). Of this debt, 80% was contracted on the domestic market, 60% comes due after 2020, and 94.3% corresponds to bond issues[16]/.

The composition of the recent issue differs substantially from the debt issued at the start of the last decade, when around 77% had a maturity of less than ten years, 30% was external debt, and only 10% corresponded to bond issues. There are also important differences in terms of the currency of denomination: the share of debt denominated in UFs rose from 7.0 to 67.8%, while debt in dollars fell from 80.0 to 16.8%.

…and the issues expected in 2011 will imply a fairly moderate debt level

Given the financing needs estimated at the start of this year, the fiscal authority announced that US$6.00 billion of public debt would be issued on the local market in 2011 (versus US$7.80 billion authorized for this year). This debt will consist of the issue and reopening of Treasury bonds, in both pesos and UFs[17]/.

Even with this new issue, the public debt level in Chile will remain low in 2011 (5.9% of GDP), and it does not represent a significant change from previous years, thereby contributing to the country's financial stability. This contrasts with the situation in a wide number of advanced economies, which have seen a significant increase in the debt level since the pre-crisis period (figure IV.22).

The Central Bank's balance has increased due to the accumulation of US$12.00 billion in reserves

The reserve accumulation program, launched on 5 January 2011, will involve the purchase of US$12.0 billion in foreign currency in 2011, via daily auctions of US$50 million. The accumulation of international reserves has been sterilized, to a large degree, with the placement of Central Bank promissory notes. As of 12 May, US$4.50 billion had been accumulated, which raises the reserve balance to US$32.36 billion. Internal debt, which is the counterpart to the greater assets, has increased in similar amounts.

Finally, the Central Bank's equity has improved slightly since the close of 2010

Based on the usual accounting procedures, the Central Bank's equity rose from –$3.45 trillion on 31 December 2010 to –$3.00 trillion on 15 April 2011. The reduction of the deficit is mainly explained by earnings associated with the depreciation of the peso.

[16]/ UF-denominated 5-, 7-, 10-, 20-, and 30-year Treasury bonds and peso-denominated 10-year Treasury bonds.

[17]/ The issues consider peso-denominated 7- and 10-year assets and UF-denominated 5-, 7-, 10-, 20-, and 30-year assets.

Box IV.1: **Growth of household debt**

This box describes and applies a methodology based on aggregate data to assess whether the growth of household debt in Chile has been exceptionally high. In general, the data suggest that debt is growing at around the long-term trend rate, so the increase recorded in 2010 does not represent a significant change in household credit risk. Despite this aggregate evidence, it is possible that some household segments have higher debt levels or even are overindebted.

Description of the methodology

The methodology follows Mendoza and Terrones (2008), who identify boom or peak periods as those in which the real per capita debt level is significantly above its long-term trend, calculated using a Hodrick-Prescott filter. The authors define d_{it} as, the deviation of debt from its long-term trend and estimate the volatility of this cyclical component ($\sigma(d_{it})$)[18]/. Using these elements, the criterion for defining whether debt is significantly above the long-term trend is $d_{it} > \theta\sigma(d_{it})$, where θ is an ad hoc parameter that captures the idea of a deviation that is sufficiently above trend. Mendoza and Terrones (2008) choose a value of θ=1.75.

There are alternative methodologies based on a similar concept of deviation, but they differ in the credit variable analyzed (Gourinchas et al., 2001; Borio and Lowe, 2002). These studies use credit over GDP in nominal terms and an ad hoc definition of when a deviation over the long-term trend is significant. Mendoza and Terrones (2008) discuss the advantages of their real per capita credit measure and the problems associated with the methodology used in Gourinchas et al. (2001). The main advantage of this methodology is that it shows a clearer association between credit peaks and fluctuations in other macroeconomic variables (such as consumption and investment) and microeconomic variables (for example, business debt and banking profitability). Another advantage of this method is that it uses per capita credit instead of debt over disposable income or, alternatively, GDP. The latter measures can underestimate credit growth in periods in which income is growing far above trend. This can be particularly important in countries experiencing temporary, but significant increases in their terms of trade.

Mendoza and Terrones (2008) find that the median duration of a credit boom is between six and seven years and that at the peak of the boom, real per capita credit grows 30% above trend. In terms of the relationship with the economic cycle, the results show that GDP, consumption, and public spending increase 2 to 4 percentage points above trend in the phase before the credit peak, and then fall between 3 and 4 percentage points. The results for prices indicate that the credit boom episodes are associated with increases in housing and stock prices, but not with an increase in inflation.

The evidence at the firm and bank levels reveals that, before the peak, the credit booms are generally accompanied by increased debt ratios, higher asset prices, and greater business profitability. At the same time, the loan-to-asset ratio and bank profitability increase, while capital adequacy ratios deteriorate and nonperforming loans increase.

In addition, Mendoza and Terrones (2008) show that credit booms are strongly related with foreign exchange and banking crises, as well as sudden stops. For emerging markets, approximately 68% of the booms are associated with foreign exchange crises, 55% with banking crises, and 32% with sudden stops.

[18]/ The subindices refer to countries (i) and time (t), so a deviation from trend is measured relative to the volatility of the given country.

Results for debt in Chile

The results for total consumer debt are presented in chapter IV of this *Report*. They show that under the deviation criterion of 1.75 times above the long-term trend, there is no evidence of a debt boom in 2010. Moreover, the results hold for a stricter criterion of $\theta = 1$.

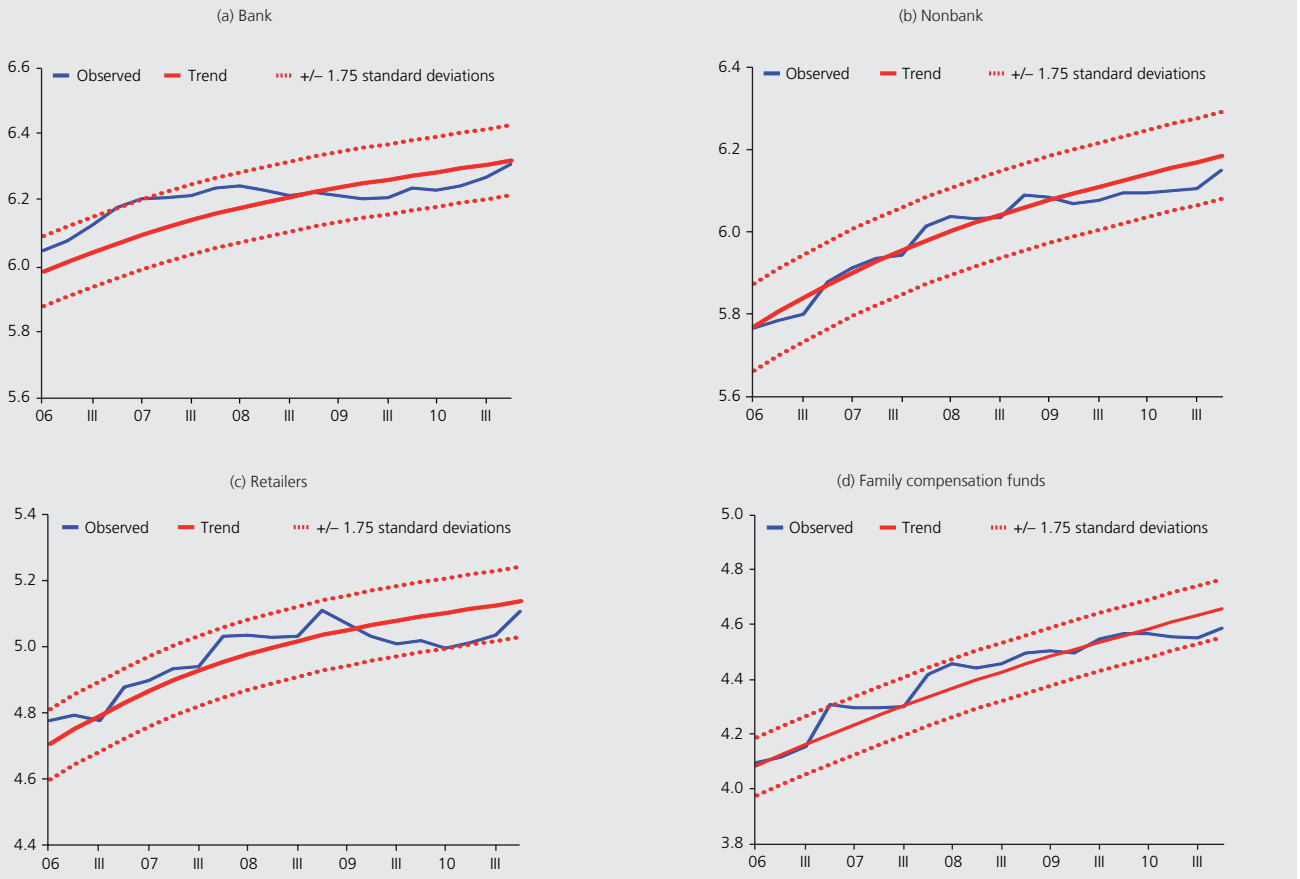
To complement this aggregate evidence, the same exercise was carried out for the two components of consumer debt: bank and nonbank (figure IV.23). In addition, nonbank debt was further disaggregated into debt with retailers and family compensation funds (*cajas de compensación*). For these four types of debt, there is no evidence that debt has increased significantly above its long-term trend.

This methodology, however, is not without caveats. First, given that the long-term trend depends on the availability of data, the fact that the sample is small and coincides with strong credit growth could lead to erroneously rejecting the hypothesis of a significant increase. Second, the trend is calculated with the full available sample, which makes it difficult to identify booms ex ante. Finally, aggregate data can hide important compositional changes in the allocation of credit, which could translate into financial vulnerabilities that need to be monitored with microeconomic data. In this sense, this method does not replace, but rather complements, other evaluation methodologies.

Figure IV.23

Consumer debt

(credit per capita on a logarithmic scale)



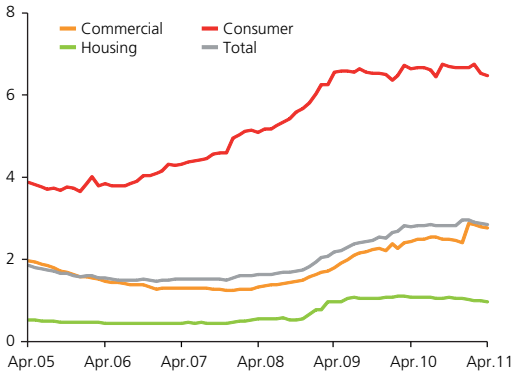
Source: Central Bank of Chile, based on data from SBIF, SuSeSo, and SVS.

V. Banking system

Figure V.1

Provisions ratio

(percent of loans)

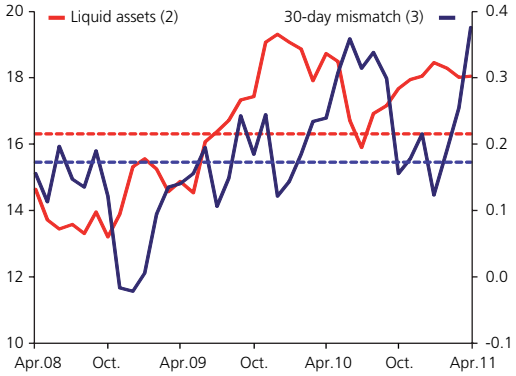


Source: Central Bank of Chile, based on data from SBIF.

Figure V.2

Liquid assets and 30-day mismatch in the banking system (1)

(percent of total assets, times Tier 1 capital)



(1) Dashed lines represent the average from January 2008 to April 2011.
(2) Cash plus trading and available-for-sale financial instruments, as a percent of assets.
(3) Liabilities minus assets, divided by Tier 1 capital. Authorized banks use adjusted basis.

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

The improved economic environment has contributed to the recovery of credit growth and borrowers' payment capacity. The capital increases announced for this year and long-term debt issuancewill contribute to channel banking activities, without compromising the banks' solvency position or risk management.

The economic environment has favored the recovery of the lending activity, without increasing credit risk in the banking system

Total loans in the banking system recorded a faster recovery in the first few months of the year, with a real annual growth rate of 8.5% in April. This dynamic performance is consistent with the overall growth of the economy, and the recovery has been stronger in those business lines which are more sensitive to the cycle, such as household consumer loans and foreign trade financing loans (chapter IV).

Credit risk indicators have fallen or at least remained stable in all loan segments (chapter IV). In particular, loan loss provisions on consumer and mortgage loans has not changed significantly in the last two years (figure V.1). One exception has been the sharp increase in commercial loan loss provisions in January of this year, as a result of the implementation of new regulations enacted by the Superintendence of Banks and Financial Institutions (SBIF) (box V.1).

Despite the dynamic lending activity, the banking system shows no signs of liquidity pressures, and the share of liquid assets remains above the historical average

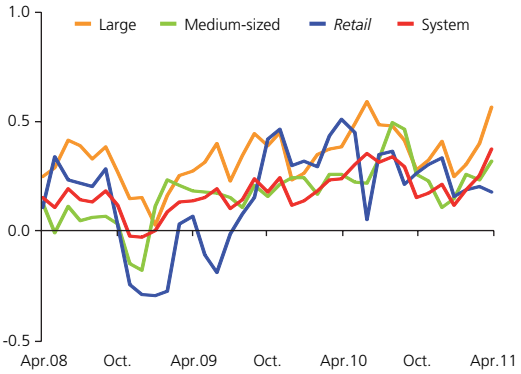
In the last year, the share of high liquid assets on the banks' balance sheet has remained above historical average (figure V.2). Traditionally, banks tend to give priority to the loan portfolio in the growing phases of the cycle, so it is somewhat surprising that liquid assets still represent, in average, around 18% of total assets. This is explained, in part, by the need to match maturities with demand liabilities, which continue to grow at real annual rates of over 11%, although they have slowed in the past few months. A large fraction of the increase in demand liabilities reflects larger balances in checking accounts held by nonfinancial firms, which is consistent with the evolution of the corporate sector's liquidity indicators in 2010 (chapter IV).

The increase in liquid assets, as well as the issuance of around US$9.0 billion in senior and subordinate bonds from June 2010 to April of this year, has

Figure V.3

30-day mismatch in the banking system (*)

(times Tier 1 capital)



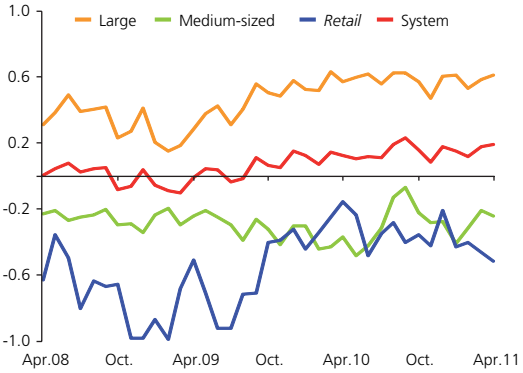
(*) Liabilities minus assets, divided by Tier 1 capital. Authorized banks use adjusted basis.

