FINANCIAL
STABILITY
REPORT

September 2011

FINANCIAL

STABILITY

REPORT

Banco de la República
CENTRAL BANK OF COLOMBIA
Bogotá, D. C., Colombia

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EXECUTIVE SUMMARY

On the international scene, the prospect for lower growth and the fears about the sustainability of the public debt that some European economies have raised the risk perception and, therefore, the uncertainty and volatility of the international financial markets. In spite of the fact that the risk perception remains at low levels for the Latin American economies, their capital markets have been affected by the greater aversion to risk. Nevertheless, the domestic situation in Colombia has continued to show positive performance so far in 2011. The GDP for the first half of the year showed a growth rate of 5.2% driven by household consumption and private investment in machinery and equipment. Furthermore, exports grew a real 11.5% due to both rises in prices and increases in quantity and direct foreign investment grew at an annual rate of 75%, especially because of what has happened in the mining sector.

This strength in the real sector continues to boost the intermediation activities that are still showing a strong performance. The gross portfolio maintained its growth trend in the first half of 2011, which translates into a real annual increase of 18.9%. The consumer loan portfolio showed the greatest strength as it registered a real, annual variation of 20.6%. The commercial loan portfolio, which had shrunk slightly between May and June, grew 19.9% and the housing loan portfolio with securitizations grew at a stable rate of a real, annual 13.5%. Regarding liability accounts there has been a significant growth in bonds (52.9%), interbank loans (41.6%), and in deposits, especially in checking and savings accounts (15.6% and 20% in each case).

With respect to credit risk there was an improvement in the quality indicator for all of the types of loan portfolios with the exception of micro-credit. For the consumer, commercial and housing loan portfolios, this indicator was at 7.5%, 7.1%, and 6.3% respectively while the one for micro-credit came to 7.4%. Likewise, the default indicator has seen a stable performance for all of the types of portfolio and is at 3.1% for the total loan portfolio. Last of all, the fact that the coverage indicators have remained stable for the first half of the year is emphasized.

The investment portfolio of the credit establishments and non-banking financial institutions (NBFI), in turn, showed an increase of $6.1 t and $1.8 t respectively. The NBFI showed a restructuring towards public debt securities in their portfolios which reduced the share in real sector and financial assets at the same time that the share in longer term securities rose. The motivation for this was the devaluation of the national variable income securities which led to lower levels of profitability for these entities than what had been seen in 2010. With respect to the investments belonging to commercial banks, the proportion of securities that are tradeable and available for sale were found to have risen 4.8% between February and August 2011.

As a result, the exposure to market risk has risen for all of the types of financial entities due to the increase in the exposed balance and the duration of the portfolios. However, the materialization of market risk has been limited because of the limited volatility in the prices of their securities in the last few months. Given their business structure, entities such as pension fund managers and stock market brokers could be the ones affected the most due to adverse shocks in the financial markets.

When liquidity risks are analyzed, financial entity holdings of public debt securities have been found to be sufficient to deal with possible adverse shocks on their sources of funding. Nevertheless, there has been a declining trend in the liquidity indicator in the last few quarters which could be explained by an increase in the share of liabilities with cost. In addition, there has been a slight decline int agent interconnection in the public debt market which indicates that the system has less resistance to liquidity shocks.

In conclusion, during the first half of 2011, the financial system continued to show expansion represented by the increase in the credit institutions' gross portfolio and stable levels of profitability. This expansion of lending has occurred in a scenario of stress in the international environment. As a consequence, it is important to do continuous, strict monitoring of the quality of the financial assets as well as the changes in the prices of loan portfolio securities.

FINANCIAL STABILITY REPORT

Prepared by:
The Financial Stability Department of the
Monetary and Reserve Division

One of the duties of Banco de la República, as stipulated in the Colombian Constitution and in Law 31/1992, is to ensure price stability. Doing so depends largely on maintaining financial stability, which is understood as a situation in which the financial system is able to broker financial flows effectively. Financial stability contributes to better resource allocation, which is important to preserving macroeconomic stability. For that reason, financial instability has a direct impact on macroeconomic stability and on Banco de la República's capacity to fulfill its constitutional mandate. In short, monitoring and maintaining financial stability are crucial to that activity.

Banco de la República provides for financial stability in a variety of ways. To begin with, it makes sure the payment system in the Colombian economy operates properly. Secondly, it extends liquidity to the financial system through its monetary transactions and by exercising its constitutional faculty as the lender of last resort. Thirdly, being the country's credit authority, it designs financial regulatory mechanisms to reduce episodes of instability. It does so in conjunction with the Superintendencia Financiera de Colombia. (Financial Superintendence) Moreover, Banco de la República carefully monitors economic trends that could threaten the country's financial stability.

The *Financial Stability Report* is part of this last task and accomplishes two objectives. First, it describes the recent performance of the financial system and its principal borrowers. This is done so future trends in that performance can be visualized. Secondly, it identifies the major risks to credit institutions. The reason for both these objectives is to inform the public of the trends and risks that can affect the financial system as a whole.

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I.   Macroeconomic Environment

Currently, there is a high degree of uncertainty in the international environment caused by the deterioration in the risk profiles of some developed economies. Nevertheless, in Colombia, the economic activity indicators have shown positive performance up to this point in 2011.

A.   BACKGROUND OF THE INTERNATIONAL ENVIRONMENT

In the first half of 2011, worldwide economic activity was negatively affected by the natural disaster in Japan and by the loss of confidence associated with the public debt problems in the United States and Europe. The slow US recovery, the needs of fiscal adjustment in the advanced economies and the fears about the sustainability of public debt on the part of some countries in the euro zone cause us to anticipate limited conditions for growth for the rest of the year.

The economic growth projections for 2011 and 2012, which were forecast by the International Monetary Fund (IMF) in June 2011, are shown in Table 1. In general, the global performance is expected to reach a level of 4.3% in 2011 and 4.5% in 2012. These figures come from the fact that forecasts for advanced economies adjusted downward for the current year (2.2% vs. 2.4%) and the ones for the emerging economies remained at relatively high levels (6.6%).

The financial and economic imbalances seen in the most recent financial crisis raised the fiscal deficit of some of the advanced economies by making them continuously raise their government debt. This could have strong repercussions on worldwide growth given that these economies will have to make fiscal adjustments in the short term that could affect their economic performance even more. Graph 1 shows the performance of the public debt as a percentage of the GDP for the United States and for some European countries. The debt shows a rising

Table 1
Economic Growth
(annual percentage variation)

	Actual		Current forecast		Differences with respect to April 2011 forecast	
	2009	2010	2011	2012	2011	2012
World output	**(0.5)**	**5.1**	**4.3**	**4.5**	**(0.1)**	**0.0**
Advanced economies	(3.4)	3.0	2.2	2.6	(0.2)	0.0
United States	(2.6)	2.9	2.5	2.7	(0.3)	(0.2)
Eurozone	(4.1)	1.8	2.0	1.7	0.4	(0.1)
Japan	(6.3)	4.0	(0.7)	2.9	(2.1)	0.8
United Kingdom	(4.9)	1.3	1.5	2.3	(0.2)	0.0
Canada	(2.8)	3.2	2.9	2.6	0.1	0.0
Other emerging market and developing countries	2.8	7.4	6.6	6.4	0.1	(0.1)
Latin America	(1.7)	6.1	4.6	4.1	(0.1)	(0.1)
Brazil	(0.6)	7.5	4.1	3.6	(0.4)	(0.5)
Mexico	(6.1)	5.5	4.7	4.0	0.1	0.0
Developing countries in Asia	7.2	9.6	8.4	8.4	0.0	0.0
China	9.2	10.3	9.6	9.5	0.0	0.0
India	6.8	10.4	8.2	7.8	0.0	0.0
Colombia	**1.5**	**4.3**	**5.5**[a]	**5.5**[a]		

a/ Banco de la República projection
Sources: International Monetary Fund (World Economic Outlook, June, 2011).

Graph 1
Gross Public Debt for the United States and
Some European Countries
(percentage of the GDP)

(percentage)

2008   2009   2010   2011[a]
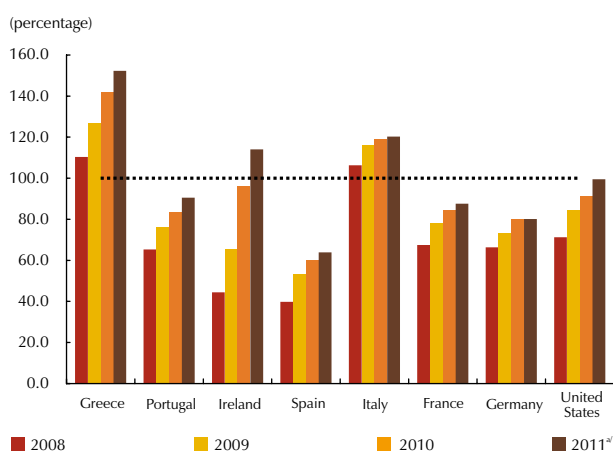
a/ IMF projection
Source: International Monetary Fund (IMF, World Economic Outlook Database, April, 2011).

trend during the period under analysis and the higher levels exhibited by countries such as Greece, Italy and Ireland can be seen.

Furthermore, in Europe the sovereign differentials[1] continued to widen for Greece and remained at relatively high levels for Portugal and Ireland (Graph 2). In July, this indicator began to widen for Spain and Italy which suggests a rise in risk perception in Europe and that the most affected economies will find it more difficult to roll over their debt.

This debt trend in advanced economies has become a significant source of financial instability which could affect not only market volatility but also the balance sheet of the financial intermediaries that have a high percentage of public debt in their investments. The exposure of the banking system to domestic public debt is shown in Table 2. The intermediaries in Italy, Ireland

1   With respect to the 10-year German bond.

Graph 2
Sovereign Debt Differential in Europe with Respect
to the German 10-year Bond

(percentage points)
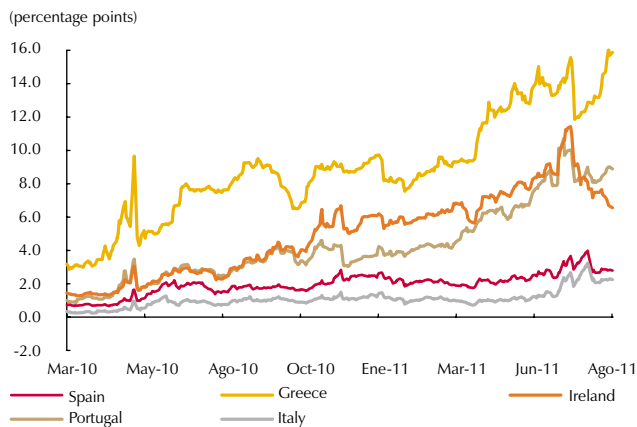
Source: Bloomberg.

and Greece showed the highest exposure to domestic debt which, in turn, showed the highest risk perception. For these three countries, the debt in the hands of the local banking intermediaries came to 32.1%, 28.2%, and 27.4% as a percentage of the GDP respectively. The bonds issued by these countries and held by foreign banking entities came to 15.2%, 8.7%, and 23.3% in that order.

Due to the above, the investors' risk perception of the European markets remains at historically high levels, a fact that is reflected in the higher premiums for the credit default swaps (CDS).[2] Countries in the euro zone such as Greece, Ireland, and Portugal showed surging increases in the premiums for 5-year CDS which reached levels that were above 1,000 basis points (bp). It is worth mentioning that this indicator was stable for countries like Germany and France while Spain and Italy have been showing an upward trend (Graph 3).

Table 2
Exposure of the Banking System to Government Debt

	Exposure of the banking system			Sovereign debt		Sovereign CDS
	Local intermediaries with government debt[a]		BIS: foreign intermediaries with government debt[b]	Rating/Outlook[c]		5-year (basis points)
	(as a percentage of the GDP for 2010)	(as a percentage of the entities' consolidated assets)				
France	19.0	4.7	8.8	10	Stable	85
Germany	25.4	7.6	10.4	10	Stable	48
Greece	27.4	12.2	23.3	(1)	Negative	1.037
Ireland	28.2	2.8	8.7	3	Negative	587
Italy	32.1	13.1	15.2	7	Stable	180
Portugal	15.7	4.8	17.2	5	Negative	498
Spain	22.3	6.8	7.1	8	Negative	253
United Kingdom	6.9	1.5	2.9	10	Stable	58
United States	7.7	5.3	3.7	10	Stable	43
Average	**20.5**	**6.5**	**10.8**	**7**		**310**

a/ This includes the public debt that belongs to those entities that work in financial brokerage.
b/ Foreign banks that report their position in government debt to the BIS.
c/ This is based on the long term average for the debt ratings in foreign currency set by Fitch, Moody's and Standard & Poor's. The outlook is defined by the worst rating of the three agencies. Higher values in the rating correspond to a lower risk.
Source: International Monetary Fund (Global Financial Stability Report, April 2011).

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2 A CDS is a financial contract between an entity and a bondholder. According to that contract, the bondholder pays the entity a premium measured in basis points in exchange for which the entity takes responsibility for the nominal value of the bond if the issuer does not meet their obligations. The valuation of a CDS is directly related to the level of risk aversion of the investors.

(basis points)   (basis points)

Source: Bloomberg.

Graph 4
Five-year Credit Default Swaps in some
Latin America Countries

(basis points)
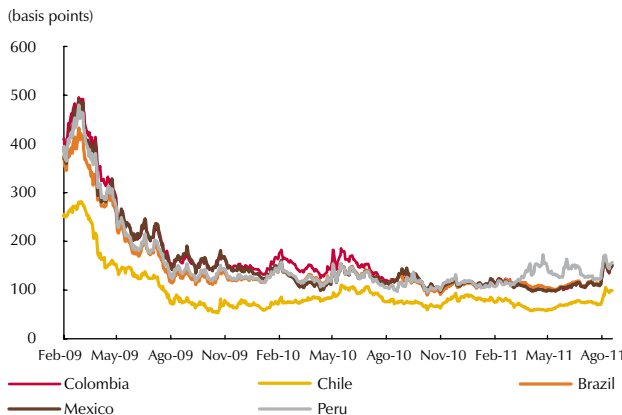
Source: Bloomberg.

Graph 5
Global Financial Stress Index

(percentage)
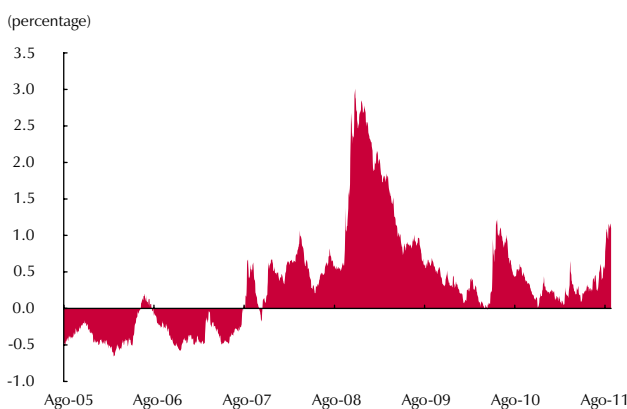
Sources: Bloomberg and Merrill Lynch (Global Financial Stress Index).

In contrast, the CDS premiums for Latin American countries have remained low and stable since mid-2010 as a result of the positive performance of their economic activity. However, it should be emphasized that during August, there was a slight upward trend in that indicator as a consequence of the uncertainty generated in the advanced economies (Graph 4).

The global indicator of financial stress,[3] which is calculated by Merrill Lynch, shows how financial conditions are deteriorating for the global economy. The levels registered as of July 2011 have not been seen since mid-2010 when doubts about the sustainability of the Greek debt emerged (Graph 5). Likewise, the VIX[4] has shown an upward trend as it reached a historical maximum in August of the current year with the highest value so far for 2011 (Graph 6). The latter is a clear reflection of investors' perception of risk with respect to the uncertainty in the stock markets.

To summarize, the debt crisis that the European region and the United States are currently going through has increased the risk perception and, therefore, the uncertainty and volatility in the financial markets. The fact also needs to be emphasized that even if the risk perception of the Latin American countries is still low, their capital markets have been affected by the higher risk aversion of the international investors.

Given the worldwide economic performance, it is necessary to analyze the trend that commodity prices have been experiencing over the last six months. In general, an upward trend has been seen for the prices throughout all of last year and, since mid-April of the present year, they have begun to decline (Graph 7). Nevertheless, it is necessary to mention that the

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3   The global financial stress index is calculated by adding a considerable number of stress measurements for different types of assets and different countries. The indicator measures three types of financial stress: volatility, capital adequacy and market risk as well as the demand for coverage and appetite for risk.

4   The VIX (composite volatility index) is an indicator of the implicit volatility in the options with respect to the S&P 500 index. An increase in the VIX implies greater uncertainty in the stock market, which is reflected in higher prices for the options. Therefore, this indicator can be interpreted as another measurement of risk aversion.

Risk Aversion Index (VIX)

(index)

Source: Bloomberg.

Graph 7
Commodity Price Index

(January 2006 = 100)

Source: Bloomberg.

Graph 8
Petroleum Prices (WTI) a/

(dollars)
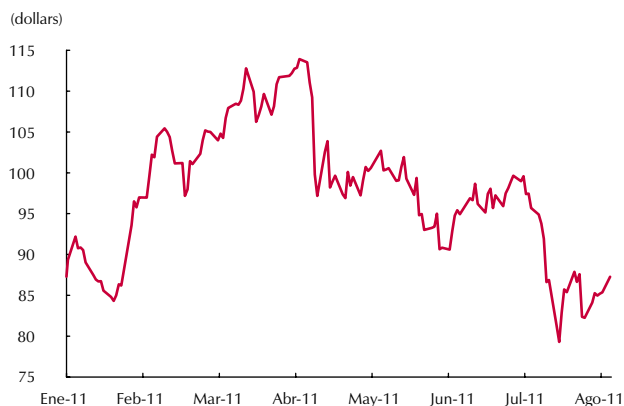
a/ These values correspond to the maximum price quote registered (April 29) and to the minimum (August 9) so far in 2011.
Source: Bloomberg.

prices for the main products exported by our country are staying at high levels (coffee, coal, petroleum, and nickel-iron). In addition, the strong heat-wave in the United States that has negatively affected wheat, soybean, and corn harvests could lead to an increase in the prices of grain.

With respect to the above it is important to highlight the decline that has been seen in the price for petroleum (WTI) in the last few months as it has gone from a cost of USD$114 per barrel in April 2011 to USD$79.3 in August (Graph 8). This decline was basically due to the fears of a possible double-dip recession in the United States and European economies, which would lead to a substantial reduction in the demand for this fuel. It is worth highlighting the fact that if the downward trend in the price of petroleum should continue, the small petroleum-producing economies such as Colombia could experience a substantial reduction in their income derived from that product.

B. GROWTH IN THE PRODUCTIVE SECTOR

In the first quarter of 2011, the Colombian economy showed an annual rate of growth that was higher than expected (5.1%). Domestic demand was what drove this performance mainly through the greater strength of investment and private consumption. Exports also showed a positive pace. However, imports showed an even higher rate as a result of which, exports exhibited a lower balance.

When the annual growth of the GP is analyzed by its expenditure components, one sees that investment measured as the gross formation of capital as of June 2011 registered an upsurge of 21.1% in comparison to the 9.5% seen in December 2010. Household consumption, in turn, maintained stable growth between December 2010 and June 2011 as it registered an annual variation of 5.5% (Graph 9).

Exports have likewise shown greater strength as they went from an annual growth rate of 2.7% in the second quarter of 2010 to one of 7.6% a year later. It is important to emphasize the fact that this was due not only to the

Graph 9
Growth of the GDP and its Expenditure Components
(constant prices)

(percentage)   (percentage)
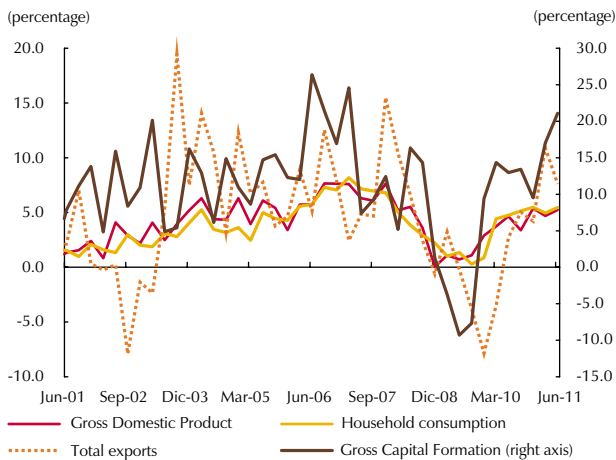
Source: DANE.

Graph 10
Export Index
(price and volume)

(Index 2005 = 100)
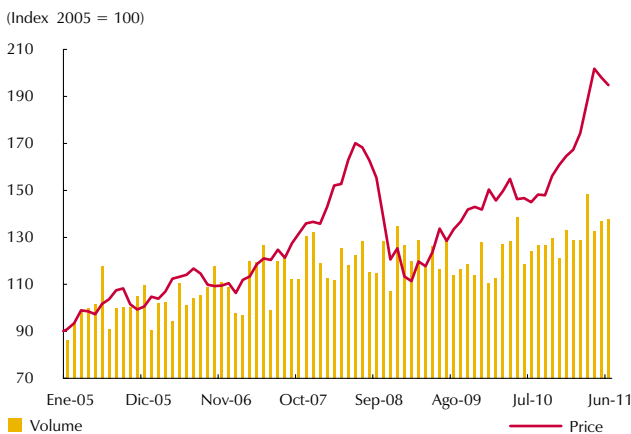
Source: Banco de la República.

Graph 11
Current Account/GDP

(percentage)
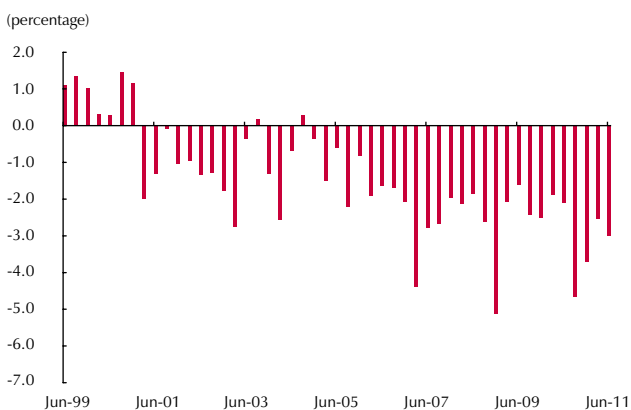
Source: DANE, Banco de la República calculations.

rise in the prices of exports but also to the increase in the quantity of products exported just as can be seen in Graph 10. Nevertheless, it is evident that the most influential factor has been the prices which, starting in September 2010, experienced a very strong recovery.

The deficit in the current account rose as a percentage of the GDP as it went from 2.1% to 3.0% during the second quarter of 2011 compared to the same period the year before (Graph 11). This is basically due to the fact that during the past year, imports grew at a faster pace than exports. This situation, just as has been mentioned in previous Financial Stability Reports, represents greater sensitivity of the economy to international shocks, particularly with respect to reductions in liquidity.

Foreign direct investment (FDI) experienced significant growth over the course of 2011 driven especially by the performance of the petroleum and mining sectors. In the second quarter, FDI reached USD$3.372 million (m) compared to USD$1.921 for the same period in 2010. This represents an increase of 75.6% (Graph 12). This performance is due the more intense exploratory and productive activity in the mining-energy sector.

With respect to the labor market, there was a reduction in the unemployment rates on the national level and for the urban areas. As of June 2011, these were at 11.2% and 11.5% respectively while they had reached a level of 11.6% and 12.1% respectively in December 2010 (Graph 13, panel A). However, just as in the previous Report, the type of work that showed the most growth was jobs in the underground economy[5] which surpassed formal employment (Graph 13, panel B). This is not an optimum situation when we consider the fact that the informal sector is characterized by shortcomings with regards to quality, stability and income.

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5   The National Bureau of Statistics (DANE in Spanish) defines informal employment those employers, private employees and workers who work for companies that have up to five people. It likewise includes workers in family businesses who are unpaid, maids and volunteer workers.

Graph 12
Direct Foreign Investment (DFI)

(millions of dollars)

Source: Banco de la República.

For the second quarter of 2011 a performance similar to what was seen in the first three months of the year is expected. The indicators of economic activity suggest that this growth path will continue and could even rise. Specifically, the results of the Combined Industrial Opinion Survey (EOIC in Spanish) done by the Colombian Association of Businessmen (ANDI in Spanish) shows a stable performance in the growth of production and total industrial sales (Graph 14). In addition to this, the issuance of construction licenses has been rising over the course of the year and, as a result, positive results are expected for building activity in 2011 (Graph 15).

Graph 13

A.   National and Urban Areas Unemployment Rate (UR) (seasonally adjusted series)

(percentage)
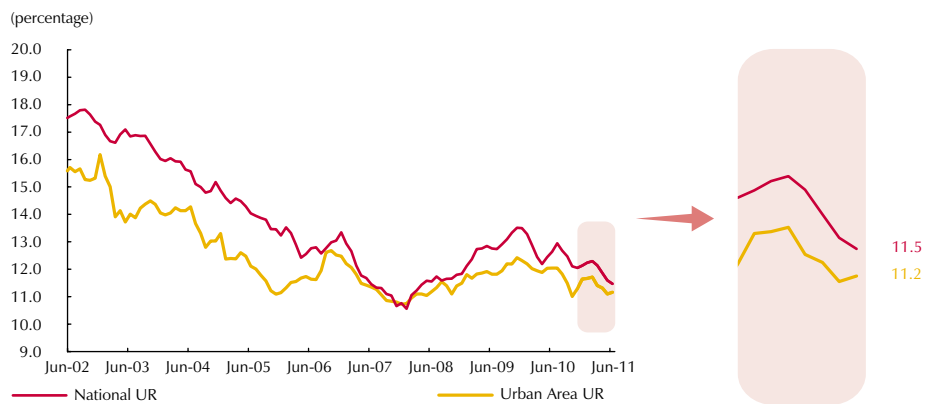
B.   Formal and Shadow Employment in the 13 Urban Areas
      (seasonally adjusted series)

(thousands of people)
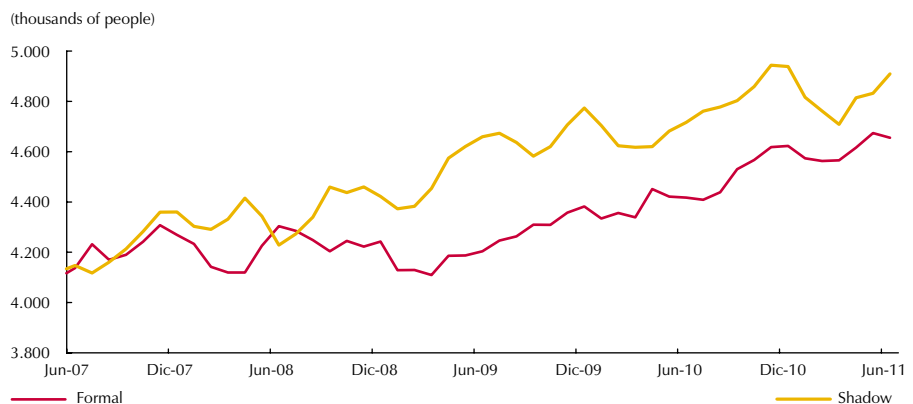
Source: DANE (GEIH), Banco de la República calculations.

In general, it can be seen that over the course of the year the Colombian economy has shown a positive momentum in terms of economic growth as it has registered a better than expected performance. Domestic demand, driven mainly by

Graph 14
Growth of Production and Total Sales in Industry

(percentage)
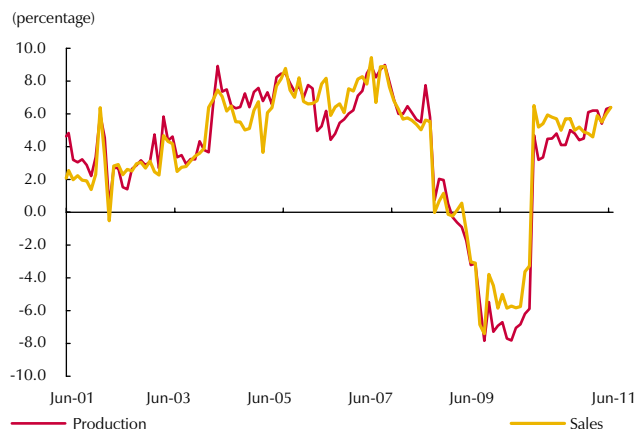
Source: ANDI (Combined Industrial Opinion Survey [EOIC in Spanish]).

Graph 15
Issuance of Construction Licenses

(thousands of square meters)   (percentage)
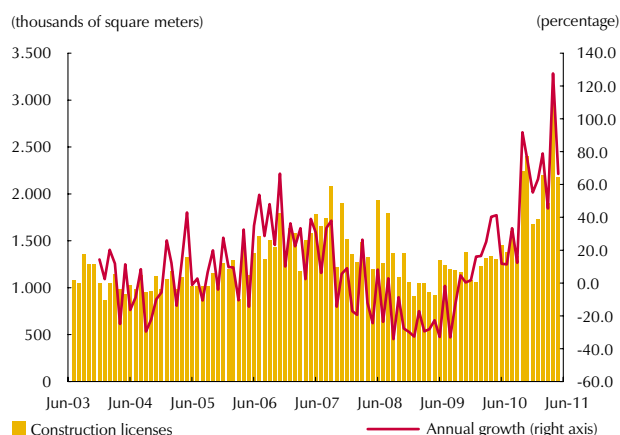
Source: DANE.

consumption and investment, is the reason for a large part of this performance. Some economic activity indicators are showing more strength so far this year which would lead one to think that during the second half of the year domestic demand will continue to boost/stimulate economic growth. Nevertheless, it is important to remember that this positive performance could be affected by the performance of economic activity in the advanced countries.

C.   OUTLOOK FOR THE FINANCIAL SYSTEM

The development of the Colombian financial system for the second half of 2011 will depend especially on the strength of worldwide economic growth, especially that of the United States and the countries in the euro zone. The performance of those economies will have an influence on the volatility of the capital markets, the risk aversion of international investors, the price of commodities, and capital flow towards emerging economies. Given these conditions, the strategies that the financial institutions implement for handling the risks that they face takes on greater relevance.

One factor that will be important for the development of the financial systems of the emerging economies will be the perception of risk that the global market will have with respect to their government debt. The indicator that is used globally to see the country risk of the emerging economies is the EMBI+.[6] Over the course of the last six-month period, this indicator showed a change that was quite stable. Nevertheless, in August it had an upward surge of 70 bp in only seven days when it went from 269 bp to 339 bp in response to the uncertainty generated by the rescue plan for the Greek economy (Graph 16).

It is important to emphasize that the EMBI+ for Colombia was below the indicator for Latin America and the global one. This is evidence of Colombia's soundness in comparison to other countries in the region and other emerging economies in regards to the perception that the global market has of this country's compliance with paying its sovereign debt.

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6   The emerging market bond index plus (EMBI+) is an indicator that measures country risk. It is calculated as the difference between the returns on government bonds issued by the emerging countries and the return on the US Treasury bonds (risk free). High EMBI+ values imply higher probabilities of default on sovereign debt payments.

**EMBI+ Spread for Colombia, Latin America
and Other Emerging Countries**

(basis points)

Source: Bloomberg.

Graph 17
Stock Market in Latin America

(January 2009 = 100)

Source: Bloomberg.

Furthermore, just as is shown in Graph 17, between March and August 2011, the Latin American stock markets have demonstrated a downward trend. This phenomenon was unleashed by the debt situation in the United States and Europe especially which has generated uncertainty in the markets. Likewise, the general Colombian Stock Market Index (IGBC in Spanish) showed a reduction and, on average, was at a level that was lower than what had been seen on the Latin American Index (MXLA).[7]

In general, the outlook for the financial system is uncertain given the situation concerning the advanced economies' public debt and their limited growth. Nevertheless, if the crisis does not become worse in those countries during the second half of the year, the external fundamentals such as the elevated flows of FDI, favorable terms of trade, and the economic performance of our main trading partners could drive the country's economic activity.

In the first half of 2011, the growth of the gross loan portfolio continued the growth trend it had been on since the beginning of 2010. In particular, among the different types of loans, the consumer loan portfolio shows the most strength. Moreover, the greater strength of the loan portfolio has not been associated with deterioration in the credit risk indicators.

The exposure to market risk, in turn, has risen in general for all of the types of financial entities due to the increase in the exposed balance and the duration of the portfolios. Nevertheless, low materialization of this risk has been seen because of the lower volatility in the prices of the loan portfolio during the first half of the year.

Credit risk maintained a downward trend during the first half of 2011 in spite of the greater strength the loan portfolio had in its different modalities. The loan portfolio quality index (QI) has shown an improvement for all of the different types with the exception of micro-credit which saw a slight increase with respect to the QI in its most recent harvest compared to the one six months ago. When the exposure to financing liquidity risk was analyzed, all of the lending entities were found

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7   The Morgan Stanley capital international emerging markets Latin American index measures the performance of the stock markets in Peru, Brazil, Mexico, Colombia, and Chile.

to show stable and positive levels on their indicators though they were lower than they had been six months earlier.

From this panorama, the outlook for the Colombian financial system will largely depend on the recovery of the international economies and on the strength of the Colombian economy's growth. Likewise, changes in unemployment and decisions in the fiscal area that the government may take on together with inflationary pressures and their impact on the interest rate could have consequences for the risks that the financial system faces.

In general, the results with regards to the performance of the loan portfolio and exposure to risk are favorable. In spite of that, constantly monitoring them is fundamental especially during periods of lending expansion. For example, in the current period, the indicators of financial burden for debtors have risen and make them more vulnerable to adverse macroeconomic shocks.

II.   FINANCIAL SYSTEM

Since the first half of 2011, the gross loan portfolio has continued the rising trend it had been on since the beginning of 2010. Specifically, the consumer loan portfolio shows the most strength. This growth has not been accompanied by significant rises in the risk indicators with the exception of the micro-credit portfolio, which has seen a substantial increase in its risky portfolio. The housing loan portfolio, in turn, has shown improvements in this area.
In addition, the investment share in the assets of financial entities continues to decline at the same time as their exposure to the private corporate sector and to households has increased.

A.   CREDIT ESTABLISHMENTS

1.   General Balance Sheet Positions

a.   *Asset Accounts*

Since mid-2010, credit establishment assets have grown more rapidly. This is largely due to a rise in the loan portfolio these institutions have. As of June 2011, the real annual upswing in their assets was 15.9% with a level of COP$296.1 trillion (t). That growth is slightly lower than what was registered in May 2011 (17.1%). However, it is still higher than what has been seen in the last few years (Graph 18).

Over the course of 2011, the real annual growth of the gross portfolio has shown an upward trend. This could be explained by the economic performance and the levels of the interest rates. The total gross loan portfolio was at COP$195.2 t as of June 2011 and grew at a real annual rate of 18.9%. This figure is slightly lower than what was registered in May of the same year (19.4%) but higher than what was seen in December 2010 (13.2%).

Going by type of credit, the consumer loan portfolio is the one that shows the highest rate of growth, and furthermore, is the only one that was maintaining its momentum as of June 2011. During that period, it registered a real annual change of 20.6% in comparison to 12.7% six months earlier. The commercial loan portfolio,

Graph 18
Credit Establishment Assets

(trillions of June 2011 pesos)
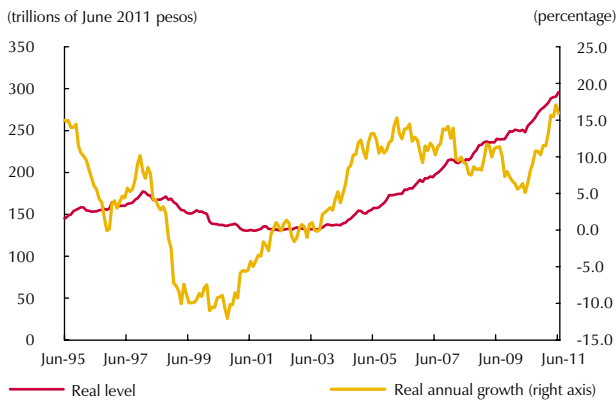
Source: Financial Superintendency of Colombia, Banco de la República calculations.

in turn, showed a real annual rate of 19.9% as of June 2011 compared to 17% for the previous six months. It is worth emphasizing the fact that the rates of growth for the commercial and housing loan portfolios tightened slightly between May and June 2011 although they are still positive (Graph 19).

With respect to the housing loan portfolio with securitization, this one remained at stable levels and showed a real annual rate of 13.5% in June 2011 compared to 12.7% six months before.

In addition, the annualized monthly loan disbursements for the purchase of housing grew at a positive, real annual rate in spite of the fact that this momentum had been declining since mid-2010. (Graph 20).

Graph 19
Real Annual Growth of the Credit Establishments' Gross Loan Portfolio
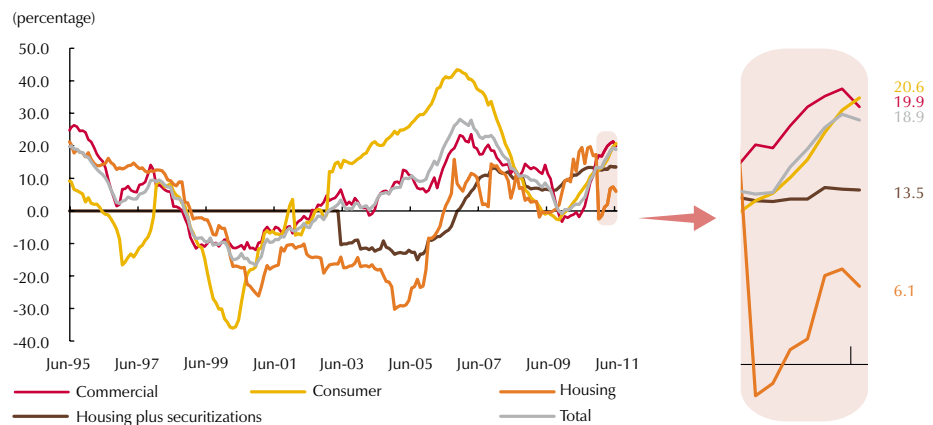
Source: Financial Superintendency of Colombia, Banco de la República calculations.

When the real growth of the loan portfolio is analyzed by type of intermediary, it can be seen that the banks' loan portfolios rose a real annual 24% as of June 2011. This rate is higher than what was registered six months earlier (19.4%). The CFC loan portfolio, in turn, continued declining and showed a real annual change of -22.8%. This was due to the migration of this type of company to the banking sector. Finally, the leasing institutions' loan portfolio has seen stable performance over the course of 2011 thus showing a real six-month growth of 4.6%.

By type of capital, national or foreign,[8] the real annual growth of these loan portfolios as of June 2011 was found to be similar and close to 19.5%. In spite of that, as of June the national banks' loan portfolio continued to hold the majority share

8   An entity is considered foreign when more than 50% of its capital comes from entities abroad.

Graph 20
Annualized Monthly Disbursements for Purchase of Housing

(trillions of June 2011 pesos)   (percentage)
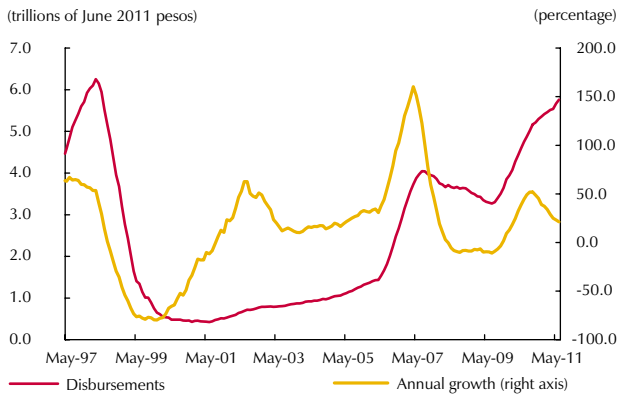
Source: Asobancaria, Banco de la República calculations.

Graph 21
Real Annual Growth of the Loan Portfolio by Type of Capital

(percentage)
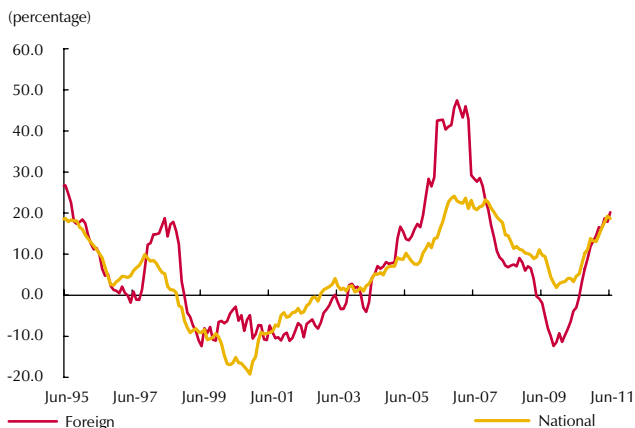
Source: Financial Superintendency of Colombia, Banco de la República calculations.

of the total gross loan portfolio with COP$160.1 t in comparison to COP$35.1 t held by the banks with foreign capital (Graph 21).

If the changes in the real annual growth of the national and foreign loan portfolios are considered by type of loan, one seen that the commercial and consumer loan portfolios show the highest real annual rates for the national institutions as of June 2011 with 20.7% and 20.2% respectively. Meanwhile, the housing loan portfolio held by the national institutions showed an increase of 2.2% as of June the same year. This last figure is lower than the growth registered a year earlier which is due to the securitization process that took place in December 2010 (Graph 22, panel A).

The consumer, housing and commercial loan portfolios held by foreign entities, in turn, showed real annual growth 21.8%, 16.3%, and 15.3% in that order as of June 2011 compared to the previous six months (9.9%, 16.7%, and 15.3% respectively). The rise in the performance of the consumer loan portfolio stands out. It doubled in six months in contrast to the stability of the other two loan portfolios in the same period (Graph 22, panel B).[9]

In the first half of 2011, the investments of the loan institutions came to COP$62.1 t thus showing a real annual 10.7% rate of growth while six months before its trend was 15.2%. This decline in the trend could be because of the upswings in the benchmark interest rate and rise in uncertainty in the international markets (Graph 23).

The greater growth of the gross loan portfolio (18.9%) in comparison to investments (10.7%) translates into an increase in the share of the former in the total assets of the credit institutions. While in December 2010, the investments represented 22.3% of the assets, six months later the share in investments dropped to 21%. As could be expected, the importance of the loan portfolio within the assets of the credit establishments climbed during that period as it went from 65.4% in December 2010 to 65.9% in June 2011 (Graph 24).

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9   Between April and May 2006, there was a jump in the growth rate of the housing loan portfolio held by institutions with foreign capital. This was due to the purchase of Granahorrar by BBVA.

Graph 22
Real Annual Growth of the Loan Portfolio by Type of Loan and Capital

A.   National Establishments

(percentage)

Commercial   Consumer   Mortgage
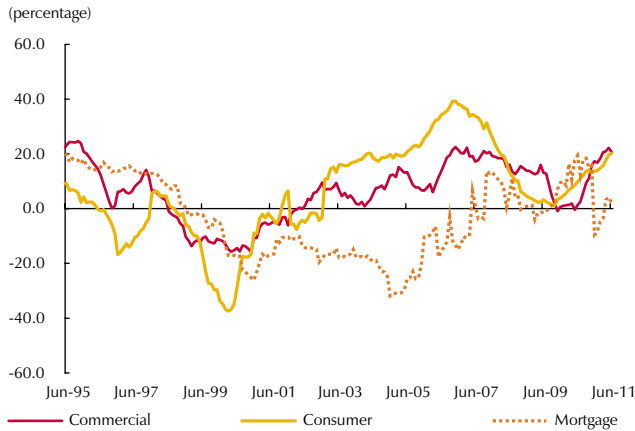
B.   Foreign Establishments
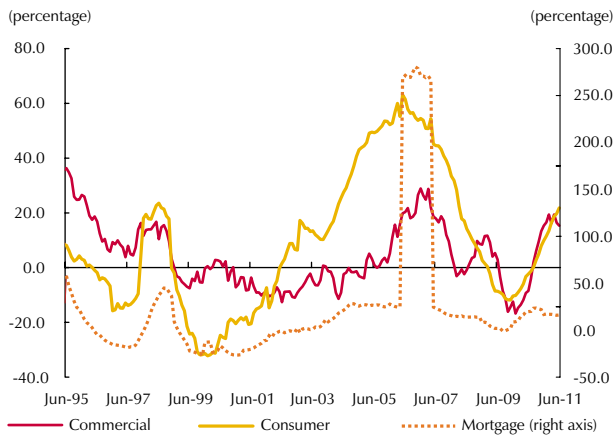
(percentage)   (percentage)

Commercial   Consumer   Mortgage (right axis)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 23
Credit Establishment Investments

(trillions of June 2011 pesos)   (percentage)

Investments   Real annual growth (right axis)
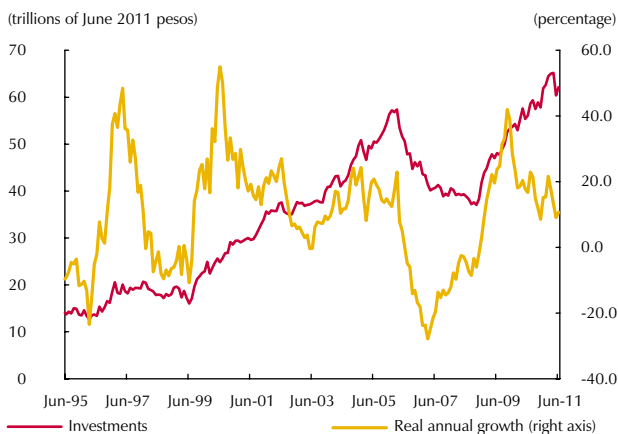
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Even if the growth of the gross loan portfolio occurred in a scenario of economic expansion, the performance of lending was better than the performance of the GDP. This translates into increases in financial deepening.[10] Between June 2010 and a year later, the index of financial deepening rose 3.8 percentage points (pp) as it went from 30.1% in June 2010 to 33.9% in June of this year. This is one of the largest surges in this indicator in the last fifteen years (Graph 25).

Said increase in the deepening is explained to a large degree by an upswing in the commercial loan portfolio with respect to the GDP. For this loan portfolio,

Graph 24
Investment and Gross Loan Portfolio as a Percentage Share of the Total Assets of Credit Institutions

(percentage)   (percentage)

Loan portfolio/assets   Investment/assets (right axis)
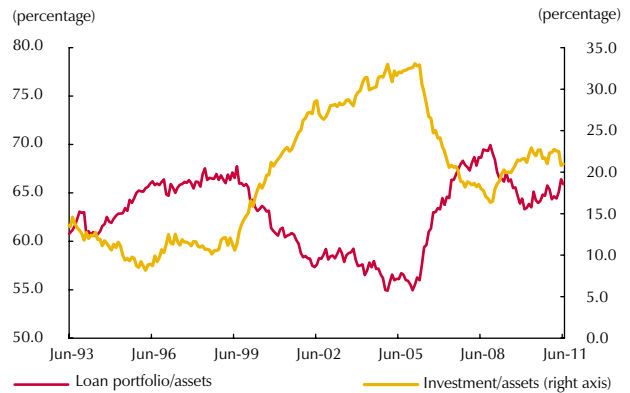
Source: Financial Superintendency, Banco de la República calculations.

Graph 25
Financial Depth (Loan Portfolio/GDP)

(percentage)

Commercial   Consumer   Mortgage   Total
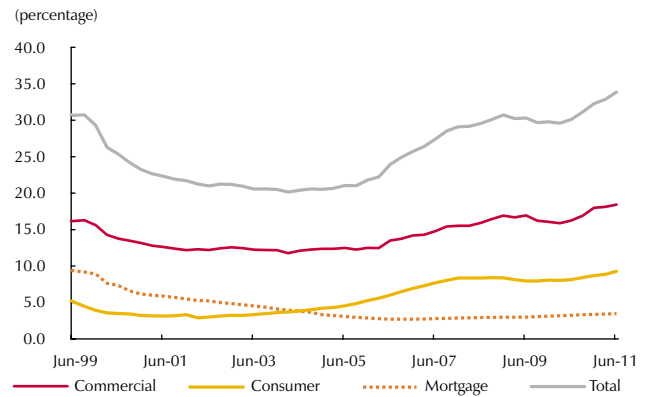
Sources: Financial Superintendency of Colombia and DIAN, Banco de la República calculations.

10   Financial deepening is a measurement of the credit institutions' share in economic activity and it is calculated as the ratio between the gross loan portfolio and the GDP.

that indicator registered a level of 18.4% in June 2011 when it had been 16.2% a year before that. The indicator for the consumer and housing loan portfolios also climbed and reached levels of 9.3%, and 3.5% respectively as of June 2011.

b.   *Liability Accounts*

As of June 2011, the liabilities of the credit institutions came to COP$254 t, which reflected a real annual growth of 15.6%. Six months earlier this was 11.5%.

This liability is mainly made up of deposits and liabilities payable on demand,[11] which represent 71.6% followed by bank loans,[12] which contribute 10.6%, and finally, bonds with 7.7%. Among these components, bonds are the item that registered the most real annual growth as of June 2011 with 52.9%. Bank loans, in turn, also saw a significant surge (41.6%). Last of all, the CDs with maturities of more than one year and shorter term deposits rose at rates of 22% and 9.4% respectively. The above figures show a slight tendency to replace shorter term liabilities with longer term ones. Given the above, over the course of last year, the deposits with shorter maturities lost 3% of their share in the liabilities while the share held in CDs with maturities of more than one year and bonds rose by more than 2% (Graph 26).

In June 2011, deposit-taking[13] by credit establishments came to COP$176.2 t thus registering a real annual growth of 10.9%. This number is higher than what was obtained the previous six months (5.7%) (Graph 27).

When the changes in deposit-taking are considered by type of deposit, the real annual growth rate of savings accounts is found to be 20% as of June 2011. This number is higher than the one at the close of 2010 (16.6%). Thus, the amount in savings accounts came to COP$87.6 t as of June 2011. It should be noted that between May and June 2011, the rate of growth for this type of deposit fell 1.68 pp (Graph 28).

Graph 26
Credit Institutions: Liability Components

(percentage)

Legend:
- Deposits and Liabilities
- CD for more than 1 year
- Bank loans
- Bonds
- Other

Source: Financial Superintendency of Colombia, Banco de la República calculations.

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11   The item, "deposits and liabilities" is made up of the amounts in checking accounts, savings accounts, CDs, and other liabilities. If the deposit-taking is divided by maturity with those that have shorter maturities (including savings and checking accounts, and less than 1-year CDs) in one group and, in another group, those CDs with maturities of more than one year, one sees that, as of June 2011, the share of the first group within the liabilities is 60.9% and the share of the second is 10.6%.

12   This loan refers to one that is granted by foreign entities and second-tier banking to credit institutions.

13   The deposits are the sum of the balances in checking and savings accounts, CDs, and short term CDs.

Graph 27
Deposits with Credit Institutions

(trillions of June 2011 pesos)   (percentage)
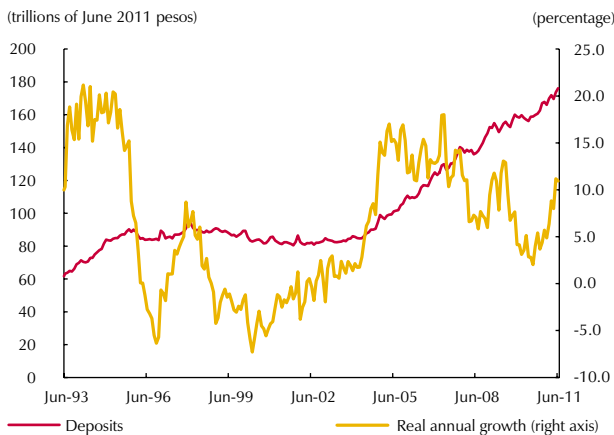
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Deposits in checking accounts, in turn, came to COP$31.5 t as of June 2011 and grew at a real annual rate of 15.3%, a figure that is lower than what had been registered six months ago (15.6%). Last of all, the CDs are still presenting negative, real annual variations in spite of the fact that the amount in this type of deposit has risen over the course of the year. As of June 2011, deposits in CDs came to COP$56.8 t, which corresponds to a real annual change of -1.1%. This change is due to a real 15.6% decline in CDs with maturities that are less than one year. In spite of that, CD deposits as of June 2011 are the highest for the year.

When the performance of the deposits is analyzed by group of intermediary, it can be seen that their growth is due to the upswing in deposit-taking by banks. As of June 2011, the deposits at these entities had risen at a real annual rate of 13.9% and the total amount was COP$164.8 t. The real annual change in deposit-taking by CFC remained negative (-19.6%) and this is because of the migration of this type

Graph 28
Real Annual Growth of Deposits at Credit Institutions by Type of Deposit

(percentage)
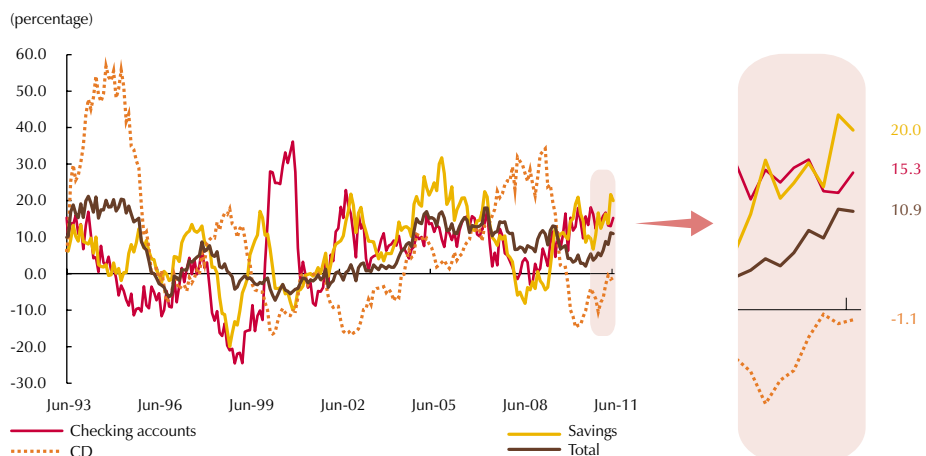
Source: Financial Superintendency of Colombia, Banco de la República calculations.

of institution to the banking sector (as was mentioned above). Finally, the monthly deposits for leasing companies have remained stable at around COP$5 t over the course of the year and have shown a real, six-month growth of 4.9%.

2. Exposure of Credit Institutions to Their Main Debtors

The exposure of the credit establishments to the different debtor agents was COP$219.9 t in June 2011 with a real annual growth of 14.4% in comparison to what was seen a year ago. The exposed amount represents 74.3% of the financial

sector assets, a figure that is slightly lower than what has been seen in the last two years (Table 3).

When the components of the exposed amount are evaluated, an upswing in the share held by the private corporate sector can be seen. This is due to the performance of that sector's loan portfolio, which registered a real annual growth rate of 19.9% between June 2010 and one year later. The exposure of the financial system also rose with respect to households which, in June 2011, had accounted for a 33.1% share of the abovementioned amount compared to 31.9% registered in June 2010. Finally, the public sector's share in the exposed amount has declined. This decline is a reduction of 3pp with respect to what was seen in June 2010.

Table 3
Exposure of Credit Institutions to their Major Debtors

Type	June-10		June-11		Percentage real annual growth
	Trillions of June-11 pesos	Percentage share	Trillions of June-11 pesos	Percentage share	
Public sector					
Loan portfolio	9.2	4.8	11.5	5.2	24.4
Securities	37.2	19.3	35.0	15.9	(5.8)
Total	**46.4**	**24.1**	**46.5**	**21.1**	**0.2**
Private corporate sector					
Loan portfolio	83.4	43.4	100.0	45.5	19.9
Securities	1.2	0.6	0.7	0.3	(42.7)
Total	**84.6**	**44.0**	**100.7**	**45.8**	**19.0**
Household sector					
Loan portfolio	57.1	29.7	67.1	30.5	17.4
Consumer	44.4	23.1	53.5	24.3	20.6
Mortgage	12.8	6.7	13.6	6.2	6.1
Securitizations	4.1	2.1	5.6	2.6	36.8
Total	**61.3**	**31.9**	**72.7**	**33.1**	**18.7**
Total amount exposed	**192.3**	**100.0**	**219.9**	**100.0**	**14.4**
Amount exposed as a share of assets (percentage)	75.3		74.3		

Sources: Financial Superintendency of Colombia and Banco de la República, Banco de la República calculations.

In the case of households, the upswing reported with respect to the household share of the amount exposed is due, in particular, to the growth of the consumer loan portfolio, which surged at a real annual rate of 20.6%, as well as to the securitizations, which were at COP$5.6 t in June 2011.

Although the public sector loan portfolio showed a significant rise in the period under consideration when it grew a real annual rate of 24.4%, the reduction in public securities offset this upswing and generated a decline in the public sector share of the exposed amount.

3.   Loan Portfolio Quality and Loan-loss Provisioning

The loan portfolio quality indicator (QI) –measured as the ratio between the risky loan portfolio[14] and gross portfolio– showed a reduction in the first half of the year as it went from 7.7% in December 2010 to 7.3% in June 2011 (Graph 29). This change was primarily due to a decline in the QI of the housing loan portfolio, which was at a level of 6.3% in June 2011 compared to 8.5% seen in December 2010. The commercial and consumer loan portfolios, in turn, have shown drops of 28 bp and 33 bp in the QI and reached levels of 7.1% and 7.5% respectively in June 2011. The micro-credit modality, in turn, showed an almost 21 bp deterioration in its indicator thus going to a level of 7.4% that month. The decline in the QI for the total loan portfolio seen over the course of 2011 is lower than what was registered in the second half of 2010. One exception is the case of said indicator in the modality of the housing loans since it is showing a declining trend like what was seen in 2010.

Graph 29
Loan Portfolio Quality Indicator by Type of Credit
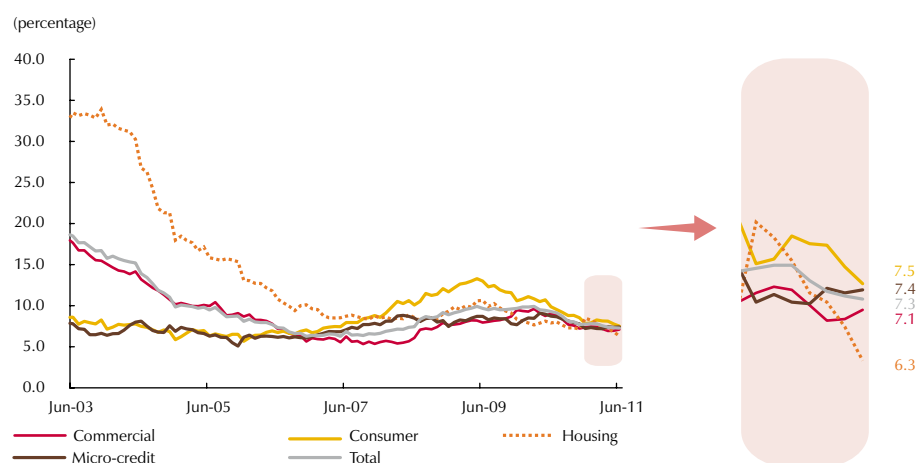
(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

The risky loan portfolio showed a -6.9% real annual rate of variation and was at a level of COP$14.2 t in June 2011 in comparison to a value of COP$15.2 t a year earlier. The results for each type of loan indicate that the performance shown by each loan portfolio over the last year has not been accompanied by an increase in credit risk. The risky loan portfolio in mortgage lending has shown the largest drop as it registered a real change of -12.7% in the first half of 2011. The risky loan portfolio for commercial and consumer loans showed positive changes in the same period as it registered growth rates of 1.1% and 4.8% in each case. Finally, in the case of micro-credit, the risky loan portfolio showed a surge of 23.4% compared to a rate of -10.2% seen between June and December 2010. This has translated

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14   The risky loan portfolio is defined as the set of loans with ratings other than A.

Graph 30
Real Annual Growth of the Risky Loan Portfolio

(percentage)
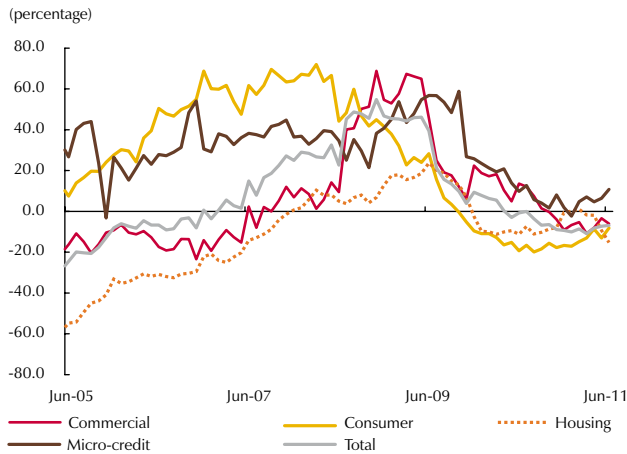
Source: Financial Superintendency of Colombia, Banco de la República calculations.

into a deterioration of the QI for this type of lending in the first half of the current year (Graph 30).

When the trend of the quality indicator of the loan portfolio is considered by type of intermediary for the last few months, it can be seen that the CFC continue to show a higher QI level with respect to the rest of the groups of entities and were at a level of 14.3% in June 2011. At the same time, one sees that these institutions, together with financial cooperatives, have shown a deterioration in their QI with respect to what was reported in December of last year. In June 2011, cooperatives registered an indicator of 8.3% compared to a QI of 7.4% in December 2011 while the CFC showed an upswing of 130 pp in comparison to the QI for December of last year as they went from 12.9% to 14.2% in June 2011. The banks and leasing companies, in turn, showed improvements in their loan portfolio quality indicators with rises of 46 pp and 43 pp respectively. In June 2011, the QI reported for banks was 7.1% while that for leasing companies reached 7.4%.

The default indicator (DI), in turn, measured as the ratio between the non-performing loan portfolio[15] and total gross portfolio shows a slight reduction in comparison to what was seen in December 2010. As of June 2011, it was at a level of 3.1%, a figure that corresponds to the lower value registered in the last fifteen years.

An analysis of the recent change in the indicator by type of lending indicates that in micro-credit there has been a slight deterioration, close to 33 bp, while the commercial and housing loan portfolios continue to show a declining trend (Graph 31). The type of lending that showed a greater reduction in the default indicator in the first half of 2011 was housing loans. The record for it dipped 1 pp and was at 8.3% in June of this year compared to what had been seen in December. It should be noted, however, that said loan portfolio continues to show the highest levels of default.

When the recent performance of the default indicator is analyzed by the type of capital the financial institutions have, it can be seen that the values registered for the foreign and national entities are converging, especially over the last year. The DI for both groups of entities continues to show a dropping trend and was close to 3% in June 2011 (Graph 32).

The indicator of loan portfolio coverage, as measured by the loan-loss provisioning expressed as a ratio of the risky loan portfolio, showed a rise for the total loan portfolio

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15   The non-performing portfolio is one that is made up of loans that are overdue by 30 days or more.

(percentage)
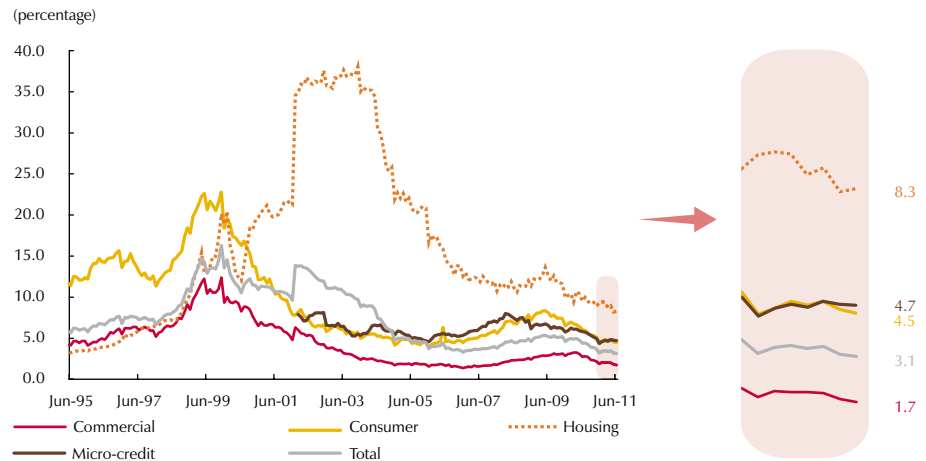
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 32
Default Indicator by Type of Capital

(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

as it went from 63.3% to 64.7% in the first half of 2011. This trend is due to a growth in the loan-loss provisioning that is above what has been seen in the risky loan portfolio for consumer, commercial, and micro-loans. In the case of the housing loan portfolio, the rise in its coverage indicator is primarily because of a reduction in the risky loan portfolio, which showed a drop of 12.7% in the first half of 2011 (Graph 33). The coverage indicator for the consumer loan portfolio reached a level of 80.5% in June 2011 while for the commercial, micro-credit, and housing loan portfolios this proportion was at 56.8%, 65.1%, and 42.6% respectively.

The loan-loss provisioning expressed as a ratio of the non-performing loan portfolio for commercial and consumer loans has shown a growth trend since May 2010 and represented 2.4 and 1.3 times the non-performing loan portfolio respectively in June 2011 (Graph 34). At the same time, the loan-loss provisioning for the micro-credit portfolio also showed a significant increase during the same period and reached a value that was similar to that of its non-performing loan portfolio in June 2011 (102%).

4.   Earnings, profitability, and Capital Soundness

Financial institutions' profits registered a real growth of 5.2% in the first half of 2011 and were at COP$6.4 t in June of this year. This change is explained by an increase in earnings from interest, which rose 2.4% in real terms between Decem-
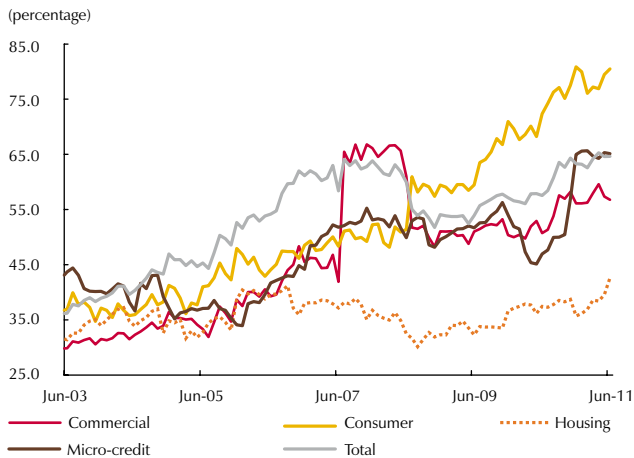
(percentage)

(percentage)
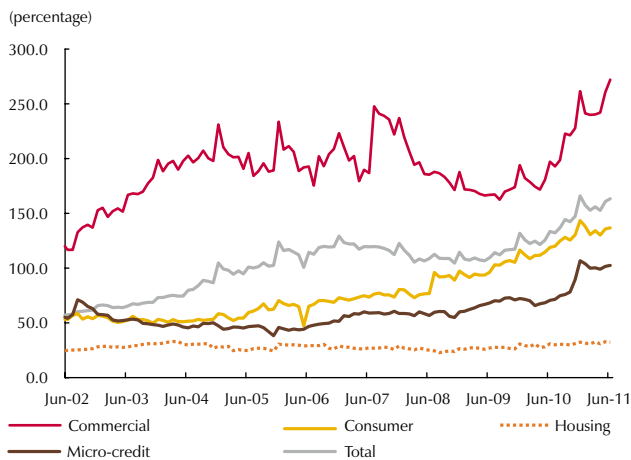
ber 2010 and June 2011, as well as by a 7.6 pp reduction in expenditures due to loan-loss provisioning.

The trend seen in profits has not been the same among groups of financial intermediaries. Profits for banks and leasing companies have shown a growth of 8 pp and 12 pp which put them at COP$5.2 t and COP$259 billion (b) respectively. Meanwhile, the CFC and financial cooperatives saw a reduction that was close to 10 pp in their profits, which could be due to a negative variation of 18 pp and 21 pp each in their earnings from interest. In June 2011, these institutions registered profits of COP$141 b and COP$59 b.

The financial income of the entities reached a value of COP$29.2 t in June 2011 thus presenting a real growth of 1.9% compared to what was seen in December 2010. That value is, nonetheless, COP$1.4 t lower than what was seen in the month of June 2010. The performance of financial earnings in the first half of 2011 is, in particular, a result of a rise in earnings from interest and commissions. These have shown a real growth rate that is close to 2.4% during the period under consideration. It should be noted that the increase in earnings from commissions is less than was seen in December 2010 when it was COP$3.6 t. Finally, the income from appreciation of investments has remained stable since December 2010 at a level of COP$3.3 t.

The item that has contributed the most to the upswing in the institutions' financial income is the earnings from interest, which was 61.8% of their income in June 2011. This share was 36 bp more with respect to what was seen in December 2010. The earnings from commissions also continue to contribute 12.7% to the total financial income as they did in December 2010. Finally, the income from appreciation of investments corresponds to 10.9% of the financial earnings registered in June 2011. This is a dip of 1.6 pp in comparison to what was reported in December of last year (Graph 35).

One measurement of financial entities profitability is the ROA, which corresponds to the profits for the accounting period as a proportion of the average assets for each entity. The results seen in the first half of 2011 point to a slight decline in the indicator, which went from 2.4% in December 2010 to 2.3% in June 2011 (Graph 36).

Graph 35
Components of Financial Income
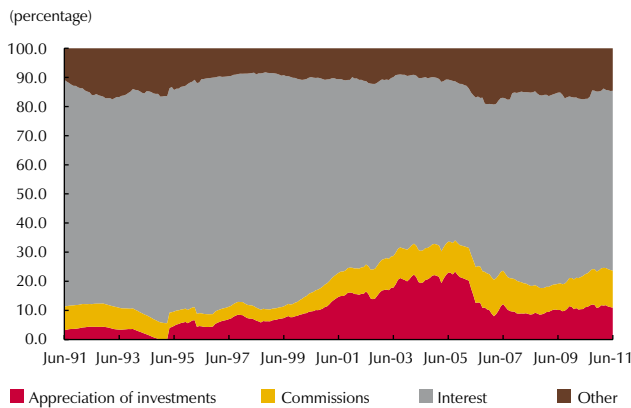
(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 36
Return on Assets (ROA)
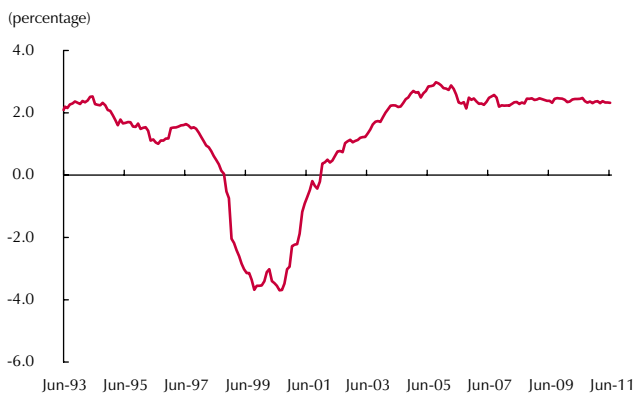
(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 37
Capital Adequacy Ratio of Credit Institutions

(percentage)
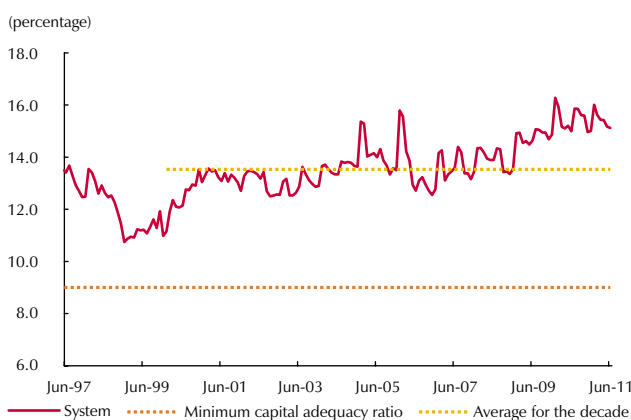
Source: Financial Superintendency of Colombia, Banco de la República calculations.

This trend indicates that the growth in the profits has been accompanied by a higher increase in the entities' assets. This variation in the assets corresponds to the performance of the loan portfolio which hit a real annual 18.9% rate in June 2011.

The ratio of capital adequacy the financial institutions have still exceeds the average for the decade (13.5%) and the regulatory minimum (9%). In June 2011, this indicator was at a level of 15.1% which is similar to what was observed in December 2010 (Graph 37).

In order to do an analysis of the capital adequacy of the institutions with subsidiaries, it is necessary to build a consolidated indicator. The purpose for this is to keep in mind the differences between the levels of leveraging for both the parent company and the subsidiary companies.[16] Based on the information reported in December 2010, the consolidated capital adequacy ratio for this set of institutions, which was built as a weighted average through each entity's share of equity, remained stable and was at 13.4%. This value is 70 bp lower than the weighted sum of the individual capital adequacy ratios, which suggests that these establishments present better financial soundness when they are considered separately than when their balances are consolidated with their respective subsidiaries.

5.   Intermediation Spreads

In the first half of 2011, the Board of Directors of the Banco de la República (JDBR in Spanish) decided to progressively change the posture of the monetary policy towards less expansionary terrain through gradual increases in the benchmark rate. This corresponded to a change of 1.5 pp with respect to the value seen in December 2010 (3%).

16   According to the regulations set by the Financial Superintendency of Colombia, credit institutions with subsidiaries and which own more than 50% of those subsidiaries are required to present the consolidated capital adequacy ratio for the group. Furthermore, if the credit establishment has less than a 50% interest, it must deduct the subsidiary's technical capital from its own.

The effects of this change in the monetary policy have been evident in the lending and deposit rate of the financial system, both of which have risen significantly in the first half of 2011. It should be pointed out that the former has registered more growth than the latter. This has generated a positive change of 18 bp in the ex ante spread of the financial institutions which reached a level of 7.2% in June 2011 (Graph 38).

An analysis by type of credit revealed that the increase in the ex ante spread for the total loan portfolio was due to an upswing in the indicator for the consumer, commercial, and micro-credit portfolios. The housing loan portfolio, in turn, shows a negative change of 1.1 pp which corresponds to a decrease in the lending rate for this type of loan along with a simultaneous growth in the deposit rate. Based on the information available as of June 2011, the ex ante spread for the housing loan portfolio was 8.2% compared to the 9.3% seen in December 2010. Meanwhile, the same spread in the rest of the types of credit showed positive variations, especially in the micro-credit portfolio, which saw an uptick of 2.7 pp in the first half of 2011.

In addition, the ex post intermediation spread continued to present a declining trend in the first half of 2011 and was at 6.9% in June of this year. This corresponds to a reduction of 21 bp in comparison to what was seen in December 2010 and 86 bp compared to the value registered in the same month the year before (Graph 39).

This reduction is the result of a larger negative change in the implicit lending rate with respect to the deposit rate. The former showed a 50 bp drop in comparison to what was observed in December 2010 and registered a level of 10.3% in June of the current year. The implicit deposit rate, in turn, declined 32 bp in the first half of 2011 and was at 3.4% in the month of June. The performance of the lending rate was because of an upswing in the performing portfolio, which rose 7.7% in the first half of 2011 while the reduction in the deposit rate is associated with the growth of the liabilities with cost, which showed a change of 9.7%.

To summarize, in the first half of 2011, the gross loan portfolio has maintained its growth trend driven by the strength of consumer and commercial loans. This rise has not generated deterioration in the portfolio quality and default indicators, which continue to show negative rates although these are lower than the ones in the second half of 2011. One exception is the case of micro-credit, where these indicators have climbed.

Graph 38
Ex Ante Intermediary Spread Calculated with the CD Interest Rate

(percentage) | (percentage)

Commercial
Housing
System total
Consumer (right axis)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 39
Ex Post Intermediary Spread

(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Investments as a share of lending institution assets has declined over the course of the year. This could be the consequence of the uncertainty in international markets as well as the rise in interest rates.

When the change in credit establishments' liability accounts in the first six months is considered, one sees that there has been an increase in deposits driven primarily by deposits in savings accounts. This shows a rate of growth that is higher than what was seen in previous six month periods. Meanwhile, the CD deposits have continued a declining trend over the course of 2011.

With respect to the aspects of profitability and soundness of financial entities, it can be seen that the upswing in profits seen in the first half of the year has been accompanied by a similar growth in assets. This would indicate that the profitability of the entities has remained relatively constant. Finally, the change in the indicators of individual and consolidated capital adequacy for the case of financial conglomerates during the six-month period indicates that there is no deterioration in the soundness of the financial institutions for the period under consideration.

B.   NON-BANKING FINANCIAL INSTITUTIONS

The analysis of the non-banking financial institutions (NBFI) is vitally important to the objective of this Report since they are entities that can have an influence on financial stability. On the one hand, they are economic agents who, through their management of portfolios, become savings and investment vehicles for households and the public in general. On the other, they are closely linked to the rest of the financial agents whether as a counterpart in their market transaction or because they are part of a financial group. Consequently, they are entities that can serve as systemic agents in certain contingencies. The NBFI which are analyzed in this section are pension and severance fund managers (PMF),[17] life and general insurance companies (LIC and GIC), trust companies (TC), brokerage firms (BF) and investment management companies (IMC).

In order to study the share of the NBFI portfolio within the financial system, the value of the investments for each type of entity in this sector is presented in Table 4. As can be seen, in the first part of 2011, the investment portfolio of the financial institutions rose 6.2% coming to COP$511.1 t as of June. This amount is equivalent to 88.7% of the GDP. This performance is mainly due to the growth of the credit institutions' portfolio, which was COP$20.2 t (which amounts to a six-month variation of 8.5%) followed by a COP$9.6 t upswing in the NBFI portfolio (corresponding to a six-month build-up of 3.9%).

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17   In March of this year, the multi-fund system began to go into effect for the mandatory pension system (Decree 2373/July 2010). For more detail about the changes mentioned, consult the box titled, "Reform of Supported Individual Savings Pension System," published in the Financial Stability Report of September 2010.

The build-up registered by NBFI investments was the result of growth in the portfolio of mandatory pension funds and of the trust funds managed by the TC. These resources showed a COP$3 t and COP$5.6 t rise respectively in the first half of 2011. The insurance companies, in turn, registered an increase in the value of their investment portfolio. Although this increase was by a lesser amount, these entities still raised the value of their portfolio COP$1.4 t during the same period. The reduction in the portfolio managed by the BF and IMC should also be emphasized. This reduction was COP$1.3 t, which is equivalent to a six-month variation of -25.1% (Table 4).

Table 4
Financial Institutions Investment Portfolio

	2008		2009		2010		2011	
	Trillions of pesos	Percentage of the GDP	Trillions of pesos	Percentage of the GDP	Trillions of pesos	Percentage of the GDP	Trillions of pesos	Percentage of the GDP (proj)
Credit Institutions								
Investment	38.8	8.1	50.8	10.1	60.3	11.2	62.1	10.8
Loan Portfolio	147.8	31.0	151.3	30.0	176.8	32.9	195.2	33.9
Total credit institutions	**186.5**	**39.1**	**202.1**	**40.0**	**237.1**	**44.1**	**257.3**	**44.6**
Non-banking Financial Institutions								
Mandatory Pensions	58.4	12.2	79.9	15.8	98.9	18.4	101.9	17.7
Voluntary Pensions	7.5	1.6	9.5	1.9	11.3	2.1	11.2	1.9
Severance Pay	4.0	0.8	4.9	1.0	5.7	1.1	6.7	1.2
General Insurance	4.0	0.8	4.6	0.9	5.3	1.0	5.3	0.9
Life Insurance	11.9	2.5	14.3	2.8	16.6	3.1	17.9	3.1
Trust companies	74.7	15.7	88.1	17.5	101.4	18.9	107.0	18.6
Brokerage Firms and Investment Management Companies	2.6	0.5	3.4	0.7	5.1	0.9	3.8	0.7
Total Non-banking Financial Institutions	**163.1**	**34.2**	**204.8**	**40.6**	**244.2**	**45.4**	**253.8**	**44.0**
Total	**349.6**	**73.3**	**406.9**	**80.6**	**481.4**	**89.5**	**511.1**	**88.7**

(proj) projected to June 2011.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

The high concentration of the resources managed by the NBFI (especially the PMF and TC) in national and public debt securities makes them more sensitive to changes in the conditions of domestic markets.[18] Therefore, a condition such as the devaluation of stocks that was seen in the first part of 2011 together

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18 This does not mean that outside dynamics do not affect the NBFI investment decisions. It only indicates the fact that the channel through which the investment decisions are affected is not direct. Rather, given the portfolio make-up these institutions have, it is through the impact that the economy's internal conditions have.

with the performance of the TES[19] has led to a lower momentum in the evolution of the portfolios.

1.   Pension and Severance Fund Managers (PMF)

In the first half of 2011, the value of the funds managed by the PMF registered a positive performance but one that was below what had been seen in the second half of 2010. This is primarily due to the lower appreciations in the investments. Unlike what was witnessed in the second half of last year, this period was characterized by a shift in the portfolio from productive sector securities to public debt where the latter continue to have the highest share.

The jump in the value of the portfolio of funds managed by the PMF was COP$3.7 t in the first half of 2011 which placed it at COP$119.8 t in June of this year (Graph 40). Nevertheless, the real annual growth of the portfolio saw a drop as it went from rates of 19.1% in December 2010 to 13.7% in June of this year. During the same period, the mandatory pension funds (MPF) saw the value of their portfolio climb a real annual 14.6%, the voluntary pension funds (VPF) 10.1%, and severance funds (SF) 7.3%. However, the VPF registered a real negative six-month growth of 3.6% in the first half of 2011. As of June this year, the value of the funds was at COP$101.9 t, COP$11.2 t, and COP$6.7 t respectively. However, the value of the SF has a seasonal characteristic in which deposits are registered in the first two months of the year and disbursements in the months after that (Graph 41).

Furthermore, as of March 2011 the multi-fund plan for the MPF began to go into effect. In this, there are three funds in the accumulation phase (called conservative, moderate, and high risk) and one for the pension stage (programmed retirement fund). During the first two months of the year, the affiliates had the option of choosing between the three funds available and those who did not choose were assigned to the moderate fund. As of June 2011, 89.2% of the value of the MPF was in the moderate fund, 4.2% in the conservative one, 0.5% in the high risk fund, and 6.1% in the programmed retirement fund (Graph 42). This composition of the MPF is not in line with what was expected since it was predicted that this plan would adjust to the different risk profiles of the affiliates (budgeted for age range). Therefore, the huge participation in the moderate fund could be the consequence of the affiliates' lack of information regarding how the multi-fund plan works, etc.

When the profitability of the MPF for the last five years is analyzed,[20] we see that a slight uptick was registered in the first six months of 2011 as they went

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19   In the first half of this year, the yield curve for the TES had flattened. In other words, there has been a devaluation in the short term securities and appreciations in the long term ones.

20   The calculation presented in Graph 43 represents the internal rate of return for the five years prior to the date of the study in order to observe the profitability over a broad period of time given the nature of the investments managed by the pension fund managers.

Graph 40
Pension Funds: Value and Real Growth
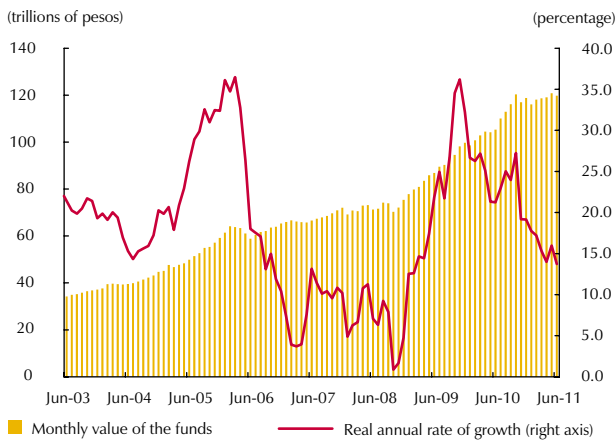
(trillions of pesos)   (percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 41
Value of Pension Fund Portfolio
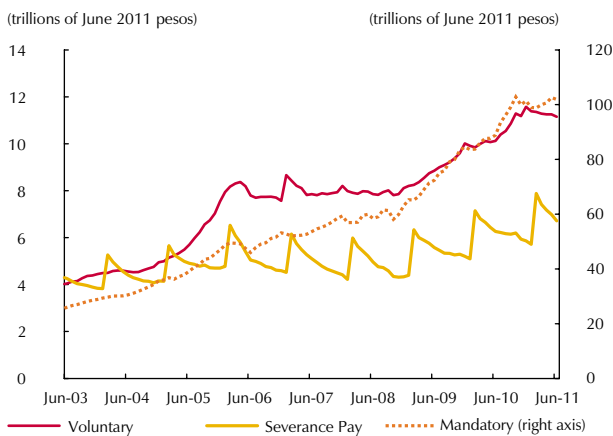
(trillions of June 2011 pesos)   (trillions of June 2011 pesos)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 42
Distribution of MPF Portfolio by
Type of Fund as of June 2011

89,2%

4,2%

0,5%

6,1%

■ Moderate fund   ■ Conservative fund
■ High risk fund   ■ Programmed retirement fund
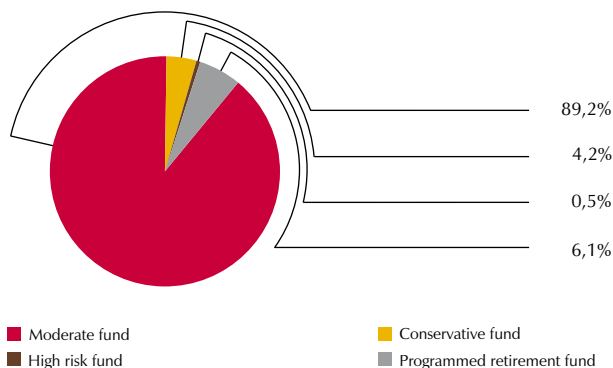
Source: Financial Superintendency of Colombia. Banco de la República calculations.

from 13.7% in December 2010 to 14.2% in June of this year. However, it should be noted that, in the first half of 2011, the yield on investments (COP$799.7 b) was significantly lower than that registered in the second half of 2010 (COP$11.3 t) (Graph 43). In addition, the biannual profitability of the SF showed a decline in the first half of 2011 and was at 11.1% in comparison to the 16.6% that was registered six months before (Graph 44).

With respect to make up of the portfolio managed by the PMF, this is still concentrated in public debt instruments and in the first half of 2011, there was a shift from investments in the productive sector to that type of security. As of June this year, investments in government bonds and the productive sector[21] represented 40.9% and 25.1% of the portfolio while these proportions were 38.9% and 28.1% respectively in December 2010. At the same time, investments in the foreign sector[22] showed a slight rise in their share of the portfolio and came to 13.4% in June 2011 when this had been 12.6% six months before. Meanwhile, the ratio of investment in the financial sector[23] within the total portfolio remained relatively constant in the first half of 2011 and was at 13.9% as of June of this year (Graph 45).

The shift from productive sector securities towards investment in government bonds and foreign sector is due, in particular, to two things. First of all, the failure on the part of the affiliates to choose a type of fund has resulted in the moderate fund holding a large share of the total resources and the high risk fund with very little. This limits the PMF to investments in local variable income securities because they have been close to the regulatory limit (35% for the moderate fund) since last year. This has led the PMF to invest in public debt and abroad. Secondly, there is the devaluation that the IGBC suffered in the first half of 2011.

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21   Mainly stocks and bonds with a high stock market liquidity.

22   The majority of these are shares in funds representative of stock indices, shares of mutual or international investment funds. The main objective of this is to invest in stocks, etc.

23   Bonds, CD, and stocks that are highly liquid on the stock market.

Graph 43
Average Return on MPF for Last Five years

(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 44
Two-year Return for Severance
Funds and Minimum Profitability
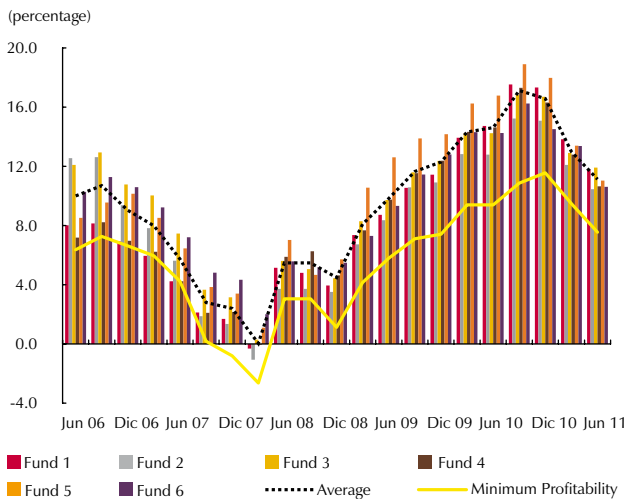
(percentage)

■ Fund 1   ■ Fund 2   ■ Fund 3   ■ Fund 4
■ Fund 5   ■ Fund 6   ······ Average   — Minimum Profitability

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 45
Composition of Pension Fund Portfolio by Issuer
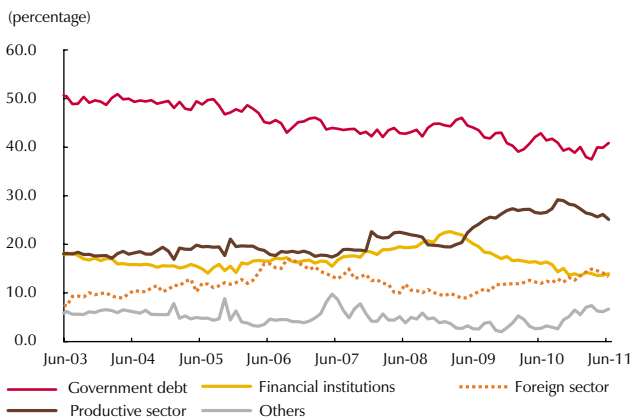
(percentage)

— Government debt   — Financial institutions   ····· Foreign sector
— Productive sector   — Others

Source: Financial Superintendency of Colombia, Banco de la República calculations.

When the make up of the investments for each type of portfolio within the multi-fund plan is analyzed, as could be expected we see that the conservative fund and programmed retirement fund are concentrated in public debt securities with a share of 62.1% and 67.4% respectively as of June 2011. The high risk fund, in turn, is concentrated in local variable income securities and the foreign sector with a 30.7% and 30.9% share respectively in the same month. Likewise, the moderate fund concentrates its investments in public debt securities and the productive sector where the former accounted for 40.7% and the latter for 34.7% (close to the maximum regulatory limit of 35%) at the end of the first half of 2011. Furthermore, the percentage of the portfolio in foreign currency without hedging has remained at low levels and well below the maximum limits in effect for all of the funds. As of June 2011, this ratio was 4.0% for the conservative fund, 3.7% for the high risk one, 4.4% for the moderate fund, and 3.6% for the programmed retirement fund (Graph 46).

It is important to emphasize the fact that in addition to the individual limits by type of investment, all of the funds have a minimum and maximum limit on the total investment in variable income[24] or the sum of local and foreign. All of the funds complied with this requirement as of June 2011 with the exception of the moderate fund, which has a maximum limit of 45% and on the abovementioned date, the fund's variable income investment had accounted for 47.4%.[25] This restriction could produce a decrease in the demand for this type of security by these agents.

In the second half of 2010, the PMF preferences for securities denominated in pesos were also maintained. Nevertheless, there was a slight shift from this type

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24   The share of investments in local and foreign variable income for the four types of funds should be within the following ranges: between 0 and 20% for the conservative and programmed retirement funds, between 20% and 45% for the moderate one, and 70% for the high risk fund.

25   Article 2.6.12.1.18, book 6, Decree 2555/2010 establishes that in the case where the expected limits are exceeded as a consequence of the appreciation or devaluation of the investment and this persists for fifteen days, the PMF should submit a plan that would allow them to adjust said limits in a set period to the consideration of the Financial Superintendency of Colombia.

of investment to those denominated in UVR. As of June 2011, the former represented 69.8% while the latter represented 15.5% of the total portfolio. These had been at 72.3% and 12.9% respectively six months earlier. Investments in dollars, in turn, showed a stable performance in the first six months of 2011 and amounted to 13% as of June of the current year (Graph 47).

2.   Life and General Insurance

a.   *Portfolio Value and Return*

As of June 2011, the ROA of the LIC was at 2.8%, which represents a drop of almost half the value seen six months before (5.2%). For the GIC, likewise, the

Graph 46
Composition of MPF Portfolio as of June 30, 2011 in View
of the Legal Limits in Force

A.   Conservative Fund
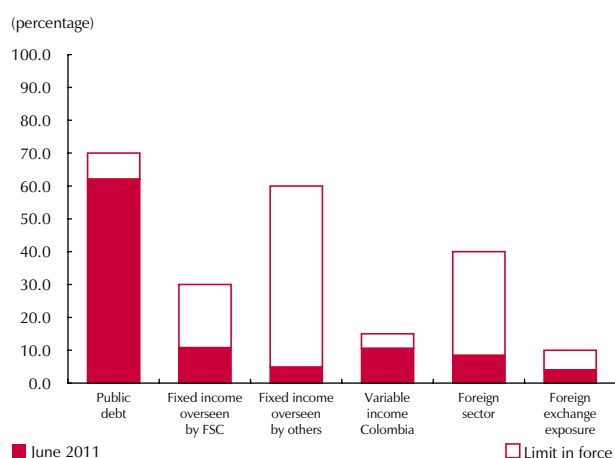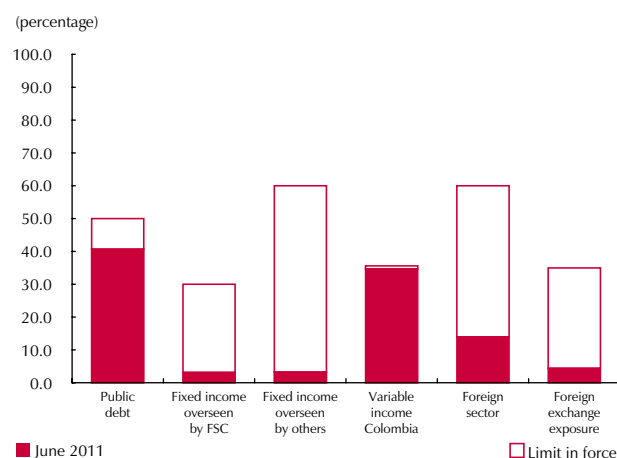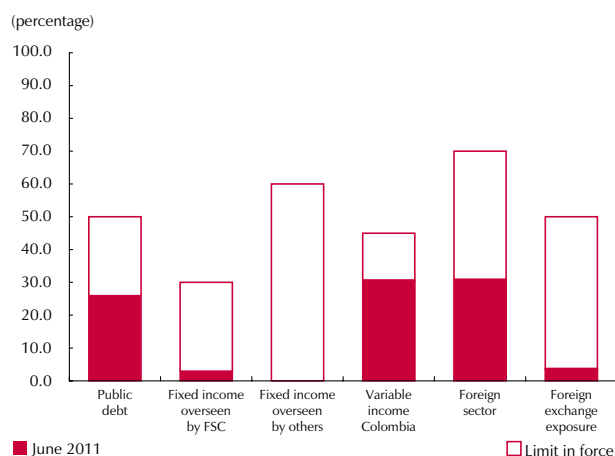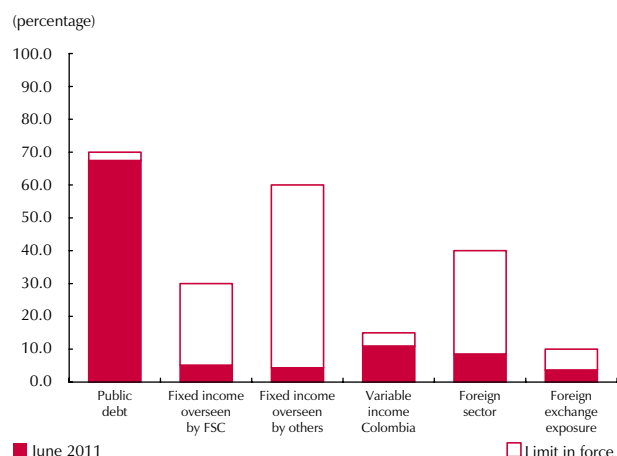
(percentage)

■ June 2011   □ Limit in force

C.   Moderate Fund

(percentage)

■ June 2011   □ Limit in force

B.   High Risk Fund

(percentage)

■ June 2011   □ Limit in force

D.   Programmed Retirement Fund

(percentage)

■ June 2011   □ Limit in force

Source: Financial Superintendency of Colombia, Banco de la República calculations.

(percentage)   (percentage)

Dollar
Euro
UVR
Other
Pesos (right axis)
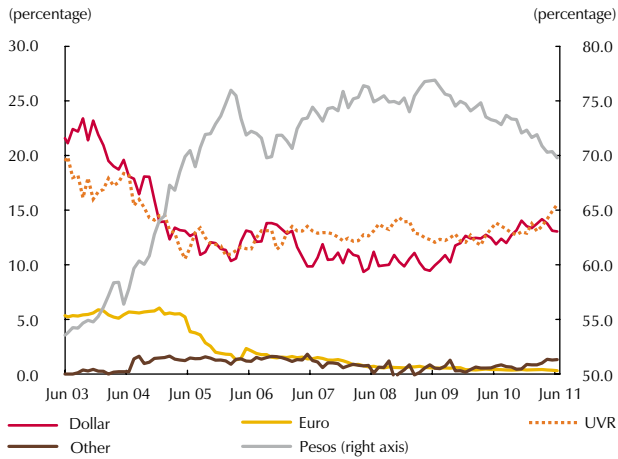
Source: Financial Superintendency of Colombia, Banco de la República calculations.

profitability dipped 1.4 pp during the same period and was at 3.1% as of June of this year (Graph 48). This decrease in the return is largely due to the downward trend of the prices for domestic stocks during the period under analysis.[26]

In addition, the value of the LIC AND GIC investment portfolios, which has been rising since 2002, continues. As of June 2011, the value of those resources came to COP$17.9 t and COP$5.3 t for the LIC and GIC respectively. This constitutes a six-month change of 7.0% for the former and 1.3% for the latter. The life insurance companies' portfolio not only accounts for the greatest quantity of resources but also grows at a higher rate.

Regarding the investment portfolio these entities have,[27] it should be emphasized that it is still concentrated in public debt instruments. In the case of the LIC, a shift from financial sector securities to public debt ones was registered in the first half of 2011. As of June this year, the share of the latter came to 57.6%, which reflects a rise of 2.5 pp compared to what was witnessed in December of last year. At the same time, the financial sector securities showed a 1.7 pp decline and were at 17.2% at the end of the first half of 2011. Investments in the productive sector, in turn, showed a constant ratio of 24.4% in the same lapse of time. (Graph 49, panel A).

With respect to the GIC, the make of their portfolio remained relatively stable in the first half of the current year. The public debt securities are still the most representative with a ratio of 45.2% followed by those issued by the productive sector and the financial system. Their share was at 22.8% and 17.7% as of June 2011 (Graph 49, panel B).

In conclusion, in the case of both the GIC and the LIC, the investment portfolio continues to be concentrated in government bonds. Likewise, in the first half of 2011, there was a shift towards these securities. In general, for this type of institution, the decline in profitability is primarily due to the devaluation of the investments in local variable income.

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26 Between December 2010 and June 2011, the IGBC has registered a devaluation of 9.2%.

27 The legal investment limits for the LIC are: public debt (no limit), fixed income overseen by the SFC (in Spanish) (50%), productive sector fixed income (70%), national and foreign variable income (35%). For the GIC, in turn, they are: public debt (no limits), fixed income overseen by the SFC (20%), productive sector fixed income (70%), national and foreign variable income (30%), foreign sector (40%), and foreign exchange exposure (35%).

Graph 48
ROA for General and Life Insurance Companies
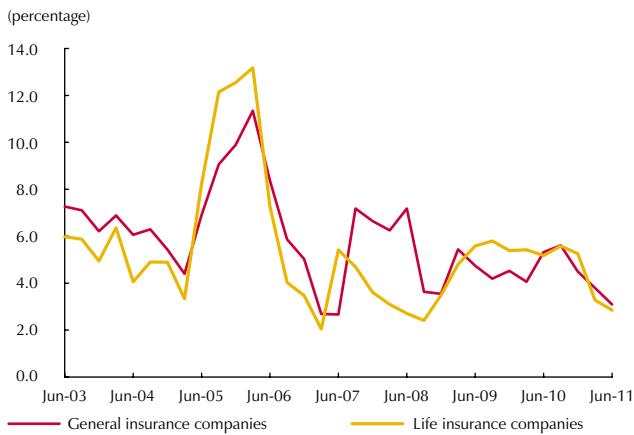
(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 49
Investment Portfolio by Issuer

A.   Life Insurance Companies

(percentage)
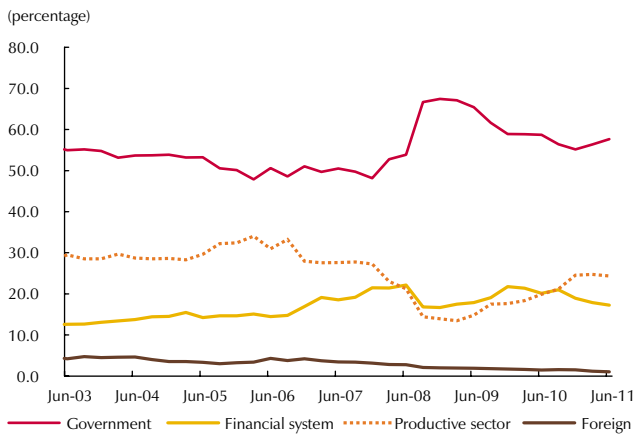
B.   General Insurance Companies

(percentage)
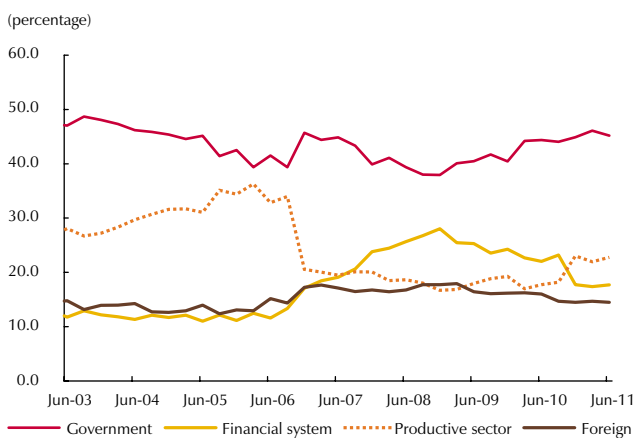
Source: Financial Superintendency of Colombia, Banco de la República calculations.

b.   *Unemployment Indicators*

A set of indicators is presented below in order to ana-lyze the performance of the GIC. These are used to study the performance of these entities from differ-ent aspects such as profitability, liquidity, and general performance.[28]

The indicator for investment yield showed a decline in the first half of 2011. At the end of the first six months of this year, this indicator was at 4.4% when it had been at 7.0% in December of last year. It should be emphasized that the level of this indicator is close to the minimums seen in the period under analysis and below the lower international threshold (4.5%). Likewise, the operating result that combines indica-tors of technical and financial aspects and that has a high correlation with the return on investments also shows a reduction of 3.7% during the same period. The above is similar to the performance registered by the ROA (Graph 50).

Regarding the change in equity, this had dropped as of June 2011 and was at 7.3% after having been at 9.5% in December of last year. This fall in equity could be explained by the lower returns on investment (Graph 51). To conclude, in spite of the fact that the insurance business is not purely financial, the return on invest-ments plays an important part in the profits and losses for the business.

With respect to the companies' liquidity, we found that the liabilities indicator as a percentage of liquid as-sets has remained very stable during the period under analysis. As of June 2011, the liabilities of the GIC were 97.6% of their liquid assets. It should be noted that based on the international thresholds we have an early warning sign when the liabilities surpass liquid assets by 105% (Graph 52).

In general, the indicator of return on investment shows a deterioration for the GIC. This has affected the per-formance of operating results and capital although as

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28   For more detail about how each indicator worked out, go to the Box entitled "Early Warning Indicators for General Insurance Companies."

Graph 50
Return on Investments and Operating Results for General
Insurance Companies
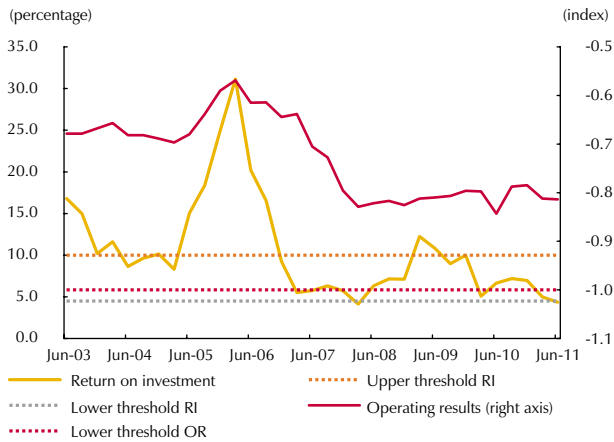
(percentage)   (index)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 51
General Insurance Companies: Change in Equity

(percentage)
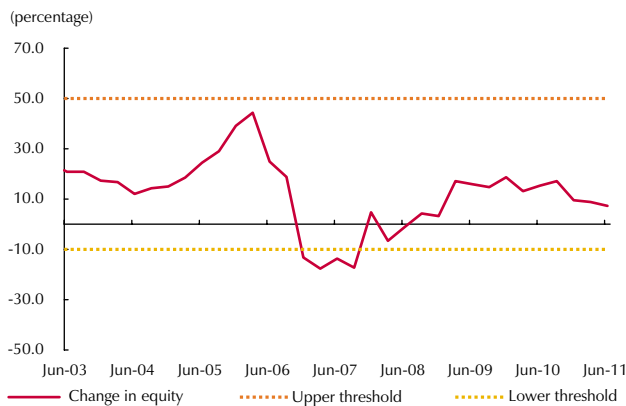
Source: Financial Superintendency of Colombia, Banco de la República calculations.

of June 2011, it was below the internationally established warning threshold. Therefore, it is necessary to watch the change in this indicator closely over the next few months.

3.   Trust Companies

As of June 2011, the TC managed funds[29] that had a value of COP$180.4 t, which represents a six-month growth of 7.2%. Of these assets, 32.6% belong to funds managed by social security, 28.5% to management trusts, and 13.4% to mutual funds. Among other trust assets we find investment trusts (9%), collateral trusts (8.4%), real estate trusts (7.3%), and voluntary pension funds (0.8%) (Graph 53).