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

Figure V.4

7-day mismatch in the banking system (*)

(times Tier 1 capital)



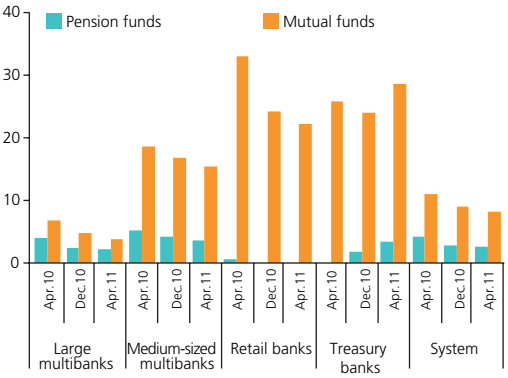
(*) Liabilities minus assets, divided by Tier 1 capital. Authorized banks use adjusted basis.

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

Figure V.5

Time deposits from institutional investors

(percent of total liabilities)



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

benefited the banks' liquidity risk management. Consequently, since the last *Report*, the 30 days aggregate maturity mismatch of the system remains, on average, around 0.2 times their Tier 1 capital, whereas the 7 days liquidity mismatch remains, on average, around 0.15 times (figures V.3 and V.4).

The monetary policy normalization process has promoted the increase of retail time deposits, offsetting the lower share of the institutional sector

In the first few months of the year, wholesale funding continued to shrink, particularly mutual funds sources (figure V.5). Time deposits have continued to expand, however, with real annual growth rates of over 9% in the last few months. This trend has been driven by retail deposits which is consistent with the intensification of the monetary policy normalization process between March and May of this year.

The last *Report* suggested that the regulatory change on the valuation of type 1 mutual funds could potentially lead institutional investors to adjust their investment portfolios as described above and that the impact would be stronger on those more dependent entities on this type of financing. These banks, most of which are relatively small[1]/, have been able to substitute the mutual funds' time deposits with retail time deposits (figure V.6), without experiencing any particular pressure on the interest rates or duration of these deposits or on the evolution of the maturity mismatch. Nevertheless, the dependence of these entities on mutual funds's deposits as a funding source is still considered high, so it will be important to continue monitoring this risk factor.

The banking industry's net interest margin has remained stable, as the higher inflation levels have offset the lower loan spreads

Commercial and consumer loan spreads contracted in the first few months of the year, due to a larger increase in the borrowing rates compared with the lending rates (figure V.7). However, higher inflation levels boosted the margins on indexed operations, given that the Chilean banking system holds a net asset position in local inflation indexed unit of account (UF). The net interest margin has thus remained stable since June 2010, at around 3.3% of assets (figure V.8).

Stable margins and lower credit risk has contributed to the increase of profitability in the last four months

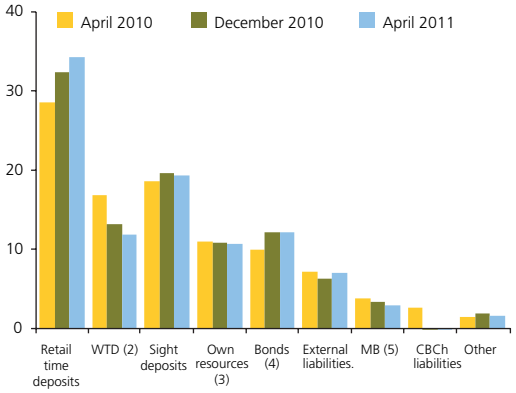
The reduction in loan loss provisions, due to the lower credit risk on loans, was the main factor that raised the annualized profitability of the banking industry to over 18% of capital in the first four months of 2011. This indicator exceeds the 2010 level for all types of commercial banks (table V.1), despite the increase in commercial loan loss provisions stemming from the implementation of the new regulations (box V.1).

[1]/ As of April 2011, banks whose exposure to mutual fund time deposits exceeds 20% of their liabilities together represent almost 8% of total system assets.

Figure V.6

Sources of bank financing

(percent of total liabilities) (1)



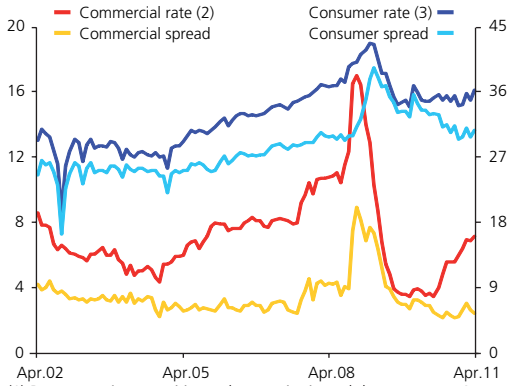
(1) Total liabilities net of contingent liabilities and fair value of derivative instruments.
(2) Wholesale time deposits, including mutual funds and pension funds.
(3) Tier 1 capital, provisions, net fair value of derivative instruments, and earnings.
(4) Senior and subordinate bonds.
(5) Mortgage bills.

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

Figure V.7

Interest rates and spreads on bank loans (1)

(annual percent)



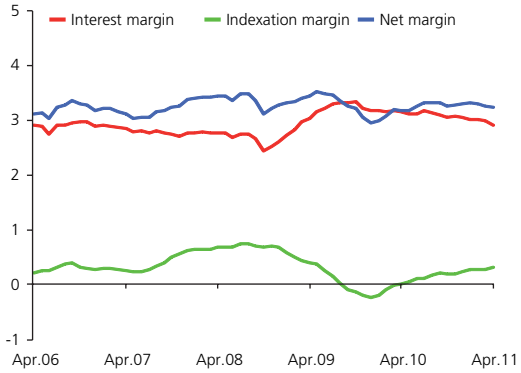
(1) Representative maturities and currencies in each loan segment. See Matus et al. (2009).
(2) Pesos, 30 to 89 days.
(3) Pesos, six months to one year.

Source: Central Bank of Chile.

Figure V.8

Net interest margin (*)

(percent of total assets)



(*) Moving year.

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

Tabla V.1

Composition of return on assets of the banking system

(percent of total assets)

	2008	2009	2010	Apr.11 (1)
Interest and indexation margin	3.3	2.9	3.3	3.2
Interest and indexation earned	8.5	4.4	5.3	5.6
Interest and indexation paid	-5.2	-1.4	-2.0	-2.4
Net commission	0.6	0.7	0.7	0.7
Net trading	0.2	0.6	0.5	0.4
Provisions	-1.1	-1.4	-1.3	-1.1
Support costs	-2.0	-2.0	-2.1	-2.0
Other	-0.1	0.2	0.3	0.2
ROA	0.9	1.2	1.4	1.4
Leverage (2)	13.7	12.9	12.9	13.2
System ROE (3)	12.4	15.1	18.6	18.7
Large multibanks	18.5	18.5	22.1	22.2
Medium-sized multibanks	4.0	12.1	14.9	15.8
Retail banks	0.3	3.1	16.6	17.4
Treasury and foreign trade	7.3	8.6	4.7	2.6

(1) Annualized data as of April 2011.
(2) Assets-to-equity ratio (times).
(3) Return on equity (percent).

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

The announced capital increases are consistent with the higher lending activity expected for this year

If the banks follow through on the additional contributions and capitalization of earnings announced over the last few months, the banking system's capital base would increase by approximately US$2.4 billion in 2011. In contrast to other periods of substantial capital increases, in which the increases were either concentrated in a few institutions or driven by mega-mergers, this time it involves a larger number of institutions of different sizes and business lines (figure V.9 and table V.2).

Tabla V.2

Capital increases announced for 2011

Banks	Additional contributions	Capitalization of earnings	Total capital increase (1)	Subordinate bonds in Tier 2 (2)
	(Ch$ million)		(percent)	
Corpbanca	316,618	106,000	79	50
Chile	240,000	113,000	25	48
Security	46,837	-	45	45
Internacional	40,000	-	84	50
Consorcio	25,000	8,029	62	-
BCI	-	144,000	14	39
Banco Estado	-	75,000	8	41

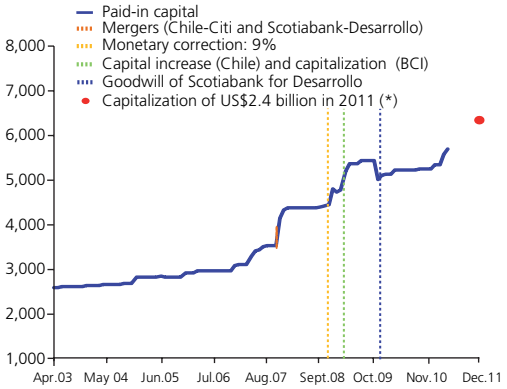
(1) As a percent of Tier 1 capital in December 2010.
(2) Values as of December 2010. Subordinate bonds accounted as part of Tier 2 capital cannot exceed 50% of Tier 1 capital.

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

Figure V.9

Paid-in capital of the banking system

(Ch$ billion)



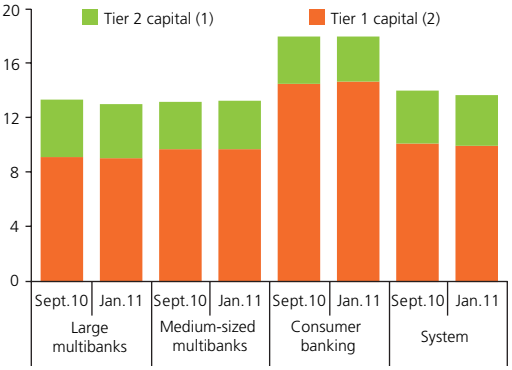
(*) Forecast for December 2011.

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

Figure V.10

Capital adequacy ratio

(percent)



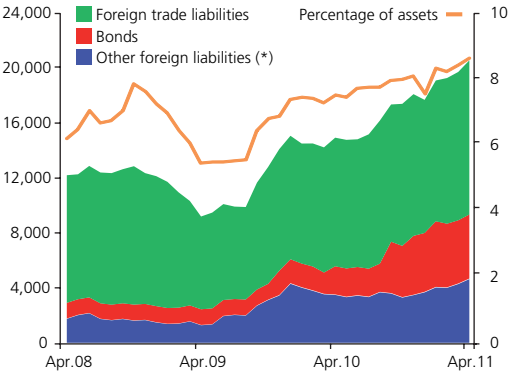
(1) Includes a fraction of subordinate bonds plus general provisions, minus unconsolidated investments and goodwill.
(2) Capital and reserves.

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

Figure V.11

External debt of the banking system

(US$ million, percent)



(*) Includes bank credit lines and syndicated loans.

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

These capital increases will not only boost high-quality capital indicators (Tier 1 capital), but will also allow those banks that reached the regulatory limit on subordinate bond issues in the second half of 2010, to be able to increase their Tier 2 capital base through new issues of these debt securities (table V.2)[2]/.

The larger capital base, combined with the retained earnings estimate for the industry this year, should allow total loans to expand at a real annual rate of 15% in 2011. This growth should not affect the system's capital adequacy ratio, which was around 14% of credit-risk- weighted assets in January 2011 and was largely concentrated on high-quality (core) capital (figure V.10)[3,4]/.

External financing conditions continue to be favorable for the Chilean banking industry

The dynamic performance of the local banking industry in the international market in 2010—with around a 20% increase in external liabilities—was augmented by syndicated loans, the use of correspondent lines, and overseas bond issues of US$2.9 billion in the first four months of 2011 (figure V.11). This greater activity has been accompanied by longer maturities and stable spreads, even after events like the rescue of the European economies in 2010 and 2011.

The success achieved in contracting syndicated loans with the participation of Asian banks has allowed the banking industry to continue diversifying its creditor matrix. In addition, the exposure of Chilean banks to European creditors has fallen from 36% of total overseas debt in the last *Report* to 26% in March of this year. Loans from U.S. and Canadian banks mainly accounted for the difference.

There are differences, however, in both the type of external financing and the terms and conditions granted, depending on the size and the ownership of the banks established in Chile

Larger multibanks rely more heavily on cross border bond issuance, whereas bank loans are a relatively more important source of financing for the medium-sized foreign-owned banks (table V.3). The latter appear to have been less affected in terms of access to external financing during the last international financial crisis, and their external debt levels are currently higher than in early 2008 (figure V.12).

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[2]/ Banking regulations stipulate that subordinate bonds accounted as part of Tier 2 capital cannot exceed 50% of Tier 1 capital. In 2010 several banks approached this limit.

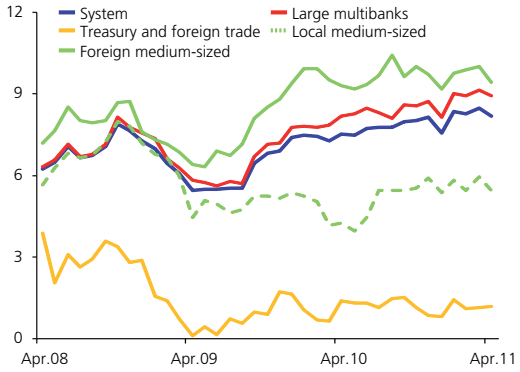
[3]/ A 15% growth rate is consistent with industry forecasts and with the historical average of the last ten years (around two times the growth rate of GDP). The calculation of the CAR only considers credit risk. Starting in December 2010, the SBIF publishes a CAR that also incorporates market risk capital requirements. On average for the system, the new index is one percentage point lower than the index based only on credit-risk-weighted assets.

[4]/ For more expansive scenarios in which bank lending grows 20.7 and 25.0%, as described in chapter IV, the banking system's CAR would drop to 13.5 and 13.1%, respectively. This calculation considers only the estimated Tier 1 capital (with no possible subordinate bond issues) and assumes that the composition of the loan portfolio is the same as in the last three years and system profitability is at the 2010 level.

Figure V.12

External debt of the banking system by cluster

(percent of total assets)

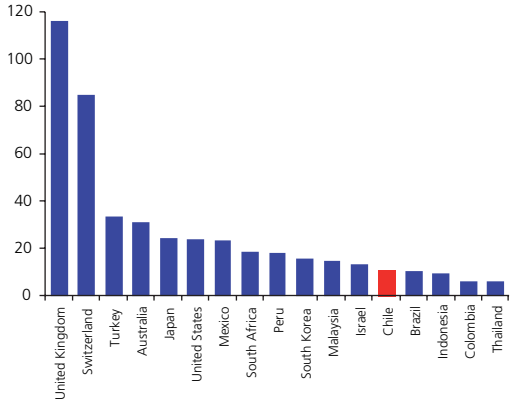


Source: Central Bank of Chile, based on data from SBIF.

Figure V.13

External liabilities of the banking system (*)

(percent of private sector loans)



(*) Average from the first quarter of 2008 to the third quarter 2010.

Source: IMF.

Tabla V.3

Composition of external financing in April 2011

(percent of liabilities) (1)

	Foreign trade financing	Bonds	Other (2)	Total	Residual short-term (3)
Large multibanks	5.5	3.1	1.4	10.0	5.8
Medium-sized multibanks	4.7	0.0	3.8	8.5	6.3
Foreign medium-sized	4.5	0.0	6.1	10.6	7.5
Local medium-sized	4.9	0.0	1.1	6.0	4.7
System	**5.0**	**2.1**	**2.1**	**9.1**	**5.7**

(1) Assets minus equity.
(2) Includes credit lines and syndicated loans.
(3) Data as of March 2011.

Source: Central Bank of Chile.

The longer maturities on external debt held by large multibanks could explain the relatively higher spreads vis-à-vis the medium-sized multibanks in the first few months of 2011, especially on loans that finance foreign trade operations. A similar pattern is found in foreign-owned banks, which pay higher spreads on non-foreign trade loans and have in turn the longest maturity (table V.4).