Of the total assets managed by the TC, investments represented 59.3% as of June 2011 and were at COP$107 t. This figure is COP$5.6 t higher than the value registered six months ago. As can be seen in Graph 54, investments have seen continuous growth over the course of time. As is the case with assets, the most important items are in the social security and mutual fund portfolios.

As of June 2011, the share of the resources invested for social security had a value of COP$55.5 b, which represents 51.9% of the total portfolio. The mutual funds managed by TC, in turn, had a value of COP$16.5 t, which translates into a share of 15.4% (Graph 54).

The portfolio managed by the TC classified by type of asset is presented in Graph 55. In the first half of 2011, a slight shift from national variable income assets to private[30] and public debt securities was registered. As of

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29   The funds managed by the TC come from different types of businesses: In the investment trust, the client places a sum of money with the trust company to be invested in securities and managed for the benefit of the investor. This is known as a targeted investment. The management trust is one where the clients put goods into the hands of a fiduciary for it to manage based on what is agreed upon in the contract without giving up their property rights over them. The purpose of a real estate trust is to manage resources and goods belonging to a real estate project. In a collateral trust, the fiduciary manages resources or goods that are placed with it by the client as a guarantee for a debt that he has with a third party. The mutual funds trust invests in mutual funds where each agent is clearly differentiated. A social security trust is a business which manages the funds allocated for social security and the voluntary pension fund trust manages the funds that the clients have allocated for that purpose.

30   CDs, bonds issued by companies in the productive and financial sectors, etc. are included among the private debt securities. As of June 2011, CD represented 55.3% of the total amount in private debt securities managed by the TC.

(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

32.6%
13.4%
9.0%
7.3%
28.5%
8.4%
0.8%

■ Social Security Trust   ■ Mutual Fund Trust
■ Investment Trust   ■ Real Estate Trust
■ Management Trust   ■ Voluntary Pension Fund
■ Collateral Trust

Source: Financial Superintendency of Colombia, Banco de la República calculations.

(trillions of pesos)

■ Mutual Funds   ■ Social Security   ■ Other assets   ■ VPF
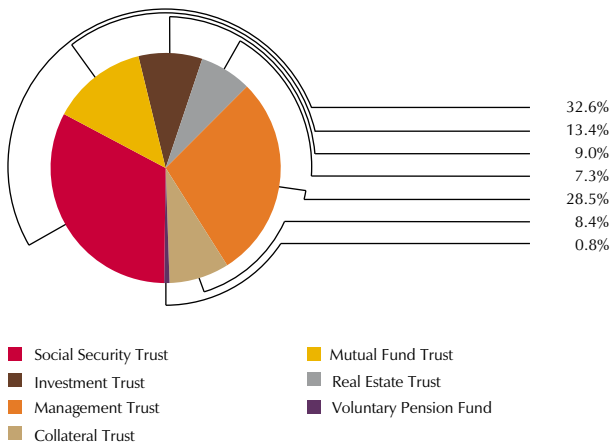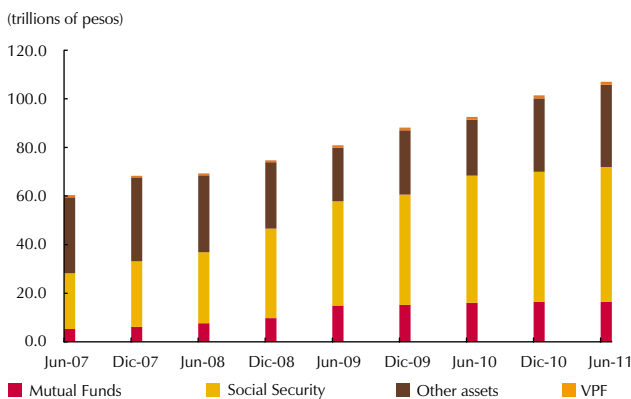
Source: Financial Superintendency of Colombia, Banco de la República calculations.

June 2011, investments in private debt and government bonds represented 38.2% and 35.1% respectively whereas they had been 37.8% and 34.9% respectively in December of last year. The securities in national variable income, in turn, were 24% of the total portfolio in June of this year but had been 24.3% six months ago. Thus, we see a high preference for national investments since the investments in foreign assets only represent 2.7% of the total.

4.   Stock Brokerage Firms and Investment Management Companies

The value of the investment portfolio managed by stock brokerage firms and investment management companies was at COP$3.8 t as of June 2011. This represents a plunge of 25.1% with respect to what was seen six months earlier. The ROA of these institutions, in turn, registered a significant rise as it went from 2.4% in December of last year to 3.2% in June 2011. This jump was mainly due to a more than proportional decline in the asset with respect to the profits (Graph 56). In fact, the profits received in the first half of 2011 were COP$66.9 b while those registered in the second half of the previous year were COP$77.3 b.

The general trend registered by the ROA does not necessarily follow the individual performance of the majority of the institutions in this sector. Here, a different

(percentage)

— Government debt   — Private debt   ····· National variable income
— Foreign variable income   — Foreign fixed income

Source: Fogafín, Banco de la República calculations.

Graph 56
ROA of Brokerage firms and
Investment Management Companies
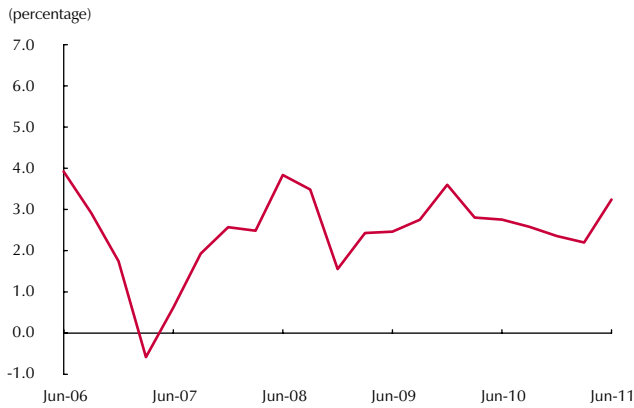
(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 57

A.   ROA of Brokerage Firms and Investment Funds

	Jun-10		Sep-10		Dic-10		Mar-11		Jun-11
◉ -40%		○ 0%		● 40%		◉ 80%			
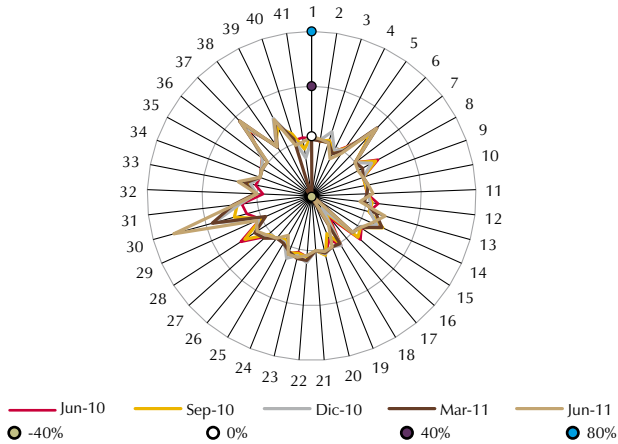
**B.   Investment/Net Worth of Brokerage
         Firms and Investment Funds**

(times)

■ Dic-10   ■ Jun-11
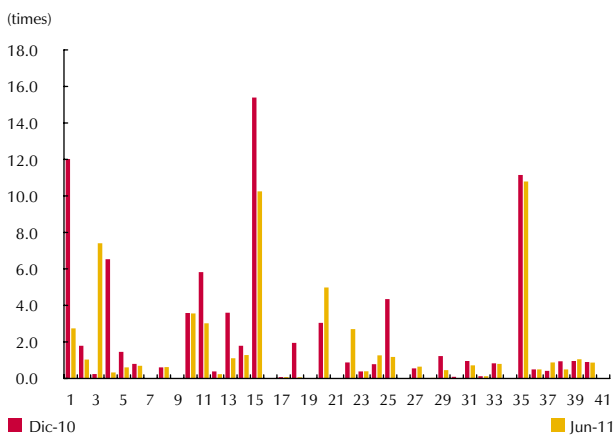
Source: Financial Superintendency of Colombia, Banco de la República calculations.

trend was evident in the return on assets in the first half of 2011. In Graph 57, panel A, 41 entities are considered. The value of their returns rises in proportion to the distance from the center. As can be seen there, only fourteen showed an ROA that was higher than the one in December of last year.

Just as was seen in the previous Financial Stability Report, institutions with a significantly negative ROA do not have excessive levels of leveraging. In fact, these had a ratio of investments to capital that was lower than the average, which was 3.9 times, registered for the sector as of June 2011. It should be emphasized that simultaneous accounting operations that stock brokerage firms and investment managers carry out on a daily basis are not included within the leveraging indicator.

When the performance of the NBFI is analyzed, it can be generally concluded that in the first half of 2011, there was less momentum in portfolio changes in comparison to what was registered in the second half of 2010. The devaluation of the national variable income securities led to lower levels of profitability for the majority of the institutions than what had been seen in 2010. In general, the NBFI demonstrated a shift in their portfolios towards public debt securities and a drop in their share of productive and financial sector assets.

Box 1
INTERNATIONAL INDICATORS

In general, the Latin American financial systems that were studied registered a positive performance between September 2010 and March 2011. This fact has been made evident by the recovery in the growth of the loan portfolio in most of the countries, the upswing in hedging for credit risk, the reduction of default in loan portfolios and the stability of the efficiency indicator for their financial systems.

In the first quarter of 2011, the real annual growth of the loan portfolio registered a positive value for all the countries analyzed with the exception of Venezuela. In this regard, the case of Argentina stands out because its gross loan portfolio went from a growth of 21.2% in the fourth quarter of 2010 to 25.6% in the first quarter of 2011. Other countries that showed high growth were Brazil (17.8%), Peru (17.7%), and Colombia (17.4%) (Graph B1.1). Chile and Mexico had moderate growth with 8.5% and 8.3% respectively, but these figures were higher than those registered at the end of the second half of 2010 (5.6% and 3.4% respectively). In contrast, the indicator for Venezuela is still negative though it has improved as it went from -5.5% in the fourth quarter of 2010 to -2.8% in the first quarter of 2011. At the end of the period under study, the average, real annual growth of the gross loan portfolio for the sample of countries was 13.2%.

With regard to the quality of the loan portfolio, the default indicator (DI) showed few changes in the first quarter of 2011 and was at 2.8% on average. It should be noted that the indicator dropped in six of the seven countries, which implies an improvement in the quality of the loan portfolio with respect to the results analyzed in the previous Financial Stability Report. Argentina registered 1.0%, Brazil, 5.1%; Chile, 2.6%; Colombia, 3.4%; Mexico, 2.3%; lombia, 3.4%; Mexico, 2.3%;

and Peru, 1.5%. However, the indicator for Venezuela had a slight uptick (3.7%) (Graph B1.2). This fact underlines the trend that the indicator for Venezuela has been seeing since the first quarter in 2007 when it registered a value of 1.1%. As a result, the default indicator for this country has gone up 2.6 pp over the last four years. The fact that Argentina and Peru are still the countries with the lowest default indicators while Brazil has the highest one should be noted.

Regarding the efficiency of the financial entities –measured as the proportion of administrative and work-related expenditures (AWRE) with respect to the assets, the indicator remained

Graph B1.1
Real Annual Growth of the Gross Loan Portfolio

(percentage)
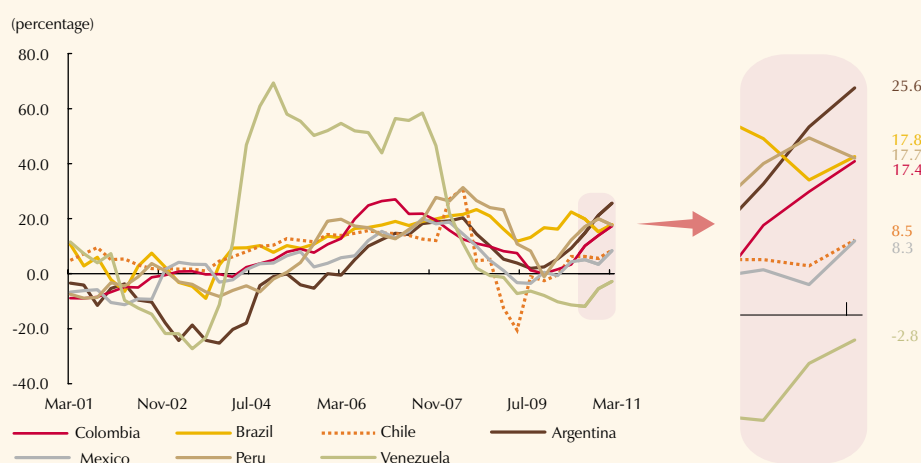
Sources: central banks and bank superintendencies in each country, Banco de la República calculations.

Graph B1.2
Default Indicator: Nonperforming Loan Portfolio/Gross Loan Portfolio

(percentage)

Sources: central banks and bank superintendencies of each country, Banco de la República calculations.

stable in the first quarter of this year with an average variation of 13 bp. Argentina and Venezuela registered the least efficient positions among the countries analyzed at the end of the period in question with values that were close to 5%. In contrast, Colombia, Brazil, Peru and Mexico have maintained this indicator at an average level of 3.7% and Chile, which had the lowest level, registered 2.3% (Graph B1.3).

(percentage)

Between September 2010 and March 2011 of the current year, the hedging indicator, measured as the ratio between loan-loss provisioning and nonperforming loan portfolio of the financial entities, did not register significant fluctuations for most of the countries. However, the upswing experienced by Argentina in which the hedging indicator went from 201.1% in September 2010 to 240.5% in March 2011 is noteworthy. This significant rise in the indicator was mainly due to both 4% increase in the loan-loss provisioning and a 13.4% reduction in the overdue loan portfolio. Likewise, Mexico and Peru were also among the countries that registered higher hedging percentages with 207.1% and 243.4% respectively as of March 2011. In comparison, Colombia (146.8%), Venezuela (138.4%) and Brazil (108.2%) had more stable indicators (Graph B1.4).

The case of Venezuela should be underscored with regard to the analysis of the changes in this indicator because its ex-post intermediation spread climbed from 8.7% in September 2010 to 12.8% in March 2011.

In summary, the conditions of the financial systems in the Latin American countries analyzed are diverse. On one hand, the majority of them registered an increase in the real annual growth of the gross loan portfolio which raised their credit risk. However, on the other hand, they showed a drop in their default indicators, which reflected a lower probability of that greater risk materializing. Also, there were stable

(percentage)

(percentage)
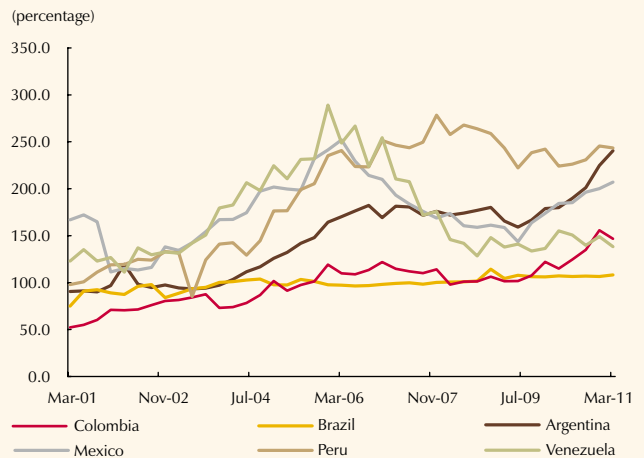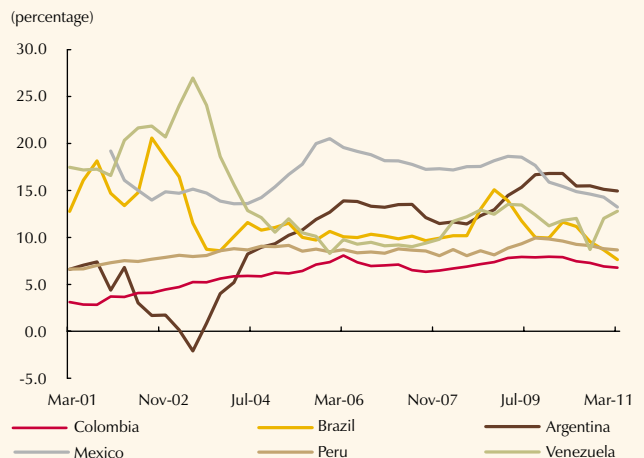
levels of efficiency and increases in hedging which reduced their exposure to the credit risk mentioned above.

Graph B1.5 shows the ex-post intermediation spreads. In the first quarter of 2011, Argentina, Mexico and Venezuela were the countries that registered the highest intermediation spreads (14.9%, 13.2% and 12.8% respectively) while the indicators in Colombia and Chile were the lowest (6.8% and 3.8% respectively).

Box 2
ANALYSIS OF THE RECENT ADVANCES IN BANCARIZATION IN COLOMBIA

Bancarization refers to the integration process of financial services into people's economic activities. It can contribute significantly to economic growth as long as the relationship between the users and the financial entities is both frequent and progressive in the long term and also allow the users to move from transactional or savings-oriented services toward financing or investment mechanisms that fit their needs. This box analyzes what progress the country has made with respect to bancarization in light of these premises.

The measurement of bancarization must take into account aspects related to the coverage the financial establishments provide through aspects such as both the number of offices and employees. In the case of Colombia, it is important to measure the coverage achieved through the banking correspondents (BC)[1] which have become an effective mechanism for facilitating contact between the financial entities with the users who live in remote or inaccessible areas and have reduced the costs related to expanding the infrastructure. Furthermore, it is necessary to include indicators that calculate the changes in factors related to the intensity with which the users take advantage of financial services such as number and amount of new loans as well as indicators of the intensity of their use of active bank accounts. The bancarization index included in the Financial Stability Report for March 2011 analyzed those aspects and generated a measuring standard that makes it possible to determine the bancarization progress in each department.

Information regarding the net loan portfolio, deposits, offices, BC and employees of the system was used to calculate the index. Likewise, the marginal amounts by type of loan and the number of new loans by type of credit as well as the ratio between active accounts and accounts opened for each period were included as ways to measure the intensity at which financial services are used.[2] Graph B2.1 presents the index calculated for each region (Amazon, Caribbean, Central, Pacific and Orinoquia) in order to facilitate the interpretation. A

separate index was built for Bogota due to the population and economic activity it accounts for.

Graph B2.1
Bancarization Index by Region
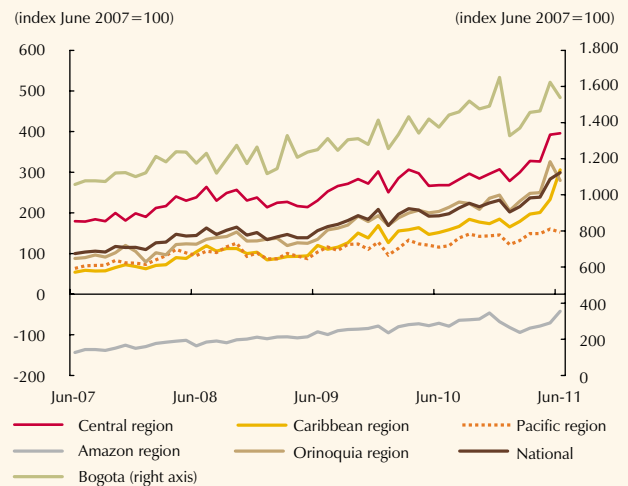
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

The results show that bancarization is not homogeneous and Bogota is the area where the financial services are the most integrated with the economic activity of the inhabitants. The differences between Bogota and the other regions in the country are considerable, particularly in relation to the Amazon and Orinoquia which show not only the lowest bancarization levels but also the lowest growth rates.

Also, between December 2010 and June 2011, access to financial services has registered a higher growth in different parts of the country in comparison with the results for 2010. This is particularly the case for the Caribbean, Central and Bogota regions. However, since January of this year, this performance has been emphasized by a significant reduction in the disbursements for the commercial loan portfolio which may have been caused by the changes in the taxes on financial transactions applied to some types of loans[3] as well as by the greater use that some companies have made

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1 Based on Article 2.1.6.1.5 of Decree 2555/2010, the External Circular 26/2011 regulates the functioning of correspondents for both stock brokerage companies and foreign exchange intermediaries. It also includes instructions related to correspondents for credit establishments, which are called "banking correspondents." In addition to their regulated activities, these are involved in foreign exchange intermediation as well as in transfers of Colombian currency within national territory.

2 The methodology used for the construction of both the index and the weight that results for each variable were described in the Financial Stability Issues, "A Bancarization Index for Colombia," published on the Banco de la República webpage.

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3 Act 1430/2010 introduced some changes to the way the levy of taxes on financial transactions is applied. Since it went into effect, only the monetary operations that do not involve payment to third parties are tax exempt. Therefore, the loan disbursements through deposits in bank accounts or issuance of checks, the payment operations to third parties to fulfill any obligations, and the offsetting and liquidation transactions carried out in the stock market or in the agricultural and commodities markets are taxable when the disbursement is paid to the debtor with

of alternative financing mechanisms such as the issuance of corporate bonds.

The growth in bancarization over the abovementioned six-month period was also spurred by the signing of agreements between financial entities and trading and postal service networks in order to create the banking correspondents. This brought about a significant expansion in the reach of the financial system during that period, especially in Bogota and the Caribbean and Central regions (Graph B2.2). Also, the growth in disbursements and the number of new loans granted for housing and micro-credit contributed to the rise in the indicator during that same period.[4]

Graph B2.2
Number of Banking Correspondents (BC)
in each Region, June 2011

(number of BC per 1,000 inhabitants) — left axis
(number of BC per 1,000 inhabitants) — right axis

Legend:
— Central region
— Caribbean region
···· Pacific region
— Amazon region
— Orinoquia region
— National
— Bogota (right axis)
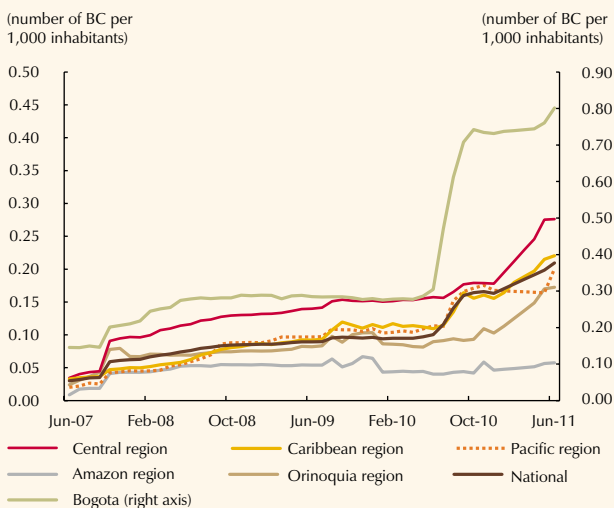
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

In spite of recent bancarization advances in some regions, the pattern in its development points to concentration of financial services in the areas of higher economic activity in the country rather than to a convergence among the regions. The above indicates that although the system of banking correspondents along with the introduction of savings products

such as the electronic accounts[5] have made the extension of financial services into remote places possible, the limitations that the inhabitants of these areas have are still significant when they do access a portfolio of services that properly fits their needs.

1. Alternative Transactional Channels

The financial institutions have introduced transactional channels that use phone or virtual offices into the market as well as information platforms that operate through cell phones. These alternatives are considered an important advance because they allow for a reduction in the marginal transaction costs for both the users and the financial institutions. Furthermore, they make access to financial services easier in remote areas and provide tighter control over monetary operations.

The expansion opportunities for bancarization through those methods are considerable since the coverage offered by the cell phone carriers has reached universal proportions throughout national territory. At the same time, there has also been a sizable increase in the population with internet access either at home or at any telecommunications store nearby.[6] Based on the transactions and operations report issued by the Financial Superintendency, the number of transactions carried out by means of cell phones in the first half of 2011 is equivalent to 2.9 times what was registered for 2008 and is maintaining an annual growth rate of 31.2%. Meanwhile, the virtual offices have been positioned as a transactional channel with an annual growth rate of 20%. In June 2011, the number of operations done through those channels was 1.2 m and 76 m respectively.

Graph B2.3 shows the reduction the traditional channels such as bank offices and ATM's have seen in their share of the total number of monetary operations carried out at the same time as the number of transactions done through BC, virtual offices and mobile phones has increased. In the last two years, the proportion of monetary operations done through virtual offices of financial entities has climbed from

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the exception of loans intended for the purchase of housing, vehicles, or fixed assets.

4   The upswing in the number and amount of micro-loans disbursed may be explained by the opening of a new bank that specializes in micro-credit. This entity functioned as an NGO in the area of financial intermediation for micro-credit and was one of the biggest agents in the market. However, it was not possible to collect information concerning its activities in each department because it was not overseen by the Financial Superintendency.

5   The electronic or low-amount bank accounts are limited to the vulnerable population (Sisben 1 and 2) and do not have management fees or minimum opening or balance requirements. Also, they have two free-of-charge monthly transactions.

6   Based on the results contained in the TIC Quarterly Report published by the Ministry for Telecommunications and Information Technologies, there were close to 46.3 million subscribers to mobile cell phone service in June 2011. In addition, the proportion of the total population with internet access has grown 23% over the last year with a record of more than three million connections as of that date. It is noteworthy that there is a high concentration of internet access in the main cities. For instance, the number of subscribers to internet in Bogota is equivalent to 13.9% of the total population while the indicator for the entire country is 0.6%.

6.5% to 9.1% in June 2011 while those done through BC represent 2.4% of the total.

In 2011, the amount in monetary transactions carried out through BC was COP$3.8 t while this value for the virtual office channel (internet) was close to COP$630 t (a figure that corresponds to 45% of the amount transacted in the network of offices).

The implementation of and accelerated growth in the use of these transactional instruments requires an effort on the

part of the authorities in terms of monitoring and regulation in order to guarantee the financial soundness of the entities that offer these services as well as the continued availability of these channels in different parts of the country. To achieve these goals, it is necessary to do an overall review of the technical aspects of the use of information and telecommunication technologies as well as of the factors associated with the financial performance of the institutions that provide these services.

In addition, it is essential to strengthen the protection mechanisms for the financial user. In this regard, the Financial Superintendency has explicitly pointed out the contractual behavior and the clauses that it considers abusive in order to nullify those conditions established by the entities and that lead to abuse of a dominant contractual position.[7] These rules become very important since the transactions carried out through electronic channels may be subject to security threats for which the customer has no responsibility. Thus, the development of bancarization on these new channels depends on the establishment of the methods necessary to generate an environment of reliability for the new users.

Finally, financial education is a basic tool for using those platforms and must be complemented by programs intended to train users in the handling of information and communication technologies. This will facilitate their use as a bancarization mechanism in the most remote areas.

Graph B2.3
Different Transactional Channels: Share
in the Total Number of Monetary Operations

A.   2nd half 2008

39.1%
31.2%
13.1%
6.5%
0.8%
0.1%
9.2%

■ Offices
■ Other a/
■ Internet
■ Non-banking correspondents
■ ATM's
■ Dataphones
■ Mobile phones

B.   2nd half 2011

37.4%
28.0%
14.8%
9.1%
2.4%
0.2%
8.2%

■ Offices
■ Other a/
■ Internet
■ Non-banking correspondents
■ ATM's
■ Dataphones
■ Mobile phones

a/ The "other" category corresponds to the ACH, service by phone and automatic payment channels.
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

7   External circulars 038 and 039/2011 from the Financial Superintendency.

Box 3
EARLY WARNING INDICATORS FOR GENERAL INSURANCE COMPANIES

The importance of analyzing the financial indicators of the insurance companies and seeking their stability is based on the fact that the market agents in this sector can transfer various types of risks. Diagram B3.1 summarizes how insurance companies function by the use of reinsurance and coinsurance.

Graph B3.1
Reinsurance and Coinsurance Contracts
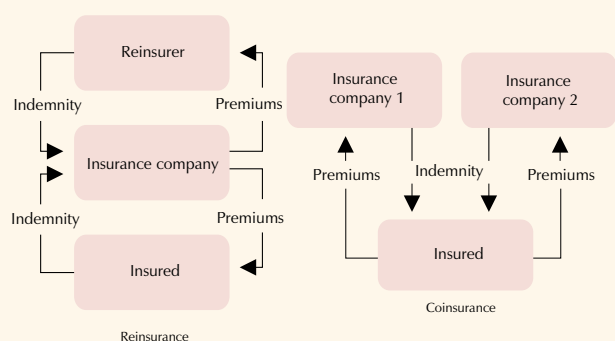
Source: Banco de la República.

Worldwide, the insurance business showed a moderate recovery in 2010 after two years of declines in the volume of premiums issued. Between 2009 and 2010, the premiums grew at a real annual rate of 2.7% and were at US$4.3 t, which is at a level similar to what had been registered prior to the recent financial crisis. Once classified by categories, the life insurance premiums had a growth rate of 3.2% while the rest registered one of 2.1% in the same period. It should be emphasized that this took place within a scenario of natural catastrophes in areas with high levels of financial deepening in terms of insurance. In addition, the insurance business has been experiencing lower profits on investments due to the low interest rates on the international markets. Furthermore, the levels of capital adequacy are still low in spite of the fact that several insurance companies were granted funds to restructure their capital.

The results have been more favorable in Latin America. The total premiums issued grew at an average real annual rate of 10.5%[1] and the higher figures corresponded to Chile, Venezuela, Argentina and Peru. In the case of Colombia, the performance was relatively moderate (4.8%). This was mostly due to the drop in the premiums for lifetime income associated

with pensions. The trend in the region is toward an increase in the supply of life insurance, especially for groups belonging to the low income tier.

The previous Financial Stability Report introduced some early warning indicators for general insurance companies (GIC)[2] proposed by the Colombian Federation of Insurance Companies (Fasecolda in Spanish). The indicators are based on the accounting information from the companies and make it possible to do timely follow up on the situation they face with respect to risks. According to the supervisor's viewpoint, it is important to emphasize that the analysis must be done for each individual company because of the heterogeneity in the way they function as well as in the business lines of each one has.

The indicators are classified into three groups based on the perspective to be analyzed: general, profitability, and liquidity indicators.

1. General indicators

The insurance business has been characterized as cyclical and, therefore, it is important to estimate not only the changes in the premiums issued but also the moment when future claims will take place. Periods of high levels of purchasing insurance policies precede periods of high levels of claims against them. Unlike other types of businesses, a moderate and sustained growth in purchases is ideal for the insurance sector. Abrupt increases in net new policies[3] imply a jump in the claims rate which may entail significant surges in costs that must be properly quantified.

The annual growth rate for net insurance purchases is shown in Graph B3.1. On average, the performance of the insurance business over the last eight years was a nominal annual 12.6%, a figure which is far below the lowest threshold of 33%. As of June 2011, this growth was equivalent to 13.5%,

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1   This is a simple average of the growth of premiums denominated in the currency of each country. The rise in dollar denominated premiums was 30%, which was mostly a result of the appreciation of the currencies in the region.

2   In spite of the major share (76%) that life insurance companies (LIC) hold in the total investment portfolio of insurance companies, the LIC are not analyzed because there is still no consensus in the Colombian insurance sector regarding the type of measurements to be used in monitoring them. In fact, not all the indicators used for the GICs are relevant and sufficient to analyze the LICs since the nature of their respective risks is different.

3   The notions of coinsurance and reinsurance exist in the insurance business to refer to ceding or distributing part of the insurance risk. The net purchase of insurance policies refers to the portion of the business retained by an insurer.

which is above the average already mentioned and is also 5.8 pp higher than the increase registered in December 2010. The fact that this indicator has maintained a growing trend since June 2009 must be underlined.

Graph B3.2
Net Insurance Policy Growth Rate
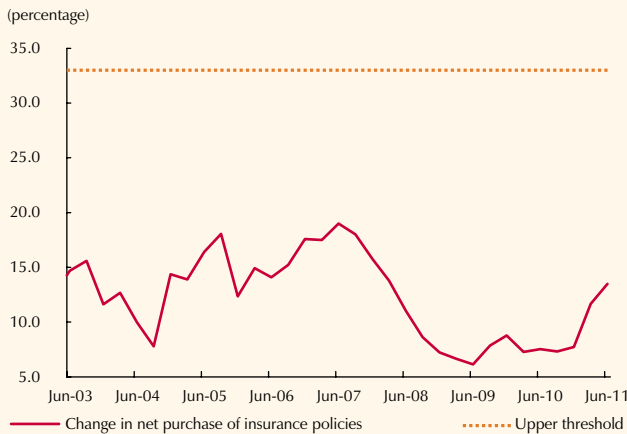
(percentage)

— Change in net purchase of insurance policies   ······· Upper threshold

Sources: Financial Superintendency of Colombia, Banco de la Republica calculations.

Graph B3.2 shows the indicators for both gross and net rate of risk. The first is defined as the ratio of the premiums issued and accepted to equity. This indicator measures the sufficiency of the equity an insurance company has in an extreme scenario in which the company must cover claims against policies equivalent to the value of their premiums. Moreover, given that this indicator does not consider the premiums ceded to the reinsurer, it takes into account a situation where there is a default on the part of the latter.

Graph B3.3
Gross Rate of Risk (GRR) and Net Rate of Risk (NRR)

(percentage)

— Gross rate of risk   — Net rate of risk
······· Upper threshold GRR   ······· Upper threshold NRR
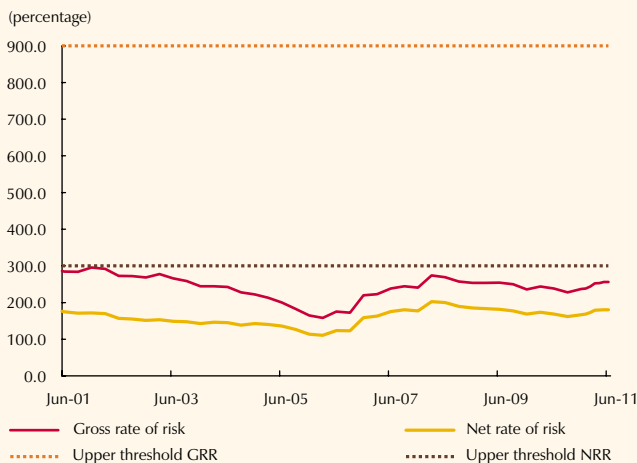
Sources: Financial Superintendency of Colombia, Banco de la Republica calculations.

The indicator of net rate of risk, in turn, which is calculated as the ratio of premiums retained[4] to equity of the company, shows the sufficiency of the company's equity in an extreme case in which it must cover obligations against the equity for the value of the premiums retained. This is the same scenario as the previous one but does not include the effect of a possible default on the part of the reinsurer.

As was the case with the indicator for net policy purchase rate, the Colombian GIC have not surpassed the international limits established for the indicators of both gross and net rate of risk. As of June 2011, the gross rate of risk was at 255.9 % and the net rate of risk at 180.2%. These figures are 19 pp and 13.7 pp above the results that were seen in December 2010 respectively. The difference between these indicators suggests that Colombian insurance companies are transferring part of their risk to the reinsurers while, at the same time, they are in a position to withstand a default on the part of the latter.

Finally, the reinsurance income indicator shows the share of the income received from reinsurance commissions in the equity of the company. When the companies get reinsurance, they become intermediaries in the business. That is why they receive commissions for transferring the risk. This income represented 5.5% of the GIC equity, a figure which is 1 pp above the proportion registered in December 2010. This would suggest a moderate increase in the dependency on reinsurance income over the last six months. However, the low risk registered by the indicator stands out since it has not been close to the upper threshold during the period under analysis (Graph B3.3).

Graph B3.4
Reinsurance income

(percentage)

— Reinsurance income   ······· Upper threshold
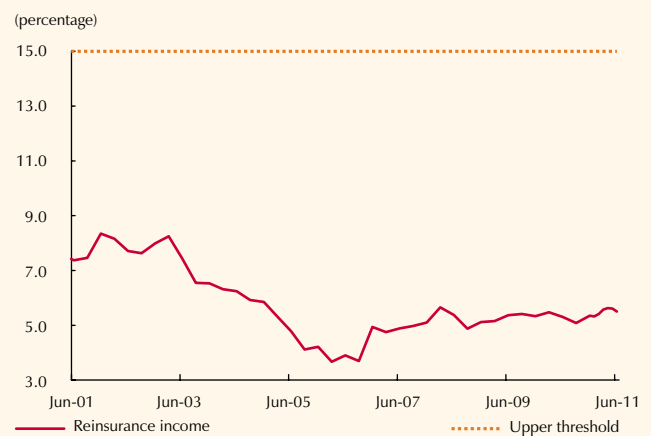
Sources: Financial Superintendency of Colombia, Banco de la Republica calculations.

4   The premiums retained correspond to the portion of premiums that represent the risk retained by the company after contracting the reinsurance and coinsurance deals.
    Mathematically: retained premiums = issued premiums + accepted premiums – ceded premiums.

2.   Profitability indicators

The profitability of the insurance companies is explained by not only the management of risk with respect to the technical aspects of the business but also by the investment of the reserves in compliance with the current regulations.

The indicator that measures the operating results is shown in Graph B3.4 and corresponds to the difference between the investment profits with respect to the index for claims, commissions and expenditures. The first factor reflects financial performance and the last three refer to technical performance. The importance of showing operating results together with the results for return on investments is based on evaluating the influence of the latter. Between June 2003 and June 2011 both indicators presented a correlation in their behavior with higher volatility in the case of the indicator for return on investments.[5]

Graph B3.4
Return on Investment and Operating Results
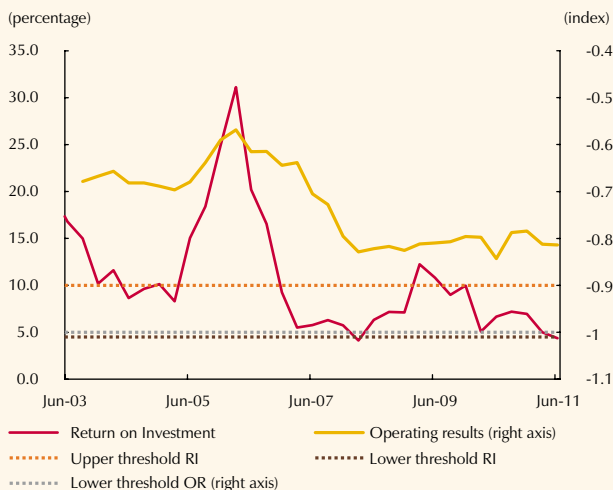
Sources: Financial Superintendency of Colombia, Banco de la Republica calculations.

As of June 2011, the operating results for the GICs corresponded to -0.8%, which is 3 bp below what had been registered for December 2010. The indicator for operating results is negative in comparison with the indicator for return on investment, which is positive in almost the entire range of analysis. Given the lower limits for this indicator, this situation could draw attention because the indicator is close to the lowest limit of -1%. Nonetheless, the trend over the last year has been to remain stable at this value. This risky situation has been the consequence of a moderate slump in the

profitability of investments over the last few months because the index for claims against policies has declined while the other indices have remained relatively stable.

Lastly, to finalize the discussion on profitability indicators, it is important to analyze the changes in the equity of a company. The companies that have gone through financial difficulties have historically experienced drastic changes in their equity as well. As has occurred in the case of changes in net purchase of insurance policies, gradual increases in equity are expected as the time goes by (Graph B3.5).

Graph B3.5
Change in equity
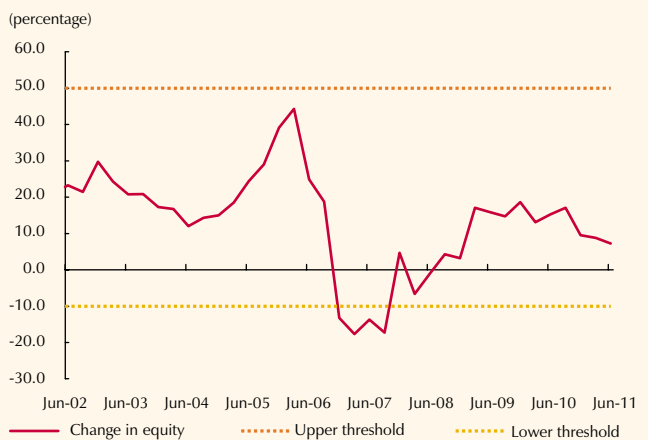
Sources: Financial Superintendency of Colombia, Banco de la Republica calculations.

Throughout the period under analysis, the values for changes in equity stayed within the international thresholds with the exception of the results for the end of 2006. This drop correlated with the decrease in the return on investments for this period, which is related to the TES devaluation.

As of June 2011, the equity registered an annual growth of 7.3%, which is 2.3 pp lower than the upswing that took place in December 2010. Since the end of last year, the growth rate for equity has shown a moderate decline. However, this is not a cause for concern because the current rates differ from the lower threshold of -10%.

3.   Liquidity indicator

Calculating the ratio between liquid liabilities and liquid assets makes it possible to explore the capacity of the insurance sector in the presence of an extreme case in which the companies must cover all of their liabilities –both short and long term liabilities— within a defined period of time when the only thing they can draw on are liquid assets. Although this scenario is almost unlikely, it is useful to estimate the coverage of liabilities with respect to most liquid assets.

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5   The rise in investment profitability above the upper limit in 2005 was explained by the liquidation of the Colombian Re-insurer (Reacol in Spanish), which was made up of the main insurance companies in the country.

Between December 2010 and June 2011, this indicator went from 95.2% to 97.6%, which suggests a larger proportion of liquid liabilities that had to be backed. In spite of the moderate increases in this indicator over the last few years, it has not yet reached the upper limit of 105%. Given the proximity of the current levels to this threshold, it is important to monitor the performance of both liquid assets and liabilities of the GICs (Graph B3.6).

In general terms, the early warning indicators for the GICs point to a positive performance of the insurance sector over the last few years. The continual monitoring of the indicators for operating results as well as the indicator for liquid liabilities/liquid assets has been emphasized while taking into account their closeness to the established thresholds. Although there has not been any crisis that jeopardizes the sustainability of the insurance industry in Colombia, it is important to continue as well as to strengthen these analyses by constantly monitoring the figures gathered in order to mitigate the effects of any potential crisis.

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Graph B3.6
Liabilities/Liquid Assets
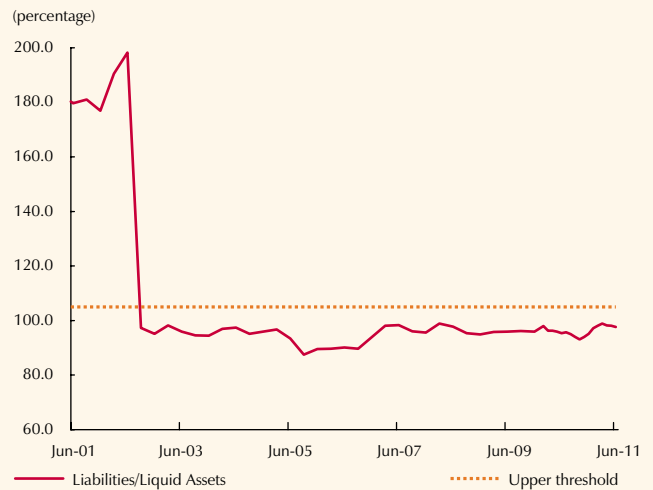
Sources: Financial Superintendency of Colombia, Banco de la Republica calculations.

Box 4
LOAN PORTFOLIO AND THE HOUSING PRICE TREND IN COLOMBIA

This box analyzes the combined dynamics of the economic growth, indebtedness, and the changes in asset prices in order to reveal potential economic and financial instability. It is important to identify situations in which there are permanent increases in asset prices resulting from an excessive level of credit associated with larger financing needs on the part of debtors.[1] Therefore, it is essential to follow up on the variables that affect the behavior and expectations of debtors in order to analyze the consequences those factors may have on their creditworthiness. This box describes the performance of credit in light of the financial deepening[2] and its trends and, at the same time, analyzes the cycles of the housing market in Colombia.

1.   Credit Market

The change in the ratio between credit and GDP is studied in this section by means of a Hodrick and Prescott (H-P) filter for the total loan portfolio as well as for the mortgage and consumer loans.[3] This makes it possible to do a descriptive analysis where the level of the series seen is compared to its respective trend.

The indicator for financial deepening (total loan portfolio/GDP) has continued its growth trend that has been caused by the surge in the total loan portfolio (a real annual 18.9%). The current levels of financial deepening (34.8%) are above those reached in the lead up to the financial crisis of the late 1990's (33.8%) which reflects the recovery that the loan portfolio has experienced since the second quarter of 2010 (Graph B4.1).

The greater deepening has been associated with the upswing in the growth of the consumer lending. The ratio of this credit to GDP shifted towards a positive gap with levels that are at their historical record for the sample (9.3%) (Graph B4.2). Also, the housing indicator shows a positive trend but its level is below what was seen in the nineties (Graph B4.3).

---

1   For greater detail about how the imbalances with high volatility in the prices of assets and credit are generated, see the Financial Stability Report for September 2007.

2   This refers to the ratio between credit and GDP.

3   The series used in the case of total loan portfolio, consumer and housing portfolios as a percentage of GDP run from December 1994 to June 2011. The GDP for June was projected by assuming an annual real 5.5% growth.

Graph B4.1
Total Loan Portfolio/GDP and its Trend
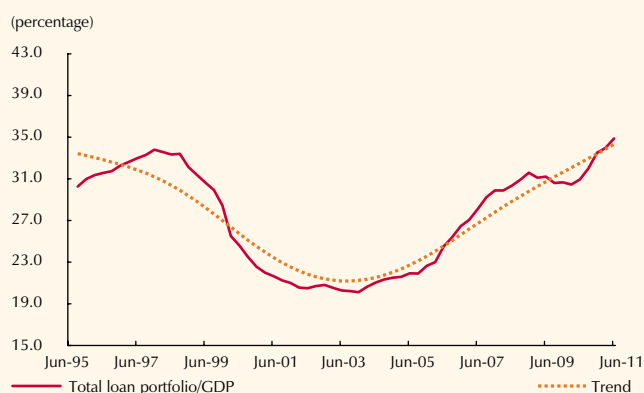
Sources: DANE and Financial Superintendency of Colombia, Banco de la República calculations.

Graph B4.2
Consumer Loan Portfolio/GDP and its Trend
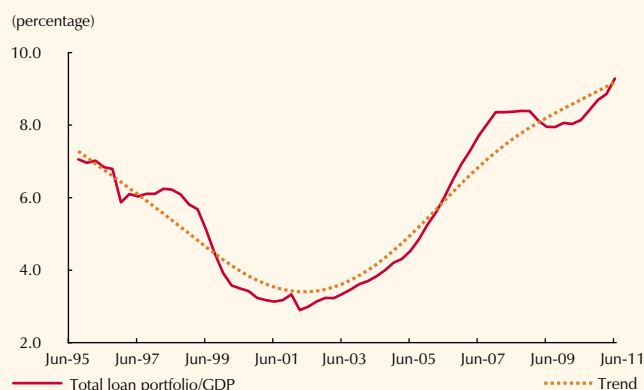
Sources: DANE and Financial Superintendency of Colombia, Banco de la República calculations.

Graph B4.3
Mortgage Loan Portfolio/GDP and its Trend
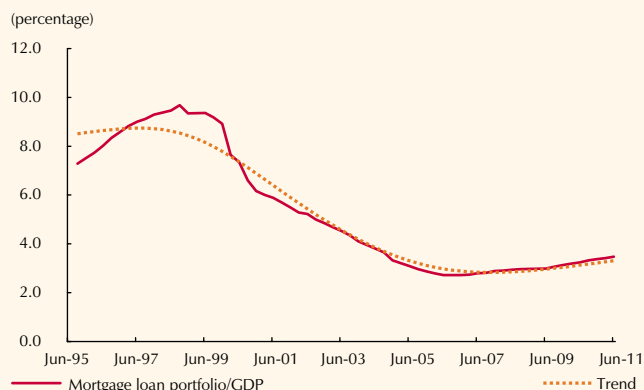
Sources: DANE and Financial Superintendency of Colombia, Banco de la República calculations.

In addition, the disbursements for housing loans have continued growing although at a slower pace compared to the levels seen in the second half of 2010. This fact explains the convergence of the indicator for disbursements relative to GDP toward its own trend. The current stabilization in the upswing of this indicator contrasts with the periods of pronounced slowdown that take place after sharp expansions in mortgage loans and signals a path of more sustainable growth (Graph B4.4).

Graph B4.4
Disbursements for the Mortgage Loan
Portfolio/GDP and Their Trend
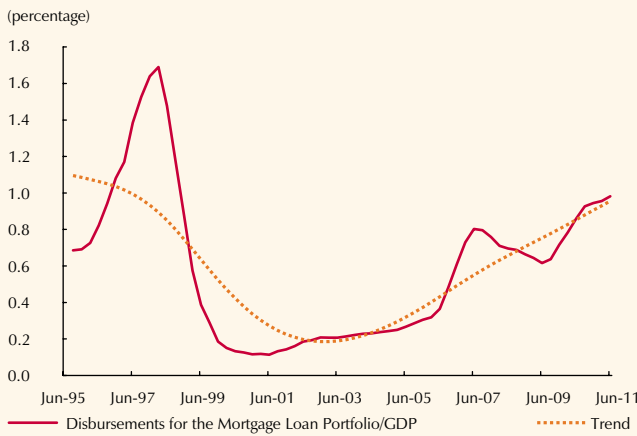
(percentage)

Sources: DANE and Financial Superintendency of Colombia, Banco de la República calculations.

2.   Housing Market

As was mentioned, it is important to analyze the change in the housing prices along with variations registered in the disbursements of mortgage loans in order to identify moments when excessive spikes occur simultaneously in these two variables.

The two indicators that are made up of the ratios between the new housing price index (NHPI) and both the rent index (RI)[4] and the construction costs index (CCI) are analyzed in Graph B4.5.[5] The goal of these indicators is to compare the trends in housing prices with the variations in profits and costs respectively. The data show that the indicators go through a similar evolution in the period analyzed and currently they are presenting a growth trend. The indicator for

4   The monthly rental for housing is regulated by the government through Act 820/2003, which forbids annual increases that are above the inflation projected by Banco de la República. This may create a distortion if a comparison is done of the index as it was before and after the enactment of that law. Particularly, the ratio of NHPI to RI tends to be lower before the legal restrictions were applied given the limits in the rental rates.

5   The cost of housing construction index does not consider the price of land but it does include the costs of both the labor and materials.

Graph B4.5
Ratio NHPI/RI and NHPI/CCI and their Trends
(index December 1999=100)

(index)
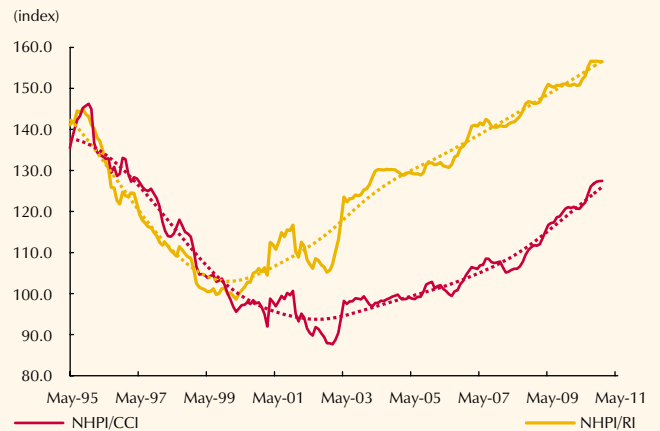
Sources: DANE and NDP, Banco de la República calculations.

new housing with respect to rent is at a historically high level. However, these have been the result of gradual increases in the prices rather than through uncontrolled growth. Also, the ratio between the NHPI and the CCI is still at levels below those registered prior to the crisis of the 1990s although it has shown a greater spike with respect to the performance of the other indicator measured since 2008.
a
With respect to the ratio between the used housing price index (UHPI) and the RI, its performance is similar to that for NHPI/RI. However, in the last four years, the UHPI has registered larger growth compared to the NHPI growth and has been at levels higher than those recorded during the mortgage crisis (Graph B4.6).

This change in housing prices may be related to the scarcity of supply in high-demand urban areas. Graph B4.7 shows a stable trend for the ratio between the prices for new and used housing and the price of land. This fact suggests that the restrictions on the supply of land have become one of the main contributors to the surge in the prices of the mortgage market. Given the fact that the UHPI, in particular, is an index built on the basis of the methodology of repeated sales,[6] the comparison of the sale of real estate property at two points in time may be influenced by the purpose behind the purchase. If the intention is to build a new house, the price may be higher compared to the price of a piece of property bought in order to live in it with no intention of making significant modifications.

It is important to emphasize that this trend in prices is not an idiosyncrasy of the Colombian market but corresponds to the interaction between the supply and demand of housing,

6   See the document "índice de precios de la vivienda usada en Colombia (IPVU)," Banco de la República, 2005.

Graph B4.6
Ratios NHPI/RI and UHPI/RI and Their Trends
(index December 1999=100)

(index)

UHPI/RI   NHPI/RI
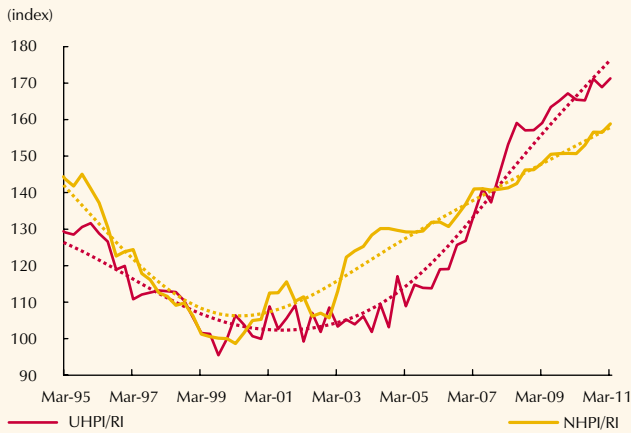
Sources: DNP and Financial Superintendency of Colombia, Banco de la República calculations.

which is usually similar in large urban centers. Given that the construction of the UHPI is restricted to an analysis of information on the three biggest cities in the country (Bogota, Medellin and Cali) and the NHPI only considers Bogota, this could be the reason for the changes in the indicators in recent years.

3.   Final Comments

The indicators of prices and credit still show an upward trend although it is lower than the one seen in the second half of 2010. The used housing indicators show the highest growth, a situation which may be associated with the market conditions for this type of housing. Despite the fact that there are signs of stabilization with regard to prices and loan disbursements, it is important to monitor their trend because the current levels are still historically high and an overvaluation of these assets may generate difficulties in the financial system in the presence of either changes in the macroeconomic scenario or variations in household expectations.

Graph B4.7

A.   Ratio NHPI to Price of Land

(index)

NHPI/Price of land   Trend
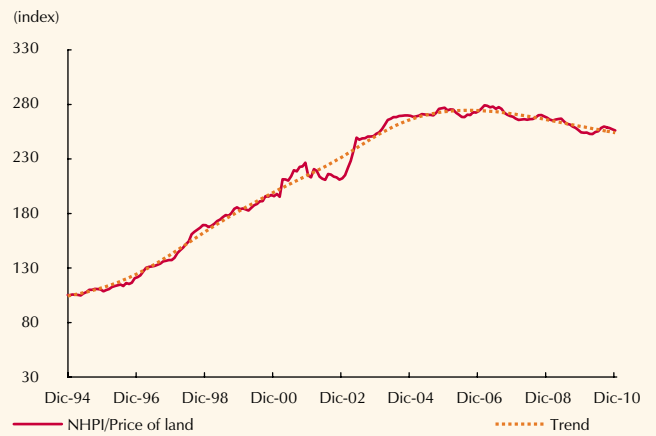
B.   Ratio UHPI to Price of Land

(index)

UHPI/Price of land   Trend
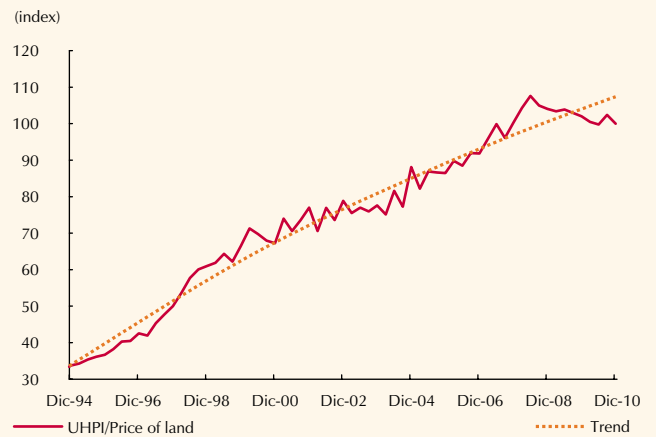
Sources: DNP, Real Estate Association of Bogota, Banco de la República calculations.

III. CURRENT SITUATION AND OUTLOOK FOR FINANCIAL SYSTEM DEBTORS

The level of household indebtedness continues to rise driven primarily by the growth of consumer lending, which was accompanied by negative changes in the non-performing loan portfolio. The real prices for housing are still showing an upward trend although one that is lower than the mortgage debt. Upswings are also now being seen in the household financial burden as a result of the expansion of the consumer loan portfolio.

A. CORPORATE SECTOR

Analyzing the trend of the performance and leveraging indicators for businesses is vitally important for maintaining financial stability due to the fact that a large part of the financial system assets is accounted for by these companies. The loans and securities of the private corporate sector represented 46% of the total credit establishment assets in June 2011.

Analysis is presented in this section based on the accounting information reported to the Superintendency of Corporate Affairs. Due to the frequency with which the information is collected, the figures correspond to the ones for the financial position in December 2010.

The indicators examined seek to describe the indebtedness of the companies as well as their creditworthiness. Among these are the indicators of indebtedness, profitability and liquidity. These have been identified as determiners of the financial fragility of Colombian companies.[31]

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31 Oscar Martínez (2003). "Determinantes de fragilidad de las empresas colombianas," in Borradores de Economía, No. 259, Banco de la República.
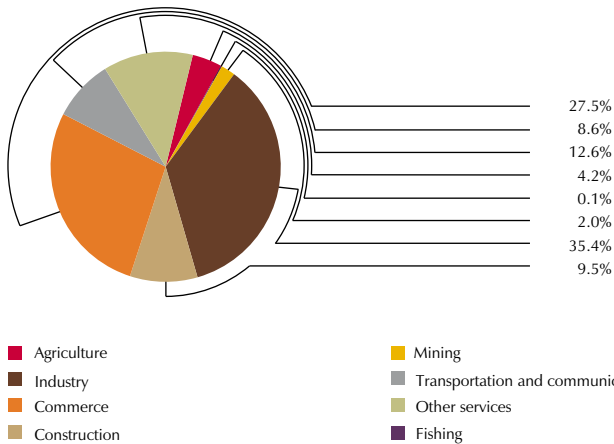
27.5%
8.6%
12.6%
4.2%
0.1%
2.0%
35.4%
9.5%

■ Agriculture   ■ Mining
■ Industry   ■ Transportation and communic
■ Commerce   ■ Other services
■ Construction   ■ Fishing

Sources: Financial Superintendency of Colombia and Superintendency of Corporate Affairs, Banco de la República calculations.

Graph 59
ROA (before-tax profits/total assets)

(percentage)

Source: Superintendency of Corporate Affairs, Banco de la República calculations.

1. Description of the Sample

An average of 16,900 companies reported their financial position to the Superintendency of Corporate Affairs between 1998-2010. These belonged to the productive sector of the economy and, as of December 2010, accounted for 52% of the commercial loan portfolio of the private corporate sector.

The analysis that will be done in this section will take the division between companies that are producers of tradable and non-tradable goods[32] and the economic sector within each group as the point of reference. Thus, it is necessary to establish the importance of each sector within the commercial loan portfolio identified.[33] Graph 58 shows the sector breakdown and there it can be seen that the manufacturing industry and commerce have the largest share with 35.4% and 27.5% respectively.

2. Dynamics of the Private Corporate Sector[34]

The economic recovery that has been seen since 2010 and the recovery in the growth of the commercial loan portfolio were reflected in the company performance and leveraging indicators with an uptick in profit, and total and financial indebtedness. It is worth noting that this performance was different in all of the economic sectors.

When the return on an asset (ROA) is examined –the ratio between the pretax profit and total assets– a general drop is seen for the companies in the tradable and non-tradable sectors. The above translates into a 54 bp reduction in the ROA for the total sample, which went from 6% in December of 2009 to 5.5% in the same month in 2010 (Graph 59). Note that, unlike 2009, the decline in the ROA did not occur as a result of a drop in profit but rather due to its lower growth (a real annual

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32   The companies that produce tradable goods are those that belong to the agricultural, fishing, mining and quarrying, and manufacturing industry sectors. The non-tradable producers are in the rest of the sectors.

33   As was mentioned, the Superintendency of Corporate Affairs compiles information on 52% of the private corporate sector commercial loan portfolio. The rest pertains to the loan portfolio belonging to companies that are not required to report to that entity.

34   In this section, the sample of companies used is made up of those that reported information in the 1998-2010 period.

1.6%) with respect to the assets (10.2%). Within the latter, the rise in long term investments (15.2%) and in investments in property, plant, and equipment (3.2%) (Table 5) stands out.

When the ROA is analyzed by sector, one sees that the producers of non-tradable goods saw their return decline as it went from 5.5% to 5.1% between December 2009 and the same month in 2010. As was mentioned, the drop in this indicator was associated with a greater upswing in assets in comparison to profit. Within this group, the ones that presented more profitability were the commercial companies (6.8%) (Table 6).

Likewise, the profitability of companies that are producers of tradable goods fell from 6.8% to 6.1% in this period. However, the decline was found to be the result of a decline in profits and, specifically, the result of a more than proportional rise in the sales costs (6%). Within this group of companies, those that belong to the mining sector showed the highest level of profitability (13.3%) and the ones in the fishing sector the lowest (-4.4%) (Table 6).

Contrasting this performance with what was seen for the indebtedness ratios (Graph 60), one sees that the companies that produce tradable goods are the most profitable and the most indebted.

The ratio of total indebtedness –defined as the proportion between liabilities and total assets– measures the degree of leveraging a company has. Thus, the higher this indicator is, the larger the amount in funds the firm will have to allocate to servicing the debt. As of December 2010, this indicator was at 36.8%, a figure that is slightly above what was seen a year ago. When this is analyzed by economic sector, this indicator was found to have risen for the tradable goods companies and fallen for the non-tradables and was at 38.5% and 35.6% respectively (Graph 60).

With respect to the ratio of financial indebtedness, that is, that which is only held with credit establishments, this registered an uptick in the indicator as it went from 11.9% in 2009 to 12.7% a year later (Graph 61, and Table 6). The above is consistent with the recovery that the commercial loan portfolio experienced in 2010 and with the higher demand for loans that the banks have seen since the second half of this year.

Going by economic sector, it can be seen that the fishing sector has the highest degree of leveraging with financial institutions (28.7%) followed by transportation and communications (24.8%) (Table 6). It should be emphasized that these sectors show a profitability that is lower than what is seen for the total sample. Their ROA are -4.4% and 2.9% respectively.

As can be seen in Graph 62, financial indebtedness continues to be mostly denominated in pesos (84%). The composition by maturity shows that the amount accounted for by long term financial obligations (liabilities at more than one year)

Table 5
General Balance: Productive Private Sector (Total Sample - 17,720 Companies)

	Trillions of December 2010 pesos			Rate of Growth (percentage)		Share (percentage)	
	2008	2009	2010	2009	2010	2009	2010
Assets							
Current assets	**175.4**	**162.0**	**170.9**	**(7.6)**	**5.5**	**33**	**31**
Available Funds	12.3	13.0	15.6	5.8	20.3	3	3
Investments	17.3	14.1	16.2	(18.5)	14.7	3	3
Debtors	91.2	86.3	89.0	(5.3)	3.1	17	16
Inventory	51.9	46.2	47.8	(11.0)	3.6	9	9
Deferred Assets	2.7	2.4	2.2	(9.8)	(10.2)	0	0
Non-current Assets	**289.1**	**335.7**	**377.8**	**16.1**	**12.6**	**67**	**69**
Investments	80.9	101.3	116.8	25.2	15.2	20	21
Debtors	9.6	10.9	9.9	14.2	(8.9)	2	2
Property, Plant and Equipment	82.1	86.6	89.6	5.6	3.5	17	16
Intangibles	16.6	19.1	19.9	15.4	4.2	4	4
Deferred	13.8	15.4	16.7	11.1	9.0	3	3
Other Assets	0.9	0.7	0.8	(19.8)	9.5	0	0
Valuations	85.3	101.6	124.0	19.1	22.1	20	23
Total Liabilities	**464.5**	**497.7**	**548.7**	**7.1**	**10.2**	**100**	**100**
Pasivo							
Current Liabilities	**129.6**	**113.9**	**127.6**	**(12.1)**	**11.9**	**66**	**66**
Financial Liabilities	39.4	30.0	32.5	(23.8)	8.1	17	17
Suppliers	34.2	31.9	35.0	(6.6)	9.6	19	18
Accounts Payable	26.1	23.9	28.1	(8.4)	17.7	14	15
Bonds and Commercial Paper	0.8	1.0	0.9	26.8	(8.9)	1	0
Other Liabilities	29.2	27.2	31.1	(6.8)	14.6	16	16
Non-current Liabilities	**52.6**	**58.5**	**66.2**	**11.2**	**13.1**	**34**	**34**
Financial Liabilities	26.9	27.0	34.6	0.4	28.1	16	18
Suppliers	1.1	1.3	1.3	17.0	1.4	1	1
Accounts Payable	7.8	11.1	10.6	42.2	(4.1)	6	5
Bonds and Commercial Paper	5.7	7.2	7.1	25.7	(1.0)	4	4
Other Liabilities	11.1	11.9	12.5	7.6	5.0	7	6
Total Liabilities	**182.2**	**172.5**	**193.8**	**(5.3)**	**12.3**	**100**	**100**
Total Equity							
Equity Capital	12.5	15.1	20.2	20.5	34.3	5	6
Surplus Capital	58.4	71.8	82.6	22.8	15.1	22	23
Reserves	35.4	42.3	46.2	19.5	9.4	13	13
Equity Revaluation	54.2	51.9	47.5	(4.2)	(8.6)	16	13
Dividends	0.0	0.1	0.0	226.1	(64.5)	0	0
Results from the Accounting Period	23.7	23.2	23.5	(2.3)	1.6	7	7
Results from the Previous Accounting Period	12.0	18.7	9.9	56.6	(47.1)	6	3
Valuation Surplus	86.0	102.2	124.8	18.8	22.2	31	35
Total Equity	**282.3**	**325.2**	**354.9**	**15.2**	**9.1**	**100**	**100**

Source: Superintendency of Corporate Affairs, Banco de la República calculations.

Table 6
Corporate Sector Financial Indicators [a/]
(percentage)

Economic Sector	ROA	Financial Indebtedness	Liquidity
Agriculture	↓ 1.6	↑ 16.0	↓ 116.5
Fishing	↑ (4.4)	↑ 28.7	↓ 91.2
Mining	↓ 13.3	↑ 5.6	↓ 104.4
Industry	↓ 4.7	↑ 14.7	↓ 136.9
Construction	↓ 4.7	↑ 17.9	↓ 159.2
Commerce	↑ 6.8	↑ 19.5	↓ 136.6
Transportation and Communications	↓ 2.9	↑ 24.8	↓ 78.3
Other Services	↓ 4.8	↑ 5.8	↑ 145.3
Total Sample	5.5	12.7	131.9

a/ The arrows correspond to the direction the indicators changed to with respect to a year ago.
Source: Superintendency of Corporate Affairs, Banco de la República calculations.

Graph 60
Total Indebtedness (total liabilities/total assets)
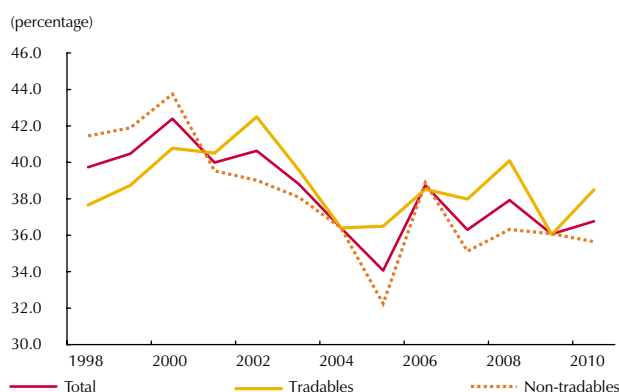
Source: Superintendency of Corporate Affairs, Banco de la República calculations.

Graph 61
Financial Indebtedness (financial liabilities/total assets)

Source: Superintendency of Corporate Affairs, Banco de la República calculations.

has increased. In 2008-2009, they went from 41% to 48% and reached 50% in December 2010.

When this same analysis was done by economic sector in 2010, it could be seen that the great majority divided their financial debt equally between short and long term debt. The exceptions were agriculture and transportation and communications for which the short term debt was only 38% and 20% respectively. By type of currency, transportation and communications is the sector with the highest percentage of external financial debt as it represents 36% of that sector's total liabilities. For the rest of the sectors, debt in pesos makes up more than 80% of the total (Graph 63).

Last of all, the liquidity indicator –measured as the ratio between current assets and liabilities– remains at high levels. In fact, it was at 132% (in other words, the current assets were 1.32 times the current liabilities) for December 2010. This shows that the companies are able to cover the short term liabilities with their most liquid assets (Graph 64 and Table 6). Note that in 2010, this indicator fell 8 pp due to the more than proportional upswing in current liabilities (12%) with respect to current assets (5.5%). The rise in accounts payable (real annual 17.7%) and debts with suppliers (9.6%) stand out in particular (Table 5).

Graph 62
Indebtedness by Currency and Term

(percentage)

Source: Superintendency of Corporate Affairs, Banco de la República calculations.
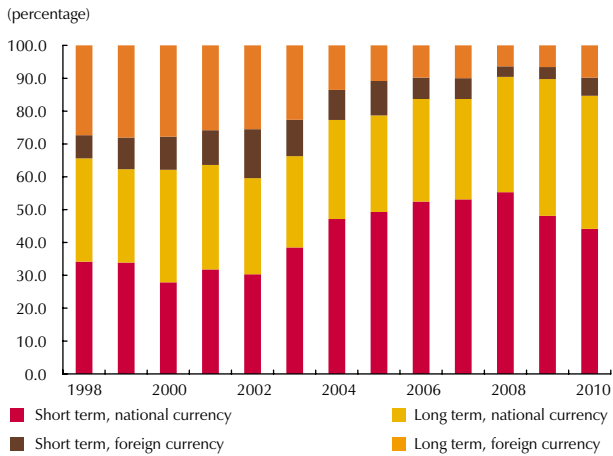
Graph 63
Indebtedness by Currency and Term: Sectors in December 2010

(percentage)

Source: Superintendency of Corporate Affairs, Banco de la República calculations.
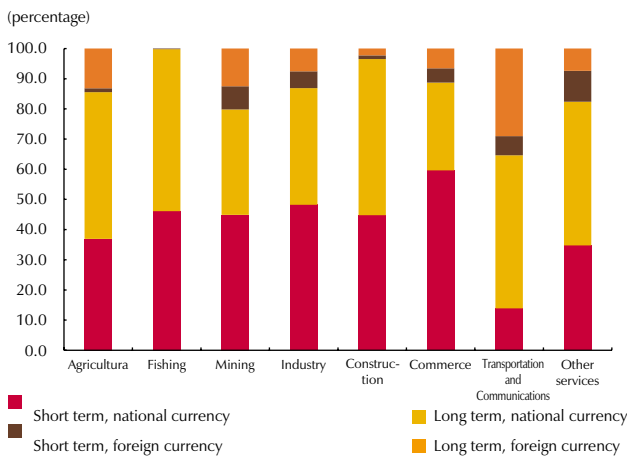
Graph 64
Current Liquidity (current assets/current liabilities)

(percentage)

Source: Superintendency of Corporate Affairs, Banco de la República calculations.

In conclusion, the indicator of performance and leveraging shows that the companies are maintaining favorable levels of profitability as well as moderate indebtedness. One thing that should be clarified is that although the fishing sector showed a negative profit and leveraging that was above that of the sample, this sector is only 0.1%, equivalent to COP$80 b, of the commercial loan portfolio identified.

3. Businessmen's Expectations

According to the survey of businessmen's expectations done by the Banco de la República in June of this year, those surveyed expect the growth of the economy in 2011 to be within a range of 4.4% and 5.2%. This result is higher than what was expressed in the survey done in March of this year (3.9% and 4.7%) (Graph 65). Regarding 2012, the businessmen predict that the economy will grow between 4.5% and 5.4%.

Based on the Fedesarrollo survey of business owner opinion (EOE in Spanish) done in June 2011, the responses regarding expectations for the economic situation in six months were optimistic on balance with a slight uptick in the number of those surveyed who expect the situation to be favorable. The balance[35] of the answers went from 33.7% to 34.2% between May

Graph 65
Expected Growth of the GDP

(percentage)

Source: Banco de la República.

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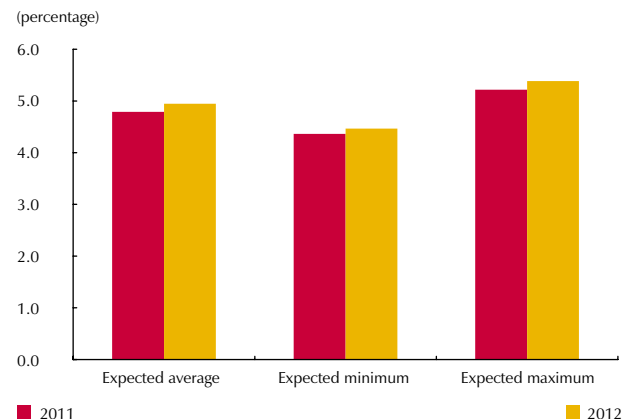
35 The difference between the percentage of those surveyed who said the situation would be favorable and the percentage who thought it would get worse.

Graph 66
Business Expectations Regarding the Economic Situation

(index)
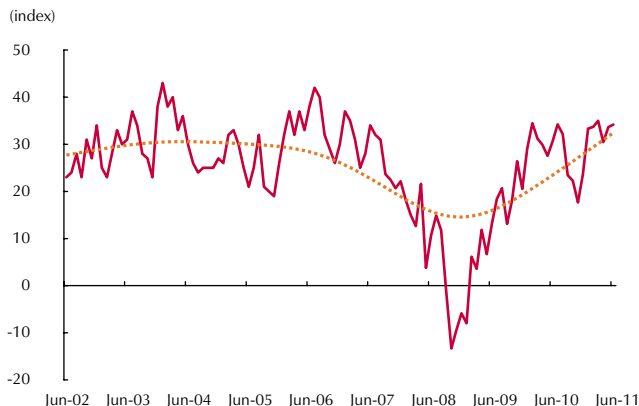
Source: Fedesarrollo.

and June. This growth trend in the indicator has been seen since the last part of 2010 (Graph 66).

According to the EOIC survey done by ANDI in June 2011, the installed capacity was 77.2%, which continues the positive trend presented so far this year. Among the main obstacles that businesses face is the change in the exchange rate (18% of those surveyed), the rise in the cost of raw materials (16%), and low demand (11%).

Finally, according to the Banco de la República survey of economic expectations, 82% of those questioned stated that liquidity was at high levels. This perception has climbed and remained at levels that are above 70% since the last quarter of 2010. Regarding the availability of credit, 89% of those surveyed consider access to financing easy. Nevertheless, the expectations for liquidity and availability of loans for the next six months show that a high proportion of the agents expect liquidity and lending to decline.

B. HOUSEHOLDS

The combined performance of consumer and housing loans as well as how these relate to the changes in prices for housing and the household financial burden are analyzed in this section. Furthermore, different indices of the expectations, confidence and economic conditions of these agents are examined in order to understand their current financial situation and their future outlook.

1. Household Indebtedness

The level of indebtedness for households –defined as the total housing and consumer loans to GDP– is still showing a positive trend and was at close to 12.8% as of June 2011. This rise is driven particularly by the greater strength of consumer loans over the course of this year (Graph 67). In spite of the fact that indebtedness continues growing, this level remains below what was seen in the third quarter of 1998 (15.8%). However, in contrast with what happened in the '90s, this strength is mainly linked to the performance of consumer loans.

Like the above, the consumer loan portfolio continues growing with respect to the housing loan portfolio after the declining trend that it had been going through since the last part of 2008. This type of loan represented 72.8% of total household indebtedness in June 2011. For this period, the level of indebtedness came to COP$73.5 t, a figure that is higher than the maximum registered in the '90s and that was seen in September of 1998 (COP$53.7 t at constant June 2011 prices). The performance of the consumer loan portfolio emphasized the growth of
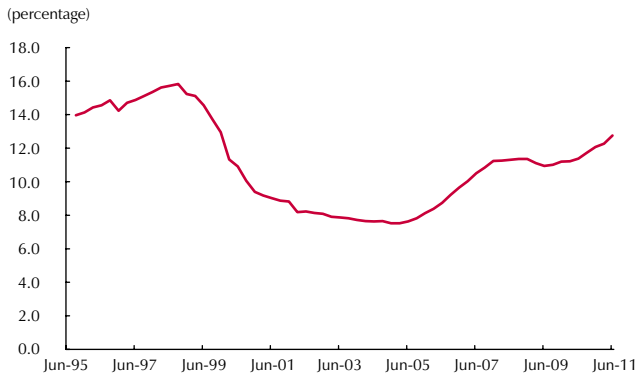
(percentage)

(trillions of June 2011 pesos)   (percentage)

■ Consumer   ■ Housing
— Real annual growth of indebtedness (right axis)

(January 1994 = 100)   (January 1994 = 100)
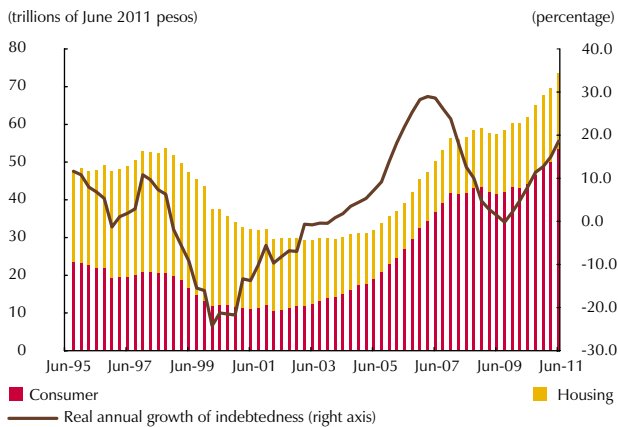
— Loan Portfolio/ Housing prices   — Real NHPI (right axis)

both (housing and consumption), which reached a real annual rate of 18.6% in June 2011 compared to the 12.7% reported six months before. The current structure of household debt exposes the financial system to a higher risk in terms of loss as a result of default due to the more limited collateral that consumer loans demand in comparison to the housing ones (Graph 68).

In the case of the housing loan portfolio, the disbursements denominated in pesos continue to have a larger share (95.2%) compared to those in UVR. This phenomenon has been in existence since mid-2006 and implies that the credit institutions are more exposed to interest rate risk given the fact that deposit rates can vary while the lending rates remain fixed.

The ratio between the index of mortgage debt and the index of new housing prices (NHPI) continued to show a growth trend and was at a level of 126 p. This level is lower than the ones registered in the lead up to the crisis at the end of the '90s. Comparing that situation with the current indicators, the variables that the index is made up of show less growth than what occurred in the last decade of the past century. In fact, between January 1995 and September 1998, the housing loans and NHPI registered, on average, nominal annual rises of 38% and 13% respectively. In contrast, during the last three years, the levels for these two items have been 14.5% and 7.8% respectively (Graph 69).

The ratio of the NHPI and CPI, in turn, has maintained a positive trend, one that has been seen since the beginning of 2003. Currently the growth rate for the NHPI is approximately double that of the CPI.

Also, since June 2011, there has been a decline in the loan to value (LTV) gap –the ratio between the value of the disbursements and the value of the collateral– for the two types of housing loans (low-income housing [LIH] and non-LIH). In March 2011, the LIH indicator was at 53.7%, which is a 2.7 pp reduction in comparison to what was seen a year ago. The LTV for housing other than LIH went from 48.4% in March 2010 to 49.1% for the same month in 2011 (Graph 70).

Household consumption, in turn, continued rising as it reached a real annual growth rate of 6.3% in the
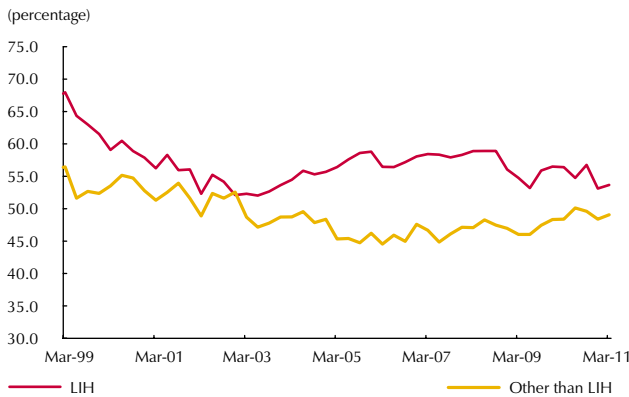
(percentage)

Sources: Asobancaria, Banco de la República calculations.

(percentage)
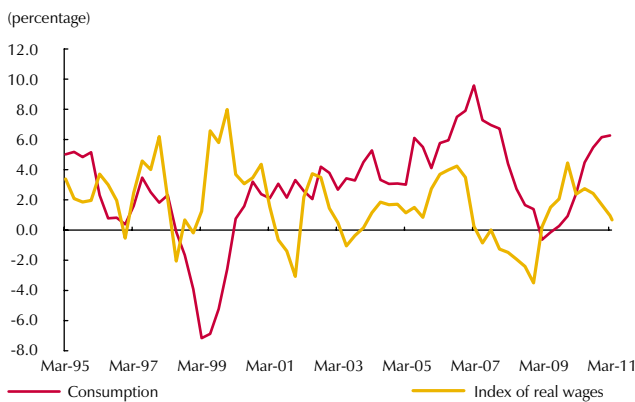
Sources: DANE, Banco de la República calculations.

(percentage)
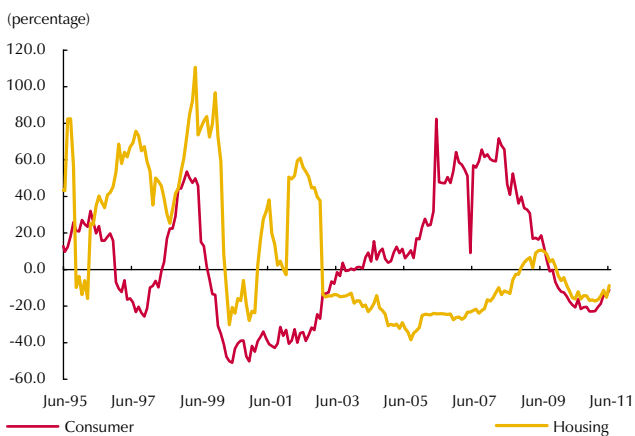
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

first half of 2011. The trend of consumption is consistent with the change in the loan portfolio for this type of credit. In contrast, a slowdown has been seen in the trend of the real wage index, which is associated with the performance that inflation has been showing (Graph 71).

With respect to default on payments, the dynamics of the non-performing loan portfolio shows a favorable performance for both the consumer and housing loan portfolios. Both loan portfolios have shown negative rates of growth since the end of 2009. The non-performing portfolio for consumer loans showed a real annual 11.1% drop in June 2011 while the one for housing registered a -8.7% rate at the same time. Nevertheless, a change in the trend of negative changes for the non-performing loan portfolio has been seen for the two types of loans since February 2011 (Graph 72).

2. Household Financial Burden

In the first half of 2011, the indicator for household financial burden (HFB)[36] presented a slight uptick with respect to what was seen in 2010. The HFB was at 15.4% in June 2011, which means a 53 bp rise compared to what was registered six months before (14.9%) (Graph 73). This performance is due to the upswing in debt repayment as a result of the stronger growth of the loan portfolio so far in 2011. The financial burden indicator, in turn, which excludes debt repayment, showed a decline as it went from 5.2% in December 2010 to 4.6% six months later due to a drop in payments on interest.

36 This indicator was slightly modified from the one that had been used for estimates until June 2009. It is defined as the interest payment (with monetary correction) and payments against principal associated with the consumer and housing loan portfolios and divided by employee wages. The 2005 base series was used to determine the increase in remuneration paid to employees as reported by DANE since the previous Financial Stability Report. Before that date, the increase in wages during 1994-1999 was estimated by using the growth registered in this period associated with the new base. Remuneration for 2010 and 2011 was projected using the increases in the real wage index for the manufacturing industry.

Graph 73
Household Financial Burden
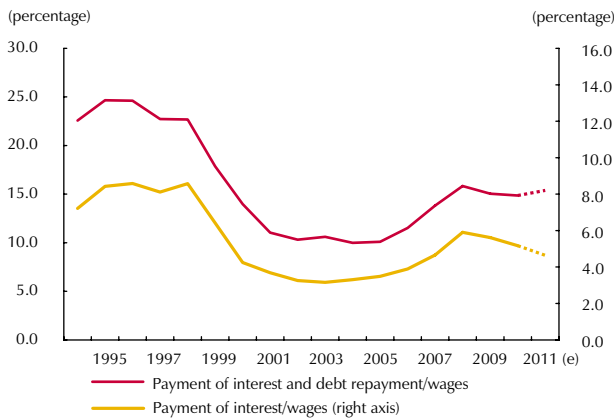
(e) estimated.
Sources: Financial Superintendency of Colombia and DANE, Banco de la República calculations.

Graph 74
Household Financial Burden (including debt repayment)
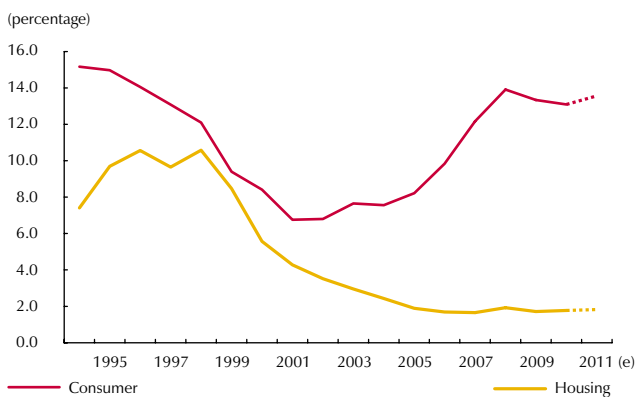
(e) estimated.
Sources: Financial Superintendency of Colombia and DANE, Banco de la República calculations.

When the components of the financial burden are separated by type, it can be seen that the rise in this burden for households is primarily due to the increase in debt servicing for consumer loans which went from 13.1% of earnings in December 2010 to 13.6% in June of this year (Graph 74). The indicator for the housing loan portfolio, which was at 1.8% in June 2011, did not have any change during that same period.

Another type of indicator for household financial burden can be built as follows:

$$financial\ burden = \frac{real\ component\ of\ interest\ paid}{wages}$$

The numerator reflects the outlays for interest but only in what concerns the real component of the interest. It does not include the inflationary component since that is not an expenditure but a payment on capital since it compensates for the loss of the nominal balance sheet value of the debt over time. That payment maintains the debt in real terms and leaves household wealth unaltered. That is the reason amortization is not included. Therefore, this indicator measures that portion of the household financial expenditure that reduces their wealth.

In the first six months of 2011, this indicator continued to show the declining trend that it had been presenting since 2009. In fact, at the end of the first half of 2011, it was at 4.0%, which represents a drop of 68 bp compared to what was seen at the end of 2010 (4.7%) (Graph 75). This trend is especially due to a decrease in the payments on interest and higher inflation in comparison to what was registered in December 2010.

The upswing in the HFB is in line with the perception that the credit institutions have of the household financial situation. Based on the results in the June 2011 Report on the Credit Situation in Colombia (RSCC in Spanish), the main reason why banks are not granting a larger number of loans to households is the creditworthiness of the existing clients.

Graph 76 presents the financial burden indicators for Colombia (CFID in Spanish) and the United States (DSR) calculated as the ratio between payments against capital plus the interest payments of the consumer and housing loan portfolios and available income. In the case of CFID, one sees that there has been a slight rise in the indicator, which was at 7.3% at the end of the first half of 2011. However, its

Graph 75
Household Financial Burden: Real
Component of Interest/Wages
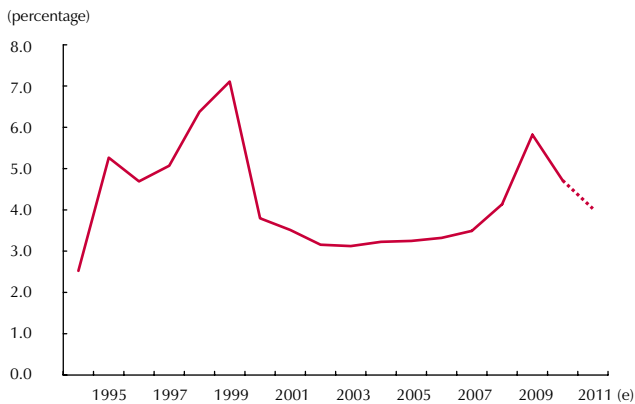
(percentage)

(e) estimated.
Sources: Financial Superintendency of Colombia and DANE, Banco de la República
calculations.

Graph 76
Financial Burden for Colombia and United States
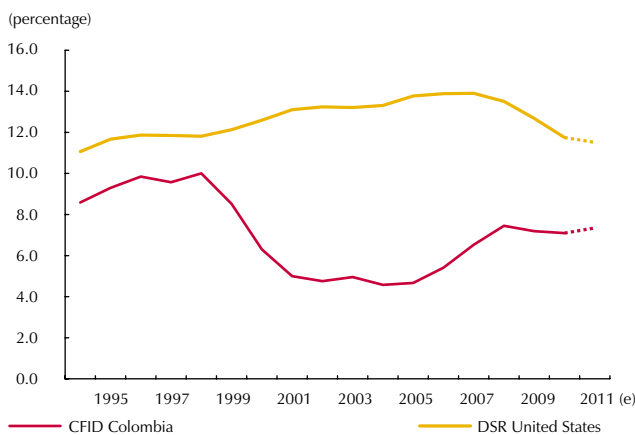
(percentage)

CFID Colombia   DSR United States

(e) estimated.
Sources: Financial Superintendency of Colombia and DANE, Banco de la República
calculations.

level remains below what was registered during the crisis at the end of the '90s (10%). The DSR, in turn, continued to decline and was at a level of 11.5% in June 2011. This figure is considerably lower than the one registered before the international crisis of 2008-2009 (13.9%).

3. Outlook

In the first half of 2011, the favorable performance of the expectation indicators for households was evident. The consumer expectation index (CEI)[37] held to its positive trend and was at 30.1 p in July of 2011. This figure is 7 p higher than what was registered at the end of 2010 (Graph 77). The economic condition indicator (ECI)[38] saw a similar trend as it reached a level of 23.6 p in July of this year. This represents a significant improvement with respect to what was seen in December 2010 (7.1 p). If the evolution of these indicators continues, both household consumption and the consumer loan portfolio can be expected to continue growing over the next few months.

Furthermore, the change in indicators of intention to purchase a house and durable goods and the trend for these show the better expectations that households have with respect to the state of the economy (Graph 78). The index of intention to purchase a house went from 23.0 p in December 2010 to 39.3 p seven months later. Also, the index of intention to purchase durable goods reached a level of 32.2 p, a result that is considerably better than what had been seen at the end of 2010 (11.2 p).

Finally, according to the RSCC for June 2011, it can be seen that a majority of the banks kept their requirements for granting new loans the same. However, some entities have begun to raise their requirements in order to make a more careful selection of clients during the expansionary cycle for loans. In spite of this, the

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37 This is constructed on the basis of the following questions: Do you believe that your household economic situation will be better, worse, or remain the same a year from now? Do you believe that economically the situation will be good or bad over the next 12 months? Do you believe that economic conditions in Colombia will be better or worse in a year compared to the present?

38 This is built on the basis of the following questions: Do you believe your household better or worse off economically than it was a year ago? Do you believe that this is a good time to purchase major items such as furniture or electrical appliances?

A. Growth of Household Consumption and Consumer Expectation Index

(points) (percentage)

Jul-02 Jul-03 Jul-04 Jul-05 Jul-06 Jul-07 Jul-08 Jul-09 Jul-10 Jul-11

— Index of Consumer Expectations   ⋯⋯ CEI trend
— Growth of Annual Consumption (right axis)
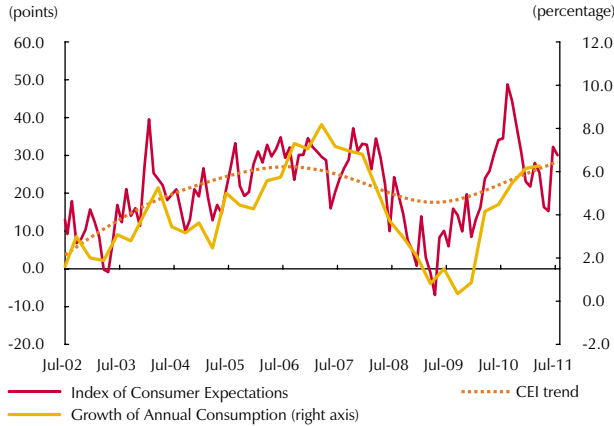
B. Growth of Household Consumption and Consumer Economic Condition Index
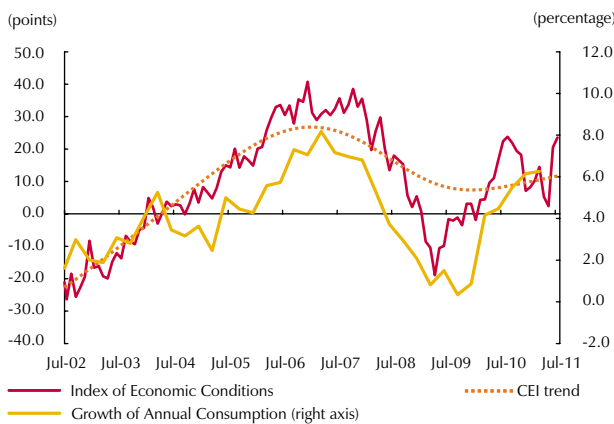
(points) (percentage)

Jul-02 Jul-03 Jul-04 Jul-05 Jul-06 Jul-07 Jul-08 Jul-09 Jul-10 Jul-11

— Index of Economic Conditions   ⋯⋯ CEI trend
— Growth of Annual Consumption (right axis)

Sources: Fedesarrollo and DANE, Banco de la República calculations.

(basis points)

Jul-02 Jul-03 Jul-04 Jul-05 Jul-06 Jul-07 Jul-08 Jul-09 Jul-10 Jul-11

— Index of intention to purchase housing   ⋯⋯ IIPH trend
— Index of intention to purchase durable goods   ⋯⋯ IIDG trend
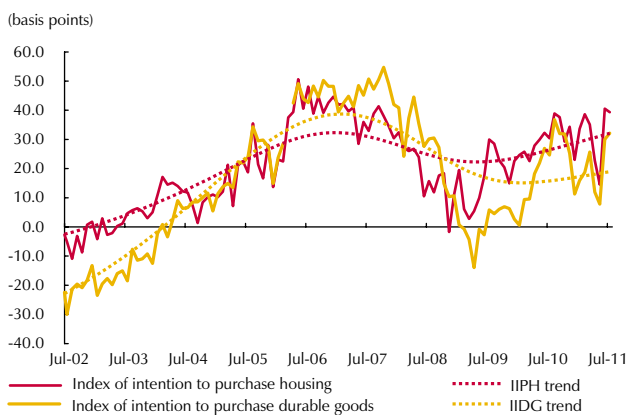
Source: Fedesarrollo and DANE, Banco de la República calculations.

banks have indicated that in a scenario of excess resources, they would be willing to grant a larger number of consumer loans (Graph 79).

In conclusion, an upsurge in household indebtedness, especially in consumer loans has been seen. This was accompanied by negative growth rates for the non-performing loan portfolio. Likewise, rises are starting to be registered in the household financial burden as a result of the expansion of the consumer loan portfolio. The expectation indicators, in turn, present a positive balance as a result of which the strength of this sector can be expected to continue over the next few months.

C. NON-FINANCIAL PUBLIC SECTOR (NFPS)

1. Fiscal Balance

To write this section, information was drawn from the Financial Plan[39] and the Mid-term Fiscal Framework[40] written by the Ministry of the Treasury and Public Credit. In the reports, the numbers from 2010 are con-

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39   The Fiscal Policy Board (Confis), Revision: Financial Plan 2011, March. This version of the document includes the projections for expenditures to support the victims of the winter flooding.

40   The Mid-term Fiscal Framework, 2011 written in June presents the 2010 balance sheet and the outlook for 2011. It also includes the Financial Plan for 2012.

(percentage)

Jun-08 Dic-08 Jun-09 Dic-09 Jun-10 Dic-10 Jun-11

■ Has risen   ■ Has declined   ■ Has remained the same
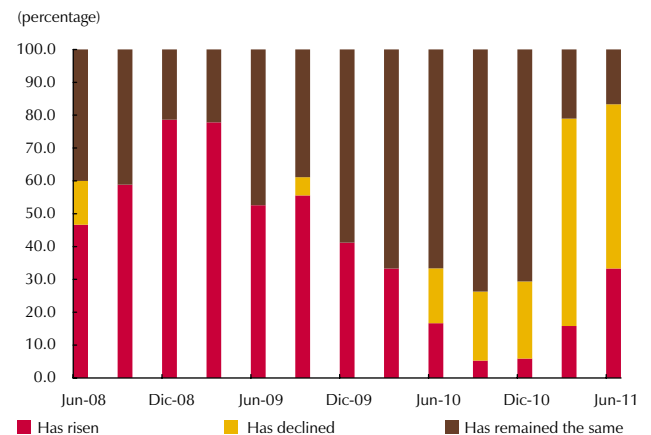
Sources: Fedesarrollo and DANE, Banco de la República calculations.

solidated and projections for 2011 and 2012 are presented. The calculations take into account the costs of the emergencies caused by the winter weather and also consider the effects of the new fiscal framework based on the legislative acts regarding fiscal sustainability – the one on royalties and the adoption of a fiscal rule.

According to the closing data, the NFPS deficit in 2010 came to 3.1% of the GDP (COP$16.9 t) thus exhibiting a deterioration of 0.7 pp compared to the deficit registered in 2009 (2.4%). With respect to that, it should be emphasized that unlike what was seen in 2009, the NFPS balance sheet for 2010 includes the extraordinary costs of the emergency due to the winter weather, which were close to COP$1 t. In spite of this situation, the NFPS fiscal closing balance for 2010 was much better than expected. This was the consequence of the careful management of the budget due to the lower revenue that was initially expected but that was higher in the end.

For 2011, a 3.5% deficit is expected for the NFPS, which will be higher than the one in 2010. This is mainly a consequence of the greater expenditures allocated to cover the losses generated by the winter weather, which will come to 0.4% of the GDP[41] for the current year. The balance sheet of the central national government (NG) is the one that reflects this higher expenditure and is the reason the government's deficit will deteriorate by 0.4% of the GDP. Thus, the NG deficit excluding the winter emergency will reach a level of 3.6% of the GDP while with the emergency included it comes to 4.0% (Table 7).

The projections for 2011 show a significant recovery in NG revenue given the higher tax collection[42] and, to a lesser degree, the higher income from capital and special funds. Nevertheless, the fiscal balance will be affected because of the increase in outlays due to the higher payments on interest and greater level of investment[43] the government will make to drive five strategic sectors (called the engines). Furthermore, the decentralized sector will reduce its surplus by 0.2% of the GDP thus contributing to the higher NFPS deficit projected for 2011.

As was mentioned in the previous edition of the Financial Stability Report, the sources for financing the winter emergency costs will come from a surcharge on the equity tax and broadening the base for that tax as well as a portion of the duty on financial transactions. For more long term projects, a part of the shares of

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41   The NFPS balance would have been much better if it had not been necessary to incur additional outlays because of winter weather. Without the emergency costs, the NFPS deficit would have been 3.1% and the NG deficit would have been 3.6% for 2011. Furthermore, the NG fiscal balance for 2010 given in this edition declined 0.2% of the GDP, the amount that was designated to cover part of the cost of winter flooding during the same year.

42   The higher tax revenue is not only the result of the greater dynamism of the economy but also the tax measures taken in 2009 and 2010 (Act 1370/2009 [tax adjustment], Act 1393/2009, and Act 1430/2010 [tax norms for control and competitiveness]).

43   Additional resources of close to COP$2 t (0.3% of the GDP) included in 2010 to push the five strategic sectors called "engines" (infrastructure, housing, agriculture, mining, and technological innovation).

Table 7
Fiscal Balance: Non-financial Public Sector

	Trillions of pesos		Percentage of the GDP	
	2010	2011[a/]	2010	2011[a/]
Balance (including emergency)				
1. Non-financial public sector	(16.9)	(20.9)	(3.1)	(3.5)
1.1 Central National Government	(21.0)	(24.0)	(3.8)	(4.0)
1.2 Decentralized sector	4.1	3.1	0.7	0.5
Balance excluding emergency				
1. Non-financial public sector	(16.0)	(18.5)	(2.9)	(3.1)
1.1 Central National Government	(20.2)	(21.8)	(3.7)	(3.6)
1.2 Decentralized sector	4.2	3.3	0.8	0.5

a/ These data correspond to the Medium-Term Fiscal Framework, 2011, last updated in June 2011.
Source: Ministry of the Treasury and Public Debt (Confis).

Ecopetrol held by the State will be sold in order to avoid the serious consequences of a winter like the ones experienced during the past year.[44]

2.   Trend of the Debt and Creditworthiness

In June 2011, a lower rate of growth for public debt in comparison to the immediately preceding two years (3.6% as of June 2011 vs. 7.8% and 16.6% in June 2010 and 2009 respectively) can still be seen. So far this year in fact, a lower debt balance is seen. This trend agreed with the counter-cyclical policy adopted by the government and the State's interest in reducing the public debt to levels that would lead to fiscal sustainability.

Just as is illustrated in Table 8, the outstanding debt declined over the course of the year coming a level of COP$195.5 t as of June. Domestic debt showed a better performance than foreign, which has seen a volatile performance and this has finally translated into a shift from foreign debt to domestic. The latter went from 69.6% in June 2010 to 72% a year later. This way, the NG began to reduce their gross outstanding debt and, to a certain degree, started to adjust their public expenditures as the economy began growing again.

Thus, the NG's creditworthiness (Graph 80) showed a notable improvement in the first half of the year if the fact that the ratio of income to debt went from 36.9% in December 2010 to 44.1% in June 2011 is considered. This result is due to the decrease in the outstanding public debt and the rise in revenue for the abovementioned period. It should be noted that, in addition to the NFPS fiscal adjustment

44   The government has authorized the sale of up to 10% of the stock value in shares in Ecopetrol (according to the estimates, this is equal to COP$16 t). The government has stated that the sale will be carried out gradually, that is, only as structured investment projects occur (updating of the Financial Plan, 2001, Ministry of the Treasury and Public Debt).

effort, the financing strategy that the NG will carry out over the next few years will contribute to alleviating the upward pressures on public debt as long as part of the public debt is replaced by privatization.[45]

Table 8
Gross Debt of the NG

	Domestic	Foreign	Domestic	Foreign	Externa	Domestic	Foreign	Total
	(trillions of pesos)			(share)		(nominal annual growth)		
Dic-05	88.1	47.6	135.7	64.9	35.1	28.3	(10.7)	11.2
Dic-06	94.4	52.6	147.0	64.2	35.8	7.2	10.5	8.3
Dic-07	99.1	47.7	146.7	67.5	32.5	4.9	(9.4)	(0.2)
Dic-08	108.7	54.6	163.3	66.6	33.4	9.7	14.6	11.3
Mar-09	116.0	64.9	180.9	64.1	35.9	10.2	47.2	21.1
Jun-09	118.4	56.6	175.0	67.7	32.3	11.5	29.1	16.6
Sep-09	118.3	51.9	170.1	69.5	30.5	11.0	1.4	7.9
Dic-09	125.6	59.7	185.3	67.8	32.2	15.6	9.3	13.5
Mar-10	129.2	55.5	184.7	69.9	30.1	11.4	(14.4)	2.2
Jun-10	131.3	57.4	188.7	69.6	30.4	10.9	1.4	7.8
Sep-10	134.3	55.2	189.5	70.9	29.1	13.5	6.5	11.4
Dic-10	143.5	59.3	202.8	70.8	29.2	14.2	(0.6)	9.4
Mar-11	141.9	58.4	200.3	70.9	29.1	9.8	5.1	8.4
Jun-11	140.7	54.8	195.5	72.0	28.0	7.1	(4.5)	3.6

Sources: Banco de la República and Ministry of the Treasury and Public Credit.

The duration of the total NG debt (Graph 81) increased in the first half of 2011. To be more specific, it increased in the month of April and was at 4.6 years. This duration represents the historical maximum for the period under analysis which began in 2004. This was also registered in both domestic debt and foreign debt, which came to duration levels of 4.0 and 6.3 years respectively. In general, the gradual lengthening of the total debt duration in recent years could make the loans held by borrowers more sensitive to changes in the interest rates even if it made amortizing it easier as the risk of refinancing declined.

As of July 2011, the maturity profile for the debt shows that more than half of the outstanding NG public debt (56.8%) will be redeemed within the next five years (Graph 82). Of this outstanding debt to be redeemed, the foreign debt represents only 16.3% due to the fact that it accounts for a smaller amount of the total indebtedness and is distributed over a much longer period than the domestic debt. Indeed, while the former has a maturity profile that goes up to 2041, the last maturity date for domestic debt is 2024.

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45   In 2012, the government expects to receive around 0.8% of the GDP in resources (COP$5.1 t) because of the reduction in the nation's stock ownership in the Petroleum Company of Colombia (Ecopetrol).

Graph 80
NG Creditworthiness

(trillions of pesos)   (percentage)

— Debt   — Income   ⋯⋯ Income/debt (right axis)
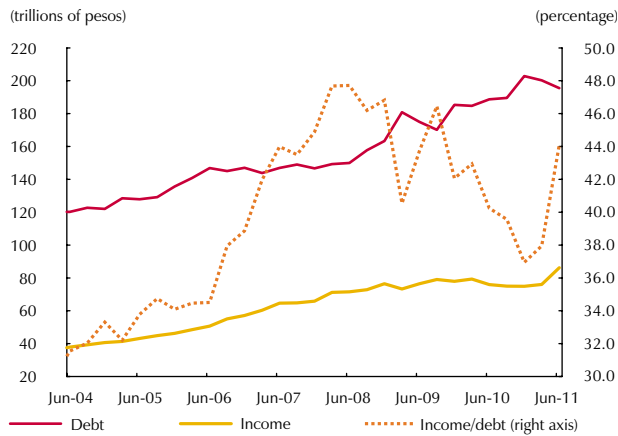
Sources: Ministry of the Treasury and Public Credit and Banco de la República.