Tabla V.4

Spreads and maturities on short-term external debt (*)

(basis points, months)

	Foreign trade financing		Other	
	Spread	Maturity	Spread	Maturity
Large multibanks	60	13	70	7
Medium-sized multibanks	50	6	70	6
Medium-sized foreign	44	6	75	13
Medium-sized local	55	7	69	4
System	**55**	**12**	**70**	**7**

(*) Median of loans with contractual maturity equal or less than 13 months, for the period from January to April 2011. Spreads over Libor at different maturities.

Source: Central Bank of Chile.

The increase in external financing is also consistent with the banking system´s growth plans for 2011

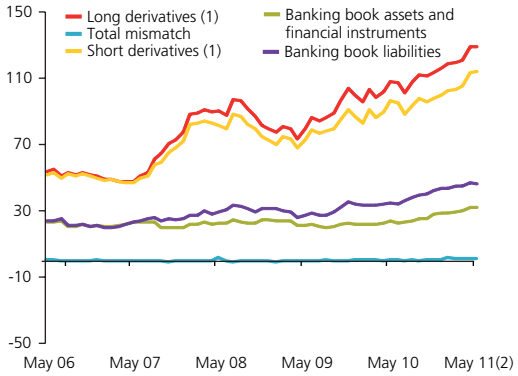
While a large share of the banks' external debt continues to finance foreign trade operations, a major use of different external financing sources will also allow the institutions to fund their current expansion plans in the local market (figure V.11). It is worth noting that the growth of external debt has been accompanied by an increase in the size of the industry, thus this financing source still represents less than 9% of system assets and 11% of private sector credit. These levels are still low compared to other countries (figure V.13). However, external debt could become more significant in periods in which pension funds reduce their investments in the local market[5]/.

[5]/ Market sources have suggested that, in the past, the banking industry used the international markets as an alternative financing source to the pension funds.

Figure V.14

Foreign currency balance of the banking system

(US$ billion)



(1) Includes the notional value of foreign currency swaps and forwards.
(2) Latest data available: 13 May.

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

Exposure to foreign currency risk is moderate despite the increase in external debt

Foreign currency risk exposure in non-derivative instruments continued to rise in the first four months of 2011, mainly through the growth of foreign liabilities (figure V.14). However, this was offset by an increase in foreign exchange derivatives, strengthening the system's long position in these instruments, so that the foreign currency mismatch remained moderate. The industry also showslow mismatches for short-term maturities (7 days), which will help mitigate foreign currency liquidity risk, if the banking system faces significant and/or sudden changes in these positions.

Market indicators uphold the positive assessment of the Chilean banking system

The favorable perception of the Chilean banking system among debt holders is reflected in both the discount rates on long-term securities issued on the local market, as well as in the favorable conditions in international markets reported above[6]/. Combined with the solid profitability and solvency position of the banking industry, this is consistent with the improvement in the risk rating of the industry's debt securities, as well as the increase in the stock price indices in the first few months of the year.

However, this assessment is sensitive to the materialization of the risk scenario described in chapter I

Although the banking industry's external debt represents less than 9% of the system's assets, the fiscal problems and debt levels in some advanced economies could affect the lending conditions offered by foreign creditor banks, in terms of volume, maturity, and/or cost. However, the national banking industry has demonstrated its ability to diversify its external creditor matrix in the event of stress, as seen in the last international financial crisis. Moreover, the Central Bank's reserve accumulation plan should help reduce the impact on the economy of new external financial shocks.

Exchange rate pressures have persisted over the course of this year, but it has had no significant impact on the foreign currency mismatch of the banking system, and the net foreign currency position is moderate. Furthermore, while bank clients could potentially see a change in their mismatches, Chilean banking regulations require banks to take into account the currency risk exposure of borrowers when carrying out their credit risk assessment, which should limit the impact of this possible risk scenario.

Finally, given the current international environment and the presence in Chile of affiliate banks with a foreign parent or head office, there is a risk of parent-affiliate contagion through higher financing costs or other mechanisms. In the case of local banks, however, there are objective conditions that could mitigate these sources of contagion. These include: a generally low

[6]/ Discount rates on subordinate bonds issued by the banking system averaged around 4% in real annual terms in the first four months of this year.

Tabla V.5

Impact of the stress tests on profitability

(percent of Tier 1 capital)

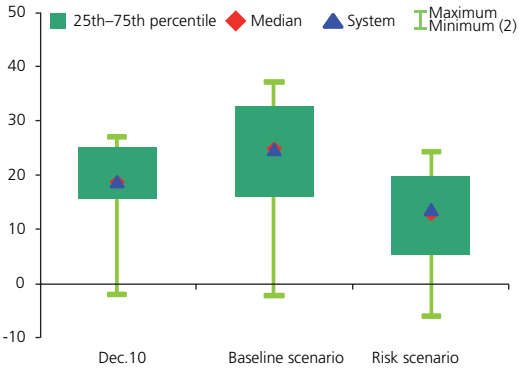
	Risk scenario
Initial ROE	18.8
Market risk	-1.8
Valuation	-0.9
Repricing	-0.9
Currency	0.0
Credit risk	-11.1
Consumer	-3.1
Commercial	-8.5
Mortgage	0.6
Margin	7.8
Final ROE	13.7

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

Figure V.15

Return on equity forecasts under different scenarios (1)

(percent)



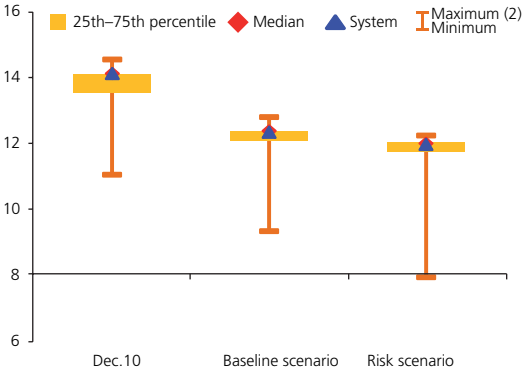
(1) Figures weighted by the Tier 1 capital of each institution.
(2) Minimums correspond to the 1st percentile.

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

Figure V.16

Capital adequacy ratio forecasts under different scenarios (1)

(percent)



(1) Figures weighted by the Tier 1 capital of each institution.
(2) Maximums correspond to the 90th percentile.

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

dependence on the parent bank for funding; the fact that Chilean banking legislation requires the affiliate to maintain all of its equity in the country in order to operate as a financial entity in the local market; and corporate governance requirements.

The next section reports the results of a quantitative evaluation of the impact on the national banking system's profitability and solvency of the materialization of the risk scenario described in chapter I.

Stress tests[7]/

The stress tests, based on December 2010 data, reveal that the banking system is in a healthy financial position for operating normally, and it has the capacity to absorb the materialization of a severe risk scenario.

The baseline scenario assumes a level of output, inflation, and interest rates consistent with the forecasts in the March 2011 *Monetary Policy Report*. In particular, the economic growth rate for 2011 is estimated at 6%, while the forecast inflation rates for December 2011 and 2012 are 4.3 and 3.0%, respectively. In contrast, the risk scenario assumes a significant downturn in the current year, with an estimated growth rate of 3%. The risk scenario further assumes a 300 basis point increase in the short-term market interest rate, a 100 basis point increase in the long-term interest rate, and 20% exchange rate depreciation in a period of 15 days[8]/.

The stress tests show that under the risk scenario, system losses would reduce return on equity (ROE) to 13.7% (table V.5). At the institutional level, the tests show that banks in the lower profitability segment (25th percentile) would see their ROE drop to 5% under this scenario (figure V.15), and the majority of the banks would hold their CAR at 12% (figure V.16)[9]/. Some banks, however, would need to take action to shore up their capital base.

Finally, bear in mind that stress tests are an analytical tool that contribute to identifying weaknesses and sizing up financial strengths in a given moment of time. Given their partial nature, they do not necessarily uncover all the effects of specific risk scenarios. Consequently, they should not be interpreted as projection exercises.

[7]/ This analysis is based on the methodology described in Jara et al. (2007) and Alfaro and Sagner (2011). Both the analysis and the results are regularly reported to the SBIF.

[8]/ This scenario is consistent with the main threats to the financial stability of the Chilean economy discussed in chapter I.

[9]/ Based on a conservative approach, these results do not take into account the capital increases announced by the banking industry (table V.2).

Box V.1: **Regulations on credit risk provisions in the Chilean banking system**

Regulations in 1986–2009

The process of restructuring the banking system following the crisis of the 1980s led to changes in the regulations governing credit risk provisions. These changes included, among other elements, covering a larger share of bank loans and establishing provisions based on expected losses for business loans and, in the case of consumer loans and mortgages, provisions based on observed delinquency. This system, which was in force from 1986 until the end of 2003, considered five risk categories defined by the banking supervisor.

Starting in 2004, the regulation was modified to address two weaknesses:

1. To go from a classification scheme based on borrower delinquency to one based on expected payment behavior (forward looking).
2. To incorporate a larger number of risk categories in order to create a more graduated provision scheme, thereby increasing the incentives for banks to reclassify lenders.

One particular aspect of this scheme was the authorization for banks to use internal models to calculate provisions, inspired by the Basel II scheme for credit-risk-based capital requirements. Relatively large borrowers (commercial loans) were subject to an individual evaluation, while borrowers classified as retail clients (consumer loans, mortgages, and smaller firms) were evaluated as a group.

Current regulation

The new regulatory framework—which went into effect in January 2010—requires the banks to constitute provisions for new contingent loans, including the approved amounts on open credit lines. Beginning in January 2011, the provision regulations increased convergence to the criteria established by the Basel Committee. In particular, the individual evaluation models for the "unimpaired" portfolio incorporate parameters such as the probability of default (PD) and loss given default (LGD), both defined in advance by the supervisor[10]/.

The unimpaired portfolio is divided into two types (normal and substandard), encompassing a total of ten risk categories; this represents a step forward in establishing a more graduated loan classification scale (table V.6). The banks classify their portfolios into one of the ten categories, taking into account factors such as the firm's industry, financial position, payment capacity and behavior, business situation, and the quality of its business partners and management.

Table V.6

Main differences in provisions regulations (1)

	Previous regulation	Current regulation	
	Normal loans	Normal loans	Substandard loans
Number of categories	4	6	4
Provisions calculation	Determined by the bank	PD * LGD * Exposure (2)	PD * LGD * Exposure (2)
Minimum required	NO	0,5%	NO
Provisions range	0 – 2%, approx.	0.04 – 9%	13.9 – 43.9%
Additional provisions	YES	YES	YES
Countercyclical provisions	NO	YES	YES
Contingent loans	YES	YES (3)	YES (3)

(1) For unimpaired individually assessed firms.
(2) PD and LGD are parameters set by the regulator (SBIF).
(3) Increases the number of contingent operations.

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

Finally, elements were incorporated based on international proposals to introduce a less cyclical bias in provisions. To this end, a minimum requirement of 0.5% was established for the normal unimpaired portfolio (previously 0%), and banks can voluntarily choose to constitute countercyclical provisions. The latter are registered as additional provisions

[10]/ The values for the PD and LGD established in the regulations are long-term estimates, that is, representative of at least one economic cycle.

when the macroeconomic scenario is favorable, and they are released or allocated to specific provisions when conditions deteriorate, thus promoting a more stable evolution of provisions across the cycle[11]/.

Provisions regulatory framework in other countries in the region

Banks constitute two types of credit risk provisions: (i) specific (backward looking), to cover losses on delinquent loans; or (ii) expected (forward looking), to cover losses in the loan portfolio where default has not yet materialized.

In addition to Chile, the group of countries in the region with the second type of provisioning includes Bolivia, Colombia, Peru, and Uruguay, which have also implemented countercyclical provisioning systems[12]/. Bolivia requires countercyclical provisions ranging from 1.5 and 5.5%, depending on the loan portfolio, and banks are allowed to use them to offset a fraction of their specific provisions. Colombia adopted countercyclical provisioning only for the commercial and consumer portfolios; they are constituted in periods of fast economic growth and are calculated based on the difference between expected losses under an adverse scenario and under a baseline scenario. Peru requires banks to accumulate minimum countercyclical provisions, ranging from 0.3 to 1.5% depending on the type of portfolio, and they are constituted when the average annual GDP growth rate exceeds a predetermined maximum. Finally, in Uruguay banks construct a dynamic provisioning fund based on the difference between "statistical" provisions and specific provisions. The former are determined using a risk factor that ranges from 0.1 to 1.8% for five loan categories.

The outlook for the local regulatory framework

The starting point in Chile with regard to the application of countercyclical provisioning schemes is different than in other jurisdictions. For example, Spain applied its countercyclical scheme starting from a provision model based on borrower delinquency. In Chile, as mentioned, the new regulations start from a model based on expected losses. It will therefore be important to analyze not only the constitution of voluntary countercyclical provisions, but also the functioning of the internal models established in the local regulations, which, if they are well defined and properly applied, could also contribute to mitigating the cyclicality of provisions.

The benefits of applying countercyclical provisioning schemes is still under debate at the international level, and it remains an area of interest in the analysis of future alternatives for improving the local regulatory framework[13]/. While the idea of constituting provisions on the basis of macroeconomic considerations has been explored in the last decade, the idea of influencing the credit cycle with macroprudential objectives is more recent, and substantial research is still needed to determine whether it is optimal.

[11]/ As of the first quarter of this year, 12 banks had constituted this type of provisions.

[12]/ For more details, see IMF (2011d).

[13]/ Section VI of the thematic chapter included in this *Report* summarizes the experience with dynamic provisioning in Peru, Spain, and Chile.

VI. Financial regulations and infrastructure

Important developments in financial infrastructure include the opening of the new securities clearing house (Sociedad CCLV). With regard to new regulatory guidelines, the Central Bank extended the authorization of foreign issuers to place peso-denominated bonds in the local market.

Table VI.1

Amounts settled through the large-value payment systems (1)

(Ch$ billion)

	2010.I	2011.I
Total payments settled	**9,207**	**10,400**
RTGS	6,149	7,725
Interbank	1,805	2,647
Own	655	891
Client account	521	1,019
Securities market, CCLV (2)	412	348
Securities market, non-CCLV	217	389
Clearing houses	570	597
Checks	96	110
ATMs	17	20
Combanc	457	467
Central Bank of Chile	3,774	4,480
Combanc	3,057	2,676
Own	968	750
Client account	1,646	1,433
Securities market, non-CCLV	444	493

(1) Daily averages.
(2) Data for 2010 are from CCL, the old securities settlement and clearing house.

Sources: Central Bank of Chile and Combanc.

Payment systems and financial infrastructure

Large-value payment systems

The real-time gross settlement system increased its share in the LPVS

The large-value payment systems (LVPS) are made up of the real-time gross settlements (RTGS) system and the large-value payment clearing house (Combanc). The RTGS system settles gross transactions immediately in the accounts of each bank, whereas Combanc nets the transactions for each bank at the end of the day and then clears them through the RTGS system.

In the first quarter of 2011, the amounts settled in the RTGS system increased significantly. Relative to the same period of last year, the average daily amount settled grew from Ch$6.1 trillion to 7.7 trillion, while the average for Combanc fell slightly from Ch$3.1 trillion to 2.7 trillion (table VI.1).

In terms of share, the RTGS system processed 74.3% of total large-value payments in the first quarter of this year. Transactions between the Central Bank and the banking entities (mainly liquidity and deposit facilities) continued to be the most significant, accounting for 43.1%. Settlements processed through Combanc (the remaining 25.7%) were primarily client account transactions, which average Ch$1.4 trillion per day.