Graph 81
Duration of NG Debt

(years)

— Domestic   — Foreign   ⋯⋯ Total
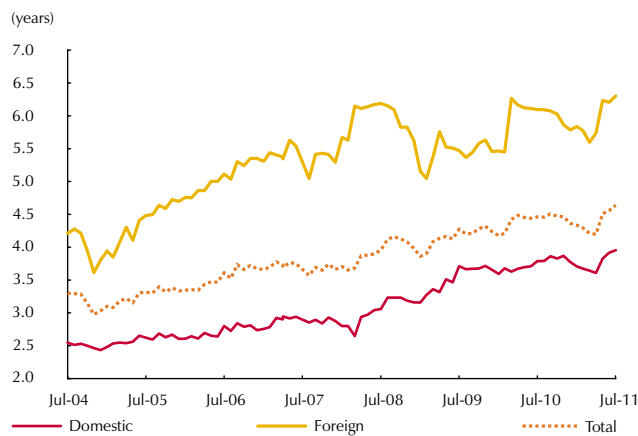
Source: Ministry of the Treasury and Public Credit.

Graph 82
Maturity Profile in Pesos

(trillions of pesos)

■ Foreign   ■ Domestic
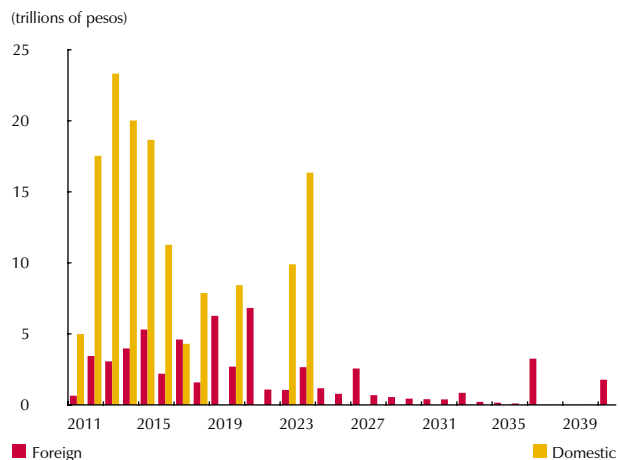
Source: Ministry of the Treasury and Public Credit.

Graph 83 illustrates the change in the maturities of domestic debt over the next few years. It emphasizes that, over the course of 2011, the maturities of domestic debt dropped from COP$19.9 t to COP$4.9 t given the debt retirement carried out up to June. With regards to future maturities, significant upswings are seen for 2012 when they will go from COP$15.4 t to COP$17.5 t, and for the years 2014 (when they will go from COP$15.2 t to COP$20 t) and 2015 (when they will go from COP$14.5 t to COP$18.7 t). The increase in maturities in 2018, 2023, and 2024 also draws one's attention. Thus, it is also worth pointing out the fact that the government issued some short term bonds over the last year. However, the majority were for the medium or long term.

To the degree in which the projections for the 2011 fiscal deficit remain the same to the end of the year, the financing of the NG will come to COP$42.7 t (7.3% of the GDP). These needs are mainly due to a fiscal deficit and financial restructuring costs that add up to COP$24.3 t (4.0% of the GDP) as well as debt amortization of COP$16.2 t (2.7% of the GDP). The sources of financing assigned to cover them correspond to COP$35.1 t in disbursements from borrowed money (domestic and foreign) and other items that correspond to the remaining COP$7.6 t.

It has been estimated that the total issuance of TES will come to COP$28 t towards the end of 2011. This

Graph 83
Maturity Profile of the Domestic Debt

(trillions of pesos)

■ January-10   ■ June-10   ■ January-11   ■ June-11
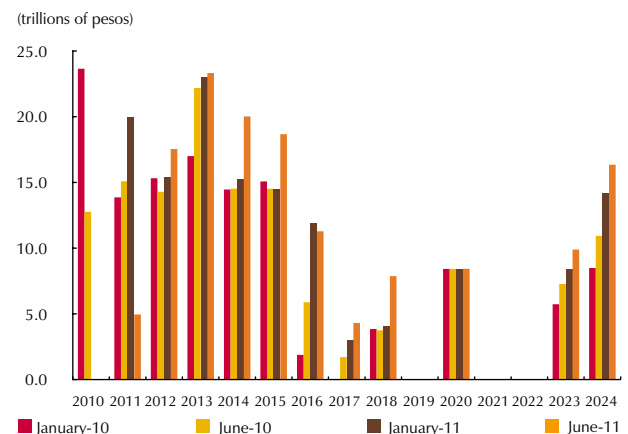
Source: Ministry of the Treasury and Public Credit.

amount is higher than what was presented in the immediately preceding two years (COP\$27.7 t and COP\$25.8 t in 2010 and 2009 respectively). The debt service, in turn, is expected to come to COP\$25.6 t, an amount that is COP\$2.9 t higher than what was presented last year. With this, the roll-over of the debt will be at 110%.[46] This indicates that the new issues of TES are financing items other than the payment of interest and debt repayment (Graph 84).

Graph 85 shows the path followed by the coupon interest rate from 2004 to July 2011. Even when the path for the two types of debt shows a declining trend, the one for domestic debt shows more fluctuations. Nevertheless, in the first half of the year, the coupon rate for both domestic debt and foreign debt showed a relatively stable performance and was at levels of 8.8% and 5.4% respectively.

Graph 84
Domestic Debt Rollover (TES)
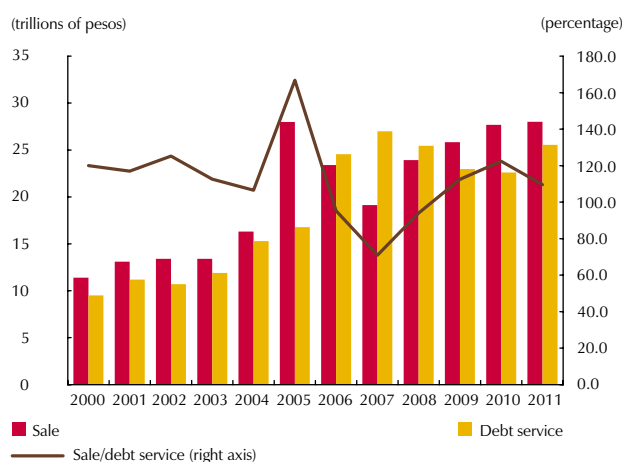
Source: Ministry of the Treasury and Public Credit.

3. Outlook

The performance of the fiscal deficit for 2011 has been negatively affected by the higher outlays associated with the effects of winter flooding throughout the country. Nevertheless, the higher revenue obtained during this period generated by the changes in tax collection and the improved economic activity has prevented the deficit from going beyond the limit. With respect to that, the deficit to be financed as well as the amortizations on debt will be higher than what they were last year. As a result, the government will find it necessary to increase their issuance of TES during the current year. For 2012, the level of bond issues is expected to return to lower levels.

The fiscal projections for the 2012 budget period incorporate the effects of the adoption of the fiscal rule and the new general system for royalties. In this context, a significant reduction in the NFPS deficit is expected which, according to calculations done by the Ministry of the Treasury and Public Debt,[47] will go from 3.5% in 2011 to 2.3% in 2012. This performance is a result of the lower deficit calculated for the NG[48] which will go from 4.0% in 2011 to 3.5% in 2012 and the higher surplus

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46 This is slightly lower than the roll-over of the debt for 2010, which was equal to 122%.

47 The data is from the Mid-term Fiscal Framework, 2011, written in June chapter IX, "Financial Plan 2012."

48 These figures include the effects of the emergency caused by the winter weather. If they did not, the deficit for the NFPS would be 3.1% in 2011 and 1.9% in 2012. The NG, in turn, would have a deficit of 3.6% in 2011 in comparison to a 3.2% deficit in 2012.

Graph 85
NG Average Debt Coupon

(annual rate)
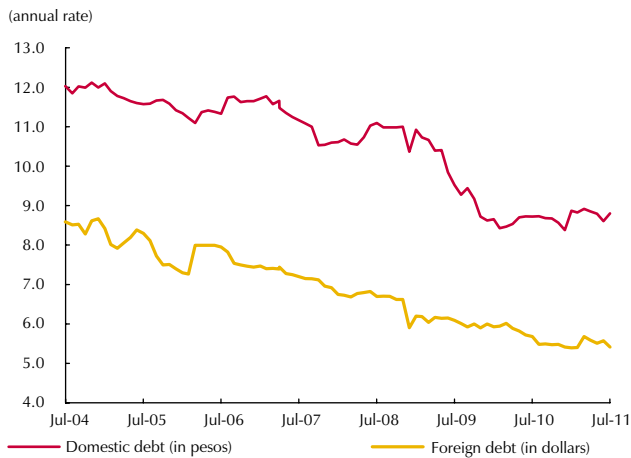
Source: Ministry of the Treasury and Public Credit.

projected for the decentralized sector which will go from 0.5% to 1.3% of the GDP[49] (Table 9).

This downward trend for public debt, especially that for the NG, is in keeping with the better performance expected from revenue[50] compared to expenditures in 2012. This is based on the expectations of better tax revenue associated with the recent tax reform, more income from oil drilling, and better performance of the economy. At the same time, outlays are expected to see lower growth given the proposed deficit goal associated with the fiscal rule.

The financing needs projected for 2012 will come to COP$43.6 t, the majority of which will be made up of a deficit of COP$23.3 t to be financed and amortization of the domestic and foreign debt equivalent to COP$18.9 t. The sources projected for satisfying this financing will be disbursements from the domestic and foreign debt (COP$27.5 t and COP$7.8 t respectively), floating debt (COP$1.5 t), and other sources of financing (COP$6.1 t) among which the sales of part of the State's shares in Ecopetrol (COP$5.1 t) stand out.

Table 9
Fiscal Balance: Non-financial Public Sector for 2012

	Trillions of pesos 2012[a/]	Percentage of the GDP 2012[a/]
Balance (including emergency)		
1. Non-financial public sector	(14.8)	(2.3)
1.1 Central National Government	(23.0)	(3.5)
1.2 Decentralized sector	8.3	1.3

a/ These data correspond to the Medium-Term Fiscal Framework, 2011, last updated in June 2011.
Source: Ministry of the Treasury and Public Debt (Confis).

Given these financing needs, the goal for TES issuance will come to COP$27.5 t of which COP$4 t will be issued through agreed upon operations, COP$20 t through public auctions in the local market, and COP$3.5 t through forced operations. As a consequence of this programmed financing, the ratio between bonds and debt servicing (roll-over) will be 96% (Table 10).

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49 A better balance sheet is expected from the sector of regionals and locals for the decentralized sector given the budget policy cycle (the first year of government shows a low level of investment projects) and the adoption of the general system of royalties.

50 In the 2012 budget period, revenue that is 0.2% of the GDP higher than what was projected in 2011 is expected.

Table 10
Domestic Debt Rollover (TES)
(trillions of pesos)

TES	2007	2008	2009	2010	2011[a/]	2012[a/]
Sale	19.1	23.9	25.8	27.7	28.0	27.5
Debt service	27.0	25.4	23.0	22.6	25.6	28.6
Sale/debt service (right axis)	71.0	94.0	112.0	122.0	110.0	96.0

a/ projected numbers.
Source: Ministry of the Treasury and Public Credit.

As has been mentioned in previous editions of this Financial Stability Report, higher levels of government indebtedness could impose barriers to monetary policy decisions to the degree that they could generate pressure on variables such as the interest rate and the exchange rate. Furthermore, if the financial system should acquire these new debt securities, it will not only face a higher market risk but could also end up replacing the loan portfolio with investments.

Box 5
STRUCTURE OF FINANCING AND FOREIGN EXCHANGE RISK FOR COMPANIES IN THE INDUSTRIAL AND COMMERCE SECTORS

The goal of this box is to present the results of the surveys on the structure of both financing and foreign exchange risk done by Banco de la República and Fedesarrollo between January and July 2011. The first of these surveys gathers information regarding access to credit and the use of financing sources while the second survey collects data related to the use, frequency and importance of the derivative instruments as hedging mechanisms for foreign exchange risk.

The results suggest that there is a positive relationship between size and credit links to the financial system. Bank loans are the main financing source for big companies whereas credit with suppliers fills that need in the case of small companies. Concerning the survey on foreign exchange risk, big companies continue to be the main ones to use derivative instruments and their primary objective is to cover contractual commitments.

1.   Financing Structure

This survey is focused on companies in the industrial and commerce sectors and is made up of both an annual and quarterly modules. The outcome of the annual module done in March 2011, in which the main topic was the financing methods of the companies, is presented below.

The first question made reference to the companies' main source of financing.

Graph B5.1 shows the results separated by size and sector. Most of the small companies agreed that the credit granted by suppliers is their main financing source in both the industrial (45%) and trade (57%) sectors. This could be caused by the restrictions some of these companies face in the financial system. Fisman and Love (2003) confirmed these results when they found that this type of financing alleviates the effects of those restrictions in countries with poorly developed financial markets to the degree in which the contracts with suppliers are different in nature from bank loans. According to the authors, credit provided by suppliers differs from bank credit in that: i) it entails lower monitoring costs; ii) the supplier has a greater ability to enforce compliance with the contract by stopping the delivery of basic materials, and iii) the supplier can demand the return of the merchandise.

In contrast, the big companies chose bank credit as their main source of financing (industry 56%, trade 55%), followed by credit from suppliers. The medium size companies have an approach that is similar to the small companies in the

Graph B5.1
Main Financing Sources[a/]

A.   Industry

(percentage)

- Bank credit in Colombia
- Company's own resources other than profits
- Reinvestment of profits
- Credit given by suppliers
- Financial leasing and factoring
- Bank credit abroad

B.   Commerce

(percentage)

- Bank credit in Colombia
- Company's own resources other than profits
- Credit given by suppliers
- Financial leasing and factoring
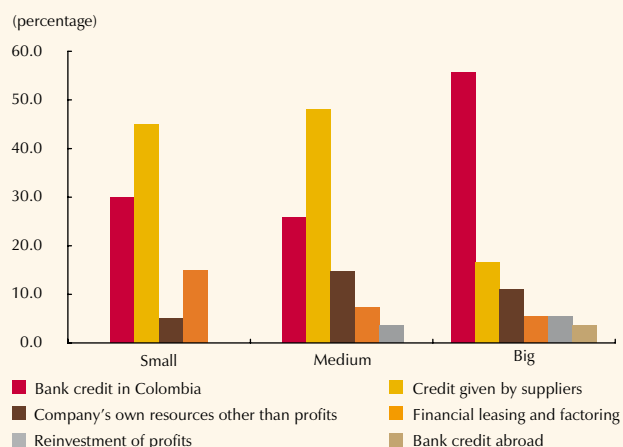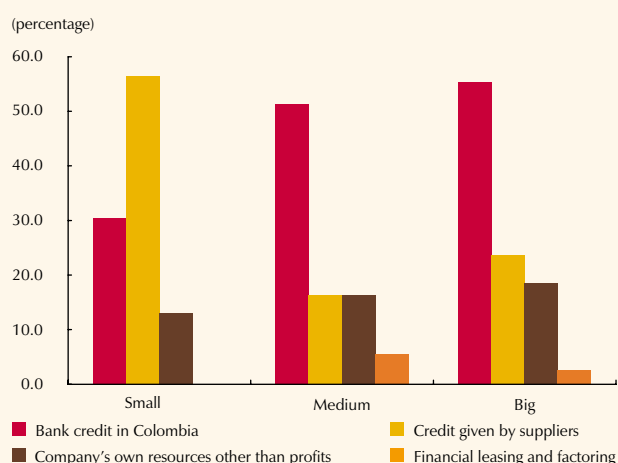
a/ Question: "Arrange your financial sources with number 1 as the most important."
Source: Survey on financing structure, Banco de la República and Fedesarrollo.

industrial sector (48% said that suppliers are their main financing source) and to the big ones in the commercial sector.

As a result, the credit from suppliers is not just the financing source used by most of the small companies but it is also identified by them as their main source. However, bank credit is the main one for the big companies. This could be the consequence of the restrictions faced by the small companies when accessing the financial system.

Additional financing methods such as using their own resources other than profits, financial leasing, factoring, and reinvestment of profits are chosen by the companies in these sectors. However, the firms rarely resort to issuing bonds or shares, or to foreign loans for financing. It should be noted that the main financing sources are concentrated in only two instruments which could indicate that the degree of substitution between these is low.

Also, the companies were asked if they had applied to the financial system for loans in the most recent year: 67% in the industry sector and 71% in the trade sector did so. The comparison of this outcome with that obtained through the quarterly surveys for February and May reveals a higher figure for the annual module in both cases with an average equal to 54% for the two sectors.

The next question was related to the main use given to those funds. Graph B5.2, panel A shows that in the industrial sector, the small companies distributed those funds between "the acquisition of inventory, payment of salaries and suppliers" and "investment in machinery and equipment." The medium size companies used them mostly for the first option mentioned above and the big companies used them the same way as the small ones did. However, a huge percentage of the companies also allocated the funds to refinancing loans. Regarding the commercial sector (Graph B5.2, panel B), one sees that most of the companies also used the funds for "acquisition of inventory, payment of salaries and suppliers" regardless of the size of the firm.

The conclusion that can be drawn is that most of the surveyed companies spent the funds from bank loans on short-term investments and operation expenditures.

2.   Foreign Exchange Risk

This survey was focused on companies in the industrial sector that report any of their accounts (assets, liabilities, income or expenditures) in foreign currency. It is divided into one annual plus quarterly modules. The results of the annual module done in March 2011 when the information related to foreign capital and definition of the hedging period was requested are presented below.

As was the case with the quarterly surveys, the results in this module also suggest that exchange rate derivatives are rarely used by companies, especially when we consider the fact that all of them have some degree of exposure. The derivatives were used by 28% of the surveyed companies during the last twelve months and this figure is slightly above that presented in the January and April surveys (25%).

Graph B5.3 shows that big companies use more exchange rate derivatives (42%) compared to medium companies (3%).

Graph B5.2
Use of Bank Loan Funds[a/]

A.   Industry

Small   Medium   Big

B.   Trade

Small   Medium   Big
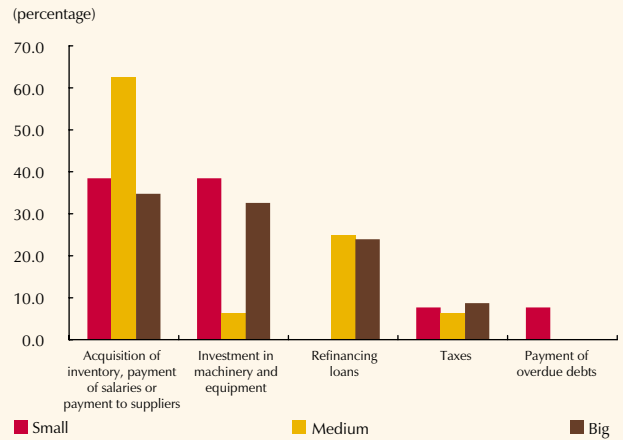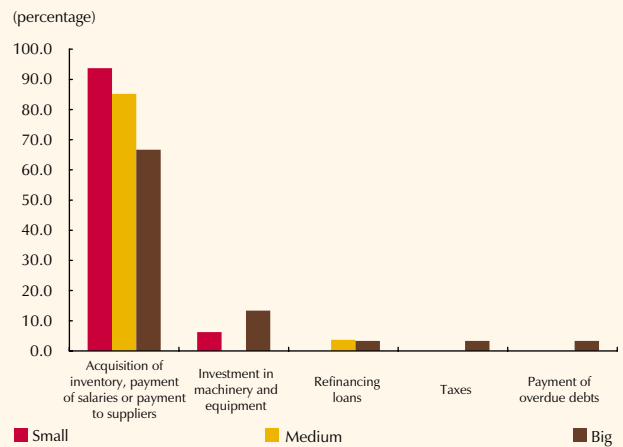
a/ Question: "The credit requested from the financial sector was used or will be used for (Choose up to three options and organize them beginning with 1 as the most important)."
Source: Survey on financing structure, Banco de la República and Fedesarrollo.

Graph B5.3
Use of Derivative Instruments by Size and Foreign Trade[a/]

Net exporter   Net importer
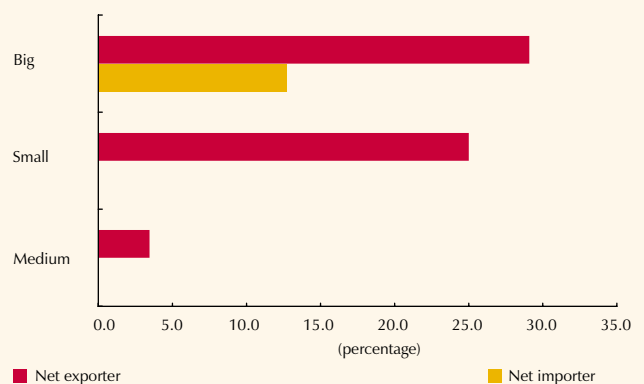
a/ Question: "Did you use exchange rate forwards, options or futures to hedge your exchange risk over the last twelve months?"
Source: Survey on exchange risk, Banco de la República and Fedesarrollo.

Unlike the results for the quarterly surveys, in this case, a percentage of small companies stated that they had used derivatives in the last year (25%). However, this is still a low level of use. When broken down by net exporter and net importer, we see that no matter what the size of the company is, the net exporters register the highest level of use of these instruments. It is only in the case of big companies that there are net importers that use exchange rate derivatives (13%).

When analyzed by type of capital, the sample is mostly made up of companies that do not have foreign investment (72%) (Graph B5.4). If the sample is split into the firms that use derivatives and those that do not, the former are found to be concentrated in the lowest ranges of foreign capital. As a matter of fact, 67% of the companies that use derivatives are entirely national ones and this suggests that the companies that used these instruments were generally firms without foreign backing.

Another important aspect in this study is the objective that

Graph B5.4
Use of Derivative Instruments by Type of Capital[a/]
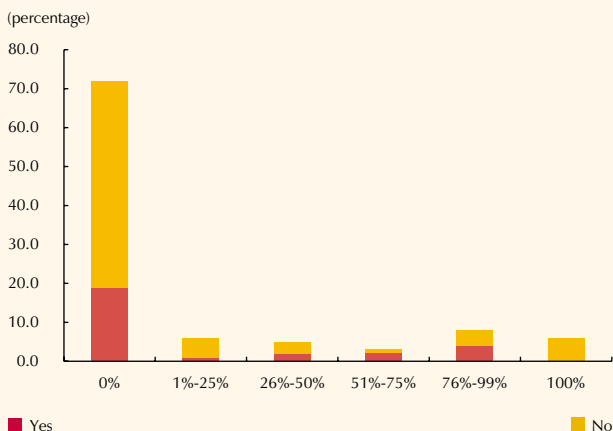
(percentage)

a/ Question: "In the ownership structure of the company, what was the percentage range of foreign capital investment in the last twelve months?"
Source: Survey on exchange risk, Banco de la República and Fedesarrollo.

the companies seek by using derivatives as a mechanism for hedging (Graph B5.5). The survey revealed that the main goals were covering for the contractual commitments of on-balance and off-balance sheet accounts (47%) and hedging against unexpected exposure (18%). When the question addresses the frequency of derivatives usage, the goals for which they are used most regularly are to cover the contractual commitments (16% use them frequently) and the transactions anticipated in less than one year (8%).

The prior outcome is consistent with the results found by Bodnar et al. (1999), who determined that, in the United States and Germany, it is a common practice for the companies to very frequently hedge both their shortest term exposure and the exposure that is directly detected.

Graph B5.5
Objectives Sought by Using Exchange Rate Derivatives and Frequency of Use[a/]

(percentage)
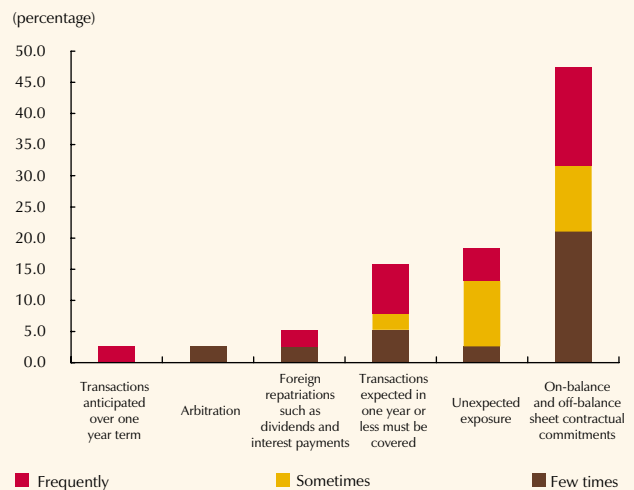
a/ Question: "What was the reason for and the frequency with which you used derivatives?"
Source: Survey on exchange risk, Banco de la República and Fedesarrollo.

Finally, the companies were asked about the strategy they followed to define their hedging time frame. Table B5.1 shows that 57% of the companies surveyed chose a hedging time frame that was equivalent to the time they were exposed to the exchange risk and, consequently, they adjusted their position in the derivatives market in accordance with this time frame. This situation along with the fact that the forward contracts had an average maturity of between 48 and 94 days suggests that there is a preference for short-term contracts.

Table B5.1
Company Strategy to Define the Time frame for the Derivative Instrument

Hedging time frame	(percentage)
The hedging time frame (forward, future, option) is less than the time they are exposed to the exchange risk	14.0
The hedging time frame (forward, future, option) is the same as the time they are exposed to the exchange risk	57.0
The hedging time frame (forward, future, option) is greater than the time they are exposed to the exchange risk	14.0
The hedging time frame (forward, future, option) goes up to the end of the year (closing of financial balances)	14.0

a/ Question: " Which one of the following statements better describes the strategy of the company to define the time frame of the derivative instrument?".
Source: Survey on exchange risk, Banco de la República and Fedesarrollo.

The single financial indicator (SFI) is an accounting and financial model that hierarchically evaluates and organizes the performance of credit establishments by means of a single financial indicator. (1) With the use of ongoing monitoring of intermediaries through SFI, this mechanism becomes an early warning system.

The SFI classifies the management of credit establishments into four zones. The top ranking entities are found in I (with a SFI between 1.5 and 2.0) and in II (between 1.0 and 1.49) because they maintain an outstanding and acceptable profitability respectively. In such zones, the basic indicators are consistent with a solid financial position. Zone III (SFI between 0.5 and 0.99) is considered a risky one because, even if these entities have a real, slightly positive profitability, their basic indicators show signs of financial weakness. Finally, zone IV (SFI between 0.0 and .49) is considered one of deterioration in as much as intermediaries with poor basic indicators are placed there, and their real negative profitability has started to weaken their equity. In this last case, the institutions are not sustainable in the medium term unless they are financially supported by their shareholders or by some external organization (Table B6.1).

1. Evolution of the financial situation by financial intermediary groups (2)

Graph B6.1 shows the evolution of the financial situation for each group of credit establishments. In the first six months of 2011, a significant change for banks was seen. The banks rating deteriorated as they dropped from zone I to zone II. It should be emphasized that this happened after they had been in the outstanding zone for a period of about two years. CFC and financial cooperatives, in turn, have shown a relatively steady performance which puts them in the acceptable zone (zone II). Meanwhile, the rating for leasing companies dropped, thus increasing their chances of migrating into the risk zone (zone III).

When analyzing the development that banks have presented, it has been found that their financial situation measured by means of SFI, has gone from a 1.62 indicator to 1.47 between December of 2010 and June of 2011. This reduction was mainly caused by a decline in the return on equity resulting from reductions in the return on investments bearing in mind the fact that there have been increases recently in the policy interest rate.

CFC, in turn, have held to an indicator of about 1.14 while Financial Cooperatives declined slightly as they went from 1.20 in December of last year to 1.10 in June of the current year.

Table B6.1
Classification by Zone

Zone	SFI Value	State
I	1.50 a 2.00	Outstanding
II	1.00 a 1.49	Acceptable
III	0.50 a 0.99	Risky
IV	0.00 a 0.49	Deterioration

Source: Banco de la República.

Graph B6.1
Financial Entities (Evolution of the SFI, 2007-2011)
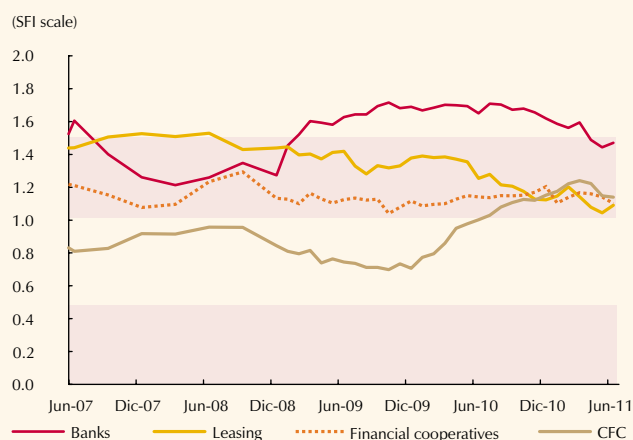
(SFI scale)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Furthermore, the indicator for leasing companies has stayed on a downward trend and went from an SFI of 1.12 in December 2010 to one of 1.09 in June of the current year. As mentioned in the previous *Financial Stability Report,* this outcome is due to the absorption process that some entities have undergone on the part of their banking subsidiaries.

2. Organization by financial entities within each group

Graph B6.2 (panels A, B, C, and D) shows the hierarchical order by group for each financial entity based on the intermediary management results assessed by the SFI. The fact that no financial entity was found in the deterioration zone (zone IV) in June 2001 should be highlighted.

In relation to the previous half of the year, Graph B6.2, panel A shows the entry of five new banks to the financial system and, of those five, four placed in the acceptable zone and one in the outstanding zone during the first half of 2011. More-

over, a slight individual deterioration of the banks was seen unlike six months ago, when they showed an improvement. As of June 2011, five banks are found in the outstanding zone, two in the risky one, and the rest in the acceptable one.

On the part of the CFC, over the course of the first half of 2011, three entities left and one went into zone I. Individually, the CFC have not shown notable changes in the indicator with the exception of CFC 8, which showed a significant improvement in comparison to the situation six months before. (Graph B6.2, panel B). In June 2011, four CFC were found in zone I, eight in II, and five in III.

Finally, two leasing companies placed in the acceptable zone and the rest of them in the risky one. It is worth pointing out that this group of entities has maintained its financial situation without major changes during the first half of the year (Graph B6.2, panel C). In contrast, financial cooperatives have shown a slight deterioration with five of them placing in the acceptable zone and two of them in the risky one (Graph B6.2, panel D).

Graph B6.2
Rating as of December 2010 and June 2011

A.   Banking system
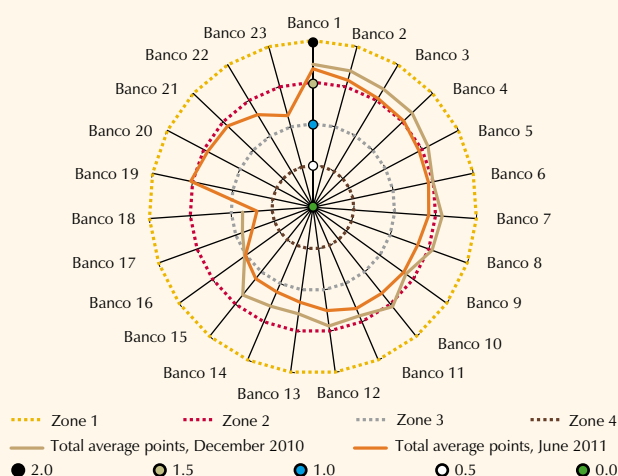
B.   CFC
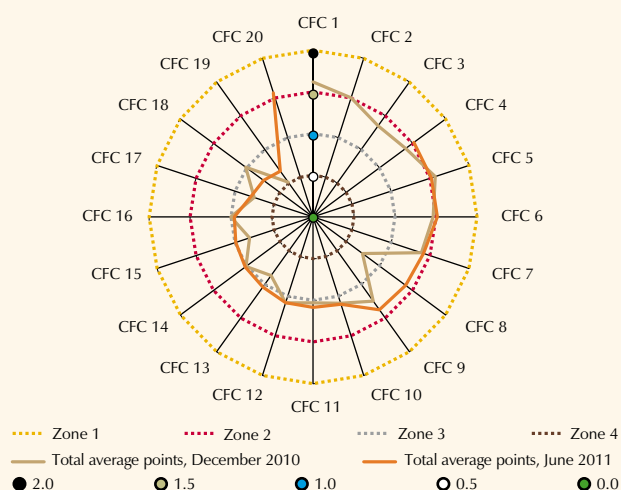
C.   Leasing
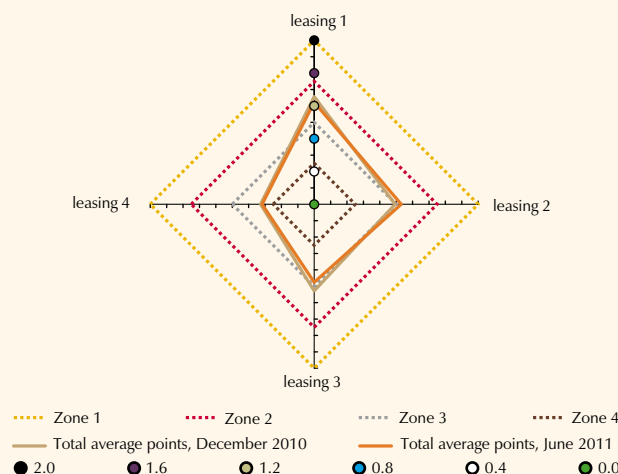
D.   Financial Cooperatives
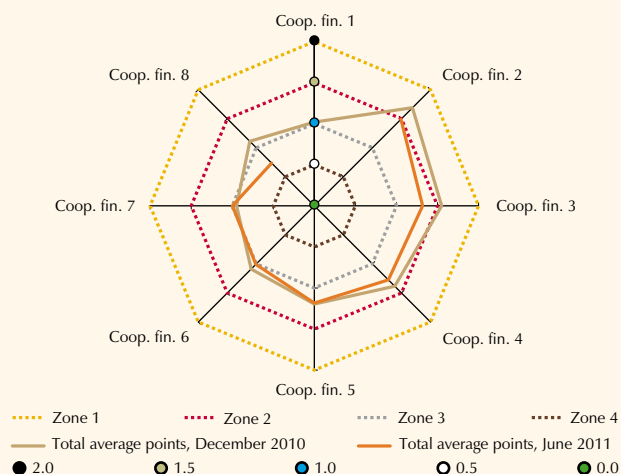
Fuente: Superintendencia Financiera de Colombia; cálculos del Banco de la República.

Box 7
FINANCIAL STABILITY INDEX FOR COLOMBIA

This box shows the updating of the financial stability index for Colombia (FSI), which is a continuous and quantifiable measurement that can determine the level of stress in the Colombian financial system over time.[1] The indicator is calculated monthly and takes into account the factors of profitability and probability of default developed by Aspachs *et al*. (2006).[2]

To build the indicator, ratios of capital, profitability, credit risk and liquidity risk of financial intermediaries were used. The variables selected to make up the index are: return on assets (ROA), return on equity (ROE), overdue loan portfolio/total loan portfolio (OP), non-performing loan portfolio over total loan portfolio (NP), intermediation spread (IS), ratio of liquid liabilities to liquid assets (LL), ratio of interbank funds to liquid assets (IF), and the ratio for non-hedged liabilities (RNHL).

These variables are weighted using different methods suggested by international literature, such as variance equality,[3] main components[4] and account data models (*zero inflated poisson* and *zero-inflated binomial negative* regressions).[5] As seen in Table B7.1, the methodologies used grant greater weight to variables associated with profitability and credit risk.

The information generated by the FSI is easy to interpret because each variable included in its construction has been standardized. Therefore, the level of stress for the current period can be compared to the historical one in terms of deviations from the average. Values of the index that are above

Table B7.1
Weights of the Variables for the System
Index based on Methodology

	VEA	CP	ZINB
ROA	12.5	15.74	7.65
ROE	12.5	15.74	11.75
OP	12.5	14.45	15.69
NP	12.5	15.23	6.17
IS	12.5	12.77	23.03
LL	12.5	9.55	11.95
IF	12.5	7.23	12.03
RNHL	12.5	9.29	11.73

Sources: Banco de la República calculations.

zero are equivalent to periods of financial stress above the average while negative values indicate periods of greater stability. Likewise, the growth of the index within a specific period also provides useful information on changes in the level of stress over time.

Given data availability, the index can be built for the system as well as for each type of entity, including commercial banks (CB), financing companies (CFC), and financial cooperatives (COOP).

Graph B7.1 shows the changes in the index of financial stability between January 1995 and June 2011. In this report, greater attention is given to the index for the last six months when it is seen that the level of financial stress registered by the FSI has risen. However, it remains at levels that are lower than those for the historical average which suggests that the stress levels in the system are still low.

Graph B7.2 shows the indicator calculated for the different types of entities analyzed.[6] In the case of CBs and COOPs, it can be seen that the level of financial stress has remained stable in the last few years while the indicator for the CFC has shown a slight dip in the last half year.

As shown above, the index can determine the current level of stress in the system, both globally and individually, which makes it possible to generate a diagnosis of the Colombian financial stability. The results from the updating process indicate that the stress level in the system is stable.

1   For further information, see D. Estrada and M. Morales (2009), "Financial Stability Index for Colombia," Financial Stability Issues, from Banco de la República, Report on Financial Stability, March.

2   O. Aspachs, C.A.E. Goodhart, M. Segoviano, S.P. Tsomocos, L.Zicchino, (2006) "Searching for a Metric for Financial Stability," LSE Financial Markets Group Special Paper Series, special paper, No. 167.

3   Better known as variance equal approach. The variables are standardized in this technique in order to express them in a single unit and then add them together using identical weightings.

4   The main idea behind this methodology is to obtain an index based on the weighting of the selected variables so that said combination fully explains the variance of the variables as a whole.

5   This approach uses econometric estimates to model the relationship between the variables indicating stress and the dependent variable, which in this case is defined as the number of banks under stress per period. The weightings are found based on the coefficients that have been estimated.

6   The methodologies used are variance equal approach and main components. The account data models are not used in this case.

Graph B7.1
Financial Stability Index
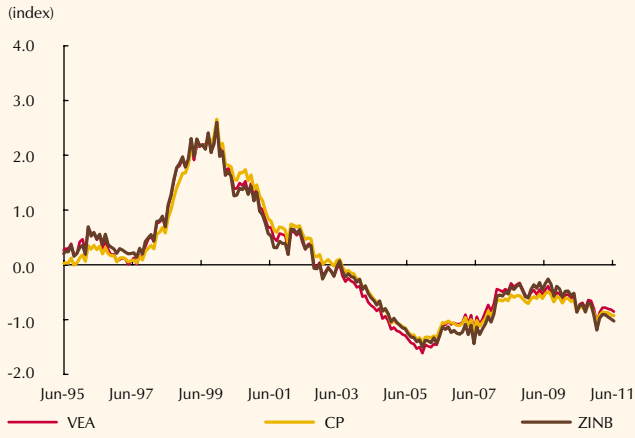
(index)

Sources: Financial Superintendency of Colombia, Banco de la República calculations.

Graph B7.2
Index of Financial Stress by Type of Entity

A.   Commercial banks
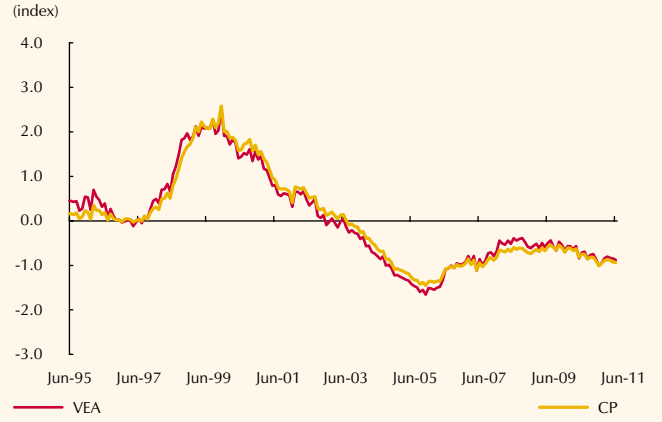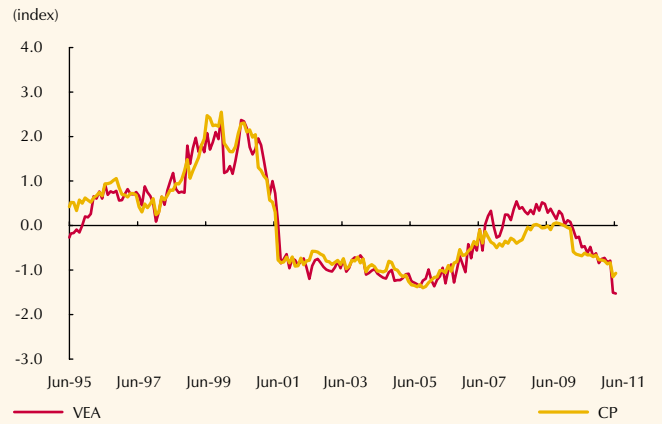
(index)

B.   Financing Companies

(index)

C.   Cooperatives

(index)
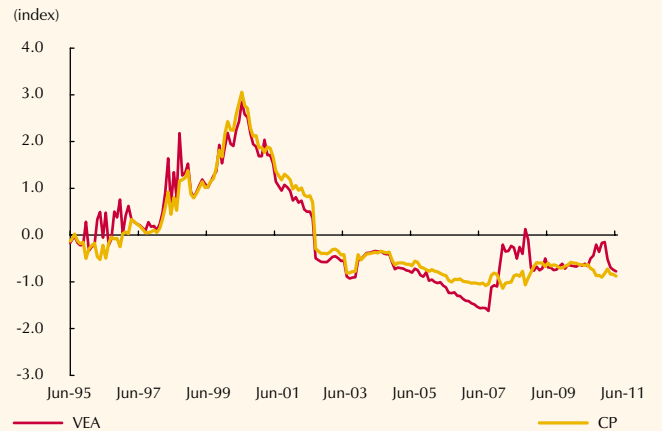
Source: Financial Superintendency of Colombia, Banco de la República calculations.

IV. POTENTIAL RISKS

In the first half of 2011, there was an improvement in the risk for the commercial loan portfolio while the consumer loan portfolio maintained levels of risk similar to those registered in the second half of 2010 and the micro-credit and mortgage loan portfolios showed a slight deterioration in their risk indicators, which were reflected in their transition matrices. Furthermore, the exposure to market risk has increased, in general, for all types of financial institutions due to the longer duration for the portfolios and the upswing in the exposed balance. Nevertheless, the presence of risk has been low due to the limited volatility in the prices of securities over the last few months.

A. MARKET RISK

1. Financial System Exposure to Public Debt Securities

The PMF, trust companies (TC)[51] and commercial banks are the entities that manage and account for most of the public debt securities within the financial system. The commercial banks had accounted for 94.8% of the outstanding TES held by credit establishments as of August 2011 compared to 95.9% six months before (Graph 86, panel A). The PMF and TC, in turn, held a share of 88.5% (49.3% and 39.2% respectively) of the total government bonds held by the NBFI while this number had been 88.6% in February 2011. The insurance companies also had a 10.2% share in the public debt investments held by the NBFI as of August this year. That figure had been 10% six months before (Graph 86, panel B).

Between February and August 2011, the outstanding TES managed by the PMF, TC and commercial banks experienced an increase of COP$5.1 t, COP$1.0 t and COP$1.8 t respectively. As of August 26 this year, the TES portfolio of

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51   In this edition of the Financial Stability Report, the portfolio managed by the trust companies will also be analyzed and not just our own as was done in previous versions.

Graph 86
Share of Outstanding Peso and UVR-denominated TES in Loan Portfolios

A.   Credit Institutions

(percentage)

these entities was at COP$37.7 t, COP$30.0 t and COP$27.5 t respectively (Graph 87).

In the case of banks, not all investments are exposed to changes in market prices.[52] That is why it is important to analyze the change in the amount exposed[53] to market risk for these entities. Between February and August 2011, the amount commercial banks had exposed climbed 4.8%. This upswing is explained by higher holdings of debt securities and an increase in the proportion of negotiable securities (69.0%) compared to what had been registered six months before (68.3%) (Graph 88). As a result, the levels at which commercial banks are exposed to market risk continue to rise and are at their highest levels for the period under analysis.

B.   Non-banking Financial System

(percentage)

With respect to the composition of the portfolio by currency, it can be seen that both the commercial banks and the PMF and TC are holding to their preference for securities in pesos. As of August 2011, their share within the portfolio was 89.7%, 56.0%, and 83.7% respectively (Graph 89). The commercial banks and TC, in turn, increased their holdings in peso-denominated securities between February and August 2011 as they went from 89.1% to 89.7% and from 83.5% to 83.6% respectively. These figures correspond to the latest values available for these entities in the abovementioned

Source: Banco de la República.

Graph 87
Outstanding Peso and UVR-denominated TES Held by Commercial Banks, PMF and Trust Companies

(percentage)

Source: Banco de la República.

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52   The investments can be classified as negotiable, available for sale or at maturity. The first are securities that are acquired to make a short term profit based on fluctuations in their prices. They are entered on the books initially at the purchase price and are revalued daily based on their current market price. The resulting adjustment is entered in the profit and loss account. The second are securities that the holder intends and is legally entitled to hold for a period of no less than one year or Central Bank bonds with low or minimal marketability. In spite of this restriction, there is no change in their condition as saleable. They remain investments that can be sold at any time. They are initially entered on the books at the purchase price and are adjusted daily just as investments at maturity are. However, the variations in their market prices are also incorporated in the adjustment, which is entered in the capital or proprietor accounts. Investments at maturity, in turn, are securities the holder intends and is legally entitled to hold until maturity or redemption. They are initially entered on the books at their purchase price and revalued daily exponentially based on the internal rate of return calculated at the time of purchase. The adjustment is registered in the profit and loss accounts.

53   The amount that is exposed is defined as the balance of the public debt securities that is subject to changes in the market price. Therefore, this corresponds to the total negotiable securities plus those that are available for sale.

(percentage)

Source: Banco de la República.

months. However, the PMF registered a shift towards UVR-denominated securities. The share of these within the TES portfolio rose 6.2 pp (this corresponds to an increase of COP$4.3 t) and came to 44.0% in August of this year.

Going by maturities,[54] the banks, PMF and TC have different components in their portfolios as a consequence of the structure of their businesses. Graph 90, panels A and C, shows that the securities held by banks and TC are primarily medium and short term ones while securities that the PMF hold are either long or medium term ones (panel B).

Between February and August 2011, the duration[55] of the debt portfolio of commercial banks remained stable at 2.5 years. In contrast, the duration for the PMF registered an uptick, going from 5.4 years in February of this year to 5.6 years six months later. Finally, the duration for the TC portfolio was 3.3 years in August 2011 compared to six months before when it was 3.1 years (Graph 91). A rise in this indicator reflects an increase in the interest rate risk.

2.   Sensitivity to Increases in the TES Rate

In this section, two stress tests are done in order to analyze the exposure to market risk that the different institutions in the financial system have. The first consists of calculating the losses in portfolio value with a 200 bp increase in all of the maturities along the zero-coupon yield curve for peso and UVR-denominated TES.[56] This is the shock suggested by the Basel Committee on Banking Supervision for countries other than the G-10. In the second stress test, three scenarios are considered with increases in the bond interest rates. It is based on the assumption that, in the event of a possible rise in those rates, financial institutions will shift the make-up of their portfolios in order to limit their losses. In other words, they will reduce the duration of the portfolio and the share of negotiable securities it holds, which will reduce their exposure to market risk. In this regard, a dynamic performance on the part of the entities is taken into account.

54   The maturities structure has a classification based on maturity terms: short maturity TES are those with maturity periods of less than two years, medium for those with periods of between two and eight years and long term for those with periods that are more than eight years.

55   The duration measures the sensitivity of the value of a fixed income portfolio to changes in the market interest rate. Thus, the longer the duration, the greater the interest rate risk.

56   For the UVR-denominated TES, an increase in the real spread for the UVR benchmark rate is assumed. If this has to do with a rise in inflation expectations, the losses will occur only in the fixed rate TES since the real return on the UVR-denominated security would not change.

Graph 89
Composition of Investment in TES by Monetary Unit

A.   Commercial banks

(percentage)

— Pesos   — UVR

B.   PMF

(percentage)

— Pesos   — UVR

C.   Trust Companies

(percentage)

— Pesos   — UVR
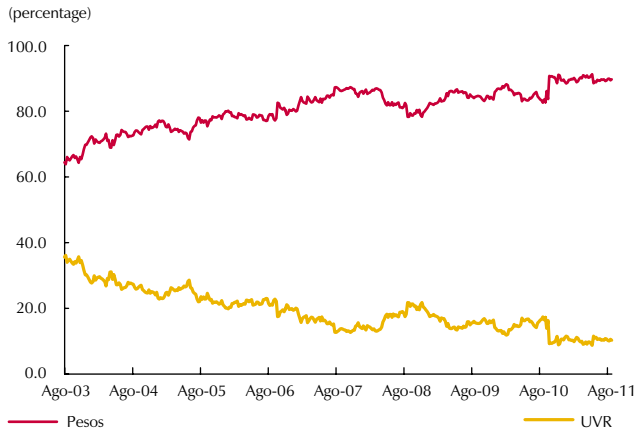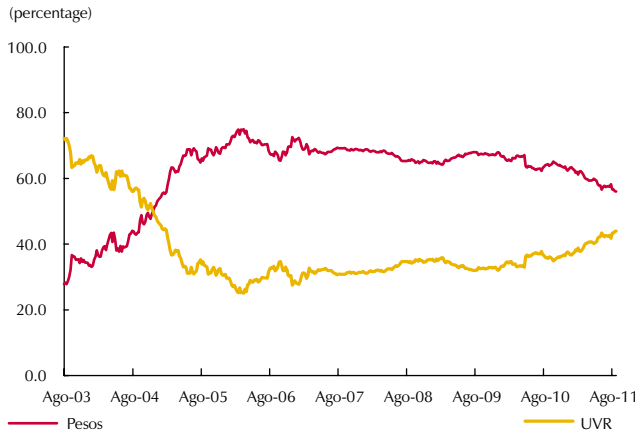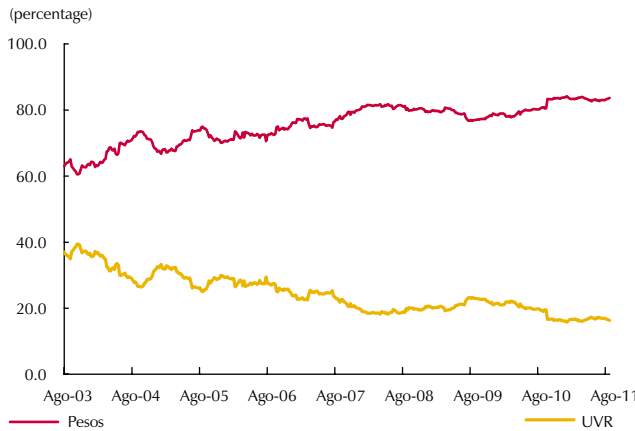
Source: Banco de la República.

Graph 90
Composition of Investment in Peso and UVR-denominated TES by Maturity

A.   Commercial banks

(percentage)

— Short term   — Medium term   ······ Long term

B.   PMF

(percentage)

— Short term   — Medium term   ······ Long term

C.   Trust Companies

(percentage)

— Short term   — Medium term   ······ Long term
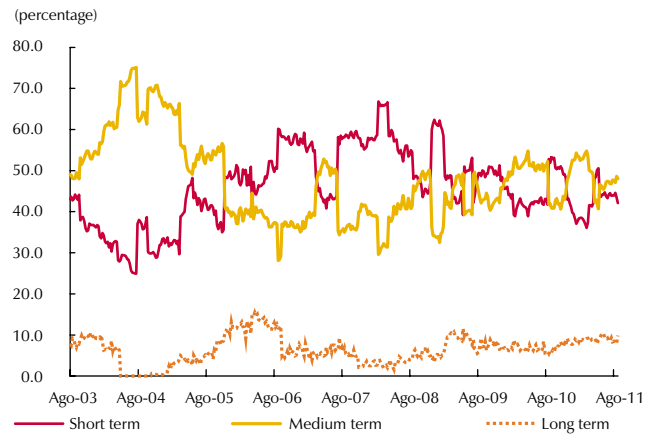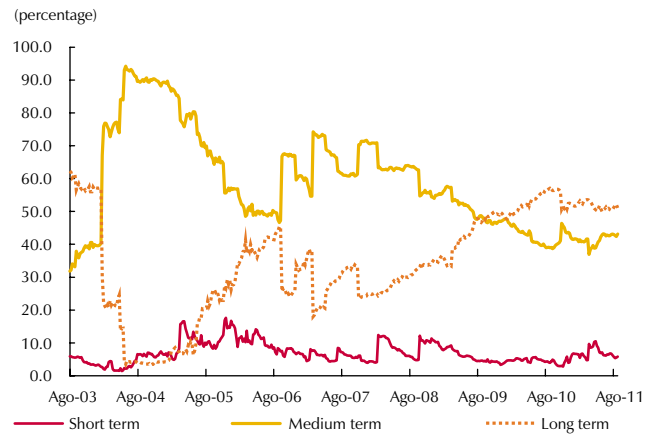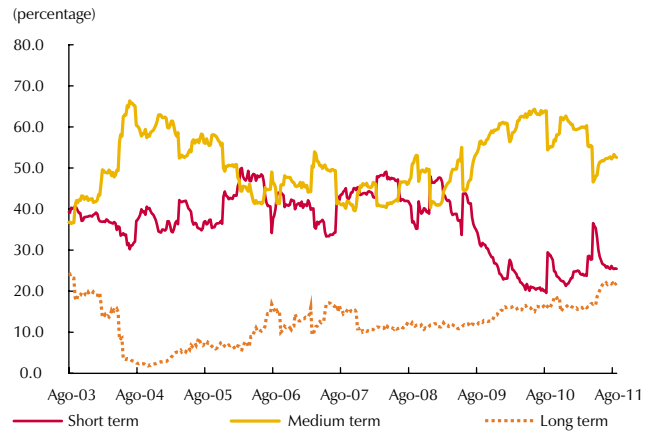
Source: Banco de la República.