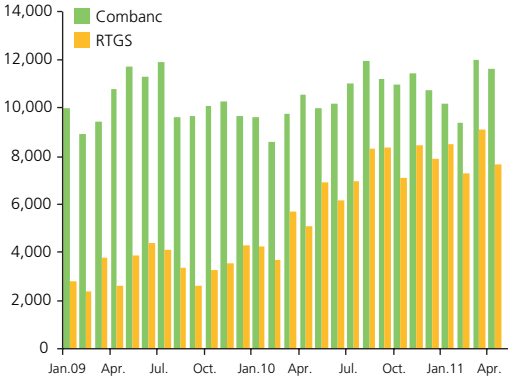
Part of the increased use of the RTGS system is related to the opening of the CCLV

A large share of the increased traffic in the RTGS system is related to the opening of the new securities clearing house (*Sociedad CCLV*), which, as indicated in the last *Report*, must clear the total balance of its settlements

Figure VI.1

Settlement systems for transactions originating in the securities market (*)

(Ch$ billion)



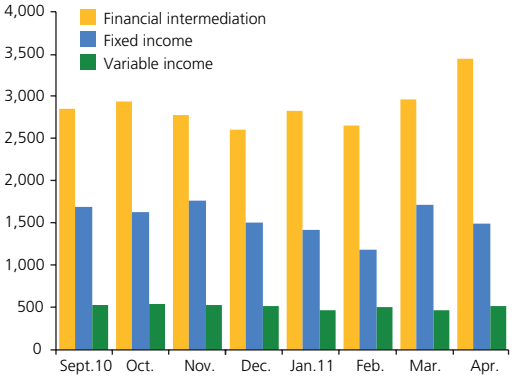
(*) Monthly total.

Source: Central Bank of Chile.

Figure VI.2

Amounts settled in the CCLV by type of instrument (*)

(Ch$ billion)



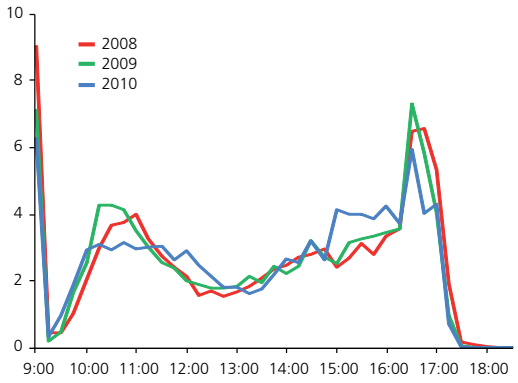
(*) Monthly total.

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

Figure VI.3

Intraday distribution of amount settled in the RTGS

(percent)



Source: Central Bank of Chile.

through the RTGS (figure VI.1)[1]/. At the same time, a drop in Combanc's activity is to be expected, since the opening of the CCLV will imply a reduction in securities market payments settled through Combanc.

With regard to amount, transactions settled through the CCLV averaged Ch$4.8 trillion a month in the period between October 2010 and March 2011. Of these, approximately 58% were financial intermediation instruments, 32% fixed-income instruments, and 10% variable-income instruments (figure VI.2).

The change in the intraday pattern of settlements associated with the CCLV has not affected the operations or liquidity of the RTGS system

The intraday distribution of settlements in the RTGS system changed in 2010 (figure VI.3). Specifically, there was a strong shift in settlements from the 10:00 to 11:30 a.m. time slot to the 3:00 to 4:00 p.m. period. In terms of risk, the restructuring of a significant amount of settlements from the morning to the afternoon represented a test for the system, in terms of both operational continuity and liquidity. However, the system continued to operate normally, without registering any delays or any increases in the number of payments rejected after closing.

Retail payment systems

The growth of the main retail payment means accelerated in 2010, especially ATM withdrawals and credit and debit card payments[2]/

Automatic teller machine (ATM) transactions were stable in 2007 and the 2008 at around 270 million transactions. They then began to grow sharply, recording rates of 23% in 2009 and 20% in 2010 (figure VI.4).

Bank credit and debit card transactions also grew strongly in 2010, when the annual growth rate of credit cards was 11% and debit cards, 29%.

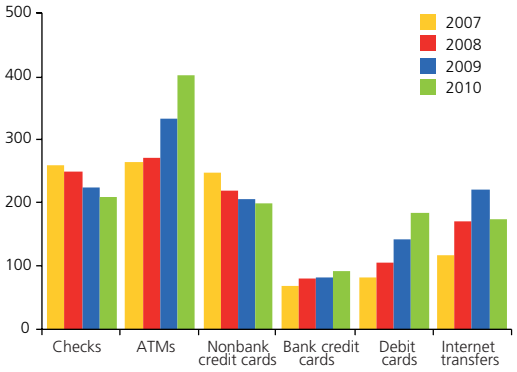
Nonbank credit card transactions moved in the opposite direction, declining 3% in the same period. This contraction is mainly associated with a reduction in credit card use for two major retailers. However, the transaction amounts for this type of card grew 17% (table VI.2).

[1]/ CCLV is an affiliate of the Santiago Stock Exchange, created under Law 20,345 and currently authorized to manage securities clearing and settlement systems. The opening of the transaction account and the participation of the management companies in the RTGS system does not, under any circumstance, involve the provision of financing or refinancing facilities to the company or in any way represent a guarantee on the part of the Central Bank of Chile with regard to the transactions settled.

[2]/ ATM withdrawals are one of the ways people obtain cash to pay for their transactions and, in this sense, are a substitute for other retail payment means.

Figure VI.4

Means of retail payment (*)
(millions of transactions)



(*) It includes personal and business transactions.

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

Table VI.2

Main means of retail payment
(Ch$ billion)

	2008	2009	2010
Checks	383,734	336,650	320,174
ATMs	10,913	13,729	17,212
Nonbank credit cards	4,973	4,636	5,438
Bank credit cards	3,400	3,713	4,598
Debit cards	1,961	2,580	3,460

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

The association of nonbank issuers with international credit card companies could change the competitive relationship between bank and nonbank credit cards

An important recent development in the credit card market is that one of the nonbank issuers has formed an association with an international credit card company, occasioning a significant shift in transactions from its original card to this new scheme. If other market participants also choose to pursue this strategy, it would generate substantial changes in this segment of the market by increasing the competitiveness of nonbank cards, since the international brands are more broadly accepted by businesses both in Chile and abroad. This scheme of associating nonbank credit cards with more recognized brands is widespread in international markets.

In general, the dynamic performance of the retail payment means analyzed in this section can be related to the economic recovery and, in particular, to a growth phase in the consumer cycle.

Financial regulation

Regulatory framework issued by the Central Bank of Chile

Extension of the authorization of foreign issuers eligible to issue peso-denominated bonds in the local securities market (March 2011, www.bcentral.cl)

In the exercise of its authority on foreign exchange issues, and in accordance with the general orientation of the government's economic policy, the Board of the Central Bank extended the authorization for nonresident issuers to issue peso-denominated bonds in the local market (known as huaso bonds), effective in April. Previously, the only entities that could issue these bonds were corporate issuers eligible to trade their securities on stock exchanges authorized by the Risk Rating Commission, which may have restricted the access of regional firms that might be interested in issuing their bonds in Chile. The modification allows huaso bonds to be issued by corporations that are legally established in countries with the following characteristics: (i) their sovereign debt has at least three risk ratings; (ii) they are members of the Financial Action Task Force (FATF) or an equivalent regional intergovernmental organization; and (iii) they are not classified as non-cooperative territories in terms of money laundering and terrorist financing by the FATF or as tax heavens by the OECD. Furthermore, foreign states and supranational organizations can now issue huaso bonds in the country, which was not the case under the previous regulatory statutes. In addition to the Central Bank Resolution, SVS General Regulation N°304 establishes the procedures for listing these instruments in the Securities Registry, offering them for sale, their diffusion, placement, and reporting obligations.

Regulations issued by other national agencies

Modification of the pension fund investment regime (January 2011, www.spensiones.cl)

In January, the Superintendence of Pensions modified the investment regime governing the pension funds, effective 1 March (resolutions N°4 and N°5). The new changes include increasing the flexibility of the regulations on investment limits, eliminating or combining some limits by instrument in order to apply the limits to groups of instruments with similar characteristics, and adding some instruments to the higher risk groups. At the same time, the methodology for measuring indirect investment was improved to encompass a larger array of underlying assets in the investments made with pension fund resources; use of the new methodology will enter into effect on 1 August 2011.

The resolutions cited above were reviewed in advance by the Technical Investment Council and approved by the Ministry of Finance.

Report of the Commission on Financial Supervision Reform (April 2011, www.hacienda.cl)

The Ministry of Finance appointed an honorary commission of experts to analyze the current structure of financial market regulation and supervision, together with systemic risk management, and to propose possible improvements in view of the post-crisis lessons and the national and international experience. The Commission's main proposals are as follows: (i) move toward an objective-based supervisory model that limits regulatory arbitrage, narrows the supervisors' functions, and facilitates the supervision of financial conglomerates; (ii) strengthen the coordination between agencies for the assessment and management of systemic risks, through the creation of a Financial Stability Council; (iii) reform the corporate governance of the regulatory agencies, including the establishment of a board of directors; (iv) grant budget independence and generate incentives to attract and retain qualified personnel in the regulatory agencies; and (v) increase the regulatory functions and accountability of the regulatory agencies (box VI.1).

Based on these recommendations, the Ministry of Finance has announced the necessary legal changes to create the Financial Stability Council, which will be composed of the Minister of Finance, the Governor of the Central Bank, the Superintendent of Pensions, and the Heads of two new commissions, namely, the Commission on Banks and Financial Institutions (CBIF) and the Commission on Securities and Insurance (CVS). The Financial Stability Council will be a formal coordinating agency whose critical functions will include the management of systemic risk, coordination between regulators, and the supervision of financial conglomerates. The Ministry also took steps to strengthen the current SBIF and SVS by improving their corporate governance, incorporating new institutional objectives, extending their regulatory functions, and improving their penalty processes. These proposals will be discussed in Congress for adoption.

Regulations on universal credit (April 2011, *Official Gazette*)

MKIII established the obligation for banks and other credit suppliers to offer universal credit, distinguishing between consumer loans, consumer credit cards, and mortgages. The regulations to implement this initiative were passed in April 2011 and will enter into effect on 24 October[3]/.

The central objective of these universal credits is to establish homogeneous and comparable conditions for each type of loan, to ensure that clients can freely contract insurance policies, and to obligate the financial institutions to inform the client of the total cost of the loan, both in pesos and as a percentage via an equivalent annual charge.

The equivalent annual charge is an annual interest rate that incorporates capital amortization and the payment of interest and expenses associated with the loan, regardless of their nature (taxes, notary charges, etc.). The equivalent annual charge can be a useful tool for comparing the cost of different loans. In this sense, the objective is to establish a mechanism for providing comparable information between suppliers for a given borrower, allowing the entities to adequately reflect credit risk.

Regulatory initiatives and documents of interest published by national and international organizations

"Progress in the Implementation of the G20 Recommendations for Strengthening Financial Stability" (FSB, April 2011, www.financialstabilityboard.org)

The Financial Stability Board (FSB) reports half-yearly on the status of the implementation of its reform program, as described in previous *Reports*. In its April 2011 review, the FSB reported positively on the adoption of the Basel III standards, which must now be implemented at the local level by its members.

With regard to systemically important financial institutions (SIFI), the FSB will present its recommendations to the G20 leaders toward the end of this year. Part of the work in this area has consisted in defining criteria for determining when a financial institution is a SIFI at the global level and, given the greater risk they pose for the global financial system, the higher capacity for loss absorbency that they should have. The FSB is also in the process of developing essential features and tools for resolution regimes of financial institutions.

The FSB is also working on other areas, which should be finalized by the end of this year. These include reforms to improve the OTC derivatives market, the development of macroprudential policy tools, the strengthening of adherence to international supervisory and regulatory standards, advances in consumer finance protection, and a reduction in reliance on risk rating agencies.

[3]/ Executive Decree 1512 of the Ministry of Economy, Development, and Tourism and the Ministry of Finance regulates universal credit in accordance with stipulations in Article 7° of Law 20,448.

"Principles for Financial Market Infrastructures: Consultative Report" (BIS-IOSCO, March 2011, www.bis.org)

The BIS Committee on Payment and Settlement Systems, in conjunction with the International Organization of Securities Commissions (IOSCO), is developing a set of "Principles for Financial Market Infrastructures," which are designed to be applicable to central securities depositories, securities settlement systems, and central counterparties. Still in the consultative phase, these new principles are intended to bolster the infrastructure supporting the financial markets, making it more robust and better prepared to withstand financial shocks than at present. They will replace the current core principles for systemically important payment systems, the recommendations for securities settlement systems, and the recommendations for central counterparties. Having a single set of principles, which are more demanding and cover issues that are not fully addressed in the current standards, should provide greater consistency in regulation and supervision and thus contribute to financial stability.

"Thematic Review on Mortgage Underwriting and Origination Practices" (FSB, March 2011, www.financialstabilityboard.org)

The FSB carried out a peer review of residential mortgage underwriting and origination practices. Taking into account that there are no international standards in this area, the FSB review included six recommendations to promote sound practices that promote financial stability, such as developing a framework of sound international principles and having the authorities compile and disclose detailed information on residential mortgage underwriting practices.

The elements identified for developing sound principles include the effective verification of borrowers' income and financial information, measures for ensuring a reasonable debt service coverage, and appropriate loan-to-value ratios, among others. Many of these principles are already incorporated in the usual lending practices in the Chilean market, although they are not necessarily required by the supervisor, but rather are independently applied by the banks.

"Closing a Failed Bank: Resolution Practices and Procedures" David C. Parker (IMF, April 2011)

This manual on bank resolution covers all phases, from the identification of a troubled bank through its possible liquidation.

The discussion starts off in general terms, with an explanation of the legal framework and the functioning of deposit insurance. It then provides a detailed look at the procedures involved in the resolution process and its escalation to the extent that the interventions do not stabilize the troubled institution. The process includes supervision and the initial measures applied to a troubled bank, intervention mechanisms, provisional management, resolution per se, and liquidation. Each phase is presented with a detailed explanation of the central points that should be considered by a designer (or implementer) of bank resolution policies, including financial, operational, political, and communicational issues.

"Macroprudential Policy: An Organizing Framework" (IMF, March 2011)

Since the last international financial crisis, there has been a growing interest in macroprudential policies—that is, policies directed at maintaining the stability of the financial system as a whole. In this document, the IMF presents the main messages on macroprudential policies from work conducted both within and outside the organization. It outlines the most important issues on the subject, including its definition and objectives, the diagnosis of systemic risk, macroprudential policy tools, and the institutional design for operationalizing macroprudential policy.

The document does not aim to be a conclusive treatise on best practices, given the early stage of development and partial knowledge in this area. Rather, it seeks to provide a basis for ensuring consistency in IMF recommendations on macroprudential policy.

Box VI.1: **Commission on Financial Regulation and Supervision Reform**

In August 2010, the Ministry of Finance appointed a group of experts to the new Commission on Financial Regulation and Supervision Reform, with the mandate to analyze and submit proposals on improving the regulatory and supervisory architecture of the local financial system, taking into account experiences at the national and international levels and the lessons that have emerged from the last financial crisis.