Duration of Commercial Bank, PMF,
and Trust Company TES Portfolios

(years)
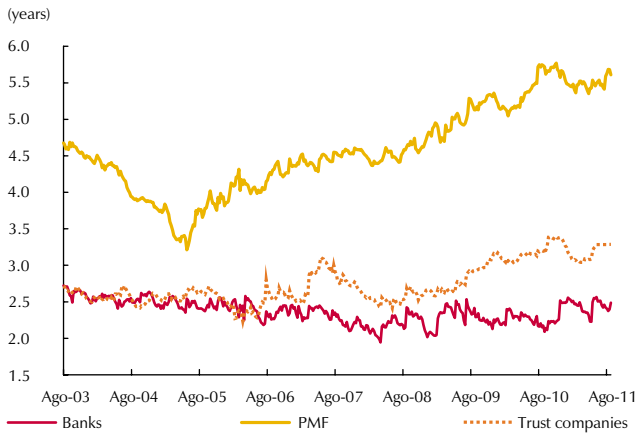
Source: Banco de la República.

Graph 92
Appreciation Losses with a 200 bp Increase

A.   Credit Institutions

(billions of pesos)   (billions of pesos)

B.   NBFI

(trillions of pesos)
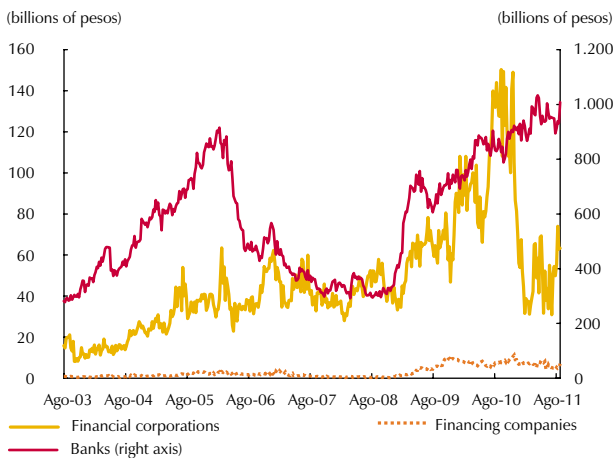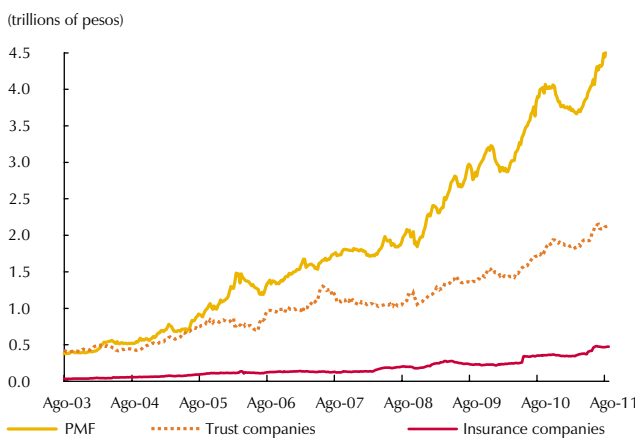
Source: Banco de la República.

a.   *Exercise 1: A Parallel Increase of 200 bp in the TES Zero-Coupon Curve*

Graph 92 shows the losses that the financial institutions would suffer with a parallel shock of 200 bp in the TES curve. It should be noted that the effect of the shock does not accumulate, rather it corresponds to the possible devaluations if one were to occur at each point in time. Panel A presents the potential losses of the credit institutions in response to the shock. For commercial banks and financial corporations (FC), given the increase in their portfolio of public debt securities, a rise in their exposure to market risk can be seen. In this scenario, the losses would amount to COP$1 t for the former and to COP$63.3 b for the latter as of August 26, 2011. These figures are COP$121 b and COP$25.8 b respectively above those that could have been registered if the shock had taken place six months before.

In panel B, the losses resulting from an interest rate shock for the NBFI are shown. In August 2011, the losses in the exercise for the entire sector would be COP$7.2 t, which is COP$1.3 t higher than those that could have occurred six months before. This spike is mainly the result of the potential losses of the PMF, which would have been COP$4.5 t on the same date as well as being COP$847 b above those that might have taken place in February 2011. This rise in exposure comes as a result of the abovementioned growth in the balance of the TES portfolio held by these entities. The TC and insurance companies, in turn, also showed higher levels of exposure in August 2011 in comparison to those registered six months before. As of August 26, 2011, these institutions would have lost COP$2.1 t and COP$473 b respectively. These figures are COP$280 b and COP$127 b higher than the losses they could have faced six months before.

When the losses are analyzed in this exercise as a percentage of the credit institutions' profits, a rise is seen in the last six months. As of August 2011, the losses represented 16.9% of the earnings, a figure that is 1.3 bp higher than the one from six months before. By type of entity, the banks are the ones that would lose the most with respect to profits (19.4%, a number that is 70 bp higher than what it would have been in February 2011). The CF, in turn, would have suffered a

Graph 93

A. Appreciation Losses with a 200 bp Increase
as a Percentage of the Annualized Profits
for Credit Institutions

(percentage)

—— Banks	—— Financial corporations	.... CFC
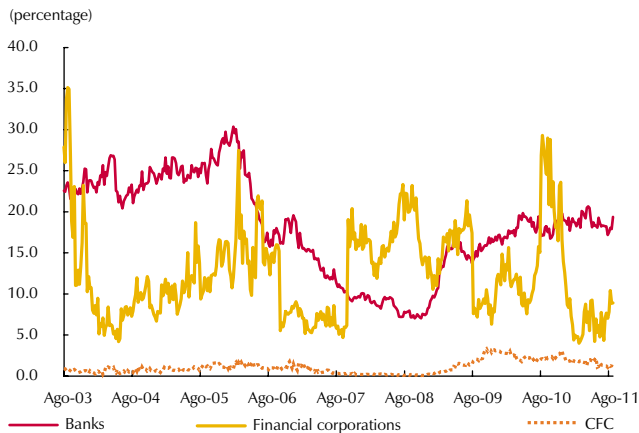
B. Appreciation Losses with a 200 bp Increase
as a Percentage of Portfolio Value for NBFI[a]

(percentage)

—— PMF	.... Trust companies	—— Insurance
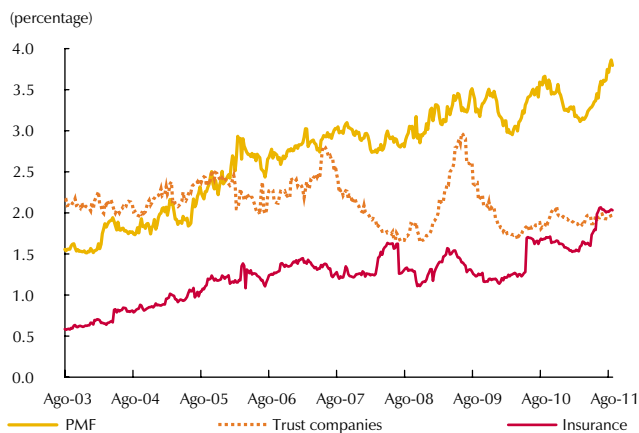
a/ Annualized profits and portfolio value as of June 2011 are being used for the 2011
calculations.
Source: Banco de la República.

devaluation that would have represented 8.9% of their profits, a number that is 4.1 pp higher than the one from six months ago. Thus, there is a rise in exposure to market risk with respect to profits, especially in the case of banks and FC (Graph 93, panel A).

When the losses in relationship to the value of the total NBFI portfolio are considered, the PMF are seen to be the institutions that are the most exposed to a shock in the TES interest rates. As of August 2011, these institutions would have lost 3.8% of their portfolio while the TC and insurance companies would have lost only 2%. It is important to emphasize that all entities showed an upswing in their exposure over the last six months (Graph 93, panel B).

b. Exercise 2: A Parallel Shift in the Zero-coupon Yield Curve for TES Considering Changes in Duration and in the Outstanding Balance[57]

In this exercise, different scenarios of changes in the interest rates of public debt securities are considered. These correspond to the 99, 80, and 60 quantiles of the annual increases that have been seen in the peso-denominated zero-coupon yield curve since 2003. In each one of the scenarios, the fact that the financial system institutions will make changes in their portfolio when they expect increases in the interest rates in order to minimize the impact on their earnings and the value of their equity is taken into account. Therefore, in the event of an increase in interest rates for securities, the entities will lower the duration of the portfolio and the share of negotiable securities. The scenarios considered (moderate, medium and extreme) are given in Table 11.

For the extreme scenario, the changes in duration and in the share of negotiable securities were the ones seen between 2006 and 2007, which pertains to the period in which public debt saw the largest devaluation in the most recent decade. For the

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57 It is worth noting that the two exercises that were done were defined differently and, as a result, their results are not directly comparable. A parallel change in all of the maturities of the TES zero-coupon curve is considered in the first one. However, the second one summarizes a parallel shock with a change in the rate for a zero-coupon bond with a maturity that is equivalent to the average maturity of the securities in the portfolio the entities hold. Nevertheless, this latter one takes into consideration the fact that the behavior of the agents is dynamic and they restructure their portfolios in the expectation of increases in the interest rates.

Table 11
Scenarios Used for the Stress Test

A. Credit Institutions												
	Scenarios											
	1. Extreme[a/]				2. Medium[b/]				3. Moderate[c/]			
Type of entity	BC	CF	CFC	Coop	BC	CF	CFC	Coop	BC	CF	CFC	Coop
Change in duration (years)	(0.3)	0.0	(0.3)	0.0	(0.1)	0.0	(0.2)	0.0	(0.1)	0.0	(0.2)	0.0
Change in share of negotiable securities (percentage)	(20.0)	(5.8)	0.0	0.0	(4.0)	(4.6)	0.0	0.0	(3.0)	(4.0)	0.0	0.0

B. NBFI						
	Scenarios					
	1. Extreme[a/]		2. Medium[b/]		3. Moderate[c/]	
Type of entity	AFP	Otras	AFP	Otras	AFP	Otras
Change in duration (years)	(0.3)	0.0	(0.1)	0.0	(0.1)	0.0

a/ 300 bp increase in the interest rate on TES.
b/ 200 bp increase in the interest rate on TES.
c/ 150 bp increase in the interest rate on TES.
Source: Banco de la República.

medium and moderate scenarios, in turn, these changes were calculated through econometric estimates.[58] For this exercise, the public debt portfolios as of August 26, 2011 were taken.

The results of this exercise are presented in Table 12. In the case of the credit institutions, in the event of a 200 bp increase in the TES rate, the banks and FC would have lost 18.3% and 8.7% respectively of their annualized earnings as of June 2011. Meanwhile, given their low balance of TES, the CFC and cooperatives would have lost just 2% and 1% of their earnings respectively.

The high losses for the NBFI in this exercise are due to the slight adjustment in the duration of their portfolio as well as to their larger holdings of medium and long term securities. This situation makes them more vulnerable to shocks to the interest rates, especially in this exercise in which an imaginary portfolio is created for the entities. Here, the institutions invest their total exposed balance in a zero-coupon bond with duration that is equal to the average value of this measurement for the portfolio considered for each entity.

3. Value at Risk

The value at risk (VaR) is a measurement that approximates the maximum loss that the system could experience in its investment portfolio during a specific pe-

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58 For each type of NBFI, a regression was estimated between the change in the duration and the change in the one-year rate for the peso-denominated TES zero-coupon yield curve. The sample considered has 452 weekly observations starting in January 2003. For each type of credit institution, in addition to the abovementioned regression, another was estimated between the change in the share of negotiable securities and the same independent variable from the previous regression. For this latter regression, there were 96 monthly observations.

Table 12
Results of Stress Test

					A. Credit Institutions					
Type	Duration	Exposed balance	Market price	Annualized profit	Scenario 1		Scenario 2		Scenario 3	
	(years)	(trillions of pesos)			($b)	(%)[a]	($b)	(%)[a]	($b)	(%)[a]
Commercial banks	2,49	18,95	21,08	5,14	(1.007)	(19,6)	(942)	(18,3)	(726)	(14,1)
FC	2,50	1,19	1,30	0,71	(92)	(12,9)	(62)	(8,7)	(47)	(6,6)
CFC	1,43	0,24	0,32	0,40	(11)	(2,6)	(8)	(2,0)	(6)	(1,5)
Financial cooperatives	3,36	0,01	0,01	0,06	(1)	(1,5)	(1)	(1,0)	(0)	(0,8)

					B. NBFI					
Type	Duration	Exposed balance	Market price	Portfolio value	Scenario 1		Scenario 2		Scenario 3	
	(years)	(trillions of pesos)			($b)	(%)[b]	($b)	(%)[b]	($b)	(%)[b]
PMF	5,61	37,73	37,87	118,19	(7.191)	(6,1)	(4.847)	(4,1)	(3.648)	(3,1)
Trust companies	3,31	29,98	34,30	107,00	(3.403)	(3,2)	(2.268)	(2,1)	(1.701)	(1,6)
Insurance companies	4,21	5,21	6,01	23,27	(760)	(3,3)	(507)	(2,2)	(380)	(1,6)
Brokerage firms	2,13	0,97	1,07	3,81	(68)	(1,8)	(46)	(1,2)	(34)	(0,9)

a/ Percentage of annualized profits.
b/ Percentage of equity value as of December 2010.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

riod. It is included to get a more rigorous approximation of the market risk that both the credit institutions and the NBFI are exposed to. Specifically, the VaR for each one of these sectors is defined as the sum of the individual VaRs for each one of the entities that the sector is made up of.[59]

First of all, the procedure implemented for calculating the VaR implies making a daily estimate of the correlations and variances of the returns on each one of the risk factors. Following the method suggested by RiskMetrics,[60] these factors were established for specific maturities for both the zero-coupon curve for the peso-denominated TES and for the UVR-denominated one between January 3, 2003 and August 26, 2011. The results of the annualized volatility of the returns that were obtained using constant correlations (model CCC) are presented in Graph 94.

Between February and August 2011, there was low volatility in all of the tranches of the curve for both the TES denominated in pesos and the ones denominated in UVR, particularly for those with longer terms. This trend in the volatility is

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59 The details of the methodology used can be found in O. Martinez and J.M. Uribe Gil, (2008), "Una aproximación dinámica a la medición del riesgo de mercado para los bancos comerciales en Colombia," Financial Stability Issues, Financial Stability Department, Banco de la República, # 31. A lagged term was added in this report to include possible asymmetries in the tarch model, which is used to estimate the dependence of the variance in the return series in order to improve its performance with respect to the model in previous reports.

60 RiskMetricks (1996). "Technical Document," J. P. Morgan/Reuters, Fourth Edition, December.

A.   In pesos

(basis points) / (basis points)

B.   In UVR

(basis points) / (basis points)
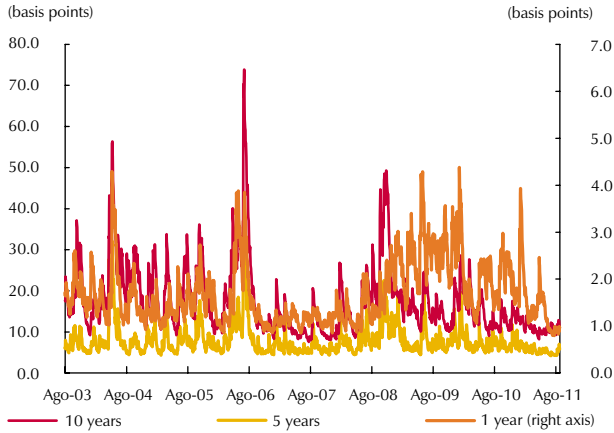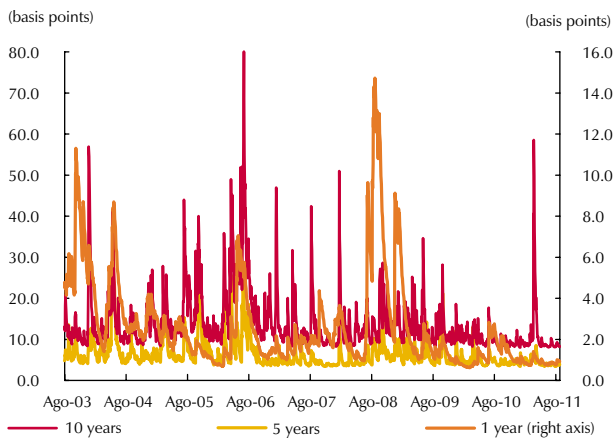
Source: Colombian Stock Market, Banco de la República calculations.

common during periods of appreciation, which in turn, may be due to the stability of inflation as well as to medium and long term expectations.

Based on the estimates of yield volatility, the VaR was calculated for the sectors which have TES portfolios that represent a significant proportion of their total investments. To do this, the portfolio information available on the Friday of each week from January 2003 to August 2011 for each one of the institutions that these sectors are made up of was used. With this information, the risk measurement was estimated daily with 99% confidence assuming normality (Graph 95).

With respect to the credit institutions, the VaR was calculated for the banks and for the financial corporations (panel A). Between February and August 2011, given the low, stable levels of volatility in the rates of return for TES at different terms, this indicator remained relatively stable as a percentage of the portfolio. In August, the overnight VaR for banks was at 0.33% unlike the 0.31% registered in February. For the FC, in turn, this indicator went from 0.24% to 0.36% during the same period.

In the case of the NBFI, the overnight VaR was estimated for the PMF, insurance companies, and TC. As can be seen in panel B, there was a low and stable level of risk between February and August 2011. In August of the current year, the overnight VaR for PMF was at 0.65% of the portfolio value. It was at 0.41% for the insurance companies, and 0.46% for the TC.

Starting from the above calculations, it can be inferred that the banks and financial corporations have a market risk, measured by the VaR, that is lower than that of the NBFI. This can be explained by the maturity composition of the portfolio for this type of institution in the sense that not only the insurance companies but also the TC and the PMF manage investment portfolios with durations that are significantly longer than those of the banks and the financial corporations. When the duration is a measurement of the change in the value of a security in the event of changes in the interest rates, the institutions with longer durations have a larger change in the value of their portfolio in response to fluctuations in the TES yields. Therefore, the PMF and the insurance companies are more sensitive to market risk.

With the analysis done in this section, it can be concluded that, in general, exposure to market risk has risen for all types of financial institutions due to upswings

A.   Credit Institutions

(percentage)

Legend: Banks ——   Financial corporations ——
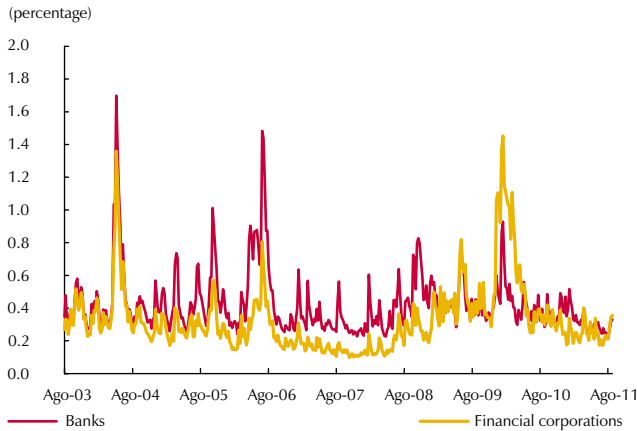
B.   Non-banking Financial Entities

(percentage)

Legend: PMF ——   Trust companies ——   Insurance companies ——
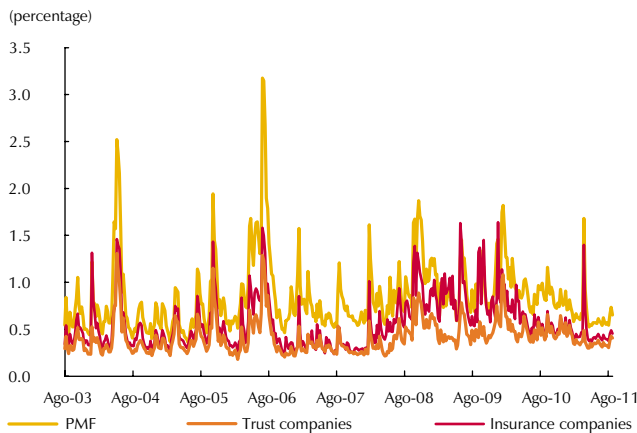
Source: Colombian Stock Market, Banco de la República calculations.

in the exposed balance and the duration of the portfolios. However, because of the stable performance in the volatility over the last few months, very little market risk has been seen.

B.   CREDIT RISK

1.   Credit Institutions

In the first half of 2011, the loan portfolio continued growing. It was accompanied by improvements in the risk indicators and a negative variation in the risky loan portfolio. However, the risks that the system faces remain latent. As a result of this, it is important to evaluate the effect that an adverse macroeconomic situation could have on the performance of credit institutions. To do this, a set of stress tests was developed based on two types of scenarios: i) moderate, and ii) extreme but unlikely. The description of these shocks is summarized in Table 13.

The exercises that are presented below show the effects that the above described shocks have on default for the loan portfolio and profits for financial intermediaries.[61] The shocks to the macroeconomic variables cause the non-performing loan portfolio for the different types of loans to rise. This translates into a decrease in profits as a result of higher costs for loan-loss provisioning and less income from interest. Likewise, the increases in the interest rates lead to an upswing in the costs of deposits along with higher earnings for the loans issued at variable rates. Depending on the size of the rises in the lending and borrowing rates, this effect on the banks' profits will be positive or negative.[62]

The analysis of the moderate scenario shows that in the presence of a simultaneous shock to the variables under study (shock 4), the profitability of banks would drop from COP$6.8 t to COP$3.1 t once the shock takes place. This represents a 53.8% fall in profits. In this case, the effects of the macroeconomic changes are insufficient to cause negative profits for any of the banks (Table 14).

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61   For more information on these methodologies, see "A Co-integration Analysis for Credit Risk" in the Banco de la República "Financial Stability Issues," Financial Stability Report, September 2008.

62   If the increase in earnings from interest is higher than the outlays for interest, the profits rise.

Table 13
Description of Shocks in Each Scenario

	Macroeconomic variable	Moderate	Extreme
Shock 1	GDP	1% decline in GDP	6.8% decline in GDP
	Domestic demand	1% decline in domestic demand	13.7% decline in domestic demand[a]
Shock 2	Interest rate	Increase of 25 bp	Increase of 450 bp[b]
	NHPI	1.0% reduction in housing prices	8.0% reduction in housing prices[c]
Shock 3	Unemployment	1.0 pp rise in unemployment	4.2 pp rise in unemployment[d]
Shock 4	Aggregate	All of the above	All of the above

a/ This corresponds to the reductions seen in the second quarter of 1999.
b/ Corresponds to the increase registered between May and June 1998.
c/ Equivalent to the average declines that occurred in the 1996-2000 period.
d/ Corresponds to the average rise seen in 1999.
Source: Banco de la República.

Table 14
Stressed ROA, Stressed Profits, and Number of Banks with Negative Profitability after the Moderate Shock

	Shock 1[a]	Shock 2[b]	Shock 3[c]	Shock 4[d]
ROA as of June 2011 (percentage)	2.80	2.80	2.80	2.80
ROA after the shock to each loan portfolio				
Commercial (percentage)	2.12	2.51	2.43	2.06
Consumer (percentage)	2.25	2.41	2.23	2.20
Housing (percentage)	2.70	2.72	2.69	2.66
Total loan portfolio (percentage)	**1.50**	**2.00**	**1.78**	**1.29**
Profit as of June 2011 (b)[e]	6,849	6,849	6,849	6,849
Stressed profit (b)	3,675	4,895	4,357	3,158
Decline in profit (b)	3,174	1,954	2,492	3,691
Number of banks with negative profit due to the shock	**0**	**0**	**0**	**0**

a/ The shock is to domestic demand for the commercial and consumer loan portfolios. In the case of housing, it is to the GDP.
b/ The shock is to interest rates for the commercial and consumer loan portfolios. In the case of housing, the shock is to the NHPI.
c/ The shock is applied to unemployment.
d/ A shock is applied to all the variables.
e/ Test done on pre-tax profit.
Source: Banco de la República.

The results of the extreme scenario, in turn, show that the shock to economic activity is the factor that has the strongest impact on the system's profitability. If a situation like this should occur, the ROA would go from 2.8% to -0.4%, which would represent a COP$7.8 t reduction in profits. Likewise, if there is an increase in the unemployment rate, the profits would drop from COP$6.8 t to COP$2.9 t after the shock. As a consequence of the simultaneous shock, it can be seen that the banks' earnings would drop COP$9.3 t and this would cause twelve institutions to register a negative profitability (Table 15).

	Shock 1[a/]	Shock 2[b/]	Shock 3[c/]	Shock 4[d/]
ROA seen as of June 2011 (percentage)	2.80	2.80	2.80	2.80
ROA after the shock to each loan portfolio				
Commercial (percentage)	1.10	2.63	2.25	1.39
Consumer (percentage)	1.34	2.39	1.90	0.96
Housing (percentage)	2.64	2.72	2.59	2.52
Total loan portfolio (percentage)	**(0.41)**	**1.84**	**1.19**	**(1.04)**
Profit as of June 2011 (b)[e/]	6,849	6,849	6,849	6,849
Stressed profit (b)	(1,002)	4,487	2,922	(2,539)
Decline in profit (b)	7,851	2,362	3,927	9,388
Number of banks with negative profit due to the shock	**10**	**0**	**1**	**12**

a/ The shock is to domestic demand for the commercial and consumer loan portfolios. In the case of housing, it is to the GDP.
b/ The shock is to interest rates for the commercial and consumer loan portfolios. In the case of housing, the shock is to the NHPI.
c/ The shock is applied to unemployment.
d/ A shock is applied to all the variables.
e/ Test done on pre-tax profit.
Source: Banco de la República.

2. Analysis of Loan Portfolio Concentration and Credit Risk[63]

a. *Commercial Loan Portfolio*

As of June 2011, the commercial loan portfolio represented 54.4% of the total loan portfolio as a result of which it remained the type of credit with the largest share. As of that date, it showed a real annual growth rate of 14.3%, a figure that is considerably higher than what had been registered a year before (0.9%). In addition, the number of debtors rose with respect to December 2010, but declined in comparison to a year earlier. This was reflected in an upswing in the average amount per debtor, which came to COP$326.3 m as of June 2011 (Table 16).

1) *Commercial Loan Portfolio Concentration*

When the concentration of the commercial loan portfolio is analyzed by entity, it is seen to have increased in the most recent months. While in June 2010, the five largest financial institutions accounted for 59.3% of the loan portfolio, a year later, they accounted for 68.1%. This trend is also seen when the ten largest entities are analyzed. In this case, the share went from 78.2% in June 2010 to 90.1% in June 2011 (Graph 96). This could be the result of the absorption of some financing companies by their parent companies during the last few years.

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63 The information on individual loans for each loan portfolio is taken from Form 341 issued by the Financial Superintendency of Colombia. This includes the loans granted by the special and official institutions (IOES in Spanish) apart from rediscount loans, leasing transactions and the loans granted to trust companies, which were not considered in the first section of this report.

Table 16
Commercial Loan Portfolio Capital

Date	Balance[a/]	Number of debtors	Average amount per debtor[b/]
Jun-04	52.9	263,478	200.6
Dic-04	61.2	274,543	223.0
Jun-05	62.4	289,018	215.7
Dic-05	63.5	312,687	203.0
Jun-06	70.0	333,934	209.6
Dic-06	78.1	362,943	215.3
Jun-07	82.8	395,963	209.1
Dic-07	92.0	432,588	212.6
Jun-08	92.1	431,552	213.4
Dic-08	105.2	415,472	253.2
Jun-09	106.0	401,073	264.2
Dic-09	104.3	394,741	264.1
Jun-10	106.9	384,561	278.1
Dic-10	117.1	368,666	317.5
Jun-11	122.2	374,619	326.3

a/ Balances in trillions of June 2011 pesos.
b/ Balances in millions of June 2011 pesos.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 96
Commercial Loan Portfolio Concentration
in the Five Largest Financial Institutions

(percentage)
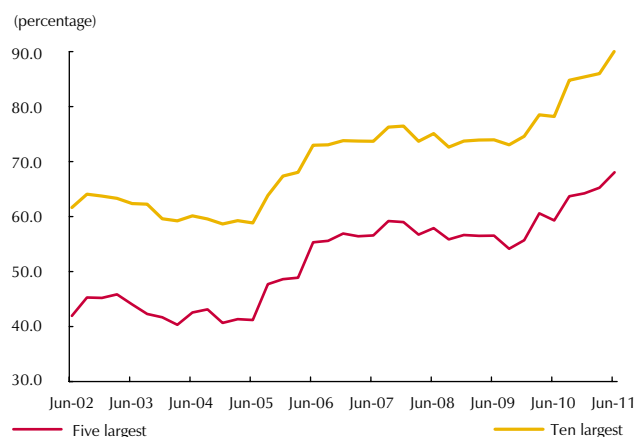
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Also, when the level of concentration per debtor is calculated, one finds that about 7% of the debtors[64] account for 90% of the loan portfolio. Although this figure is not the minimum registered, it shows that the loan portfolio has tended to be more concentrated in fewer debtors over the most recent years (Graph 97). This outcome is consistent with the results in Table 16, where it is evident that while the number of debtors in the commercial loan portfolio drops (-2.6%), the capital surges a real annual 14.3% with respect to June 2010.

Finally, when an aggregate analysis is done between companies that produce tradable goods and those that produce non-tradable ones,[65] it can be seen that the gap between these sectors has enlarged since December 2009 (Graph 98). For June 2011, the share of the non-tradables was 58.2%. It should be emphasized that the above is the consequence of the increase in

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64   This refers to the borrowers with the largest loans.

65   The companies that produce tradable goods are those that correspond to the sectors of agriculture, fishing, mining and quarrying, and manufacturing. The companies that produce non-tradable goods are included in other sectors.

Graph 97
Percentage of Debtors Accounting for
90% of the Commercial Loan Portfolio
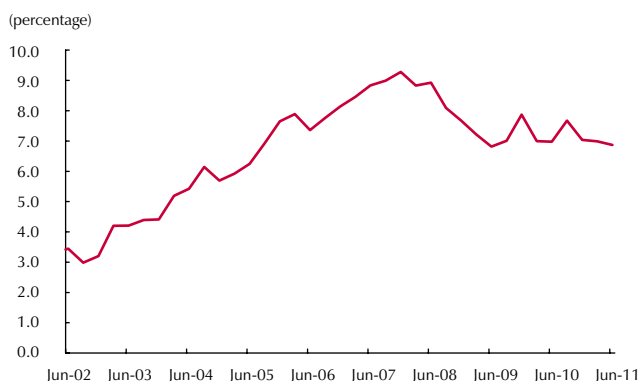
(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 98
Share by Type of Sector
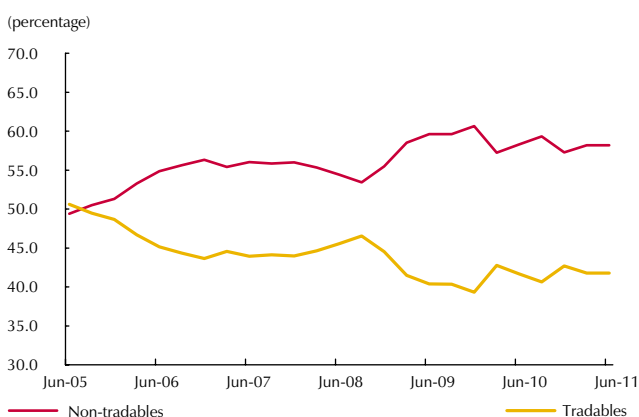
(percentage)

Sources: Financial Superintendency of Colombia and Superintendency of Corporate Affairs, Banco de la República calculations.

Graph 99
Share of Risky Loan Portfolio by Rating

(percentage)
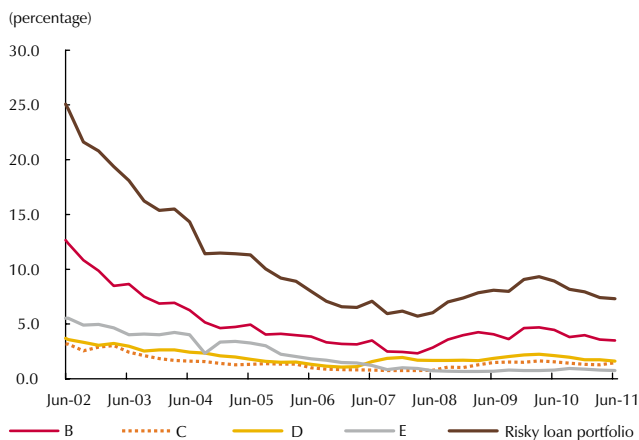
Source: Financial Superintendency of Colombia, Banco de la República calculations.

indebtedness in the sectors of commerce, transportation and communications, and construction.[66]

2) Credit Risk

With regard to changes in the portfolio quality index, one sees that this declined as it went from 9% in June 2010 to 7.3% a year later. This is due to a contraction in the amounts for loans rated B and D (Graph 99). It is important to note that the loans rated C took a larger share within the risky loan portfolio by going from 17.4% to 20.0% in the same period under analysis.

Furthermore, when the QI is broken down and analyzed by type of entity, the outcome shows that most institutions in which the commercial loan portfolio represents the largest percentage of the total loan portfolio have a QI that is lower than the average (Graph 100). Note that more than 60% of the establishments have a QI that is below 10.0%.

Graph 101 shows the QI for the tradable and non-tradable sectors. As can be seen, the indicator has fallen for both sectors since June 2010 and hit 8.8% for the tradable sector and 4.1% for the non-tradable sector a year later. The agriculture sub-sector is identified as the riskiest within the tradable sector with a QI of 18.3% while in the non-tradable sector, education has the highest QI with 5.9%.

Although the above loan portfolio quality indicator makes it possible to figure out an approximation of the credit risk that the financial entities face, it is necessary to broaden this analysis by using other indicators based on the number of loans. Two indicators are constructed for this: one of quality based on operations (OQI) measured as the ratio between the risky loans and the total loans and another that shows the ratio between the loans in default and the total (NLIO).

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66 This analysis was done through an exchange of the information based on economic sector from the Superintendency of Corporate Affairs and the information on loans from the Financial Superintendency of Colombia. Thus, the 49% of the total balance for the commercial loan portfolio was identified.

Graph 100
QI of the Commercial Portfolio Vs. Share of
Commercial Loans in Each Institution's Loan Portfolio
(percentage)
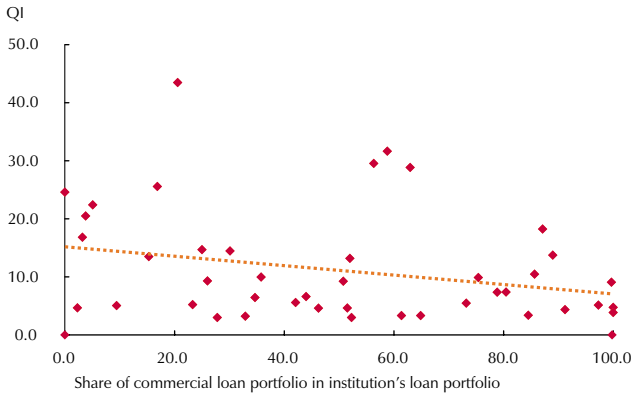
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 101
Loan Portfolio Quality Indicator by Type of Sector

(percentage)
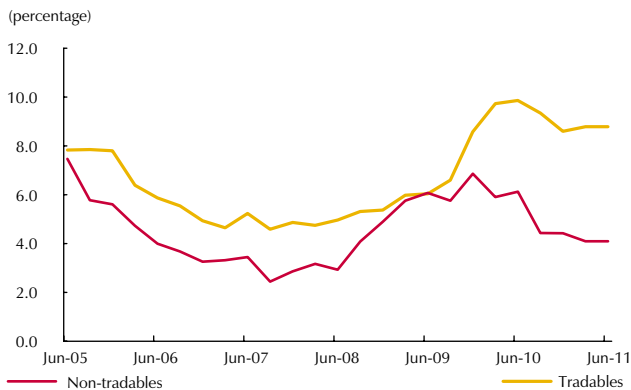
Sources: Financial Superintendency and Superintendency of Corporate Affairs of Colombia, Banco de la República calculations.

Table 17 shows these measurements and it can be seen that, although they have higher values than those for the indicators based on the loan amount, their performance is similar since they showed substantial decreases in 2011 in comparison to their values for 2010. The difference between the amount for the loan indicator and debt indicator is a result of the fact that in the commercial loan portfolio, the largest loans are usually the ones with the best credit risk rating. At the same time, the differences in amount between large and small loans are substantial.

The change in the risky portfolio can also be evaluated by means of the transition matrices, which show the probability of staying at the same rating or moving to another. The elements on the diagonal show the probability of remaining at the same rating (persistence) from one period of time to another. The probabilities below the diagonal (lower triangle) are associated with improvements in rating while the percentages located above the diagonal (upper triangle) correspond to the probabilities of getting a rating associated with higher levels of risk.

The average transition matrix between June 2008 and June 2011 is found on panel A of Table 18. As can be seen, the highest probabilities are on the diagonal, which shows a high persistence. However, the sum of the percentages in the upper triangle is higher than the one for the lower triangle. Therefore, the probability of deterioration is higher than the probability of improvement.

The transition matrices for December 2010 and June 2011, in turn, are on the B and C panels respectively. When they are compared to the average, it can be seen that the probabilities of persistence have risen, especially for the C rated loans, which shows lower mobility between ratings. Nevertheless, when these last two matrices are compared, the probability of persistence drops in June 2011. This is reflected in rises in the percentages of both the upper and the lower triangle with the increase being higher for the latter. Thus, the probability of moving to a better rating had risen with respect to December 2010. This trend is consistent with the recent change in the QI for the commercial loan portfolio.

Table 17
Quality and Default Indicator by Number of Commercial Loans

Date	Totals	Risky	In default	OQI	NLIO[a/]
	(number of loans in thousands)			(percentage)	
Jun-04	567.1	88.6	59.7	15.6	10.5
Dic-04	618.7	68.6	43.8	11.1	7.1
Jun-05	674.0	75.1	43.7	11.1	6.5
Dic-05	726.9	74.9	43.9	10.3	6.0
Jun-06	786.5	89.2	50.0	11.3	6.4
Dic-06	871.1	95.6	55.9	11.0	6.4
Jun-07	1,004.3	140.5	88.0	14.0	8.8
Dic-07	1,023.9	119.9	75.5	11.7	7.4
Jun-08	1,049.6	125.1	80.4	11.9	7.7
Dic-08	1,035.8	182.9	98.2	17.7	9.5
Jun-09	1,019.3	194.5	114.9	19.1	11.3
Dic-09	1,009.6	199.2	127.7	19.7	12.6
Jun-10	1,010.8	191.4	118.9	18.9	11.8
Dic-10	1,004.3	169.0	94.7	16.8	9.4
Jun-11	970.8	153.7	84.0	15.8	8.7

a/ The number of loans in default is calculated as the sum of those rated C, D, and E, which corresponds to the maturity profile determined by the Financial Superintendency of Colombia.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Table 18
Transition Matrices for the Total Commercial Loan Portfolio
(percentage)

A. Average Transition Matrix between June 2008 and June 2011					
	A	B	C	D	E
A	93.7	5.2	0.9	0.2	0.0
B	30.3	42.4	16.7	9.8	0.8
C	7.4	9.4	36.3	42.5	4.5
D	2.4	1.4	2.6	83.0	10.7
E	1.7	0.9	1.2	2.7	93.4
B. December 2010					
	A	B	C	D	E
A	93.4	5.7	0.7	0.2	0.0
B	32.3	48.2	13.7	5.5	0.3
C	5.5	13.4	51.8	28.2	1.1
D	2.0	1.3	3.8	81.8	11.1
E	0.7	0.5	2.5	1.0	95.3
C. June 2011					
	A	B	C	D	E
A	93.9	5.2	0.7	0.2	0.0
B	35.8	45.2	12.8	5.5	0.8
C	4.3	11.1	52.4	28.7	3.5
D	3.2	1.5	3.7	80.5	11.3
E	2.8	1.0	2.6	0.7	93.0

Source Financial Superintendency of Colombia, Banco de la República calculations.

The risk indicator for harvests of debtors[67] makes it possible to examine the evolution of the loans throughout the period they are in effect and compare between harvests for different periods. The QI for each harvest as well as for the total commercial loan portfolio since June 2008 is shown in Graph 102. Here the bars represent each one of the harvests evaluated for different quarterly periods.[68] When the change in this indicator is analyzed, it can be seen that the loans granted in the second quarter of 2011 showed a lower QI (2.6%) than the QI for the other harvests at the time they originated. These showed an average indicator of 3.5%. However, in the latest six months, there has been a general deterioration of the rest of the harvests.

When these results are compared with the harvests analyzed in previous editions of the Financial Stability Report, it is clear that loans tend to deteriorate for the two years following their issuance and that, starting at that point, their quality indicator declines. Nevertheless, the velocity at which the loans deteriorate each six months is not the same for all of the harvests and the loans granted in the last quarter of 2008 showed a faster deterioration. This performance is a result of the fact that these loans were granted during a period in which a larger proportion of establishments began to experience a less favorable economic outlook (Report on the Credit Situation in Colombia, December 2008). This was based on lower levels of profitability for the companies (Financial Stability Report, March 2009).

In general terms, the commercial loan portfolio continued showing real positive growth rates at the same time that increases in the concentration by intermediary and debtors were registered. In terms of risk, the quality indicators, transition matrices, and harvests showed an improvement.

Graph 102
Commercial Loan Portfolio: Analysis of Quality Index by Harvests
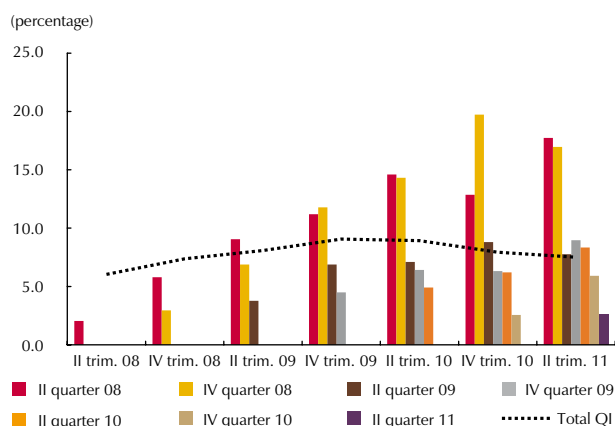
(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

b. *Consumer Loan Portfolio*

Consumer loans are classified into three types: credit cards, loans for the purchase of vehicles, and other

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67   One harvest represents the set of loans that are granted within a specific period of time.

68   Beginning with this Financial Stability Report, the harvests correspond to the loans originated in the abovementioned quarter rather than the six-month period which was the former basis of calculation. The harvest graphs are interpreted as follows: the horizontal axis shows the six-month period for evaluating the harvest while the colors of the bars are associated with each harvest. The line is, in turn, the loan portfolio quality indicator for the total of each type of loan in each period. In the analysis of loan portfolio quality for a harvest, we must clarify the fact that, a few six-month periods after its inception, the riskiest loans must be taken into account since they have a larger share in the current balance. However, this bias is common for all of the harvests and, therefore, they can be compared to each other. The reader is reminded that the analysis of harvests was changed from a six-month to a quarterly basis, but their evaluation is done every six months.

consumer loans.[69] Each one of these categories has different average amounts, average loan duration, type of collateral, and changes in its quality. The consumer loan portfolio and the risk profile for each one of its modalities are described in this section.

A.   Share of the Amount of Consumer Loan Portfolio by Type
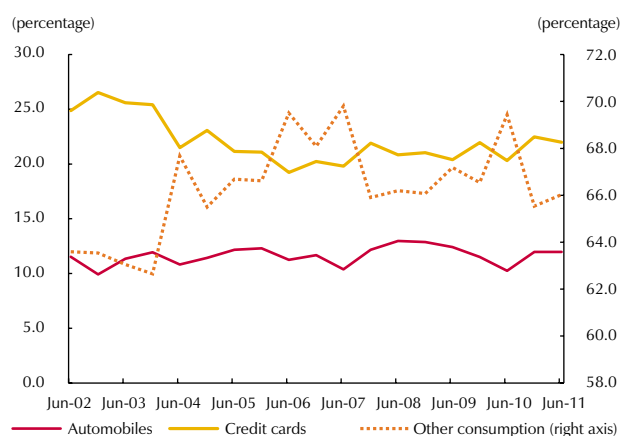
B.   Share of the Number of Consumer Loan Portfolio Transactions by Type
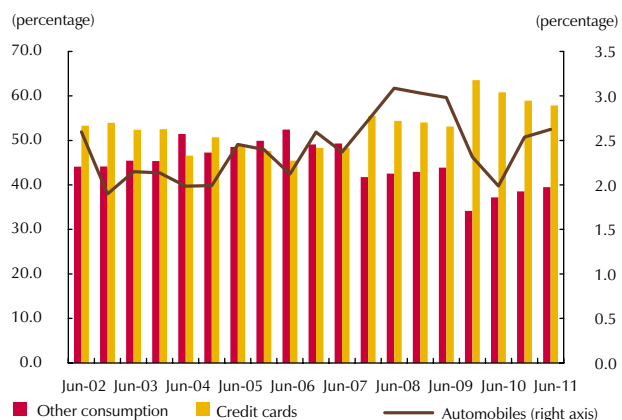
Source: Financial Superintendency of Colombia, Banco de la República calculations.

1)   General Characteristics of Consumer Loans

The consumer loan portfolio amounted to COP$54 t[70] towards the end of June 2011. Of this total, 66% pertained to other consumer loans, 22% to credit cards and 12% to loans for automobiles and other private use vehicles (Graph 103, panel A). In the first half of 2011, a moderate upswing in the share going to lending for other consumption (50 bp) and a decrease in credit card loans (50 bp) stand out. Although the loans for automobiles had significantly increased as of December 2010, they have remained stable with respect to their share in the total consumer loans in the first half of 2011.

When the consumer loans are analyzed by number of operations (Graph 103, panel B), credit cards went from representing 58.9% in December 2010 to 57.9% of the total operations in June 2011. In the same period, other consumer loans went from 38.5% to 39.5% and those for purchasing vehicles went from 2.5% to 2.6%.

Given the larger growth of the loan portfolio and the stable performance in the number of operations, the average loan amount increased for all types of credit. Table 19 shows that the highest average loan amount is the one for purchase of vehicles with COP$18.1 m per operation compared to COP$1.5 m for credit cards and COP$6.6 m for other consumer loans. The real annual growth of the average amounts by type of credit was 23.4%, 59.4% and 25% for purchase of automobiles, credit cards and other consumer loans respectively.

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69   In the category of "other consumption," the following stand out: unspecified use loans, revolving credit, overdrafts, portfolio purchase and school loans.

70   The value does not necessarily coincide with the balance obtained from the balance sheets of the credit institutions reported to the Financial Superintendency monthly as it is calculated on the basis of Attached Format 341. The component percentage and number of loans are procured from the same source.

Table 19
Average Amount of Debt by Type of Loan as of June each Year[a/]

Date	Automobiles	Credit cards	Other consumption	Total consumption
2002	12,73	1,34	4,14	2,87
2003	14,41	1,34	3,79	2,72
2004	15,67	1,33	3,79	2,88
2005	15,36	1,33	4,26	3,09
2006	17,09	1,37	4,27	3,23
2007	14,67	1,37	4,73	3,35
2008	15,34	1,40	5,69	3,65
2009	14,75	1,36	5,42	3,54
2010	14,73	0,95	5,33	2,82
2011	18,06	1,50	6,61	3,96

a/ The average amount is in millions of June 2011 pesos.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

2)   *Credit Risk and Loan Portfolio Quality*

As can be seen in Graph 104, the loan portfolio quality indicator continued to show a declining trend for all of the types of consumer loans. As a result, the QI for credit cards went from 12% to 9.4% between June 2010 and the same month in 2011. The QI for vehicle loans changed from 10.1% to 7.2% and the one for other consumer loans dropped from 9.2% to 6.9% during the same period. It should be emphasized that the QI level for credit cards is still higher than the one for the total consumer loan portfolio (7.5% as of June 2011). This could be due to the fact that the policies for giving out new cards tend to be laxer than those for other types of consumption.

In order to evaluate the concentration of risk by entity, the relationship between the total QI for the consumer loan portfolio and the share of this portfolio within the portfolio of each entity is analyzed. Graph 105 shows a major dispersal in the data. Nevertheless, there are some institutions with a high share of the consumer loan portfolio within their own portfolio and a QI above 10%. It is important to monitor these entities due to their serious vulnerability to greater deterioration in the consumer loan portfolio.

Graph 104
Loan Portfolio Quality Indicator by Type of Consumer Loan
(risky loan portfolio/gross loan portfolio)
as of June of each Year

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 105
QI of the Commercial Portfolio Vs. Share of Commercial
Loans in Each Institution's Loan Portfolio[a/]
(percentage)
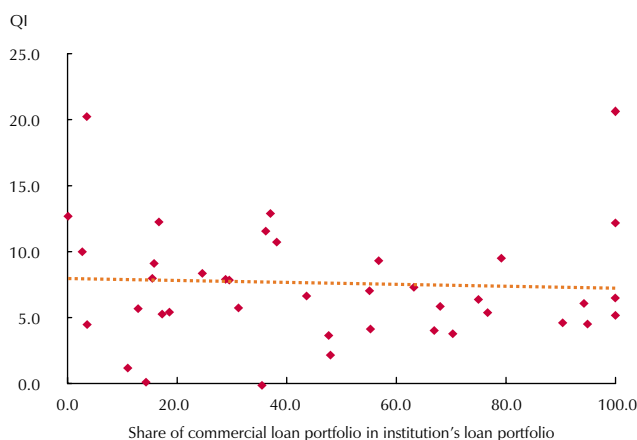
a/ One of the institutions which had a QI of 46% and a share of consumption within its portfolio that was 0.1% as of June 2011 was not included in the graph.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

In Table 20[71] the change in the number of total loans, risky loans and loans in default for the consumer loan portfolio since 2006 is analyzed. As mentioned in the previous Financial Stability Report, the OQI and the NLIO have a trend similar to the one registered in the QI. However, it can be seen that the OQI is always higher, which indicates that the loans with larger amounts in this portfolio are less risky. As of June 2011, the OQI remained stable at around 11.4% (the QI was 7.5%) while the NLIO dropped 20 bp compared to December 2010 and was at 7.7% in June 2011. This could indicate that there is a potential risk similar to the one six months ago, but defaults on payments have decreased moderately. It should be mentioned that both indicators are significantly lower than the level registered a year ago.

In order to analyze the change in credit risk, a calculation of transition matrices for quarterly periods was done for the total consumer loan portfolio. Table 21 shows the average for the transition matrices between March 2002 and June 2011 (panel A), the transition matrix for December 2010 (panel B), and the one for June 2011 (panel C). The higher percentages below the diagonal are associated with improvements in rat-

Table 20
Default and Loan Portfolio Quality Indicators by Number of Loans for the Total Consumer Loan Portfolio

Date	Totals	Risky	In default	OQI	NLIO[a/]
		(number of loans in thousands)		(percentage)	
2006-I	8,366.6	734.7	424.3	8.8	5.1
2006-II	10,190.2	938.8	567.8	9.2	5.6
2007-I	11,128.3	1,180.2	699.2	10.6	6.3
2007-II	11,654.4	1,256.3	770.7	10.8	6.6
2008-I	11,582.3	1,393.7	831.8	12.0	7.2
2008-II	12,173.3	1,691.9	1,107.0	13.9	9.1
2009-I	12,057.1	1,856.9	1,188.3	15.4	9.9
2009-II	15,095.9	2,246.2	1,564.0	14.9	10.4
2010-I	15,687.0	2,278.8	1,604.0	14.5	10.2
2010-II	13,791.7	1,569.3	1,098.1	11.4	8.0
2011-I	13,651.7	1,561.2	1,051.7	11.4	7.7

a/ The number of loans in default was calculated as the sum of those rated C, D, and E, which corresponds to the maturity profile determined by the Financial Superintendency of Colombia.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

71   The decrease registered for the total operations between June and December 2010 was due to the fact that one entity changed the way they reported credit card transactions.

ings while those that are above it are related to deteriorations in ratings or, in other words, increases in credit risk.

When the matrices for June 2011 are compared to the matrix for the historical average, there are lower probabilities for worsening and higher probabilities on the diagonal. The probabilities on the diagonal have decreased and those for improvement have increased in comparison to those for December 2010.