In March 2011, the Commission presented its report (henceforth, the Report), which identified weaknesses mainly in the following areas: insufficient coordination in the identification and mitigation of systemic risks, limitations in the supervision of financial conglomerates, opportunities for regulatory arbitrage, possible conflicts of interest given the different objectives assigned to the superintendents (solvency and market conduct), exposure to the political cycle, and limited independence of the regulatory entities.

To address these weaknesses, the Report proposes fostering the coordination of authorities through the creation of a formal agency that will identify and address systemic risks and through a series of reforms to the current supervisory and regulatory structure.

These proposals generally coincide with the principles of the majority of the financial reform projects undertaken in various jurisdictions in the last two decades. This box discusses those initiatives that, in case of implementation, require greater precision in their definition and scope, in order to effectively improve the safeguards of the stability of the Chilean financial system, while at the same time ensuring the preservation of its strengths.

The Financial Stability Council

One of the most important lessons of the last financial crisis is that supervising the financial soundness of individual financial intermediaries does not guarantee the stability of the financial system as a whole. The growing interconnection of financial markets and agents, the relative size of some of these, and their potential interaction with macroeconomic variables are factors that justify the inclusion of systemic considerations in oversight and in the adoption of regulatory and supervisory measures for the financial system[4]/.

It is therefore essential to establish an agency that will analyze and assess potential risks to financial stability and measures for their mitigation, study the systemic effects of relevant regulatory and legal proposals, and coordinate actions during episodes of stress. This agency should, at a minimum, have the participation of the capital market supervisors (responsible for "microprudential" regulation) and the Central Bank.

The Report takes this lesson into account and proposes the creation of a Financial Stability Council (FSC), which would be headed by the Minister of Finance and whose members would include the Governor of the Central Bank and the authorities responsible for the supervisory agencies. The mission of the FSC would be to safeguard the integrity and solvency of the financial system, and to this end it could draw up and recommend macroprudential policies, bring new sectors or instruments into the regulatory perimeter, and coordinate the actions of the regulators in times of crisis.

The Report proposes that the FSC be given direct regulatory power on macroprudential issues, and that the regulatory entities present their microprudential regulations and sanctions to the Council for approval.

While it is important to move forward on a supervisory and regulatory scheme that incorporates systemic factors, there is a concern with the degree to which the proposed design might affect the autonomy of prudential supervisors, diluting their

[4]/ For example, an increase in housing prices can facilitate lending to households and the real estate sector, which in turn fuels additional price increases. See the article at the end of this report for a more extensive discussion of this issue.

responsibility and possibly undermining their effectiveness in exercising their functions[5]/. Furthermore, given the possibility, as proposed in various international forums, of conferring a macroprudential dimension to microprudential regulations (for example, by calibrating the regulations based on cyclical variables or on the systemic impact of an institution), it is crucial to strengthen the coordination of the two objectives without allowing one to eclipse the other. In this context, the dilution of responsibility can be avoided and the full benefits achieved in terms of attenuating systemic risk through an agency tasked with non-binding discussion and coordination and the proposal of regulatory or supervisory changes to the microprudential supervisor.

This assessment is also based on the international experience. In particular, the only example of a coordination agency with such broad powers is the recently created Financial Stability Oversight Council (FSOC) in the United States. It is premature, however, to extract lessons from the FSOC as a benchmark, considering the time it has been functioning and the fact that it was formed as an urgent response to the problems of coordination and oversight of the financial markets and institutions in that country.

The majority of the comparable international agencies, such as the Council of Financial Regulators (CFR) in Australia, the Financial Institutions Supervisory Committee (FISC) in Canada, or the European Systemic Risk Board (ESRB) in the E.U., have limited functions, which are restricted to coordination, and do not intervene directly in regulatory or supervisory functions.

In sum, although the idea of creating an FSC that reinforces the systemic aspects of the Chilean financial structure is appropriate, it is crucial that the Council's mandate and powers do not weaken microprudential regulation and supervision.

Supervision by objectives

The Report suggests adopting a twin peaks model of supervision and regulation, inspired by schemes such as those implemented in Australia and the Netherlands. Under this scheme, the supervision of the financial system is organized around two broad objectives: to safeguard the stability of the supervised institutions (solvency objective) and to ensure the protection of the financial client (market conduct objective).

Many of the financial reforms implemented in recent years have moved in this direction, especially after the problems experienced by the FSA in the United Kingdom, which demonstrated the limitations of an overburdened management structure and how it can end up prioritizing one objective over the other[6]/.

In the Report's proposal, the implementation of this model in Chile would be achieved through the creation of a Solvency Commission and a Market Conduct Commission. The former would take over the solvency functions of the SBIF and the Insurance Office of the SVS, while the latter would incorporate the consumer protection and market conduct functions that are currently performed by the SBIF, the SVS, and the financial area of Sernac[7]/.

This proposal has several advantages for the case of Chile: it could contribute to reducing possible regulatory arbitrage, understanding the implicit risks in financial conglomerates, and strengthening the supervision of solvency or market conduct in areas that are currently weak. However, the integration of supervisors does not settle the debate on the regulation and supervision of financial conglomerates, since it leaves open other central issues like the scope of formal supervisory processes and capital and liquidity requirements for the holding company.

Given that the twin peaks proposal represents a radical change to the current financial infrastructure, its adoption must be implemented very carefully, to ensure that it does not erode the strengths of the current financial legislation. An essential precondition for its adoption must be the development of an FSC, which would provide a space for effectively coordinating the solvency and market conduct objectives, so as to safeguard the stability of the financial system.

[5]/ Regulations and sanctions would have to be approved first by each regulatory entity and then later voted on again by the FSC, whose decisions would be binding. In the case of the Central Bank, despite having veto power, the Governor's participation as a member on the council presided over by the Minister of Finance would open up a series of juridical questions with regard to the effects on the Bank's autonomy.

[6]/ Examples of economies that have moved in this direction include the United Kingdom, Spain, and, to some extent, the United States.

[7]/ Although the Report does not explicitly describe the arrangement, it is understood that the supervision and regulation of securities brokers and dealers, as well as the institutions that provide market infrastructure, like the CSD and the CCLV, would be supervised by the Solvency Commission in the area of solvency and by the Market Conduct Commission with regard to their market practices.

Strengthening the corporate governance of the regulatory agencies

The Report argues that it is necessary to grant greater regulatory powers to the superintendents, so as to allow these agencies to react flexibly to changes in the financial system. It also cites other studies that have questioned the degree of autonomy and the appointment process for superintendents in the current system[8]/. As emphasized in the Report, however, advancing in these areas requires strengthening the control mechanisms and accountability of the superintendents.

While the Report proposes a collective governance scheme, there are alternatives that could be used to improve the control mechanisms of these institutions—for example, strengthening the prior consultation procedures that have been used to pass various regulations of the Chilean financial system, or establishing technical consultation bodies similar to the Technical Investment Council that advises the SP. Beyond the specific definition, it is highly relevant to adopt measures that foster greater flexibility and scope in the regulatory process, increase the continuity of internal policies, and reduce the interference of the political cycle and the possibility of capture of the financial system regulators.

[8]/ IMF (2004); OECD (2011b).

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Glossary

Acid liquidity: The acid-test ratio, or the ratio between current assets net of inventory and current liabilities.

Additional provisions: Bank provisions constituted in excess of required provisions, which are not allocated to any particular loan portfolio.

Available-for-sale instruments: Financial instruments that are not included in either the trading instruments category or the held-to-maturity investment category.

Average interbank interest rate swap (*promedio cámara*): Derivatives contract between two parties, who carry out an exchange of flows at future dates, between a fixed rate established when the contract is written and a variable rate (fixed-for-floating swap). The variable rate corresponds to the average interest rate in the interbank clearing house (*cámara*), which in turn is derived from the average clearing house index.

Basel II: The second accord issued by the Basel Committee on Banking Supervision (BCBS), with the goal of creating an international standard for the banking industry's operation and risk control. Basel II is based on three pillars, which seek to foster greater stability of the financial system: (1) minimum capital requirements aimed at making resource allocation more sensitive to credit and market risks; (2) procedures for improved supervision; and (3) greater market discipline.

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.

Basis point: Unit of measure equal to one one-hundredth of one percent (0.01%).

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

CCAV: Large-Value Payment Clearing House (*Cámara de Compensación de Pagos de Alto Valor*). Electronic system of interbank payments that operates as a netting engine, with procedures to ensure the final clearing of the net results of each settlement cycle in the RTGS system.

CDS: Credit default swap. A derivative instrument that provides insurance against the credit risk of the issuer of a given underlying sovereign or corporate bond. The institution that grants the CDS commits to covering the loss associated with a previously established credit event occurring before the bond's maturity date.

CEMBI Broad Premium: Measures the differential return on corporate bonds in dollars issued by a set of emerging economies in international markets, relative to U.S. Treasury bonds.

CEMBI Chile Premium: Measures the differential return on corporate bonds in dollars issued by a Chilean firm in international markets, relative to U.S. Treasury bonds.

Central government: Institutions associated with the three branches of the state (executive, legislative, and judicial), as well as Law 13,196, the interest earned from recognition bonds, and the oil price stabilization fund.

Commercial papers: Documents issued by corporations specially authorized by the Superintendence of Securities and Insurance (SVS), with the goal of attracting funds directly from the public to finance the short-term operations of the issuer (working capital).

Consolidated government: Total central government and the Central Bank of Chile.

Consumer divisions: Bank units oriented to a specific segment or group of the parent bank's clients, generally a lower-income segment. Several of these divisions are heirs to the old finance corporations.

Countercyclical provisions: Bank provisions constituted when the macroeconomic scenario is favorable and released when the environment deteriorates, thereby promoting a more stable evolution of provisions across the cycle.

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 indicator is calculated as the difference between external debt and the net derivatives position, scaled by exports minus imports.

Currency risk: Exposure to losses caused by adverse changes in the value of the foreign currencies in which the instruments, contracts, and other transactions recorded on the balance sheet are denominated.

Currency swap: A contract between two parties establishing a commitment to exchange the specified notional principal and fixed interest in one currency for the specified notional principal and fixed interest in another currency, at a future date and at a pre-established price. In this type of contract, the notional principal must be specified in both currencies.

Default: The nonpayment of the interest or principal on a legally contracted debt.

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

EMBI Global Premium: The most commonly used measure of emerging market risk. The difference between the return on emerging economies' sovereign debt in dollars issued in international markets and U.S. Treasury bonds.

EMBI Premium: The most commonly used measure of an economy's risk. The difference between the return on a country's sovereign debt in dollars issued in international markets and U.S. Treasury bonds.

ESSF: Economic and Social Stabilization Fund (*Fondo de Estabilización Económica y Social*, or FEES). Created in 2007 by Decree with Force of Law DFL 1, of 2006 issued by the Finance Ministry. The Fund's objective is to accumulate the surplus flows that are generated by the application of the structural balance rule, and it will serve as a source of financing in future deficit periods.

External debt: Includes bank debt, bonds, and other overseas loans, as well as loans associated with foreign direct investment.

Factoring: A financing option oriented toward small and medium-sized enterprises, which allows such firms to obtain liquidity by selling or assigning their accounts receivable. The receivables are usually made up of invoices, checks, and drafts. The firm receives a cash advance in exchange for transferring the right to collect payment on the accounts to the factor, which could be either a bank or a specialized firm called a factoring company.

Financial debt: Interest-bearing debt, measured as bank debt, plus public liabilities (bonds and commercial papers).

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

FIR: Financial burden-to-income ratio. Measures the payments that households must make to fulfill their consumer and mortgage loan commitments, as a percentage of their disposable income.

Forward: A contract between two parties, establishing a commitment to exchange a certain quantity of an asset on a future date, at a predetermined price.

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, Russia, the European Union, and a group of other economies, including Brazil, India, China, and South Africa, among others.

G7: An economic and political group made up of the seven largest industrialized countries (namely, Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States).

Goodwill: The recognized value of a company, above the market value of its assets.

IFRS: International Financial Reporting Standards. A set of standards issued by the International Accounting Standards Board (IASB), whose goal is the comparable and transparent revelation of financial statement information, for all participants in the world capital markets.

Impaired portfolio: Loans for which there is evidence that the borrowers will not fulfill their obligations under the contracted payment terms, without the possibility of recovering the debt through guarantees, legal actions, or the contracting of different terms. A loan is considered impaired when it is past due by 90 days or more.

Indexation margin: Difference between the indexation adjustments earned and paid by banks, measured relative to total bank assets.

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

Interest margin: Difference between the interests earned and paid by banks, measured relative to total bank assets.

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.

Leasing: A contract through which a natural or legal person (the lessor) transfers to another (the lessee) the right to use a physical good in exchange for some compensation, usually a periodic payment for a specified period, at the end of which the lessee has the option to buy the good, return it, or renew the contract.

Liquidity risk: The risk that a counterparty (or participant in the payments system) will not be able to meet its obligations when they come due, although it may be able to do so in the future. Liquidity risk does not necessarily imply that the counterparty is insolvent.

Listed instruments: Instruments issued by firms and traded in the capital market.

LVPS: Large-value payment systems. Comprises the RTGS and CCAV systems.

M1: A measure of the money supply that includes currency in circulation, the value of checking accounts held by the nonfinancial private sector (net of clearing), non-checking demand deposits, and demand savings accounts.

M2: M1 plus time deposits, time savings deposits, mutual fund shares with investments in debt instruments with a maturity of up to one year, and deposits with savings and loan cooperatives, less the time deposits of the aforementioned mutual funds and savings and loan cooperatives.

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.

MKIII: Law 20,448, published on 13 August 2010, whose purpose is to increase the liquidity and depth of the capital market, enlarge the financial market, introduce elements of competition to the credit market, and facilitate the financial integration of the capital market.

Multibanks, large: Banks with a large market share and a high degree of diversification in their operations (loans and derivative and nonderivative financial instruments).

Multibanks, medium-sized: Banks with a smaller market share than large multibanks, but as much diversification.

Net interest margin: Difference between interests and indexation adjustments earned and paid by banks, measured relative to total bank assets.

NIIP: Net international investment position. The difference between the economy's external assets and liabilities.

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 transfer to the nonperforming portfolio if acceleration clauses are enforced.

Onshore dollar rate: Estimate of the external rate relevant to the national foreign exchange market, which is derived from the covered interest rate parity.

Onshore dollar spread: The difference between the onshore rate and the Libor. It is therefore a proxy for the cost of financing in dollars in the national market vis-à-vis the international market.

Operating flow: Cash movements including all transactions and events that are not defined as investment or financing, which are mainly related to the entity's business, that is, the production and supply of goods and services in a given period.

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

Paid-in capital: The contributions of shareholders for the issue of subscribed shares, which have been paid in cash, or for the capitalization of reserves or of distributable earnings.

PRF: Pension Reserve Fund (*Fondo de Reserva de Pensiones*). A fund created by the Fiscal Responsibility Law, whose objective is to complement the financing of fiscal liabilities deriving from the state minimum pension guarantee on old age, disability, and survivor's pensions and welfare benefits. It is managed by the Central Bank of Chile in its role as fiscal agent, under investment guidelines defined by the Finance Ministry's Decree 1382 and complementary instructions.

Prime deposit rate: Interest rate that financial institutions offer their best clients on short- and medium-term deposits.

Repos: Repurchase (reverse repurchase) agreements. A sale (purchase) collateralized with an agreement or commitment to repurchase (sell back) the security.

Repricing: A component of interest rate risk, corresponding to the exposure to losses caused by rolling over of assets and liabilities with different maturities under different financial conditions.