Table 21
Transition Matrices for the Total Consumer Loan Portfolio
(porcentaje)

A. Average of the Transition Matrices Between March 2001 and June 2011					
	A	B	C	D	E
A	95.2	2.9	1.1	0.6	0.1
B	44.9	27.1	9.3	17.8	0.9
C	23.5	11.5	18.7	43.8	2.6
D	12.0	4.5	6.1	34.6	42.8
E	5.9	1.4	1.7	4.0	87.0
B. December 2010					
	A	B	C	D	E
A	96.1	2.3	0.9	0.7	0.0
B	36.4	31.6	13.3	17.2	1.5
C	13.6	13.8	29.8	37.6	5.3
D	3.4	2.5	8.3	59.5	26.2
E	6.3	1.3	2.6	6.8	83.0
C. June 2011					
	A	B	C	D	E
A	95.8	2.5	1.0	0.7	0.0
B	35.3	34.6	12.8	16.5	0.8
C	13.9	13.8	28.1	39.2	5.0
D	5.0	2.7	7.5	59.8	25.1
E	10.5	2.0	3.0	4.4	80.1

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Furthermore, for each type of consumer credit, an analysis of the changes in credit risk was done based on the harvests of debtors. This analysis identifies, over the course of time, the quality of the loans held by borrowers from the financial system during a given quarterly period (harvest) and also makes it possible to distinguish between the risk profiles of new loans compared to prior harvests.

Graph 106 shows the quality of the loan portfolio based on the harvests and by type of consumer loan. Unlike what took place in the last six-month period, the QI for the new consumer loans was higher for all of the types of credit with the exception of the one for other consumer loans. Indeed, the new loans in the second

quarter of 2011 showed a 1.5% QI for car loans, 2.3% for credit cards, and 2.7% for other consumer loans. In addition, a QI for the new harvests of the total new consumer loans similar to that from six months ago has been registered. It should be emphasized that in spite of the increase in the QI for the new harvest for credit cards and vehicles, their levels are still low in comparison with those for new harvests prior to June 2010.

When the changes in each harvest are analyzed, the pace of deterioration for the QI has been stable over the latest six months in the case of credit cards and vehicle loans. At the same time, the changes in the QI for harvests from other consumer loans and the one for the total loan portfolio have shown lower and lower levels.

To summarize, a higher average amount for consumer loans is seen due to more growth in the consumer loan portfolio and stability in the number of operations.

Graph 106
Analysis of Consumer Loan Portfolio Quality by Harvests

A.   Automobiles
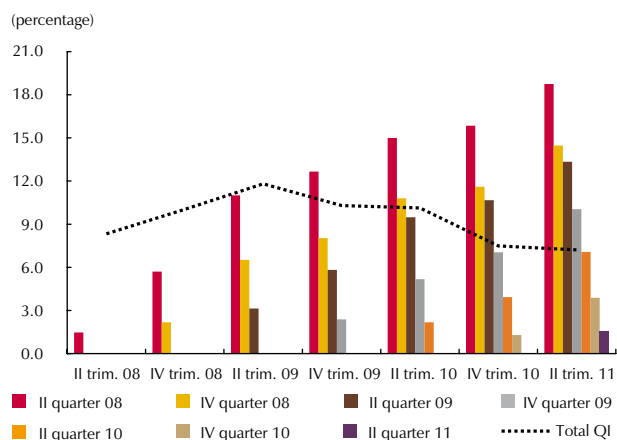
B.   Credit cards
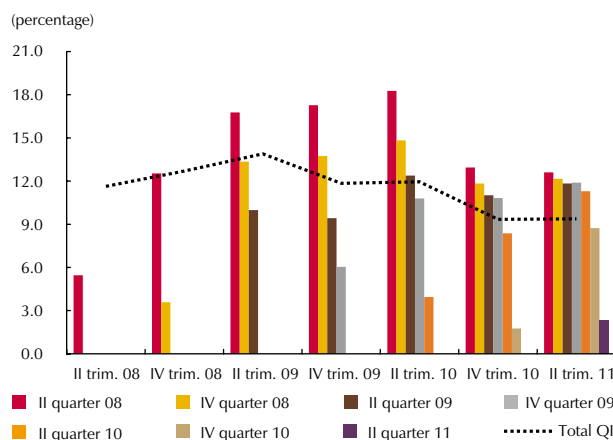
C.   Other consumption
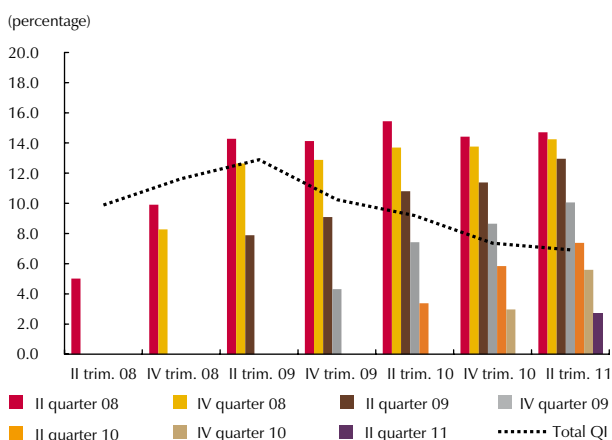
D.   Total consumption
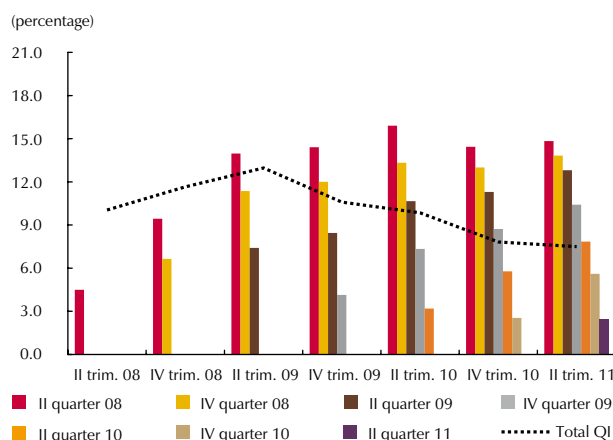
Source: Financial Superintendency of Colombia, Banco de la República calculations.

With regards to credit risk, the QI levels have continued dropping compared to those from a year ago while the probabilities of credit migration have registered a favorable trend. This is because the probabilities of worsening have declined and the probabilities of improving have gone up in comparison to the transition matrix for December 2010. In addition, the analysis of harvests makes it possible to verify a slight deterioration in the QI of the new harvests of credit card loans and loans to purchase automobiles. However, the risk which new loans start with is still at lower levels than those for prior harvests.

c.   Housing Loan Portfolio

1)   Credit Risk

In the first half of 2011, the loan portfolio without securitizations regained a share of the total after the securitization process that took place at the end of 2010. Thus, the loan portfolio went from 65.8% of the total at the end of 2010 to 72.2% in June 2011, which indicates that the intermediaries are more exposed to credit risk (Graph 107).

When the composition of the portfolio is analyzed by type of rating, an improvement in the quality indicator of the loan portfolio is found. This dropped from 8.5% in December 2010 to 6.3% six months later. This performance is mainly the result of a significant upsurge in the A rated loan portfolio and, to a lesser degree, a decline in the balance of the risky loan portfolio. An analysis of the latter shows that the loan portfolio with a B rating lost the largest share by going from 4.5% of the total at the end of 2010 to 3.4% in June of the current year while the other types of lending remained relatively stable (Graph 108).

Graph 107
Composition of the Mortgage Loan Portfolio
by Loan Portfolio and Securitization in Pesos

(percentage)
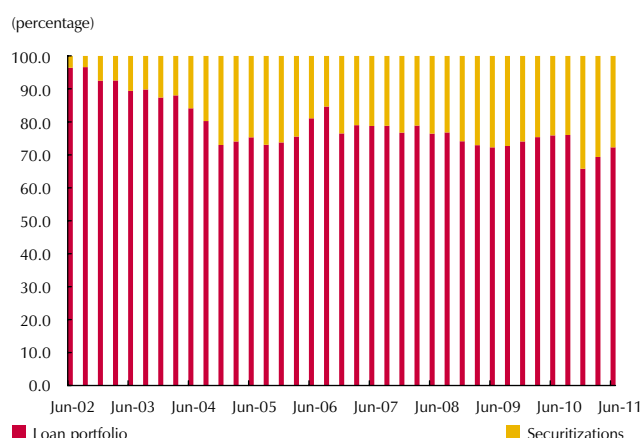
Source: Financial Superintendency of Colombia and Colombian Securitization, Banco de la República calculations.

Furthermore, when the QI is evaluated with respect to the share of the housing loan portfolio in the total loan portfolio, a negative relationship between these two variables is found, i.e., the intermediaries for whom the housing loan portfolio has greater weight have a better quality indicator (Graph 109).

In terms of number of loans based on their level of risk, both the OQI and the NLIO have continued to show a declining trend as they went to 9.5% and 4.5% respectively in June 2011. Meanwhile, they registered 10.3% and 5.0% six months before. This performance is due to a disproportional growth of the A rated loans compared to the growth of loans with different ratings (Table 22). In addition, it is noteworthy that these indicators are slightly higher than those calculated based on the balances of the loan portfolio. This could be due to the fact that the largest loans have better ratings than the smallest ones.

Graph 108
Share of the Risky Loan Portfolio by Rating
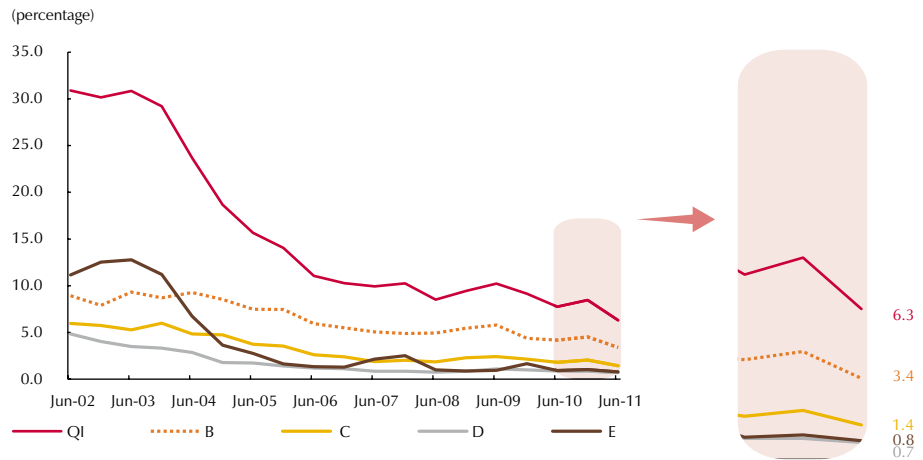
(percentage)

Source: Banco de la República calculations.

Graph 109
QI of the Mortgage Portfolio Vs. Share of Housing Loans in
Each Institution's Loan Portfolio[a/]
(percentage)
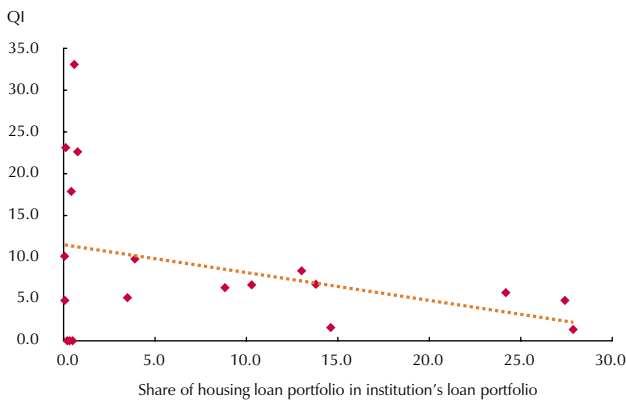
a/ as of June 2011.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

In order to analyze the changes in credit risk, the transition matrices were calculated for this loan portfolio. Table 23 shows the average transition matrices between June 2007 and June 2011 (panel A) as well as the matrix for December 2010 (panel B) and for June 2011 (panel C). Positive values above the main diagonal (upper triangle) represent increases in the probability of moving towards worse ratings while the positive values below the main diagonal (lower triangle) indicate rises in the probability of going to better ratings. When the matrix for June 2011 is compared with the average matrix and that for December, a drop in persistence for all ratings is found. This was reflected in a disproportional upswing in the probability of migrating towards a worse rating in comparison to the probability of moving towards a better rating.

In order to do a risk analysis of the new loans, the new harvests from each six-month period since June 2008 were evaluated. This analysis makes it possible to study the risk profile of the loans that originated in a specific period (harvest) and compare it to those that were granted during other six-month periods. In general, an improvement in the harvest for the first half of 2011 is found with respect to the one that originated six months before, which had a QI of 0.7% (Graph 110). Although the harvest for the second half of 2010 showed a high QI, it should be mentioned that its rate of deterioration is the lowest in the entire sample.

Table 22
Number of Loans Based on Risk Level

Date	Total loans	Risky	In default	OQI	NLIO[a/]
	(number of loans)			(percentage)	
Jun-04	561,745	126,185	75,533	22.46	
Dic-04	473,899	82,974	43,243	17.51	9.12
Jun-05	461,091	76,201	38,951	16.53	8.45
Dic-05	434,851	65,673	29,539	15.10	6.79
Jun-06	454,453	63,147	30,364	13.90	6.68
Dic-06	441,703	56,488	27,129	12.79	6.14
Jun-07	470,327	64,406	32,799	13.69	6.97
Dic-07	435,103	52,224	25,482	12.00	5.86
Jun-08	434,986	48,444	20,857	11.14	4.79
Dic-08	423,394	49,770	21,686	11.76	5.12
Jun-09	411,403	53,962	24,595	13.12	5.98
Dic-09	426,611	47,714	26,120	11.18	6.12
Jun-10	433,654	43,913	20,882	10.13	4.82
Dic-10	387,896	39,881	19,188	10.28	4.95
Jun-11	521,461	49,534	23,221	9.50	4.45

a/ The number of loans in default was calculated as the sum of those rated C, D, and E, which corresponds to the maturity profile determined by the Financial Superintendency of Colombia.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Table 23
Transition Matrices for the Mortgage Portfolio
(porcentaje)

A. Average Transition Matrix between June 2007 and June 2011					
	A	**B**	**C**	**D**	**E**
A	96,4	3,4	0,1	0,0	0,0
B	30,6	49,5	19,2	0,3	0,4
C	14,3	8,2	59,0	17,7	0,8
D	8,1	2,2	6,2	55,4	28,0
E	6,3	1,3	1,9	3,6	86,9
B. December 2010					
	A	**B**	**C**	**D**	**E**
A	97,1	2,8	0,1	0,0	0,0
B	28,1	51,8	19,7	0,2	0,2
C	12,7	8,9	57,7	19,6	1,1
D	6,2	2,2	6,9	54,3	30,4
E	4,7	1,0	1,8	4,8	87,7
C. June 2011					
	A	**B**	**C**	**D**	**E**
A	96,4	3,6	0,0	0,0	0,0
B	31,2	38,2	29,9	0,5	0,2
C	14,3	6,9	52,3	25,9	0,6
D	10,5	2,4	6,8	46,8	33,5
E	13,2	2,2	3,4	5,3	75,8

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 110
Graph 110
Analysis of Mortgage Portfolio Quality by Harvests
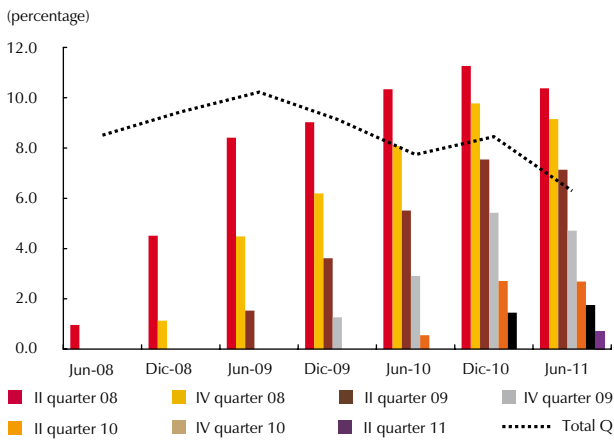
(percentage)

■ II quarter 08   ■ IV quarter 08   ■ II quarter 09   ■ IV quarter 09
■ II quarter 10   ■ IV quarter 10   ■ II quarter 11   ⋯⋯ Total QI

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 111
QI Comparison Between Sample and Total

A. Consumer Loan Portfolio
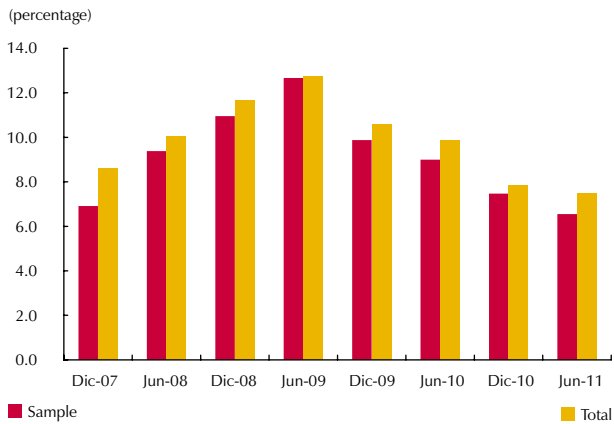
(percentage)

■ Sample   ■ Total

B. Mortgage Loan Portfolio

(percentage)

■ Sample   ■ Total
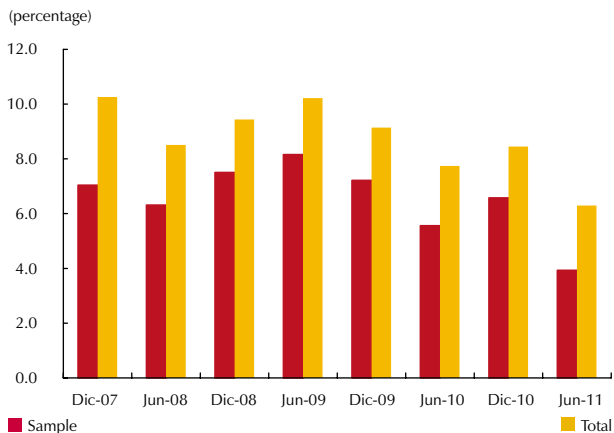
Source: Financial Superintendency of Colombia, Banco de la República calculations.

2) *Combined Credit Risk: Housing and Consumer Loan Portfolio*

In this section, an analysis is presented of the exposure the financial institutions have to the credit risk of agents that have more than one type of loan. To do this, a base was built of the debtors who have housing and consumer loans by using the information from the six-month periods since December 2007. As of June 2011, the agents with the two types of loans represented 70.1% of the total housing loan debtors and 6.4% of the consumer loan debtors.

Graph 111 compares the quality indicator for the loan portfolio for consumer loans and mortgages of agents which have both types of loans to the total loan portfolio. When the results for each one of these are analyzed, the QI of the debtors with both types of loans is seen to be lower than the one for the total sample and the gap between the indicators rose in the first half of 2011. This implies that the debtors that have the two classes of loans are, on average, less risky than the debtors in the total loan portfolio. This could be due to greater creditworthiness.

In conclusion, an upswing in the exposure to credit risk originating from the growth of the loan portfolio is seen. There was also an improvement in the QI, which was mainly caused by an uptick in the A rating. However, a rise in the credit risk as a result of a drop in the persistence of the ratings was evident along with an increase in the probability that loans could migrate towards worse ratings. Furthermore, we continue to see that debtors with consumer and housing loans are less risky than those who have only one of the two types of loans.

d. *Micro-credit Portfolio*

The real, annual growth of the micro-credit portfolio was 30% in June 2011, a figure that is higher than the performance for the last two years when its rate

of growth remained at or below 10%.[72] This growth has been accompanied by an increase in the number of debtors. With respect to six months before, the number of debtors in this loan portfolio went up 520,218 and reached a total of 1,542,551 in June 2011. It is noteworthy that this is the highest figure the micro-credit portfolio has ever registered. This performance may be because of a greater strength in this loan portfolio which is held by credit establishments as well as by the addition of a bank specializing in this type of loan portfolio to the financial system. The latter generated substantial surges in the balances and number of debtors in the micro-loan portfolio since the new bank was already handling loan portfolio operations before becoming part of the financial system. In addition, the average balance per debtor declined from COP\$4.1 m in December 2010 to COP\$3.4 m in June 2011 (Table 24).

Table 24
Micro-credit Loan Portfolio: Capital and Debtors

Date	Balance[a/]	Number of borrowers	Average amount per borrower[a/]
Jun-02	215.230	118.912	1.8
Jun-03	638.254	151.495	4.2
Jun-04	866.928	204.607	4.2
Jun-05	1.419.495	308.055	4.6
Jun-06	1.858.726	437.068	4.3
Jun-07	2.229.657	559.345	4.0
Jun-08	2.505.950	646.051	3.9
Jun-09	3.827.068	900.097	4.3
Jun-10	4.182.604	981.908	4.3
Jun-11	5.282.556	1.542.551	3.4

a/ Balances in millions of June 2011 pesos.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

1)   *Micro-credit Portfolio Concentration*

Graph 112 shows the changes that micro-credit concentration has gone through in the main financial institutions holding that portfolio. It is evident there that the largest entity has accounted for around 50% of the micro-credit portfolio as of June 2011. Nonetheless, this percentage, which has been growing moderately since 2009, fell 5 pp with respect to December 2010 due to the new bank's entrance into the market. Likewise, a moderate decline of 2 pp in the share the five largest entities had was registered. This corresponds to 87.7% of the total loan portfolio as of June of the current year. This could indicate that other entities that

72   In general terms, most debtors in the micro-credit portfolio are individuals (over 90% of them). However, many of these loans are part of the financial support offered to small businesses, but due to their informal character, the debt is recorded under the name of the individual who contracted it. This could be mainly due to the high costs small businesses incur in terms of registration procedures and requirements for by-laws as was mentioned in the latest issues of the Financial Stability Report.

(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

(percentage)

Source: Financial Superintendency of Colombia, Banco de la República calculations.

QI
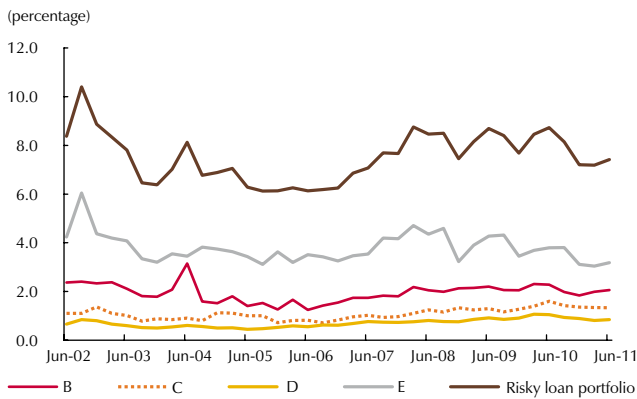
Share of micro-credit portfolio in institution's loan portfolio
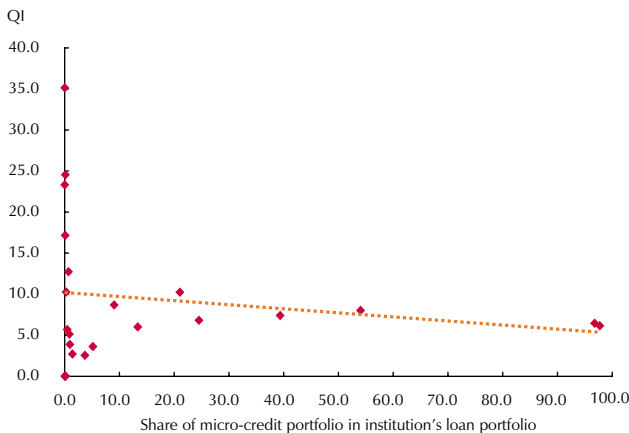
a/ One of the institutions which had a QI of 81.9% and a share of micro-loans within its
portfolio that was 0.2% as of June 2011 was not included in the graph.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

are not as representative have bolstered their micro-loan portfolio over the last six months.

2)   Credit Risk

Graph 113 shows the changes in the QI for micro-credit and the share of each category of risky loan portfolio within the total gross loan portfolio. As of June 2011, the QI for micro-credit came to 7.4%, which indicates a relatively stable performance compared to the QI registered in December 2010.

When the QI of the loan portfolio of each entity –with micro-credit being a part of that portfolio– is considered, no major risks associated with this loan portfolio are found. The entities that account for most of micro-credit maintain a risk level (measured by the QI) that is lower than that shown by the total loan portfolio and the riskiest entities have a less than 1% share of micro-credit within their own portfolios (Graph 114).

Table 25 shows the total number of loans, the number of risky ones and the ones in default for the micro-credit portfolio. When the OQI is compared to the QI for the micro-loan portfolio, the risk per number of debtors is higher than the risk based on loan balances (9.5% vs. 7.4% as of June 2011). This could suggest that the loans granted for higher amounts are the ones with lowest levels of risk. Furthermore, there is a seasonal nature in the OQI and the NLIO since the indicators deteriorate in the second half of each year in comparison to those for the first half of the same years. As of June 2011, the OQI was at 9.5%, a figure which is 50 bp above what was registered in December 2010 while the NLIO remained relatively stable at 6.9%.

The transition matrices make it possible to see the trend that credit risk is moving towards. The matrices are shown in Table 26 for the average between March 2004 and June 2011, for the fourth quarter of 2010, and the second quarter of 2011. The highest probabilities are those of remaining with the A and E ratings (95.4% and 97.5% respectively as of June 2011).

The sum of the probabilities in the upper triangle indicated that there were upswings in the probabilities that

the rating would become worse in June 2011 in comparison to both the previous six-month period and the historical average. The probabilities of the rating getting better, in turn, have risen though to a lesser degree when the changes in the lower triangle are contemplated, especially for movements toward the A and C ratings.

Finally, the analysis by harvests of loans makes it possible to monitor the QI of the loans granted in each period. Graph 115 shows the changes in this indicator for micro-loans in the second and fourth quarters since 2008.

The QI for the new loans in the second quarter of 2011 was 1.5%, a figure that is 50 bp above the one for the new harvest in the fourth quarter of 2010. This suggests that the new loans in the first half of the year became riskier at their inception than they did six months ago. However, these new loans still show a potential risk that is lower than the risk at which the loans originated between the second quarter of 2008 and the third quarter of 2010.

To summarize, the performance of the balance and the number of debtors for micro-credit in the first half of the year was characterized by a significant upsurge that was partially the result of the fact that a new bank that specialized in micro-credit entered the system as well as by the greater dynamism in this type of loan portfolio for the entities that were already present in the market. The newest harvest showed a slight increase compared to the QI of the new harvest from six months ago. It is noticeable that this indicator is still lower than those for new harvests in previous periods. Finally, the transition matrices present lower probabilities of persistence at the same rating and upswings in the probabilities for the ratings to either worsen or improve.

Table 25
Default and Loan Portfolio Quality Indicators by
Number of Loans for the Total Micro-credit Loan Portfolio

Date	Totals	Risky	In default	OQI	NLIO
	(number of loans in thousands)			(percentages)	
Jun-06	516.1	39.0	30.9	7.6	6.0
Dic-06	595.3	45.3	34.5	7.6	5.8
Jun-07	656.5	60.1	46.5	9.2	7.1
Dic-07	687.0	62.9	49.0	9.2	7.1
Jun-08	746.3	79.2	61.6	10.6	8.3
Dic-08	989.0	96.8	72.1	9.8	7.3
Jun-09	1,081.1	124.0	96.4	11.5	8.9
Dic-09	1,145.8	107.8	81.3	9.4	7.1
Jun-10	1,170.3	117.9	89.9	10.1	7.7
Dic-10	1,231.1	110.7	84.4	9.0	6.9
Jun-11	1,542.6	145.4	105.7	9.5	6.9

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Table 26
Transition Matrices for the Micro-credit Loan Portfolio
(percentage)

A. Average Transition Matrix between March 2004 and June 2011					
	A	**B**	**C**	**D**	**E**
A	96.4	1.9	1.0	0.6	0.1
B	28.1	26.0	11.3	8.1	26.6
C	12.2	5.6	20.5	8.6	53.1
D	7.2	2.2	2.6	15.8	72.2
E	2.5	0.5	0.4	0.6	96.0

B. December 2010					
	A	**B**	**C**	**D**	**E**
A	96.7	1.6	1.1	0.6	0.0
B	14.6	41.3	14.2	7.9	22.0
C	3.5	7.1	44.9	8.3	36.2
D	4.4	1.2	2.4	31.8	60.2
E	1.5	0.3	0.6	0.7	97.0

C. June 2011					
	A	B	C	D	E
A	95.4	2.5	1.2	0.8	0.0
B	24.6	21.4	15.0	11.8	27.2
C	9.3	6.9	18.5	12.4	52.9
D	6.5	3.4	5.3	16.3	68.5
E	1.0	0.3	0.3	0.9	97.5

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 115
Analysis of the Loan Portfolio Quality
tby Harvests: Micro-credit

(percentage)

II quarter 08   IV quarter 08   II quarter 09   IV quarter 09
II quarter 10   IV quarter 10   II quarter 11   Total QI
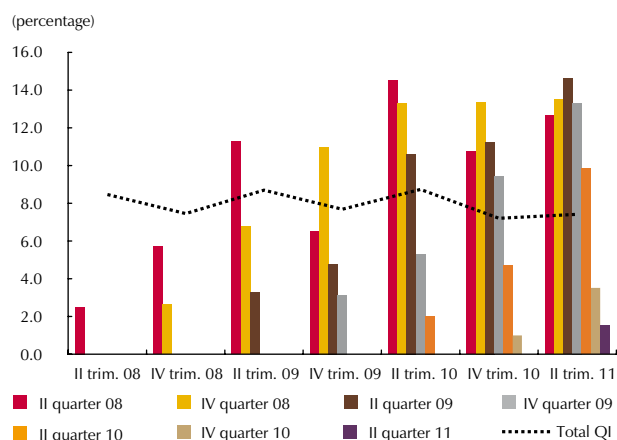
Source: Financial Superintendency of Colombia, Banco de la República calculations.

3) Combined Credit Risk: Consumer, Housing, and Commercial Loan Portfolios

In this section, the credit risk stemming from borrowers who have more than one type of loan that financial institutions are exposed to is analyzed. To do this, an analysis of debtors who have a micro-loan and, at the same time, another type of loan (consumer, housing, and commercial) was carried out.

As of June 2011, 22.1% (340,903) of the borrowers in the micro-credit portfolio also had transactions in the consumer loan portfolio. At the same time, in terms of capital, these represented 55.5% of the total balance of the micro-credit portfolio. In other words, borrowers who had these two types of loans have, on

average, debts that are larger than those that only have micro-credit. With respect to the results found in December 2010, these proportions are maintained in spite of the rise in the number of debtors.

Moreover, the loan portfolio quality indicator (QI) of the debtors with these two types of loans was at 7.4% as of June 2011 and remained relatively stable in comparison to the one for December 2010. Likewise, the QI for this sample is equal to the QI for micro-credit in June of the current year. This may suggest that borrowers with these two types of loans are, on average, as risky as the rest of the debtors in this loan portfolio (Graph 116).

Furthermore, the same combined analysis was done for the commercial and the housing loan portfolio. As of June 2011, 1.3% of the debtors in the micro-credit portfolio also had a housing loan while 4.2% also had a commercial loan. These figures are similar to those registered six months ago. Likewise, the QI of the borrowers with a micro-loan and housing loan was 7.2% while those with a micro-loan and a commercial loan also had a QI of 7.2% in the same month. These QI levels are lower than the QI for the entire micro-credit portfolio (7.4%), unlike the outcome in the previous six-month period when these borrowers were riskier than the average (Graph 116).

Graph 116
QI Comparison Between Samples and Total

(percentage)
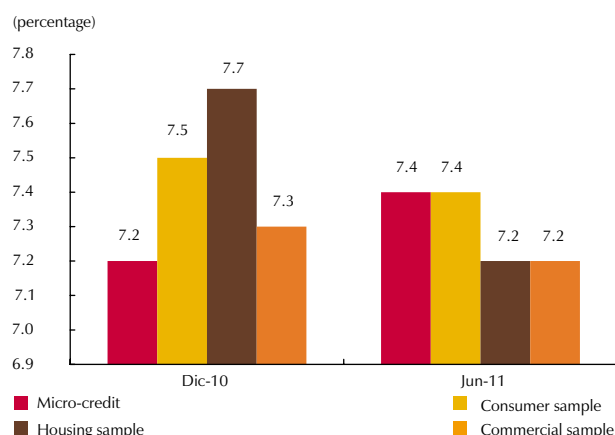
Source: Financial Superintendency, Banco de la República calculations.

C.   LIQUIDITY RISK

There are two dimensions of liquidity risk that have been widely discussed in literature. The first is the funding liquidity risk which is understood as the inability to cover current liabilities on time due to insufficient supply of liquid assets available. The second is associated with the market liquidity risk, which occurs when it is not possible to liquidate assets at adequate prices and in a timely fashion.

With this difference taken into account, exercises for measuring the liquidity risk associated with each of the abovementioned dimensions are given in this section. Furthermore, stress exercises are included to measure how sensitive the system is to extreme, but unlikely scenarios of low liquidity. At the end of the section, an analysis of the structure of the interbank market network is also included.

1.   Funding Liquidity Risk

The scaled liquidity risk indicator (LRI) is used to measure funding liquidity risk. This indicator was introduced into Colombia by the Financial Superintendency when the liquidity risk management system (SARL in Spanish) went into effect

in the first half of 2009. It is constructed as a short term liquidity gap, which is calculated for a horizon of seven, fifteen, and thirty days.[73]

For a horizon of one week, the LRI formula corresponds to the sum of the liquid assets adjusted for market liquidity (*AML*) and the requirement of net liquidity (*RNL*$_1$) estimated for that range of time:

$$LRI_1 = AML + RNL_1$$

where,

$$RNL_1 = FNVC_1 + FNVNC_1$$

FNVC$_1$ is the net cash flow of contractual maturities from assets, liabilities and off-balance sheet positions within the next seven calendar days and *FNVNC*$_1$ is the estimated net cash flow for the next seven days from deposits and liabilities payable on demand that do not correspond to contractual maturities. The *FNVC* can be positive or negative, depending on whether cash income exceeds outlays, but the *FNVNC* has a negative sign based on its construction:

$$FNVNC_1 = -frn_1 * [demand\ deposits\ and\ liabilities\ to\ date]$$

Where frn_1 is the net withdrawal factor for a seven-day horizon, which is calculated as the maximum percentage of net reduction in the sum of deposits and liabilities the respective institution may have faced from December 31, 1996 to the last day of the month immediately prior to the calculation, taking end-of-month withdrawals into account for this calculation. The *FNVNC* is, therefore, an indicator of a stressed withdrawal scenario. Liquid assets adjusted for market liquidity (*ALM*), in turn, are calculated using the following equation, where securities are entered at a fair market price:[74]

$$ALM = available + (bonds\ issued\ by\ the\ national\ government,\ Banco\ de\ la\ Republica,\ Fogafin)\ x$$
$$(1 - TES\ haircut) + (all\ other\ securities)\ x\ (1 - 1.2 * TES\ haircut)$$
$$- (total\ required\ daily\ average\ reserve)$$

When calculating the LRI, an additional 3.7% haircut is applied to the foreign currency component of the institution's liquid assets. In addition to including the adjustment for market liquidity, the purpose is to do the same for foreign exchange risk. Moreover, this indicator is scaled by illiquid assets to allow for a comparison among the different financial institutions. That is,

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73   In the September 2008 edition of the Financial Stability Report, the SARL and the method for calculating the LRI implemented by the Financial Superintendency of Colombia are described.

74   The haircuts applied to securities correspond to the ones published monthly by the Banco de la República.

$$\widehat{LRI}_{it} = \frac{LRI_{it}}{TA_{it} - MLA_{it}}$$

Where *TA* represents total assets while *MLA* are liquid assets adjusted to market liquidity risk.

Given that *LRI* is a liquidity gap of the type liquid assets – liquid obligations and liabilities, it is interpreted as follows: $\widehat{LRI}_{it} < 0$ implies high risk while higher LRI_{it} levels are associated with a better liquidity position for the institution being analyzed.

Graph 117 shows the evolution of the *LRI* for commercial banks from April 29, 2010 to August 19, 2011 based on the last week of the month. Although the agents' liquidity levels are considerably disperse, in no case was the indicator negative. This suggests low funding liquidity risk for the financial institutions in question.

The level of the LRI for the combination of entities has shown a relatively stable performance in the last few months and reached a level of 10.2%. However, this level is below what had been seen at the end of February of this year (12.5%) and the one seen for the same week one year ago (13.2%). In a more detailed analysis for the banks, the indicator also registers a lower level, which suggests that the liquidity level has dropped. This performance is caused by the higher level for non-contractual liabilities along with the lower levels registered for the investments in liquid assets.

Graph 117
LRI7/(TA-LA)
August 19, 2011

(percentage)

■ Ap 29, 2011 ■ May 27, 2011 ■ June 24, 2011 ■ June 29, 2011 ■ Aug 19, 2011
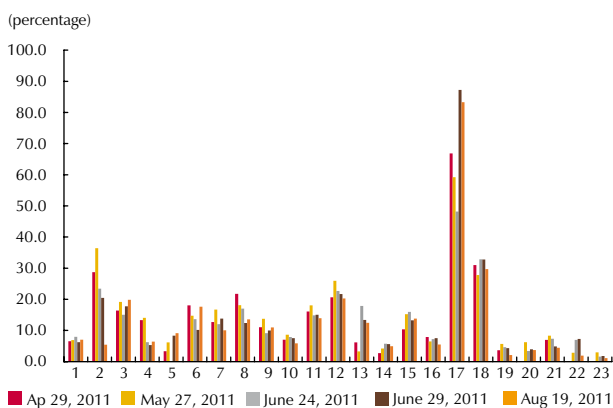
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Stress tests

Stress tests make it possible to evaluate the ability of institutions to respond to shocks to certain variables in extreme but unlikely scenarios. The following test was done by assuming a deposit-withdrawal scenario in addition to the one already incorporated into the LRI. The stressed indicator was calculated for the commercial banks and is defined as:

$$\widehat{LRI}_{stressed} = \frac{LRI_{i,t} - x\ (checking\ and\ savings\ accounts)}{TA_{i,t} - MLA_{i,t}}$$

LRI stressed = LRI i,t – x(checking and savings accounts) / TA i,t – MLA i,t

Using the data for $LRI_{i,t}$ (seven days) as of August 19, 2011, the stress test was calculated for the banks, assuming $x = 4\%$. As can be seen in Graph 118, none of the entities showed a negative *LRI* level after the stress test was applied. This was

proof that the banks were able to resist the withdrawal shock without a substantial deterioration in their liquidity condition.

After that, the same stress test was done but this time with a liquidity gap after fifteen days. The LRI indicator is seen to take positive values for the majority of the institutions after the shock. This indicates that none of them would find themselves in a situation of high liquidity risk. Nonetheless, two entities registered negative LRI levels, which indicates that they would face a situation of high liquidity risk in this extreme scenario (Graph 119).

In addition to the abovementioned stress scenario, a stress test was built in which the shocks to deposits are weighted based on type of creditor.[75] Given the information available for the case of Colombia, a stress test was built in which the creditors were classified into three categories: companies, private people and other depositors.[76] The adjustment factors as defined give greater importance to the deposits from companies and less to those from private individuals. These differences are due to the fact that the concentration of deposits per agent is higher in this case than it is in the case of individuals, whose deposits are generally isolated. Thus, in this exercise the shock is equivalent to a 6% withdrawal of deposits for companies, 3% for households and 4% for other depositors.

Graph 120 shows the adjusted *LRI* for a week, the unified *LRI* that corresponds to a shock of 4% for all deposits and the results of the stress exercises described above for the different banks based on the proportion of the deposits coming from companies.

When the results are analyzed, we see that this exercise succeeds in capturing the liquidity risk associated with the business structure of each entity. In other words, the banks where a high percentage of the deposits come from companies are more sensitive to a liquidity shock while banks with a higher concentration of deposits that belong to households are more resistant to the shock. Using the information that was available for the third week of August 2011, it should be emphasized that the institutions did not

Graph 118
Stress Test for LRI7/(TA-LA)
August 19, 2011

(percentage)

■ LRI 7 days   ■ LRI stressed 7 days

Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 119
Stress Test for LRI15/(TA-LA)
August 19, 2011

(percentage)

■ Ratio LRI 15 days   ■ Ratio LRI stressed 15 days

Source: Financial Superintendency of Colombia, Banco de la República calculations.

75   This exercise is based on the method developed by the Bank of Sweden (Riksbank). For additional information, see Sveriges Riksbank (2010), Financial Stability Report, December 2nd.

76   This classification includes the loans for the foreign, public and financial sectors.

A.   Banks with a Higher Proportion
      of Deposits from Households

(percentage)

■ LRI ratio   ■ Unified LRI   ■ LRI shock differentiated by type of depo
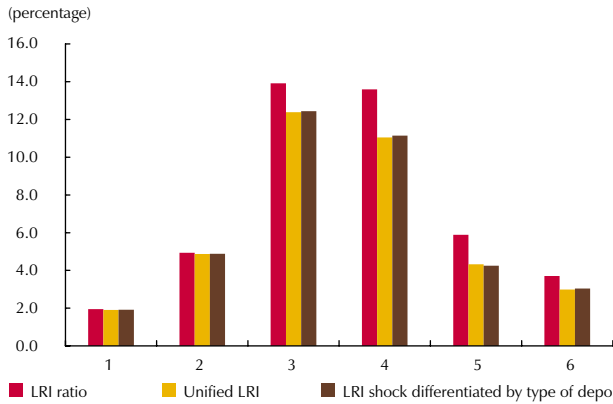
B.   Banks with a Uniform Distribution
      of Deposits by Type of Client
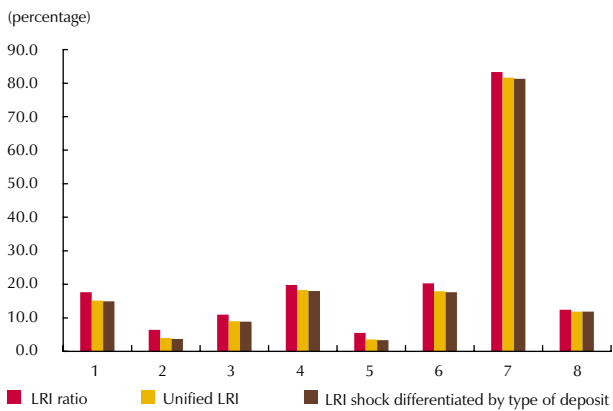
(percentage)

■ LRI ratio   ■ Unified LRI   ■ LRI shock differentiated by type of deposit

C.   Banks with a Higher Proportion of
      Deposits from Companies

(percentage)

■ LRI ratio   ■ Unified LRI   ■ LRI shock differentiated by type of deposit
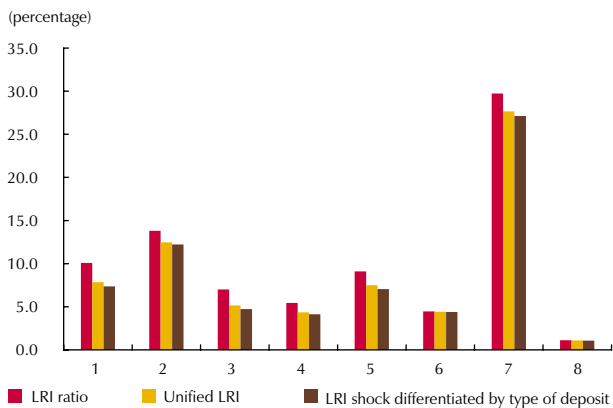
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

have liquidity problems even though the proposed shock was more severe for some.

2.   Liquidity-adjusted Value at Risk (L-VaR): A Market Liquidity Risk Indicator[77]

L-VaR makes it possible to determine the percentage increase in the VaR estimate that would be required to include liquidity concerns. The larger this percentage is, the greater the market liquidity risk will be and, therefore, the greater the adjustment that will have to be applied to the VaR.[78] The results of the L-VaR estimated for commercial banks are presented in this section. The exercise was done only for their TES portfolio based on data as of August 26, 2011 (Table 27).

The results show that the VaR for credit institutions as a whole should increase by 6.0% to incorporate market liquidity risk. This figure shows a decrease in liquidity risk in comparison to what had been registered on February 18, 2011 (7.1%). The drop in this risk is the result of both a slight reduction in the average bid-ask spread (bas)[79] for the system and the lower volatility shown by the bands of debt securities with a higher share in the portfolio (short term).

When the L-VaR is analyzed by entity, the banks are found to be less dispersed in comparison to what was seen in February 2011 which showed a lower variability in exposure to market liquidity risk on the part of these institutions. It is noteworthy that the indicator improved for most institutions and only deteriorated in four cases. In general, a favorable situation in terms of exposure to this risk was found.

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77   The method for calculating the L-VaR is found in Gonzalez and Osorio (2007). "El valor en riesgo ajustado por liquidez en Colombia," Financial Stability Report, Banco de la República, March 2007.

78   It is important to emphasize the fact that as a consequence of the information restrictions on the bid-ask spreads for public debt securities, the VaR calculated in this exercise differs from the one that is presented in the section on market risk.

79   The bas is a measurement of the distance between the points registered for the bid and the purchase of a security. A higher bas is associated with a higher liquidity risk since it indicates greater difficulty for a transaction to occur.

Institutions	February 18, 2011		August 26, 2011	
	VaR-L scenario excluding volatility	VaR-L scenario with volatility[a]	No volatility	Volatility scenario[a]
1	8.4	20.6	9.2	20.3
2	7.9	22.7	5.7	23.5
3	9.5	28.1	8.0	20.1
4	4.6	21.6	5.1	20.3
5	9.9	17.6	9.1	16.8
6	8.1	24.0	6.5	20.3
7	5.3	19.7	4.8	20.0
8	15.6	13.7	3.8	14.3
9	7.2	20.7	5.9	18.4
10	8.8	22.0	3.9	20.2
11	3.1	21.0	6.3	21.2
12	6.4	20.5	4.4	21.4
13	5.7	20.6	5.5	22.0
14	5.0	20.4	5.8	15.5
15	6.1	22.7	4.4	20.4
16	8.3	19.3	7.2	24.7
17	n.d.	n.d.	7.0	23.5
18	n.d.	n.d.	6.9	23.9
Total	**7.0**	**21.1**	**6.0**	**20.7**

a/ Based on volatility in the second quarter 2006.
Source: Banco de la República calculations.

Moreover, a stress test was done to evaluate the performance of liquidity adjustment in extremely illiquid market conditions. The scenario simulates a market performance similar to what was seen in the first quarter of 2006 when there were high levels in both the bas and the bas volatility for all of the bands. The results show a decline in liquidity adjustment from 21.1% to 20.7% between February 18, 2011 and August 26, 2011. The current composition of the aggregate loan portfolio shows lower vulnerability in the system in the event of an adverse liquidity shock. Furthermore, the percentage adjustment is lower for more than half of the institutions analyzed which indicates an improvement in the resistance that these have with respect to scenarios of little liquidity in the market and high volatility in the bond points (Table 27).

3. Interbank Market for Public Debt Securities: Network Structure

Currently, financial institutions manage a large part of their liquidity through government bond transactions which can be negotiated through two trading systems. One is the Colombian Electronic Market (MEC in Spanish) run by the Colombian

Stock Exchange (BVC in Spanish). The other is the Electronic Trading System (SEN in Spanish) which is managed by the Banco de la República.

Graph 121 shows the changes in the two trading systems over the course of 2011. A daily average of COP$9.5 t was transacted in the two markets with the MEC market taking the largest share of the total (54.3%). This could be due, in part, to the larger number of agents that participate in the BVC trading market. However, due to the fact that the large financial institutions can participate in the two trading systems, the size of these does not differ substantially.

In order to determine what the pattern of behavior of the financial institutions has been in the interbank markets for government debt securities (TES in Spanish), the networks consisting of institutions (nodes) and the transactions among them (links) are analyzed. Information on the interactions of the agents participating in SEN for each one of the dates analyzed is used to build the networks. In addition, centrality indices[80] are calculated to assign them to a radius on the network. Agents who are the most central are found in the center of the network while those who are more peripheral are situated at the extreme ends. The peripheral participants are shown within a dark gray area, based on the centrality index. The color of each node is associated with how much of a net supplier of liquidity the agent was that day. The existence of a line between nodes indicates that there were operations between those agents. The color of the line indicates the sum of the transactions between agents as an absolute value.

Graph 122 shows the structure observed in the SEN market for four Fridays between July 8 and August 26, 2011 but takes only the collateralized transactions between commercial banks into account. The networks presented show an incomplete structure indicating that the agents who participated in the market that day preferred to carry out few transactions with few credit institutions. Specifically, we see the largest disconnections in the networks under observation on August 5 and 26 as well as the persistence of some agents at peripheral positions. Finally, it should be noted that there was a net position of stable liquidity for the agents without significant variations on the days analyzed.

Graph 123 shows the number of peripheral entities in SEN and their trends so far this year. Beginning in May, the number of peripheral entities has registered an upswing compared to what was seen in March and April when there were several days with complete markets, i.e., without peripheral entities. This trend

Graph 121
MEC and SEN Share in 2011

(percentage)
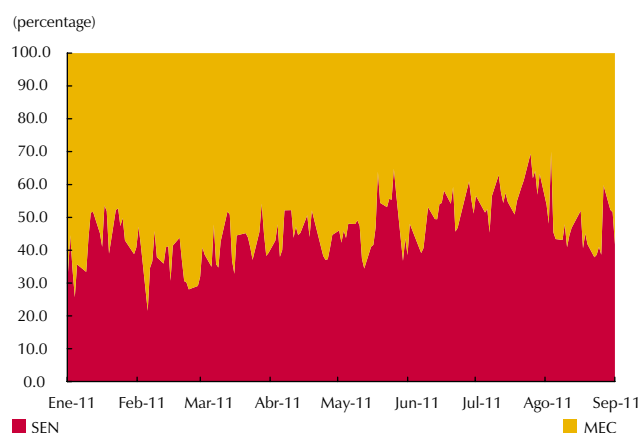
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

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80   The centrality indices are described in Saade (2008). "Aproximación cuantitativa a la centralidad de los bancos en el mercado interbancario de juegos cooperativos," Financial Stability Issues, # 037, Banco de la República.

suggests that the SEN market has been acting like an incomplete structure over the last few months if it is compared to what was seen in March and April 2011. This type of connectivity in the network indicates that the system has a lower resistance to liquidity shocks since the risk is not spread out among all the agents.

In order to study the role played by the different institutions in the current structure of the market for government debt securities, the structure of this market in the MEC was also examined for August 26, 2011. On that date, the number of entities that participated in the market was 520. A sample was taken of transactions in terms of amount carried out by the 30 most representative institutions in the market. The share of these transactions in the total for that day was 79.1% (COP$4.3 t).

If the number of connections that the institutions in the sample made is compared to the potential number of connections, one finds that they carried out 34% of the possible transactions. This level is lower than the one seen six months ago and even much lower than the connectivity in the SEN where the connection is usually higher than 80%.