Residual short-term external debt: External debt coming due within 12 months of a given date.

Retail banks: Banks whose main business is consumer lending.

Risk Rating Commission: A legally recognized entity with equity in its own right and with duties and powers established in Article 99 of Decree Law 3500, including the authorization for the pension funds to invest in stocks issued by foreign firms that are listed and traded on specified stock markets.

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 an indicator of capital adequacy (known as the Basel ratio), which is internationally accepted as a measure of bank solvency.

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

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

RTGS: Real-time gross settlements system. Electronic interbank payment system managed by the Central Bank of Chile, in which the processing and clearing of transactions is carried out continuously, individually, and in real time.

Savings banks: Financial institutions in Spain (known locally as *Cajas de Ahorro*), which are limited liability companies run as foundations (whereas commercial banks are corporations) and must therefore earmark a share of dividends to social ends or have government representation on the board, although they are private entities.

Senior bonds: Ordinary long-term bonds issued by banks.

Shadow inventory: Real estate properties that have been foreclosed by the banks but are not yet listed for sale; also includes mortgages with negative equity and mortgages that are over 60 days past due, which that will soon be foreclosed by the banks.

Sovereign bonds: Debt instruments issued by the government of a country in local or foreign currency. In the case of a foreign-currency-denominated sovereign bond, the selected currency generally corresponds to a more stable economy.

SPV: Special Purpose Vehicle. A subsidiary entity whose operations are limited to the acquisition and financing of specific assets and that has an asset and liability structure and legal status that ensure the fulfillment of obligations even if the parent company goes bankrupt.

Subordinate bonds: Long-term bonds issued by banks, with an average maturity of not less than five years and with no prepayment clauses. Because subordinate bonds are repaid after the claims of other creditors are settled in the case of bank liquidation, a share of these bonds is computed as effective equity.

Subprime: A loan segment of the U.S. financial market. They are loans (usually mortgages) granted to borrowers whose characteristics and payment history are below the average standards of the banking industry, such that they present a greater default risk than the average for other loans. The loans granted to borrowers that satisfy the average standards of the banking industry are called prime.

Swap: Derivatives contract between two parties, who carry out an exchange of flows at future dates. One of the most common swap contracts is the interest rate swap, in which the parties exchange predetermined flows at a fixed rate, set when the contract is written, for predetermined flows at a variable rate.

Syndicated loans: Financing provided by a group of banks or financial institutions, under a single loan contract, with the goal of diversifying the risks associated with a very large loan.

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

Tier 2 capital: Bank equity exceeding Tier 1 capital. Includes subordinated bonds, up to 50% of Tier 1 capital, and general provisions up to 1.25% of risk-weighted assets.

Trading instruments: Easily transferable instruments acquired with the objective of reselling them in the short term in order to make gains from arbitrage or fluctuations in the market rate or price.

Trading: Net earnings from financial operations and foreign exchange transactions.

Treasury banks: Banks that are dedicated to investment in derivative and nonderivative financial instruments and that do not have loans.

Type 1 mutual fund: Mutual funds that invest in short-term debt instruments, with a duration of 90 days or less.

VIX: Stock volatility index calculated by the Chicago Board of Trade, and the most commonly used measure of general volatility in the markets at the international level. It measures the implicit volatility in S&P 500 options contracts.

Abbreviations

Achef: *Asociación Chilena de Empresas de Factoring* (Association of Chilean Factoring Firms).
BIS: Bank for International Settlements.
Cembi: Corporate Emerging Markets Bond Index.
CSD: Central Securities Depository.
ECB: European Central Bank.
EMBI: Emerging Markets Bond Index.
EU: European Union.
GDP: Gross domestic product.
IMF: International Monetary Fund.
Ipsa: *Índice de Precios Selectivo de Acciones* (Selective Stock Price Index).
Libor: London inter-bank offered rate.
OECD: Organization for Economic Cooperation and Development.
PDBC: Central Bank discount promissory note denominated in pesos.
SBIF: *Superintendencia de Bancos e Instituciones Financieras* (Superintendence of Banks and Financial Institutions).
Sernac: *Servicio Nacional del Consumidor* (National Consumer Service).
SMEs: Small and medium-sized enterprises.
SP: *Superintendencia de Pensiones* (Superintendence of Pensions).
SuSeSo: *Superintendencia de Seguridad Social* (Superintendence of Social Security).
SVS: *Superintendencia de Valores and Seguros* (Superintendence of Securities and Insurance).
U.S.: United States of America.
UF: *Unidad de Fomento* (an inflation-indexed unit of account).

The Chilean financial system and macroprudential policies

On 29 April 2011, the Central Bank of Chile organized a Macroprudential Policy Workshop. This chapter describes the concept of macroprudential policies and its relevance for Chile, discusses the papers presented at the conference, and summarizes the issues addressed in the panels

I. Introduction [1/]

The recent financial crisis set in motion a large number of research and review processes in the global financial arena. One of the most important topics has been the debate on the regulatory policy framework.

A key point—for both political institutions and academics—is the need to incorporate systemic stability considerations into the financial regulations. For example, the IMF (2011) points out that "it is now widely recognized that in the run-up to the recent crisis, a key missing ingredient was an overarching policy framework responsible for systemic financial stability." Blanchard et al. (2010) hold that "the traditional regulatory and prudential frameworks need to acquire a macroeconomic dimension. Measures reflecting systemwide cyclical conditions will have to complement the traditional institution-level rules and supervision." Finally, the Bank of England (2009) indicates that "one of the key challenges is to re-orient prudential regulation towards risk across the system as a whole—so-called systemic risk. This is the role of macroprudential policy."

These visions reflect the fact that, until now, systemic stability considerations have not been systematically incorporated into prudential regulations. Traditional financial regulatory frameworks tend to be concerned on the strength of individual institutions. The implicit principle appears to be that systemic stability is a natural consequence of the strength of the system's components.

This perspective is incomplete on two dimensions. First, it ignores the cyclical nature of risk-taking and the potential endogeneity of risks. That is, the benign phase of the cycle can encourage decisions to take on credit risk, leverage, and maturity mismatches that turn out to be riskier than expected when conditions change (Borio et al., 2001). Furthermore, as institutions adjust to these harsher conditions, their actions can have an impact on market conditions that make their position even riskier (Adrian and Shin, 2009). Second, the lack of a systemic perspective can result in a failure to notice the accumulation of risks in large institutions or institutions that are highly interconnected.

I.1 Definition of macroprudential policy

The incorporation of this systemic perspective is what currently distinguishes the concept of macroprudential policy. The G-20 Financial Stability Board, the International Monetary Fund, and the Bank for International Settlements (2011) recently defined macroprudential policy as follows:

Macroprudential policy is a policy that uses primarily prudential tools to limit systemic financial risk, thereby limiting the incidence of disruptions in the provision of key financial services that can have serious consequences for the real economy, by:

[1/] This chapter was prepared by Rodrigo Cifuentes, Rodrigo Alfaro, Eduardo Olaberría, and Rubén Poblete. The opinions and arguments expressed herein do not necessarily reflect the official position of the Central Bank of Chile or its Board. The documents and presentations of the workshop are available online at www.bcentral.cl/conferencias-seminarios/otras-conferencias/Workshop29042011.htm.

a. dampening the build-up of financial imbalances and building defenses that contain the speed and sharpness of subsequent downswings and their effects on the economy;
b. identifying and addressing common exposures, risk concentrations, linkages and interdependencies that are sources of contagion risk that may affect the proper functioning of the system as a whole.

The first element of this definition is what is known as risk over time. One example is the accumulation of risks over the business cycle. As discussed by Borio et al. (2001), the risks that tend to materialize in the recessive phase of the business cycle were accumulated during booms. Indeed, during expansion, asset prices and collateral value are robust, which promotes the contracting of debt. Similarly, the probability of default is low in the short term. If this generates a change in long-term risk perception that leads to a drop in lending standards, then we have an inefficient cuclicality on the credit quality[2]/.In this case, an intervention to correct this misperception would be efficient from the perspective of social well-being.

The set of macroprudential tools should therefore include mechanisms for stabilizing the decisions of financial intermediaries across the cycle in terms of credit risk, leveraging, and the intensity of the maturity-transformation process. The argument in favor of an intervention does not depend on whether the excessive risk-taking over the cycle has an impact on the cycle itself, making it deeper. If that happens, it would provide an even stronger case for this policy.

The second element in the definition is also known as risk at a given point in time. This refers to the concentration of similar risk exposures and the concentration of risk in specific institutions. The presence of these risk concentrations could give rise to institutions that are "too systemic to fail." This condition can be associated with very large or very interconnected institutions—that is, institutions that are a counterparty in many transactions. One policy objective is to avoid such situations. This type of risk can exist in a system without being detected by an analysis that only focuses on individual institutions.

Macroprudential concerns are not just a banking issue. This is easy to see after having passed through a crisis in which one of the main protagonists was the so-called shadow banking system. In principle, it applies to any agent that issues debt and participates in the creation of credit or the transformation of liquidity, as well as agents that, due to their size or systemic importance, could generate substantial counterparty risk or excessive volatility in financial asset prices. In the latter case, for example, a macroprudential prism can be used to assess the incentives that govern the portfolio decisions of large investors in order to detect and mitigate factors that can have a strong impact on asset prices, which could be avoidable in some scenarios.

As mentioned, the main objective of these policies is to avoid the accumulation of financial risk—not to attenuate the economic cycle. At the same time, it is important to take similar preventive measures with regard to financial asset prices. A desirable objective from a systemic perspective is to defuse situations that can generate excessive asset price volatility—for example, through regulations that require or encourage financial intermediaries to make portfolios adjustments to incorporate price effects. This does not, however, consider the prevention of asset price "bubbles" as an objective in itself.

I.2 Is it really necessary to talk about a new policy?

Although the tone of the current discussion might suggest that these are groundbreaking developments, that does not mean that these characteristics have never been present in policy design in the past. In particular, this type of policy can be found in developing countries, which have a more extensive history with financial crises, mainly of external origin. One example is policies that try to contain the systemic impact of capital inflows.

That might lead one to think that it would be enough for microprudential regulators to incorporate a systemic perspective in their analysis. Christian Upper addressed this issue in the workshop's guest conference, presenting two arguments to the contrary. First, micro and macro approaches involve different skill sets and analytical procedures, so it is rather unreasonable to expect a single entity to perform both functions. Second, and perhaps more fundamentally, it would assign two different objectives to be carried out with a single set of instruments, which could produce conflicts of interest.

[2]/ The process described here is different from the financial accelerator (Bernanke and Gertler, 1995; Kiyotaki and Moore, 1997). With the latter, information asymmetries create a crucial role for collateral in lending. In the recessive phase, collateral value is low, so credit is also low. In a growth phase, collateral value recovers, which allows a credit expansion.

One benefit of considering these policies as a specific unit is that it allows a solution to problems that they have in common. In particular, it offers the opportunity to systematize analytical processes that lead to the identification of systemic risks and to the design of a corresponding decision-making framework.

Examples of macroprudential policy include not only policies that have emerged in the recent debate, but also existing microprudential policies that can be applied from a macroprudential perspective. In the former group, policies that address risk over time include countercyclical capital requirements, countercyclical adjustments in risk weights for exposure in specific sectors, a focus on risk "across the cycle" when setting margins or haircuts on repos, and taxes on the liabilities of other financial intermediaries. In the case of risk at a given point in time, proposals include special liquidity requirements and/or capital charges for systemically important financial institutions (SIFIs), capital charges on transactions settled outside the central counterparties, and taxes on non-traditional financing.

Microprudential measures that can be adapted for application as macroprudential measures for risk over time include time-varying caps on loan-to-value (LTV), debt-to-income, and loan-to-income ratios, with regard to specific loan characteristics. Time-varying caps applied to banks' balance sheets include limits on exposure to certain sectors (such as properties) and/or financial assets (such as currencies), caps on loan-to-deposit ratios, and restrictions on the level or growth rate of aggregate credit, as well as dynamic provisioning and possible additional capital requirements in boom periods, determined through value-at-risk (VaR) calculations in adverse scenarios. For risk at a given point in time, possible measures include the power to break up firms based on systemic risk considerations, risk-adjusted deposit insurance premiums, and other specific restrictions (for example, proprietary trading in SIFIs).

I.3 Central Bank workshop on macroprudential policy

The Central Bank organized this workshop to move forward on the analysis of which dimensions of this international debate might be relevant for our regulatory framework. Professionals from the Central Bank and other national and international institutions participated in the event. The rest of this chapter contextualizes the presentations and describes their main conclusions.

The workshop's guest conference was presided over by Christian Upper, Head of Financial Markets in the BIS. He discussed the macroprudential policy decision-making process and the challenges of designing institutions in the different stages of this process.

Then two papers discussed the empirical evidence on risk-taking over the cycle in Chile, from different perspectives: García and Sagner (2011), who use aggregate data for the banking system, and Alfaro et al. (2011), who draw on individual loan data.

The analysis of the application of macroprudential policy to the specific characteristics of the Chilean financial system raises at least three issues. First, foreign-owned banks represent over 50% of the banking system in Chile. Considering that risk-taking over the cycle is one of the primary motivations of macroprudential policy, it is worth exploring the extent to which the cycle in other economies affects the decisions of foreign-owned banks. This reframes the question of how foreign ownership affects the banking industry. The link between the lending decisions of foreign-owned banks and the situation in the parent company's country of origin is addressed by Galindo and Micco (2011).

A second issue is external capital flows, which can have systemic consequences through their impact on asset prices, through the supply of credit that increases the leverage of financial intermediaries, and through the supply of foreign currency financing that increases foreign exchange risk. Olaberría (2011) addresses the first of these factors. The evidence on capital flows in the recent period indicates that this factor is more important than the other two in Chile.

The third issue with a strong bearing on the case of Chile is the large size of the pension funds, whose assets represented 70% of GDP in March 2011. From a macroprudential perspective, their portfolio decisions can have important consequences both on asset prices and on sectors that depend strongly on these investors for financing. These issues were addressed in a panel that included the participation of economist Claudio Raddatz, of the World Bank, and Luis Figueroa, Director of Regulation, Superintendence of Pensions, Chile.

Finally, the workshop also explored the international experience on dynamic provisioning, that is, provisioning schemes that seek to mitigate risk-taking across the cycle, as described

earlier. Jorge Mogrovejo, Deputy Superintendent of Risk at the Peruvian Superintendence of Banks, Insurance, and Pension Fund Administrators, presented the Peruvian experience; Jorge Cayazzo, economist with the Central Bank of Chile and the IMF, covered dynamic provisioning in Spain; and Sergio Huerta, Head of Research at the Chilean Superintendence of Banks and Financial Institutions, discussed the Chilean provisioning scheme.

II. Implementation of a macroprudential policy: processes and institutions

The issues surrounding macroprudential policy implementation and decision-making processes are similar to those that arise in relation to the implementation of monetary policy. Key issues include the use of rules versus discretion and, more generally, the necessary governance arrangements for these policy decisions.

Because many of these issues are sensitive to political factors, it might seem advisable to focus on rules-based policies, to the extent possible. However, the changing nature of the financial system and its risks makes it unlikely that decisions can be made in this area without a strong element of judgment. This becomes even clearer on considering that the interaction with monetary policy plays an important role in many of the macroprudential policy instruments, especially those related to the cycle. A scheme based only on rules would thus have to incorporate models capable of assessing a large number of possible scenarios, in terms of both financial variables and monetary policy determinants.

Christian Upper addressed the dilemmas surrounding decision-making and the work structure in this area. For the analysis, he defined macroprudential policy functions as including analysis, communication, decision-making, and implementation. He also discussed the merits of the different agents (the Central Bank, the Ministry of Finance, sectoral regulators, or a committee composed of all of the above) for carrying out each of these functions.

Three points stand out from his presentation. First, he addressed the question of who should be responsible for the analysis that provides the basis for identifying systemic risks. The type of analysis required for this task must combine detailed practical knowledge of how financial instruments and contracts work with the ability to analyze the aggregate consequences of these characteristics. There are two candidates with an advantage for carrying out this analysis. The first is the microprudential regulator of the sector in question. However, Upper argues that the micro analysis is distinct from the macro: while one requires a detailed knowledge of individual institutions, the other demands a global perspective.

The second candidate is the Central Bank, which has synergies stemming from the macro perspective of monetary policy. As with the regulator, however, the analytical process is not identical. Whereas monetary policy focuses on expected values, macroprudential policy is based on extreme values. This implies that in either of the two cases, the analysis will have to be carried out by a new team formed specifically for the purpose, so it is not clear, a priori, which institution should develop this additional capacity. In practice, many central banks have been acquiring the skills for analyzing systemic risk, as a result of their responsibility as lender of last resort and their role in the payment system.

The second point highlighted in the presentation addresses a similar tension, namely, who is responsible for decision-making. Given the need to balance the incentives of the different institutions involved, the solution points toward the formation of a committee that brings the institutions together, with the possibility of including external members. However, Upper warns against the risk of diluting responsibility. That is, when a specific responsibility is assigned to a committee of institutions, it is diluted among the committee members since it is not the mandate of one institution in particular.

Finally, Upper discussed the need to analyze a little-explored area of economics and finance—one that appears central to the issue at hand—which he calls the conventional wisdom trap. There is a risk that the incorporation into the analysis of the deficiencies revealed in the last crisis will generate a false sense of security. The challenge is to turn the analysis into an unbiased search for any vulnerabilities that might be forming and that do not conform to previous patterns. In particular, it is necessary to find a way to incorporate heterogeneous perspectives into the risk analysis. Upper suggests that other disciplines in which risk assessment under changing scenarios is essential, such as defense or nuclear energy, can serve as guides in terms of how to systematize the analysis.

III. Business cycle and risk-taking

This section reviews the empirical evidence on excessive risk-taking in booms, following Borio et al. (2001). It starts with a look at the international evidence and then summarizes the workshop presentations on the case of Chile. Specifically, García and Sagner (2011) analyze the existence of risk-taking over the cycle using aggregate data and a VAR methodology. Alfaro et al. (2011) use data on individual loan default by date of loan origination in the period 2003–09 to identify the intrinsic credit quality of each cohort, after controlling for macroeconomic factors. The authors then analyze this information to assess the behavior of risk-taking over the cycle by Chilean banks in the recent period. The first of these two studies finds no evidence of risk-taking over the cycle, whereas the second does.

III.1 International evidence

The last financial crisis ended a long period of economic stability known in the literature as the Great Moderation. During this period, the majority of economies were not subject to strong inflationary risks, and monetary policy was expansive to promote output growth. However, the low cost of financing led banks, fund managers, and insurers to take greater risks in their investments (Borio and Zhu, 2008; Adrian and Shin, 2009). In this area, Gambacorta (2009) presents evidence that supports this relationship, establishing, for example, that the so-called "search for yields" proposed by Rajan (2005) led financial institutions to substitute low-risk, low-yield government bonds for very risky high-yield private bonds. Some of this behavior can be explained by the existence of nominal portfolio management objectives that were not adjusted to the available investment opportunities for a given level of risk. The author also establishes an empirical relationship between a bank risk measure (namely, the expected default frequency, or EDF), individual bank characteristics (size, profitability, etc.), and macroeconomic variables in the country of headquarter. The last set of variables includes the number of periods in which the monetary policy rate is below the optimal level, as defined by a Taylor rule. The results indicate that this variable and the excess credit growth relative to the industry have positive and significant effects on bank risk as measured through the EDF.

Jiménez et al. (2009) obtain a similar qualitative result based on microeconomic data for Spain. They find that low interest rates reduce credit risk in the short term, but in the medium term, banks tend to grant riskier loans and generally reduce their lending standards, due to the higher valuation of collateral and possibly a search for yields. This seems to be in line with the casual evidence reported by subprime mortgage fund managers, who coined terms like NINJA (no income, no job or assets) to "describe" the underlying characteristics of the mortgages included in the structured products.

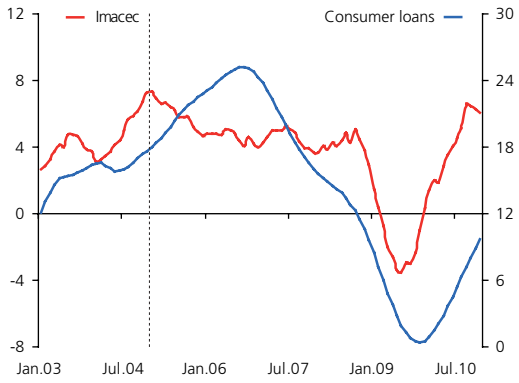
III.2 Credit risk and the economic cycle

In the workshop, García and Sagner (2011) presented their study of credit and economic cycles over the last fourteen years in Chile, based on a standard set of macroeconomic variables used in monetary policy models plus two financial variables that measure risk (nonperforming loans) and credit (loans). This period was marked by strong output growth, which propelled the growth of consumer loans. After output growth peaked, loans continued to expand, amplifying the credit cycle. This could have resulted in an accumulation of risk by encompassing borrowers with an inferior credit standing (figure 1).

Figure 1

Growth of output and consumer loans (*)

(percent)



(*) Six month moving average of the annual change. The vertical line marks peak output growth.

Source: Alfaro et al. (2011).

Using a structural VAR and filtered variables, the authors find a direct relationship between increased risk and the drop in output. This relationship is robust when they consider the variance decomposition of output (where nonperforming loan shocks explain 8% in a half year) and impulse response functions (where a positive nonperforming loan shock results in a drop in output, credit, and, through the Taylor rule, the

monetary policy rate). The results are the same for exercises that only use specific loans like consumer, commercial, and mortgage loans. The authors further find that positive shocks on output do not result in an accumulation of risk. Nor is there a significant relationship between a reduction in the monetary policy rate and increased risk (nonperforming loans) that would provide evidence of risk-taking across the cycle.

III.3 Probability of default on consumer loans

Credit risk is one of the most important risks in traditional banking (Crouchy et al., 2005), which has motivated the development of statistical credit risk models[3]/. Although a range of models is available on the market, Basel II proposes the use of internal models such as a Vasicek (1991) model, which is an extension of Merton (1974). This model assumes that the asset value of a firm or individual can be disaggregated into a systematic factor and an idiosyncratic factor. The model establishes that the firm or individual will cease making debt payments when the value of its assets falls below a given threshold. This model correlates the long-run probability of default (LRPD)—also called the probability across the cycle—with changes in an unobservable factor. The unobservable factor is systematic, that is, it affects all firms or individuals, and its coefficient is also the asset correlation. This parameter can be understood as the level of exposure of borrowers' asset value to the general state of the economy.

A key element of the model is the parameter calibration, in particular the parameter measuring the asset correlation. This requires a historical default series that covers a full business cycle. Given the scarcity of this type of data, the Basel II Accord suggests values for the different types of credit weights. Botha and van Vuuren (2009) empirically assess these parameters and find that the values suggested by Basel II are higher than the empirical values obtained for the United States, so the proposal is conservative.

For the workshop, Alfaro et al. (2011) use the Vasicek (1991) model to evaluate risk-taking over the cycle. They calculate the default rate on consumer loans at the level of the banking system as a whole, both for the current total credit in a given month (stock) and for new loans issued that month (cohort). The authors define a default event as occurring when a current credit in a given month is transferred to nonperforming loans within the next twelve months. This definition is in line with international standards that consider the default probability within one year and the default event as 90 days past due[4]/. Econometric estimates are used to correlate the default rate of the loan stock with macroeconomic variables and the default rate of the cohorts with both macroeconomic variables and cohort variables.

For both the stock and the cohorts, the estimated LRPD is almost 15%, while the asset correlation is 1.7 and 3.1%, respectively (table 1). The LRPD indicates the unconditional probability that a loan will not be paid—that is, not conditional on the state of the cycle. To arrive at the expected loss of a loan portfolio, the LRPD is multiplied by the loss given default (LGD). In turn, the asset correlation obtained in the cohort estimate corresponds to the value suggested by Basel II for this type of loan. When the model is extended with exogenous variables (macroeconomic and cohort), this coefficient drops to 0.7%, raising the economic and financial interpretation of the variations in the default rate.

The cohort variables capture changes in bank lending policies. For example, the share of loans originated by the consumer division increases the default probability (table 1), and the sample shows a positive correlation with annual Imacec variation of 28%, which indicates that credit to this sector increases with positive growth.

[3]/ One of the most important works in this area is the Merton (1974) model for corporations, which has been developed commercially by Moody's KMV. Some noteworthy competitors are CreditMetrics and CreditRisk+ which exploit the relationship between default and systemic factors, including macroeconomic variables.

[4]/ A loan is transferred to nonperforming loans when a payment is 90 days past due, such that the event captured is a nonpayment by at least 90 days in the first nine months of the loan.

Table 1

Results of the Vasicek model (*)

	Stock		Cohorts			
	[1]	[2]	[3]	[4]	[5]	[6]
Imacec (annual change)		-1.86		-1.78	-2.22	-1.68
		(0.27)		(0.42)	(0.40)	(0.41)
Inflation		3.67		5.08	4.97	4.52
		(0.30)		(0.46)	(0.43)	(0.37)
Share of consumer div.					0.52	0.67
					(0.14)	(0.12)
Average maturity (log)						-0.34
						(0.17)
Average amount (log)						0.34
						(0.09)
Constant	-1.02	-1.09	-1.05	-1.18	-1.37	-2.84
	(0.01)	(0.02)	(0.02)	(0.03)	(0.06)	(0.26)
Asset correlation	0.017	0.005	0.031	0.011	0.009	0.007
	(0.003)	(0.001)	(0.005)	(0.002)	(0.001)	(0.001)
LRPD	0.154	0.152	0.148	0.145	0.145	0.145
	(0.004)	(0.002)	(0.005)	(0.003)	(0.003)	(0.002)
Akaike	-234.0	-333.3	-185.5	-264.6	-275.2	-299.5
Schwartz	-229.3	-323.9	-180.8	-255.1	-263.5	-283.0

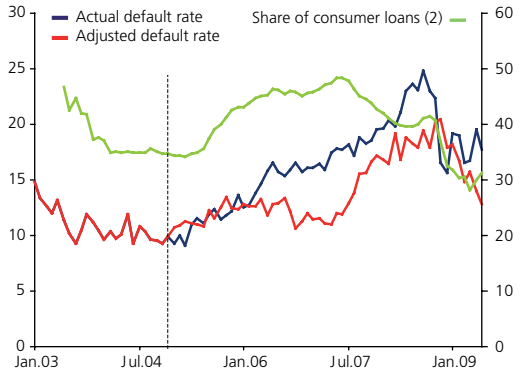
(*) Standard errors in parentheses.

Source: Alfaro et al. (2011).

To quantitatively establish the effect of changes in lending policies on portfolio quality as measured through the default rate, the authors estimate the default rate for the period 2005–09 assuming that the cohort characteristics are the same as the average in 2003–04. That is, they generate a series for the default rate assuming that there is no qualitative change in the cohorts, such that their dynamics are solely explained by macroeconomic factors. The difference with the original default rate is attributable to changes in the credit quality of the cohorts (figure 2).

Figure 2

Default rate and importance of loans originated by consumer divisions (1)
(percent)



(1) The vertical line marks peak output growth.
(2) Six month moving average.

Source: Alfaro et al. (2011).

Between January 2005 and February 2006, the two lines move in a very similar pattern, which indicates that there were no major changes in the quality of the cohorts. However, a gap appears starting in March 2006 and peaks in the second quarter of 2007. This would be a period of loosening credit standards. One indicator of this deterioration is the percentage of consumer loans originated by the banks' consumer divisions, which serve lower-income segments; this indicator peaks in this period. This coincides with a favorable macroeconomic environment, with average GDP growth rates of over 4.5% and a decreasing unemployment rate of around 8.6%. The later shrinking of the gap at higher default rates indicates an improvement in the quality of new loans, where default is explained primarily by macroeconomic factors.

IV. International financial integration: foreign banking and portfolio flows

IV.1 International financial integration and foreign banking

The increased international financial integration has been the subject of much debate, especially following the emerging markets crisis in the late 1990s and the recent financial crisis originating in the advanced economies. This financial integration includes both the opening of the financial account of the balance of payments and the presence of foreign banks in the local banking systems. Some of the benefits of this financial opening are obvious, such as the greater access to credit and the adoption of modern management systems. The costs, in turn, include the potential increase in financial imbalances in the receiving country in the form of currency mismatches on bank and/or borrower balance sheets, credit growth, and the possibility of sudden stops, whose impact on the real economy can be substantial.

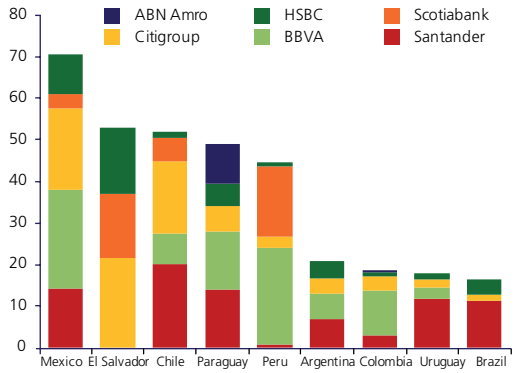
Given the importance of foreign ownership in the Chilean banking industry, it is important to understand the stabilizing or destabilizing effects on local credit. This would allow the design of mitigating systems (macroprudential policy) for potential scenarios of vulnerability. This section reviews the international empirical evidence in this area and indicates areas of interest for future research from the perspective of Chile.

Galindo et al. (2010) examine the impact of international financial integration on credit markets in Latin America. Using aggregate macroeconomic and financial data for the period 1996–2008, they identify the degree to which financial integration plays a role in the propagation of external shocks to domestic financial markets. In particular, they examine the relationship of real credit growth and real interest rates with external shocks. External shocks are defined as changes in the risk perception of investors, as evidenced in increases in the VIX index, the EMBI spread, or the U.S. high-yield bond spread. The results show that financial integration does, in fact, magnify the impact of international shocks on real credit and also increases real interest rate fluctuations. However, it is not possible to distinguish between the role of flows in the capital account of the balance of payments vis-à-vis the presence of foreign banks in the local system.

The next step is to more precisely determine the role of international banks, in terms of both cross-border loans between unrelated banks and headquarter-branch relationships. A large share of bank assets in Latin America is currently held by foreign banks. In the case of Chile, the share of bank assets held by foreign banks was around 50% in late 2008 (figure 3).

Figure 3

Bank assets held by international banks (*)
(percent of total banking system assets)



(*) Percent of bank assets held by international subsidiaries and branches. Data as of December 2008.

Source: Galindo and Micco (2011).

Cetorelli and Goldberg (2009) study how foreign bank loans affect emerging markets, whether through cross-border loans or via direct entry into the banking market. They use the BIS database on cross-border bank loans (Locational Banking Statistics) and data from Federal Financial Institutions Examination Council (FFIEC) on the net debit and credit positions in international loans of different banks at the world level. The authors show that during the recent crisis, the biggest drop in capital inflows to emerging markets was mainly from bank loans. They also find that foreign bank branches played a decisive role in the propagation of the shock to the host economies, because they were affected through two channels. The first, and most important, was a reduction in internal capital transfers (headquarter-branch flows); the second was a drop in cross-border loans. Local banks, in turn, were only affected by the latter. This indicates that the presence of foreign-owned banks made the host countries more vulnerable to international shocks in the recent crisis.

Kamil and Rai (2010) also establish differences between the behavior of cross-border loans and the ability of foreign bank branches to grant loans. In particular, they analyze why the deterioration of global liquidity conditions and the slowdown in the loan cycle in advanced economies had a smaller impact on foreign bank loans in Latin America and the Caribbean (LAC) than in other emerging economies. Using the BIS database on Consolidated International Banking Statistics for 1999–2008, they show that a weakening of liquidity in the country of origin reduces the growth of cross-border loans to LAC countries, as found by Cetorelli and Golberg. At the same time, the foreign bank branches' loans were more stable than cross-border loans during the recent crisis. The authors argue that this difference in the propagation of external shocks is due to the fact that loans by foreign bank branches in LAC are largely denominated in local currency and are financed with deposits in the local markets. These results complement the findings of Cetorelli and Goldberg, showing that the impact of foreign banks in the host country in the face of international shocks is lower when their loans are in local currency.

Other studies based on microeconomic, rather than aggregate data, explore the dynamics between international banks and their branches. De Haas and van Lelyveld (2009) use a bank integration model developed by Morgan et al. (2004) to make various predictions about the behavior of international banks.

They show that international banks can transfer resources between their branches in response to existing economic conditions in the respective host countries. Specifically, they can send resources from branches in low-yield countries to countries with higher returns; this is known as the "substitution effect." International banks can also help their branches in the event of a negative financial shock through a reallocation of capital, via the "support effect." This suggests that the presence of foreign-owned banks could increase the host country's sensitivity to external shocks, while providing a source of support in the case of domestic shocks.

The paper by de Haas and van Lelyveld (2009) finds solid evidence of an interbank capital market, both at the local level (branches within the country of origin) and the international level (between branches in different countries). Using microdata for a group of 45 multinational banks in 1991–2004, the authors analyze how external conditions, in both the country of origin and other host countries, affect credit growth in a given host country. The results provide robust evidence of the existence of a support effect, but not a substitution effect. Specifically, the authors find that foreign bank branches represent a more stable source of credit than local banks during a banking crisis in the host country. International banks thus have a stabilizing effect on the banking industry in host countries in the face of local financial problems. Finally, while the authors find that GDP growth and a decline in unemployment in the country of origin are negatively related to credit growth in the branch, these may be due to macroeconomic relationships between the countries.

Given the importance of foreign banks in the local system, and considering that the empirical evidence indicates that there are few generalizable results, it is important to study the specific case of Chile. In the workshop, Galindo and Micco (2011) address a similar question to Kamil and Rai but using bank balance sheet data, in the spirit of de Haas and van Lelyveld. To adequately identify the effects, they consider five countries in Latin America and include local banks from each of the countries. They also incorporate the medium- and long-term dynamics of bank credit and GDP in the host country, in addition to allowing feedbacks between external shocks. The preliminary results suggest that foreign banks respond to credit conditions in their native countries and that they behave differently than local banks.

IV.2 Capital flows and the impact on asset prices

Another issue that is highly relevant for the emerging economies is understanding the degree to which the dynamics of capital flows amplify the dynamics of local asset prices. Since late 2009, the emerging economies in Latin America and Asia have experienced a sharp recovery of capital inflows combined with a rapid appreciation of asset prices. This has awakened the concern that bubbles could be forming in these prices, creating a risk to financial stability. Consequently, learning the degree to which capital inflows affect asset prices will allow the authorities to correctly assess the risks involved.

The theoretical motivation is based on the works of Krugman (1998), Caballero and Krishnamurthy (2006), Aoki et al. (2009), Ventura (2010), and Laibson and Mollerstrom (2010), who suggest that in periods of abundant capital inflows, emerging markets become fertile ground for the development of asset price bubbles. Although different versions of this story are presented in numerous theoretical works, the empirical evidence is as yet limited[5]/.

From a financial stability perspective, only a few empirical studies have been carried out to date, and the evidence is inconclusive. Early works include a study by Jansen (2003), who examines the economy of Thailand in the 1980–96 period. Using a VAR approach, Jansen finds that capital inflows are associated with increases in stock prices. More recently, Aizenman and Jinjarak (2009) study the relationship between the current account and real estate prices in a panel of developed countries, finding a positive relationship between current account deficits and the appreciation of real estate prices. Similarly, Jinjarak and Sheffrin (2010) explore causality between real estate prices and the current account. They find that current account deficits directly affect real estate prices in Ireland, Spain, and the United States, but in England the effect was only temporary. Finally, Jinjarak et al. (2011) provide new proof on the relationship between international portfolio flows and stock and bond yields. However, none of these papers study the association between different categories of capital inflows and stock prices or analyze the channels through which capital inflows affect asset prices.

[5]/ Several studies explore the relationship between capital inflows and return on assets, such as Lakonishok et al. (1992), Froot et al. (2001), and Kaminsky et al. (2004), but the primary objective of these works is to understand the portfolio investment decisions of the institutional investors, not to analyze their implications for financial stability.

Olaberría (2011) tries to answer the following questions. First, is it true that capital inflows affect stock prices? Second, do all types of inflows have the same effect, or are some categories more likely to affect stock prices than others? Third, do the quality of institutions, the level of financial development, the degree of financial opening, and the exchange rate regime affect the relationship between capital inflows and asset prices?

The preliminary results suggest that capital inflows are associated with a real appreciation of stock prices, even when controlling for other factors. However, the average effect hides an interesting variation between countries and types of capital inflows. In particular, net stock portfolio flows are more likely to be associated with a real stock price appreciation than other types of capital flows. For the largest changes in stock prices, bond flows explain much more of the difference than other types of flows. Finally, the results show that the relationship between capital inflows and stock prices is mainly a problem in emerging markets. In developed countries, the effect is not statistically significant.

The results also confirm previous theoretical findings, by showing that the level of financial development and institutional quality are the main channels through which capital inflows affect the dynamics of asset prices and thus create a threat to financial stability.

A methodological problem with these results is that, by construction, the dependent variable captures both real stock market appreciation and exchange rate appreciation, so it is not possible to distinguish between the two. One possible solution to this problem is to include exchange rate fluctuations in the control variables. A second solution might be to use the stock index directly in local currency as the dependent variable.

V. Panel: Chilean pension funds and their impact on other local financial industries

The assets of the Chilean pension funds are equivalent to 70% of GDP. Given this magnitude and the concentration of the investment decisions (there are only six pension fund administrators, and two of these account for 55% of the assets), they could potentially have an impact on asset prices.

Claudio Raddatz, an economist with the World Bank, presented evidence on the behavior of pension funds in Chile. In 2005–08, almost 40% of the portfolio, on average, was concentrated in fixed-income government instruments or bank deposits. Raddatz used work by Opazo et al. (2009), which provides data on the portfolio maturities of the different institutional investors, to show the short duration of the managed assets. The mutual funds, in turn, present a short-term investment behavior similar to the pension funds, whereas the insurance companies invest in longer maturities. In Chile, in the period from September 2002 to December 2005, the average portfolio maturity was 3.2 years for the pension funds, 3.9 years for the mutual funds, and 10.3 years for the insurance companies. In the case of the United States, the average portfolio maturity was 7.8 years for short-term mutual funds and 9.6 years for multi-sector funds—both much higher than their Chilean counterparts.

A second issue is whether the pension funds engage in herd behavior. Based on data from 1996 to 2005, Raddatz and Schmukler (2011) suggest that the pension funds do not do much trading, which does not support the secondary market or price formation. Furthermore, when they do trade, they generally buy and sell the same assets. This behavior provides signs of herding, especially in so-called opaque assets, for which there is little market information. Raddatz suggested that although this situation may not be very efficient, it could be the result of current regulation that encourages the Pension Fund Administrators to minimize risk for the industry.

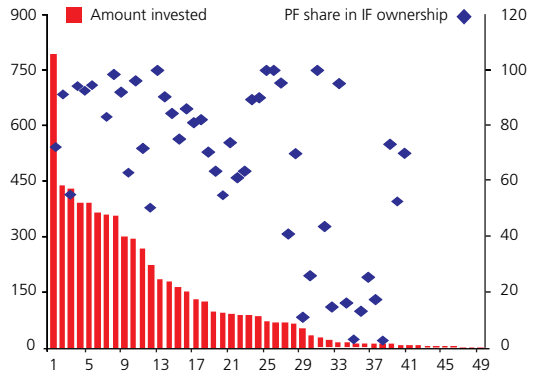
Luis Figueroa, Director of Pension Regulation, discussed the evolution of the investment portfolio and the importance of the pension funds in sectoral financing. With regard to the former, he indicated that the largest share of the portfolio (almost 45% of assets) is currently in foreign investment, with 29.7% in variable income and 15.4% in fixed income. At the same time, bank deposit holdings have declined substantially, reaching 4.5% in late 2010.

With regard to the pension funds' role in sectoral financing, Figueroa emphasized their participation in investment funds. Notably, the pension funds have a majority ownership share of the largest investment funds (figure 4).

The pension funds' role in bank financing has been a sensitive issue. In the recent period, the banking system has seen its financing sources dwindle due to large outflows as the pension funds invest overseas. This has been accompanied by a significant drop in time deposit holdings since December 2008. However, bank bonds and demand deposits have offset this phenomenon.

Figure 4

Pension fund investments in investment funds (*)
(US$ million, percent)



(*) As of December 2010.

Source: Presentation by Luis Figueroa, based on data from the SP.

VI. Panel: Dynamic provisioning in the banking system

Dynamic or countercyclical provisioning has become one of the most studied macroprudential policy issues in the recent period of regulatory adjustments in response to the crisis. The fact that there is a real-world case (namely, dynamic provisioning in Spain) has probably contributed to its popularity.

Jorge Mogrovejo, Deputy Superintendent of Risk at the Peruvian Superintendence of Banks, Insurance, and Pension Fund Administrators, gave a presentation on the countercyclical provisioning scheme in Peru, which was introduced in November 2008. The scheme centers on accumulating provisions in the upward phase of the business cycle for use in the downward phase. In the Peruvian scheme, a certain percentage of additional provisions is allocated to specific provisions when the average annualized GDP growth rate of the last 30 months exceeds 5%[6]/. The additional provision rate varies by type of credit, with higher rates for riskier credits.

GDP growth was chosen as the basis for the activation rule for additional provisions because it leads the credit growth. Thus, the increased provisions provide a safeguard against the potential risk associated with the growth of loans, and it may put a brake on excessive credit growth.

Jorge Cayazzo, a consulting economist for the Central Bank of Chile, presented the Spanish dynamic provisioning model and discussed the lessons the process offers for Chile. In Spain, the regulators calculated the expected annual loss for different types of credit over the full cycle, based on historical data. If the specific provisions that a bank must constitute in a given period are below the level given by the expected annual loss, then the difference must be made up in an additional provisions fund. If the specific provisions are more than the expected annual loss, then the bank only has to constitute the latter amount, since the difference can be charged to the reserve fund. The model thus stabilizes the bank's income statement over the cycle and reduces the risk that the bank will be caught without resources to cover losses due to credit risk in the adverse phase of the cycle. With regard to lessons for the Chilean case, Cayazzo highlighted the research process that led to the design of this system in Spain, which was adapted to the requirements of the Spanish banking industry, creating an adjusted countercyclical provisioning system built to serve as a complement to the specific provisions scheme. In this sense, the Spanish experience underscores the need to understand credit risk dynamics and their relation to the current provisioning scheme, so as to determine the necessary complements, if any, that can be provided through a countercyclical provisioning scheme.

Finally, Sergio Huerta, Head of Research at the Chilean Superintendence of Banks and Financial Institutions, discussed the provisioning model that is being developed for the Chilean system. He showed that provisions have historically lagged the cycle in Chile, with provisions growing in negative phases of the cycle. A new regulatory framework that was recently introduced incorporates the concept of expected losses as a fundamental pillar for determining provisions. The scheme involves a countercyclical component of provisions that operates as a self-regulatory mechanism and thus is voluntary in nature.

[6]/ The scheme includes deactivation and reactivation triggers for cases of a significant drop or rise in GDP.

A comparison of the different international experiences reveals important differences in the nature of the triggers used in the rule for accumulating and using provision funds. Some supervisors have opted for macro-indicators like GDP (Peru), while others have chosen triggers that operate as a function of the reality of each bank, such as the level of specific provisions (Spain).

To ensure the countercyclical nature of this type of mechanism, the chosen trigger must be correlated with the financial situation of the banks over the length of the cycle. In addition, the models presented above have the virtue of being rules based. This facilitates their implementation and provides a predictable regulatory environment for the banks.

In assessing the advisability of applying some of these schemes in other countries, it is important to consider what is expected from them in each country. A priori, both cases appear to be effective in reducing loan growth. History shows, however, that the use of fixed coefficients can limit the ability of these schemes to affect the risk quality of loans.

In the international debate (Bank of England, 2009; Brunnermeier et al., 2009), it is argued that capital requirements that are sensitive to risk conditions dominate countercyclical provisions. This is because capital requirements can be sensitive not only to credit dynamics, but also to other important determinants of cyclical risk-taking, such as leveraging and the degree of liquidity transformation. On the flip side, it is argued that one problem with procyclical capital requirements is that while the regulation can allow these to drop in weak economic periods, there is a risk that the banks will compete in not letting the market see them use this benefit, such that the policy loses force (Financial Services Authority, 2009).

VII. Conclusions

Although it seems like one of the big lessons of the crisis, the idea behind macroprudential policy is not new and is, in fact, present in the regulatory design of many countries. However, an important contribution of the current discussion is the proposal to design a comprehensive and systematic analytical and decision-making framework in this area. This design is not without challenges, in particular given the need to analyze, from a systemic perspective, institutions and markets that today are subject to supervision and/or monitoring by existing supervisors.

The empirical works presented at the workshop highlight a series of preliminary results. First, there is some evidence of procyclical risk-taking in the Chilean banking industry, but it appears moderate. Identifying the magnitude and assessing the advisability of ad hoc mitigation policies are part of the future agenda. With regard to the latter, it will be important to evaluate the cyclical characteristics of the current provisioning regime in order to detect the adjustment needs.

Second, the impact of foreign banks in Chile would appear to have a relatively positive bias, by providing stability during domestic shocks, by having one of the lowest external shock transmission levels observed in the different regions, and by using local sources for most of the foreign bank branches' financing. Obtaining a more precise estimate of the ranges of external shock transmission is part of the current agenda.

Finally, the Chilean pension funds are concentrated in short-term instruments, and they display a substantial degree of herding in their portfolio decisions. This calls for continuing the study of the incentives of portfolio managers. The focus on the short term generates lower returns for branches than would be achieved with a longer horizon, while herd behavior can produce inefficient volatility in market prices.

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Index of tables and figures

Tables

Figures

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