In Graph 124, the structure of the market in government bonds in the MEC for August 26, 2011 is shown. The color of the links changes depending on the amount traded between the entities and the color of the nodes differs based on the net position that each agent has. Likewise, the position within the network represents each institution's degree of connection. The intermediaries with a high degree of

Graph 122
SEN Structure

A.   July 8, 2011

Net supply of liquidity

● Between $-136.9 b and $-110.6 b
● Between $-110.6 b and $-84.4 b
● Between $-84.4 b and $-58.2 b
● Between $-58.2 b and $-32 b
● Between $-32 b and $-5.8 b
● Between $-5.8 b and $20.4 b
● Between $20.4 b and $46.6 b
● Between $46.6 b and $72.9 b
● Between $72.9 b and $99.1 b
○ Between $99.1 b and $125.3 b

Total Transactions

— Between $0 b and $2.5 b	— Between $10.2 b and $12.7 b	— Between $20.3 b and $22.9 b
— Between $2.5 b and $5.1 b	— Between $12.7 b and $15.3 b	— Between $22.9 b and $25.4 b
— Between $5.1 b and $7.6 b	— Between $15.3 b and $17.8 b	
— Between $7.6 b and $10.2 b	— Between $17.8 b and $20.3 b	

connectivity are found in the center while the agents with a low one are found on the periphery. The entities with the most central position in the MEC network are still the brokerage firms given the amount in transactions and the high number of connections they have. Comparing the results with those obtained that day for the

B. July 22, 2011

Net supply of liquidity

- Between $-147.3 b and $-119.4 b
- Between $-119.4 b and $-91.6 b
- Between $-91.6 b and $-63.7 b
- Between $-63.7 b and $-35.9 b
- Between $-35.9 b and $-8.1 b
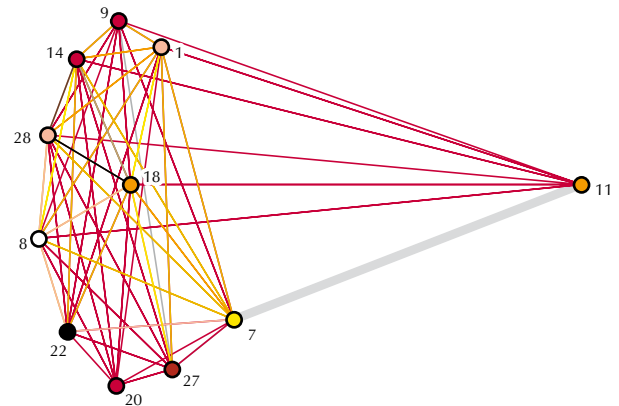- Between $-8.1 b and $19.8 b
- Between $19.8 b and $47.6 b
- Between $47.6 b and $75.4 b
- Between $75.4 b and $103.3 b
- Between $103.3 b and $131.1 b

Total Transactions

- Between $0 b and $4.5 b
- Between $4.5 b and $9 b
- Between $9 b and $13.5 b
- Between $13.5 b and $18 b
- Between $18 b and $22.5 b
- Between $22.5 b and $27 b
- Between $27 b and $31.5 b
- Between $31.5 b and $36 b
- Between $36 b and $40.5 b
- Between $40.5 b and $45 b

C. August 5, 2011

Net supply of liquidity

- Between $-135.6 b and $-102.3 b
- Between $-102.3 b and $-69.1 b
- Between $-69.1 b and $-35.8 b
- Between $-35.8 b and $-2.6 b
- Between $-2.6 b and $30.7 b
- Between $30.7 b and $64 b
- Between $64 b and $97.2 b
- Between $97.2 b and $130.5 b
- Between $130.5 b and $163.7 b
- Between $163.7 b and $197 b

Total Transactions

- Between $0 b and $2.8 b
- Between $2.8 b and $5.6 b
- Between $5.6 b and $8.5 b
- Between $8.5 b and $11.3 b
- Between $11.3 b and $14.1 b
- Between $14.1 b and $16.9 b
- Between $16.9 b and $19.7 b
- Between $19.7 b and $22.5 b
- Between $22.5 b and $25.4 b
- Between $25.4 b and $28.2 b
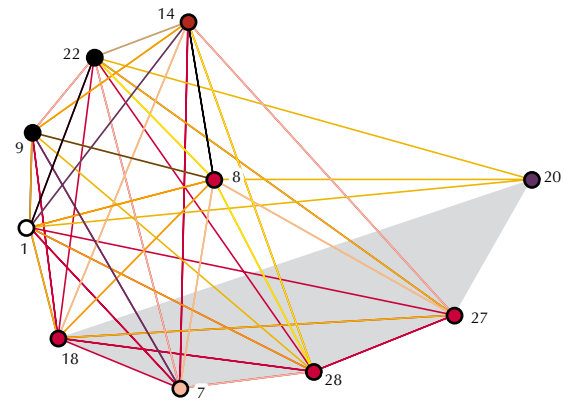
D. August 26, 2011

Net supply of liquidity

- Between $-141.9 b and $-102.4 b
- Between $-102.4 b and $-63 b
- Between $-63 b and $-23.6 b
- Between $-23.6 b and $15.9 b
- Between $15.9 b and $55.3 b
- Between $55.3 b and $94.8 b
- Between $94.8 b and $134.2 b
- Between $134.2 b and $173.6 b
- Between $173.6 b and $213.1 b
- Between $213.1 b and $252.5 b

Total Transactions

- Between $0 b and $2.1 b
- Between $2.1 b and $4.3 b
- Between $4.3 b and $6.4 b
- Between $6.4 b and $8.6 b
- Between $8.6 b and $10.7 b
- Between $10.7 b and $12.9 b
- Between $12.9 b and $15 b
- Between $15 b and $17.2 b
- Between $17.2 b and $19.3 b
- Between $19.3 b and $21.5 b
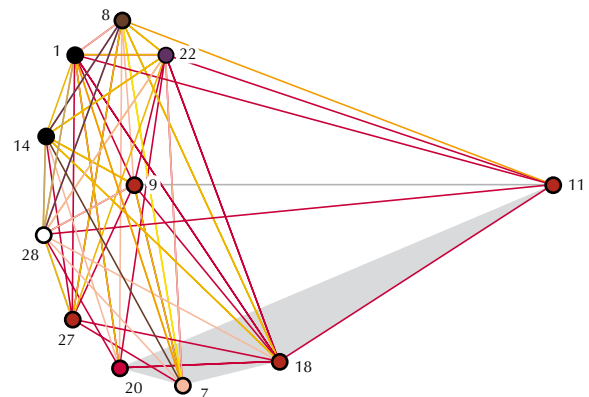
Right axis: Extent to which the agent was a net supplier of liquidity in pesos. This is shown graphically by the size and color of the node.
Lower axis: Extent to which the agent was a net supplier of liquidity in pesos. This is shown graphically by the size and color of the node.
Dark gray area corresponds to all of the banks that were peripheral to the network on that day, if indeed there were such.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 123
Number of peripheral entities in the SEN in 2011

(units)
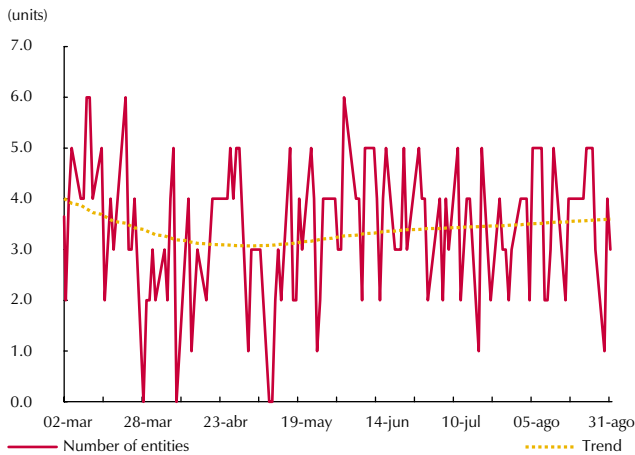
Source: Financial Superintendency and Banco de la República.

SEN, there is persistence in the net liquidity position for the banks that participate in the two markets.

D.   COMBINED RISK ANALYSIS

In terms of financial stability, it is important to continuously monitor the different kinds of risks and the levels of profitability and soundness of the financial intermediaries as well as the macroeconomic conditions they face.

To do a combined analysis of the risks that the financial system is exposed to, the Financial Stability Map (FSM) is presented. The purpose of the map is to measure the stability of the system based on six aspects or dimensions. Three are related to current risk conditions. Two are related to the macroeconomic environment and one, to the soundness and profitability of the system. The method used ranks the risk situation on a scale of one to nine with one being a low level of risk. Note that the model is designed to provide an indicator of the current situation in the financial system and should not be interpreted as an early warning indicator.[81]

1.   Diagram Design

As was mentioned, the FSM considers six dimensions: the domestic macroeconomic environment, the foreign sector, profitability and capital adequacy, and credit, market and liquidity risks. For each one of these categories, representative variables were selected in order to evaluate the levels of risk that each institution is facing[82] pursuant to the method suggested by the IMF[83] and by Bedford and Bloor (2009).[84] The indicators considered for each of the dimensions are shown in Table 28.

The model was built with a quarterly basis for the dimensions related to the macroeconomic environment and monthly for the dimensions related to the financial

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81   The method used for the construction of the FSM is based on the Global Financial Stability Map of the IMF and on the Financial Stability Cobweb of the Central Bank of New Zealand.

82   In the selection of variables, the indicators that showed an unchanging performance with respect to the risk that needed to be analyzed in each dimension were taken into account. However, in some cases it is difficult to find indicators that have that characteristic.

83   International Monetary Fund (IMF) (2008), Global Financial Stability Report, October.

84   Bedford and Bloor (2009). "A Cobweb Model of Financial Stability in New Zealand", Discussion Paper Series, Reserve Bank of New Zealand, DP2009/11, November.

Graph 124
MEC Structure, August 26, 2011

Net supply of liquidity

- Between $-180 b and $-146.5 b
- Between $-146.5 b and $-112.9 b
- Between $-112.9 b and $-79.4 b
- Between $-79.4 b and $-45.9 b
- Between $-45.9 b and $-12.3 b
- Between $-12.3 b and $21.2 b
- Between $21.2 b and $54.7 b
- Between $54.7 b and $88.2 b
- Between $88.2 b and $121.8 b
- Between $121.8 b and $155.3 b

Total Transactions

Between $0 b and $5.7 b	Between $22.8 b and $28.5 b	Between $45.5 b and $51.2 b
Between $5.7 b and $11.4 b	Between $28.5 b and $34.2 b	Between $51.2 b and $56.9 b
Between $11.4 b and $17.1 b	Between $34.2 b and $39.8 b	
Between $17.1 b and $22.8 b	Between $39.8 b and $45.5 b	

Note: Banks start with 1; financial corporations, 2; Brokerage firms, 3; Insurance companies, 4; Trust companies, 5; Pension funds, 6; and others, 7.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

system.[85] For each one of the indicators, the longest available time series was used. Therefore, there are some variables which have a smaller dimension.

The comparative results of the FSM are presented in Graph 125. The brown line represents the median and is considered a normal level of risk. Note that the graph should be read cautiously since the description of the risks does not imply the analysis of a measurement of systemic risk nor does it take into account the relationships between the different risks.

At the end of the first half of 2011, the financial system reflects a decline in its vulnerability with respect to the domestic macroeconomic environment compared to what was registered six months before by going from level 3 to level 1. These results may be explained by the larger growth experienced in the economy over the first half of 2011 as well as by a positive outcome in the expenditure balance from the central national government (NG).[86] Exposure to the foreign sector, in turn, continued declining as a result of a better perception of the country risk, an increase in the balance of the current account and, fundamentally, the upswing in foreign direct investment.

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85 The difference in frequency for each dimension does not create difficulties since each one of them was constructed independently of each other.

86 The NG went from registering deficit balances between 2009 and 2010 to surplus results in the effective cash transactions accumulated over the two first quarters in 2011.

Table 28
FSM: Dimensions and Variables

Domestic Macroeconomic Environment	Exposure to Foreign Sector	Credit Risk	Liquidity Risk	Market Risk	Profitability and Capital adequacy
Growth of the GDP	EMBI+ Colombia	Default indicator	ULR[a/]	Percentage of negotiable securities	Capital adequacy
Inflation	Exports/Imports	Growth of non-performing loan portfolio	Liquid liabilities/ liquid assets	VaR	ROE
Unemployment	Current account		Deposits/gross loan portfolio		Ex-post intermediation spread
Fiscal deficit	Foreign direct investment		Interbanking funds/ liquid assets		Leveraging

a/ Ratio of unhedged liabilities. This indicator is described in the September 2009 edition of the Financial Stability Report in the section on liquidity risk.
Source: Banco de la República.

Graph 125
Financial Stability Map
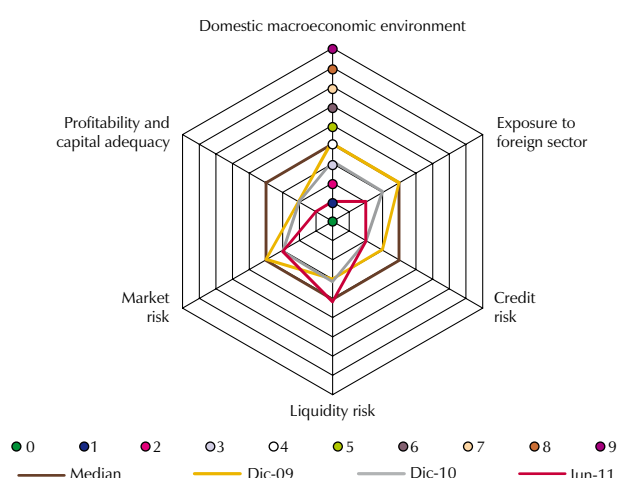
Sources: Financial Superintendency of Colombia, DANE, and Bloomberg; Banco de la República calculations.

With respect to the risks to the system, the FSM shows that both the market and the credit risk remained at the same level they had at the end of 2010 (levels 2 and 3 respectively). The liquidity risk, in turn, experienced deterioration as a result of the rise in the liquid liabilities and the interbank funds compared to liquid assets.

In the case of the profitability and capital adequacy of the financial system, it can be seen that they showed an improvement as of June 2011 when they reached a minimum level of vulnerability. This was mainly the result of a decline in the degree of leveraging the institutions had.

In conclusion, there has been stability in the levels of credit and market risk faced by the intermediaries while the liquidity risk has experienced a slight uptick. Furthermore, for this Financial Stability Report, the exposure to the foreign sector as well as the profitability and the capital adequacy continue showing sound conditions. The domestic macroeconomic environment, in turn, has been benefitted by the greater economic growth and, to a lesser degree, by the NG surplus registered over the course of the year. It is noteworthy that both the domestic macroeconomic environment and the foreign sector could experience variations as a consequence of the greater uncertainty in the international markets.

Box 8
BENCHMARK INDICATOR OF FIRMS (BIF)

The performance of the companies in the most representative sectors of the economy is analyzed in this box. These are also companies that play an important role in the loan market. Initially, there will be an analysis of the changes in the profitability, leveraging, efficiency and liquidity indicators for each sector followed by the construction of the BIF, which rates the performance of the firms in their respective sector and also makes it possible to analyze the performance of each branch with respect to their corresponding historical levels. In addition, the relationship between the BIF and the credit rating of the companies in each sector is also studied.

Analyzing the companies with respect to financial stability becomes relevant when they have a significant share in the total loan portfolio of the credit institutions because their vulnerability would represent a risk for the financial system.

The balance sheet information for December 2010 of the companies that report data to the Superintendency of Corporate Affairs was used for the construction of this indicator. Likewise, the change in the loan portfolio that they had with credit establishments was studied in order to analyze their credit performance with respect to their vulnerability indicator (BIF).

The branches analyzed are those that contribute significantly to economic growth and play an active role in the credit market. As of June 2011, the branches in the productive sector that make up the majority of the GDP were the manufacturing industry, commerce, and the construction, mining and agricultural sectors. These sectors, especially manufacturing and commerce, have the largest proportion of the commercial loan portfolio as of June 2011 (35.3% and 27.5% respectively).[1]

1.   Descriptive Statistics

For the five sectors mentioned above, the return on assets (ROA) was positive in 2010 and had maintained that trend since 2001. At the end of the 1990s, all the sectors showed decreasing profitability and two of them registered negative levels (agriculture and construction) as a consequence of the economic crisis that took place during that decade (Graph B8.1).

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1   To know more about these data see the section entitled "Current situation and outlook for debtors in the financial system" included in this Financial Stability Report.

Graph B8.1
Return on Assets (ROA)
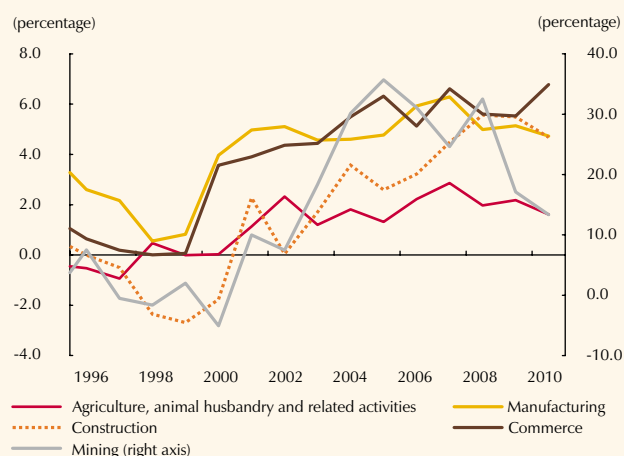
Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.

Mining is the sector that showed the highest level of profitability in 2010 followed by commerce while the agricultural sector showed the lowest level of profitability. It should be noted that, in 2010, the profitability of the mining sector was lower than what has been registered since 2003 due to a substantial drop in the profitability relative to assets.

When the average for the historical data was calculated, a measurement of long term profitability was found. In the case of the mining sector, this indicator came to 13.9% for commerce and close to 4% for manufacturing while for the sectors of construction and agriculture, it is below 2%.

The indicator of financial obligations with respect to assets measures the leveraging the companies have with the financial sector. When this indicator was analyzed, the mining sector had the lowest level of leveraging with respect to its assets in 2010 while, at the same time, the commerce and construction sectors were the most leveraged (Graph B8.2).

Between 1997 and 2003, the mining sector registered its highest historical levels of leveraging. This could be explained by initial investments that required sizable amounts of capital. In the case of other sectors, this indicator has not experienced major changes over the last fifteen years. When the long term figures were calculated, it was found that the levels of leveraging for the commerce and construction sectors were close to 20% while manufacturing and agriculture recorded levels of 16% and 13.5% respectively. Finally, the mining sector registered close to 10% for this indicator and, as was already mentioned, it also had the highest volatility.

Graph B8.2
## Financial Obligations/Assets

(percentage)
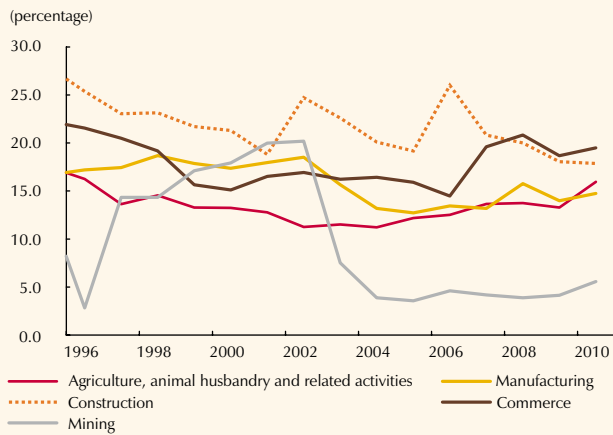
Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.

The ratio between current liabilities and current assets was used to measure the liquidity of the firms. If this indicator is higher than 1, it means the companies do not have a favorable position in terms of liquidity. The construction and manufacturing sectors were found to have the best positions with respect to liquidity. At the same time, mining and agriculture had the least favorable indicators. All of the sectors have shown a liquidity indicator that has been relatively stable over time with the exception of the mining sector. In the long term, the construction sector was found to have the lowest indicator at almost 61%, but in the case of the mining sector, the current liabilities came to 86% of the current assets (Graph B8.3).

Finally, the ratio of both management and labor-related expenditures to assets was calculated in order to measure the efficiency of the companies. Low figures show better levels
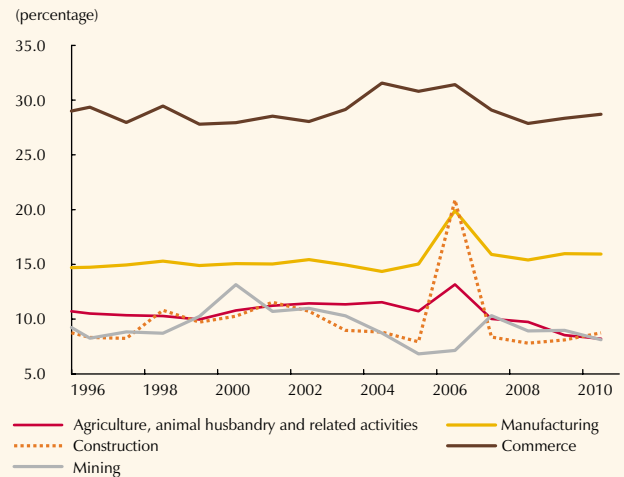
Graph B8.3
Current Liabilities/Current Assets

(percentage)
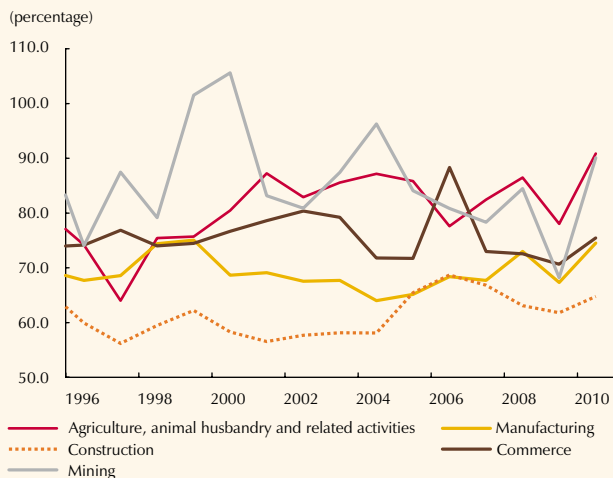
Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.

of efficiency and high values reflect large expenditures with respect to assets (Graph B8.4).

Graph B8.4
Management and Labor-related Expenditures/Assets

(percentage)

Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.

The commercial sector had the highest level in this indicator for the entire period analyzed while the lowest levels corresponded to the sectors of mining and construction. In the long term, the indicator was 29% for the firms in the commerce sector, 15.5% in manufacturing, 10.5% in agriculture, and 9.9% and 9.4% in construction and mining respectively.

2.   Construction of the BIF indicator

Following the results of prior studies,[2] four indicators were defined and built based on the accounting information of the companies to evaluate their performance with respect to liquidity, efficiency, leveraging and profitability. The performance of the companies in each one of these aspects is compiled in the BIF.

In order to build the BIF it is necessary to standardize the four abovementioned indicators so they reflect the performance of the companies in relation to the historical data for their sector and allow the data to be compiled consistently.[3]

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2   Gutierrez Rueda (2010). "Determinantes del riesgo de crédito comercial en Colombia," "Financial Stability Issues," Banco de la Republica, March.

3   By means of a logistic function, the indicators are standardized so they may take values between zero and two. For more details about the methodology, see the Financial Stability Report for March 2011. The purpose behind this standardization is to distribute the indicators of each firm in a sector based on their distance in standard deviations with respect to some average benchmark for performance. The average for the 2009 data

The indicators will take values between 0 and 2 based on that standardization. If the value for an indicator is between 0 and 0.5, the firms are in the zone of worst performance because they show an indicator that is more than one standard deviation below the long term average for the sector. Firms with standardized indicators between 0.5 and 1 have a low performance because they are below the long term average for the sector and have a standard deviation that is between 0.5 and 1. Finally, indicators above 1 imply a positive performance (better than the long term average for the sector or, in the worst case, less than a half standard deviation below the average). The zone between 1.5 and 2, to be specific, corresponds to the best performance.

The BIF is calculated as the simple average of the standardized indicators. Consequently, it takes values between 0 and 2 and leads to a method for classifying the companies into the four zones described.

3.   BIF Results

When the BIF was calculated for both the mining sector and its respective components, it was found that the firms were in the lowest zone in terms of profitability, i.e., the profitability for all of them was below the long term profitability. These results are due to the fact that even though the profitability level for this sector was high in 2010, it was below the levels that had been registered since 2003 (Graph B8.5, panel A). The aggregation of these results in the BIF showed that 50% of the firms in this sector had an indicator below one. In other words, they are in the lowest performance zones (Graph B8.5, panel B).

When the relationship between the BIF and the credit rating of these companies is analyzed, there is a significant density in the firms that are rated A (corresponding to 1 on the graph). Furthermore, there are firms with poor performance in comparison to the historical levels of this sector that, nonetheless, had an A credit rating (in this case, 48.3% of the ones rated A). Also, a correlation close to zero (-0.08) between the BIF and the credit ratings was found (Graph B8.6).

Regarding the agricultural sector, there is a large dispersion of the companies in each indicator (Graph B8.7, panel A). After the indicators were averaged, more than 82% of the firms had BIF level above 1. In other words, most of the firms had a positive performance relative to the historical levels for the sector (Graph B8.7, panel B).

A major concentration in the A rating was found by contrasting the BIF results with the credit ratings. It is noteworthy that there are cases in which some companies that have positive BIF results do not have low credit ratings and also, cases in which firms that have low BIF levels do not have a poor credit performance (Graph B8.8). In spite of this, the correlation between these variables was significant but negative (-0.28).

Also, the manufacturing sector showed a substantial dispersion of the firms in every indicator. With regard to leveraging and liquidity, there was an ostensible concentration of the firms in the upper region, which is that of the best performance in opposition to what happened in the case of the profitability indicator. When the BIF for the companies in this sector was calculated, more than 50% of the firms had a BIF below 1, and 8.5%, in particular, of the total number of firms in this sector were in the critical zone (Graph B8.9).

Graph B8.10 shows that this sector has a large concentration of A rated firms with a BIF below 1 (51%). This may be explained by the collateral that usually supports the loans granted to these companies. The information analyzed does not include the performance indicator and, therefore, there is insufficient evidence to prove a negative correlation between the variables (Graph B8.10).

The BIF for the construction sector, in turn, revealed high concentration of companies with levels that were above 1 (91.5%), which reflects the positive performance of this sector in 2010. This outcome was brought about by the results for the leveraging, liquidity and profitability indicators, which are above their long-term averages. It is important to mention that the long term averages for this sector include the low profits earned during the mortgage crisis. Furthermore, the fact that no firm in this sector placed in the BIF critical zone should be emphasized (Graph B8.11).

By contrasting the performance indicators with the credit ratings, a strong concentration of loans in the best rating category is found. They are mostly in the region in which the BIF is above 1. As happened in the case of the results of some of the sectors analyzed, the negative relationship expected between credit risk and performance of the construction companies is not present.[4] This shows that the positive momentum of this sector in 2010 was not reflected in the ratings for the loans granted in that period (Graph B8.12).

The commerce sector is the most heterogeneous in relation to the performance of its companies. However, the majority of them are within the two best BIF zones (69.8%). This is the effect of more liquidity and improvement in leveraging with respect to its historical levels. It is noticeable that only 2%

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was used in that Report. In addition, the long term average for the sector was used in this box in order to gather the effects of the economic cycle in the indicator.

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4   The correlation between these variables was -0.06.

Benchmark Indicator for Firms in the Mining Sector

A.1   Efficiency

(indicator)

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   BIF Mining Sector

(indicator)   (percentage)
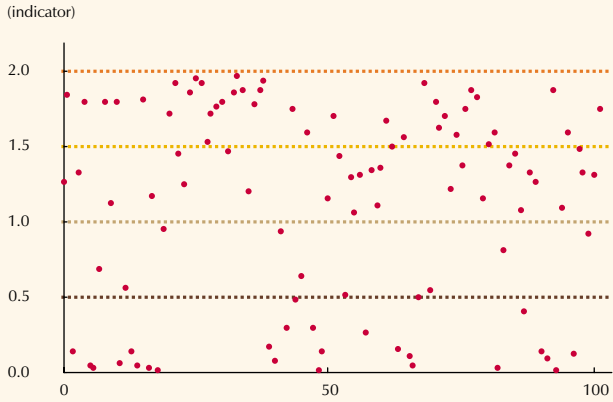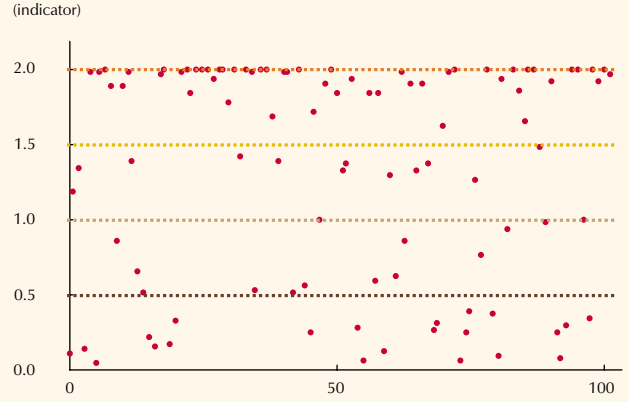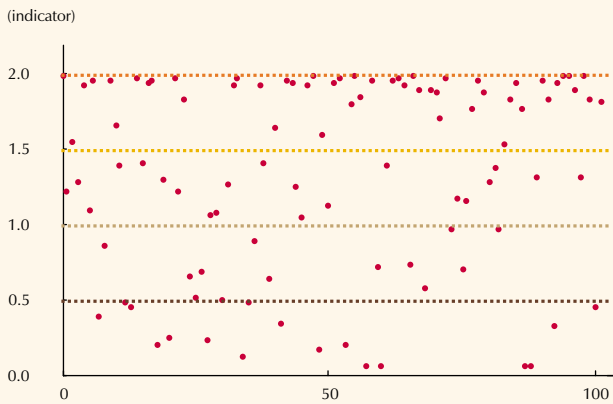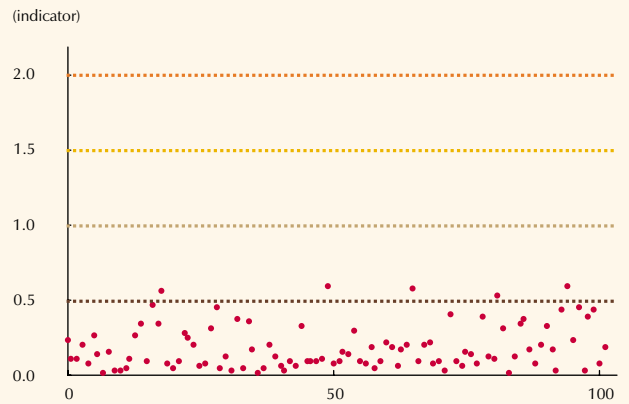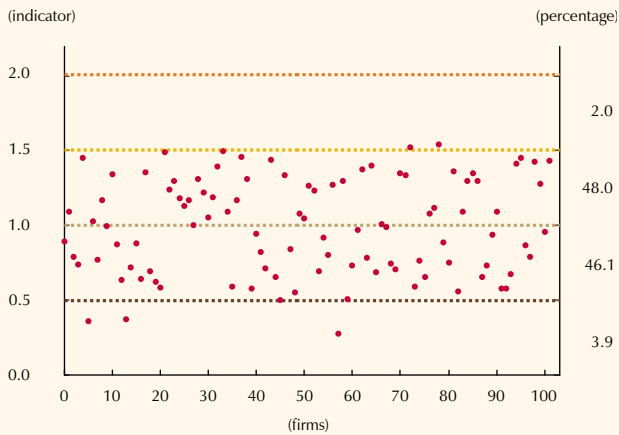
(firms)

Graph B8.6
Benchmark Indicator for Firms
and Mining Sector Credit Rating

(indicator)

(credit rating)
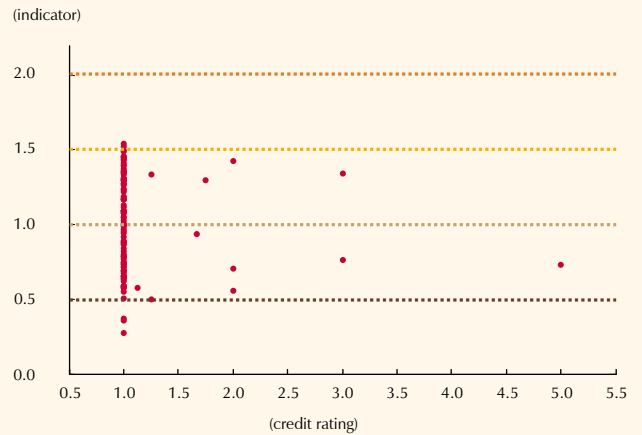
Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.

Sources: Superintendency of Corporate Affairs, Financial Superintendency of Colombia, Banco de la Republica calculations.

Benchmark Indicator for Firms in the Agricultural Sector

A.1   Efficiency

(indicator)

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   BIF Agricultural Sector

(indicator)   (percentage)
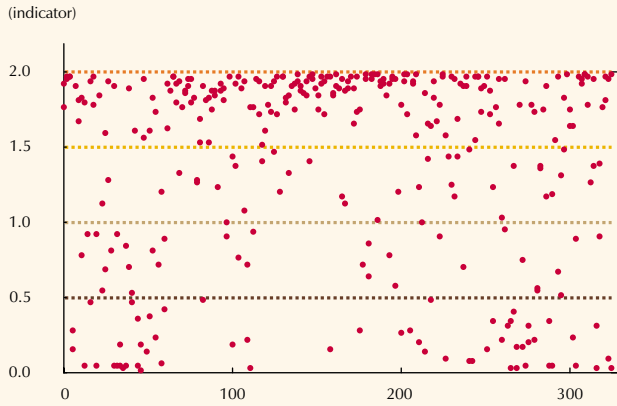
(firms)

Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.
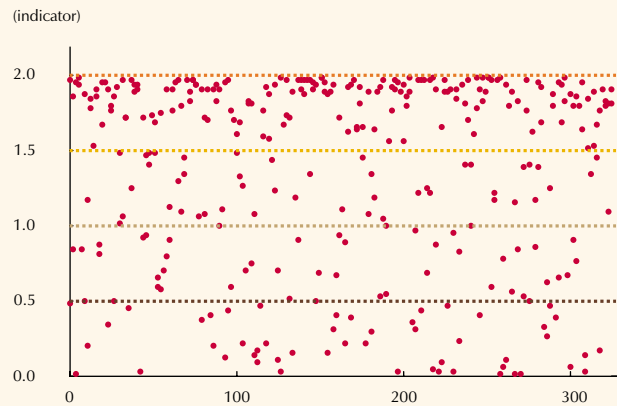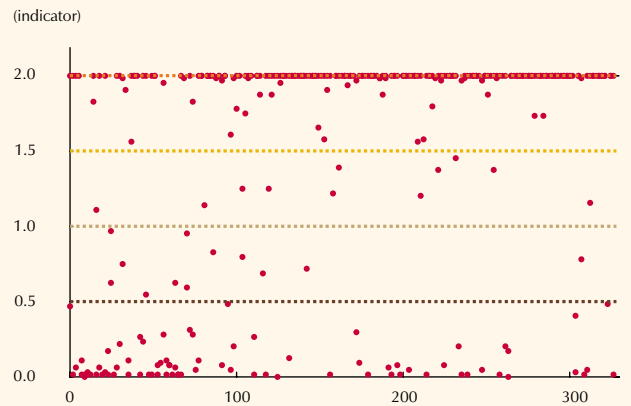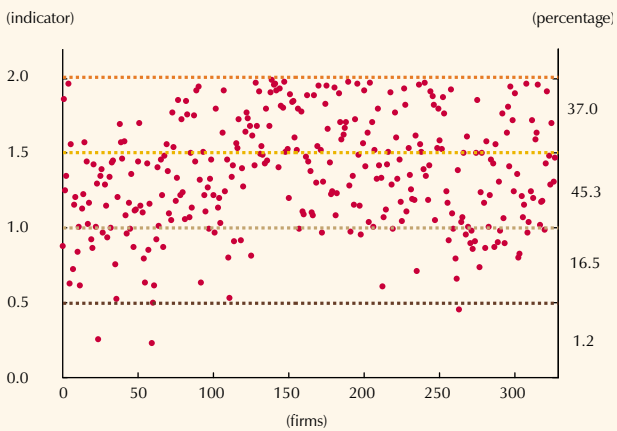
Graph B8.8
Benchmark Indicator for Firms and
Credit Rating of the Agricultural Sector

(indicator)

(credit rating)

Sources: Superintendency of Corporate Affairs, Financial Superintendency of Colombia, Banco de la Republica calculations.

Graph B8.9
Benchmark Indicator for Firms in the Manufacturing Sector

A.1   Efficiency
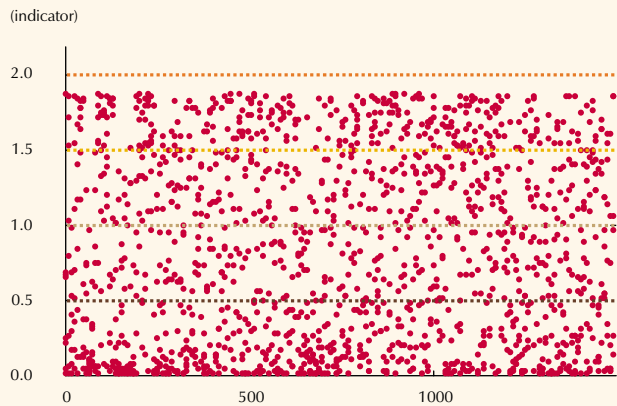
(indicator)

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   BIF Manufacturing Sector

(indicator)   (percentage)

(firms)

Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.

Graph B8.10
Benchmark Indicator for Firms and
Credit Rating of the Manufacturing Sector
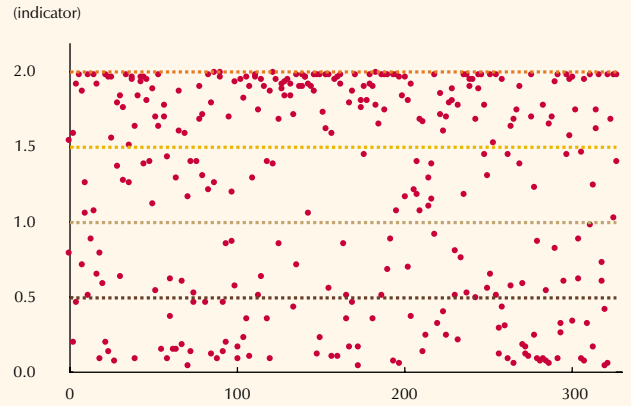
(indicator)

(credit rating)

Sources: Superintendency of Corporate Affairs, Financial Superintendency of Colombia, Banco de la Republica calculations.

of the companies in the trade sector are found in the worst performance zone (Graph B8.13).

When the performance is compared with the credit rating, there is no conclusive evidence of a negative relationship between the performance and the credit risk. A considerable proportion of the A rated loans have a BIF that is below 1 (29.4%). These results suggest that the approval of loans depends on criteria other than the performance indicators analyzed. Particularly, the fact that the credit institutions have lagged balance sheet information could influence the low correlation between the performance of the companies and the ratings for their loans (Graph B8.14).

In general, the BIF indicator reflects the economic cycle of the sectors and their trends in reference to the long term performance. The results vary among the sectors. The construction sector shows the best BIF levels given its positive performance at this point in time with respect to the outcome in previous years. Both the commerce and the manufacturing sectors have benchmark indicators characterized by a high level of heterogeneity. However, a high proportion of the companies in the commercial sector are positioned within the two best performance zones. In contrast, the mining sector holds a noticeable concentration of companies with a BIF less than 1 because this sector had an outcome that was lower than the long term average although it was still considered high. Finally, the firms in the agriculture sector show a positive performance with respect to its long term indicators, especially with respect to profitability.

In addition, the results reveal a lack of clarity in the relationship between the ratings of the loans approved in 2010 and the performance of the companies in that same year. There has been a sharp concentration of loans in the best rating categories even for companies with a low level in their performance indicators. These cases must be monitored carefully because the indicators analyzed do not reflect their credit ratings.

Graph B8.11
Benchmark Indicator for Firms in the Construction Sector

A.1   Efficiency

(indicator)

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   BIF Construction Sector

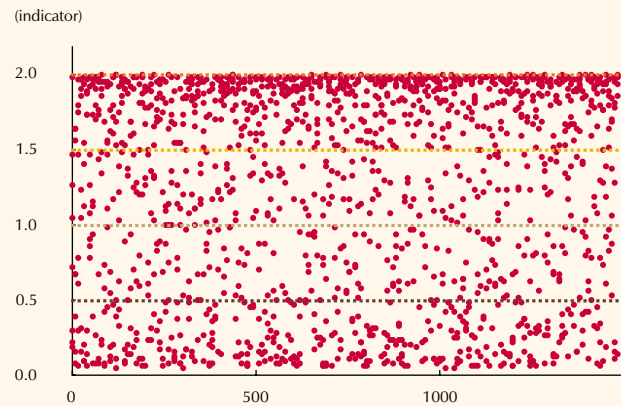(indicator)   (percentage)

(firms)

Sources: Superintendency of Corporate Affairs, Financial Superintendency of Colombia,
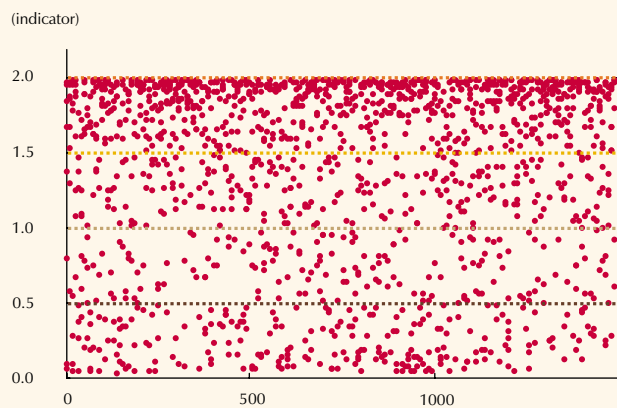Banco de la Republica calculations.
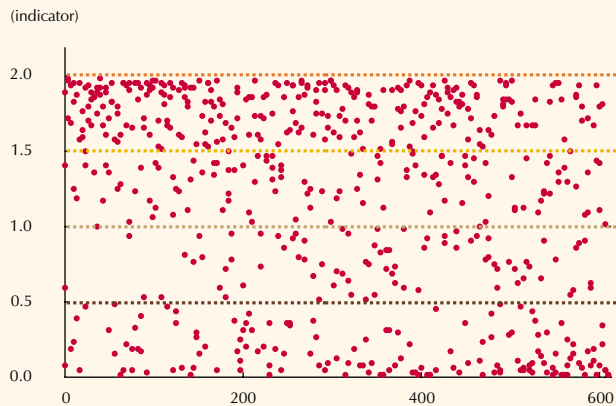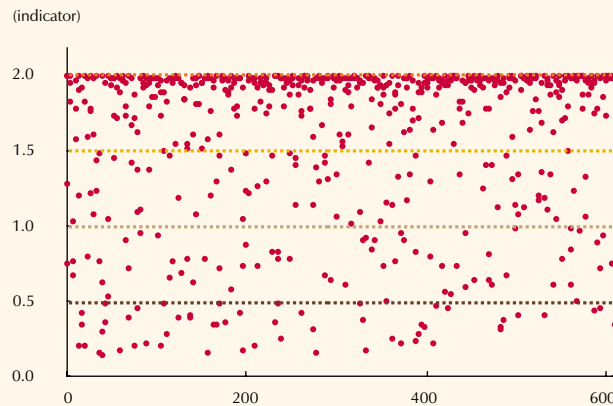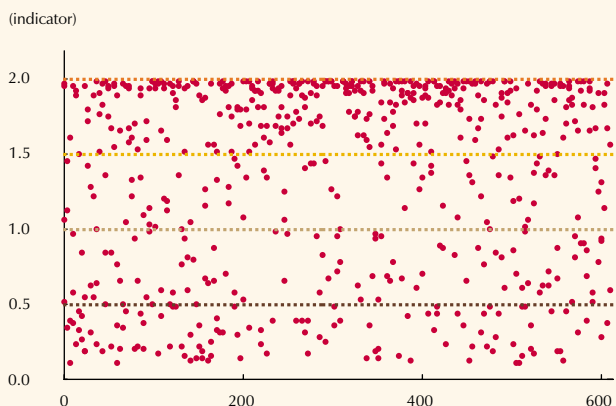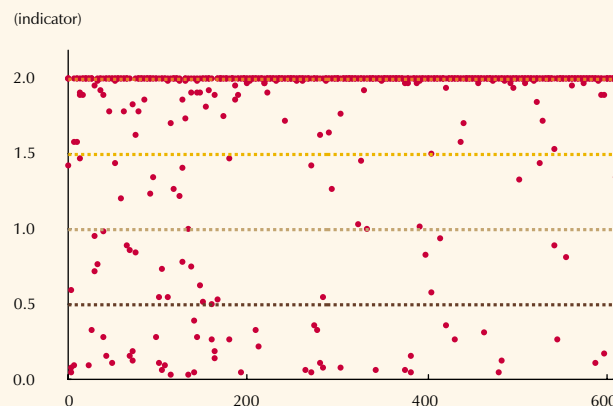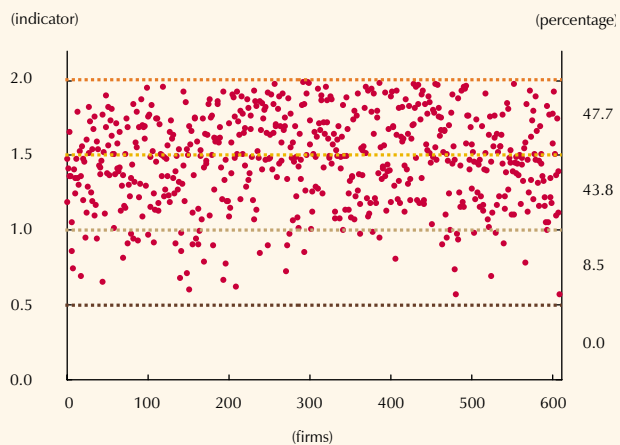
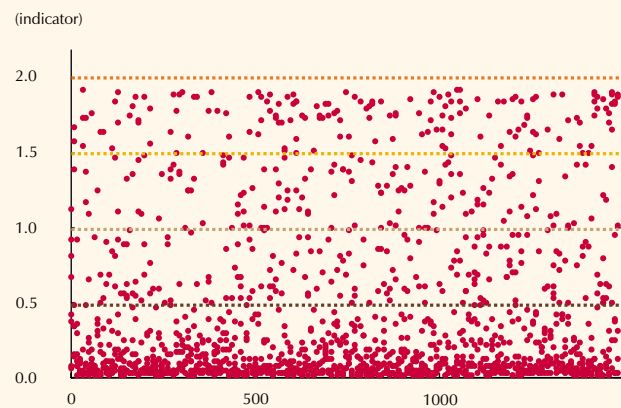Graph B8.12
Benchmark Indicator for Firms and
Credit Rating of the Construction Sector
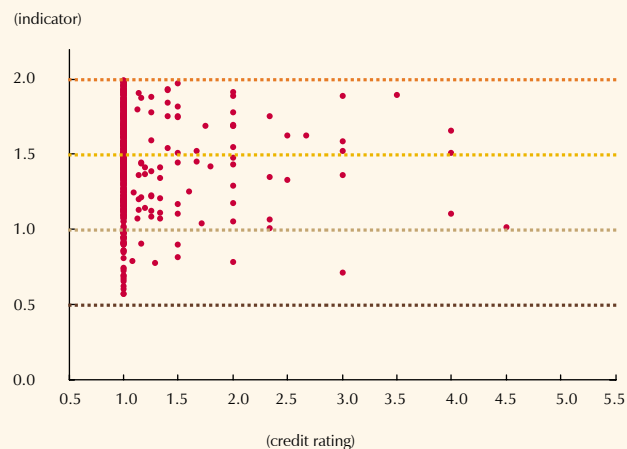
(indicator)

(credit rating)

Sources: Superintendency of Corporate Affairs, Financial Superintendency of Colombia,
Banco de la Republica calculations.

Graph B8.13
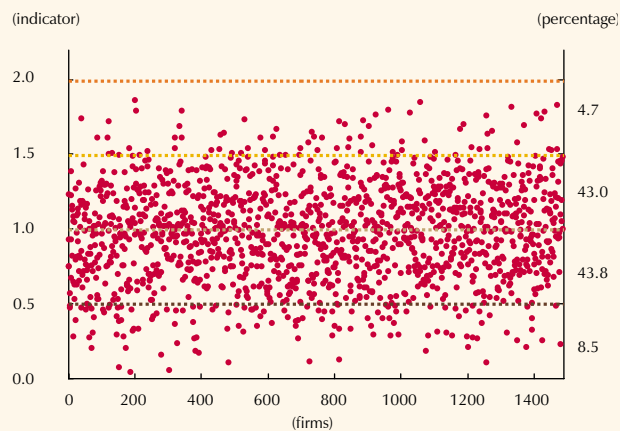## Benchmark Indicator for Firms in the Commerce Sector

A.1   Efficiency

(indicator)

A.2   Leveraging
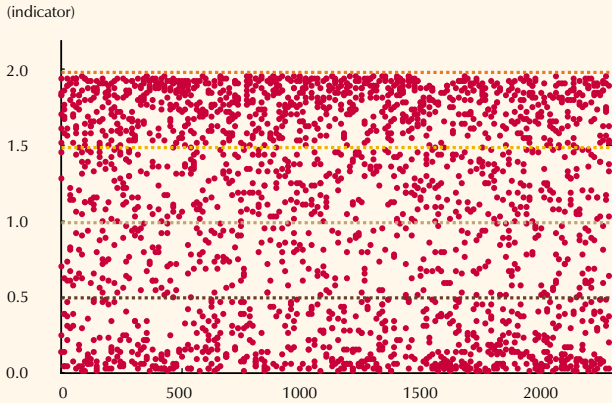
(indicator)

A.3   Liquidity
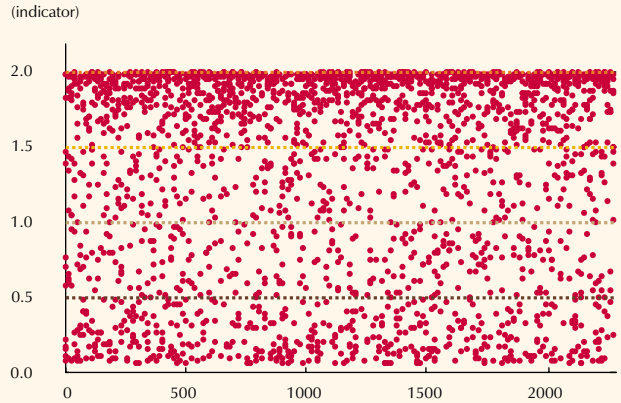
(indicator)
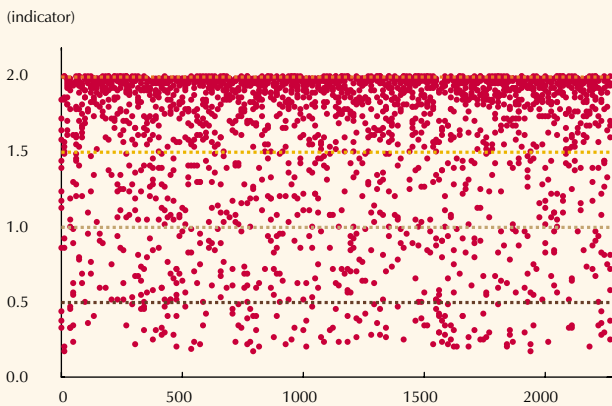
A.4   Profitability
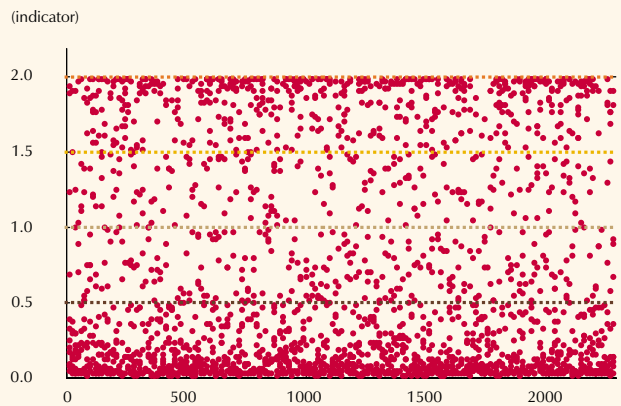
(indicator)

B.   BIF Commerce Sector

(indicator)   (percentage)

(firms)

Sources: Superintendency of Corporate Affairs, Banco de la Republica calculations.
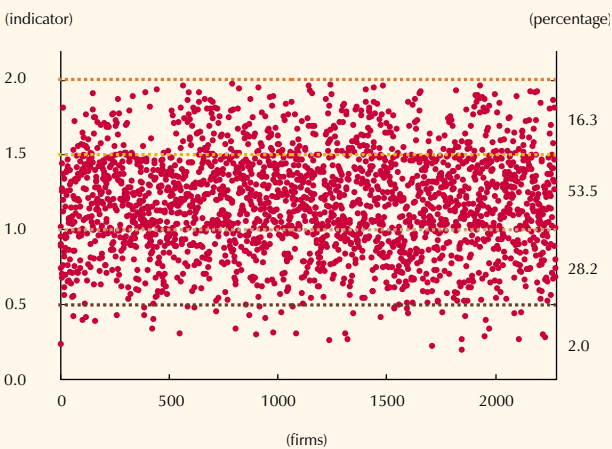
Graph B8.14
Benchmark Indicator for Firms and
Credit Rating of the Commerce Sector

(indicator)

(credit rating)

Sources: Superintendency of Corporate Affairs, Financial Superintendency of Colombia, Banco de la Republica calculations.

The exposure of the financial system to households has experienced a considerable upswing over the last five years and is now at levels above those registered before the crisis in the late 1990s (Graph B9.1). Furthermore, the composition of the household indebtedness has shown a substitution of the consumer loan portfolio for the mortgage loan portfolio. This has increased the vulnerability of the credit establishments as a result of a higher level of credit risk.[1] Thus, it is of vital importance to built indicators that make it possible to monitor the creditworthiness of households and warn of any possible vulnerability in their financial situation in order to preserve the stability of the system.

Graph B9.1
Real Indebtedness of Households by Type of Credit

(trillions of June 2011 pesos)
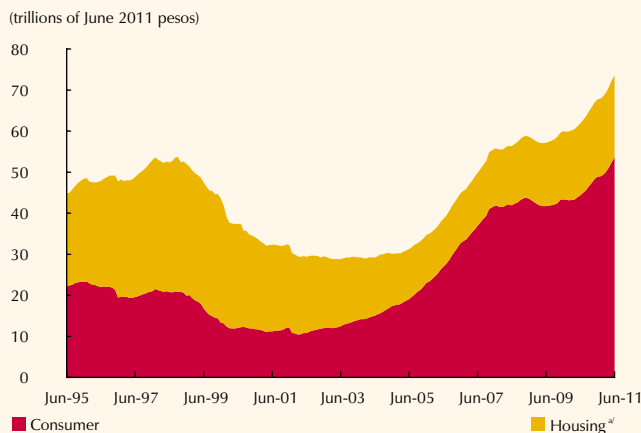
a/ Housing includes securitization.
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

As a consequence, some public as well as private entities have joined efforts in order to gather information that would allow for that follow-up. On one hand, Banco de la República and the National Bureau of Statistics (DANE in Spanish) implemented the survey on financial burden and financial education of households (lefic in Spanish), which has been done in Bogota since early March 2010.[2]

The goal of the survey is to gather data related to the financial and socio-demographic features of the households as well as

the information needed to understand how they make decisions with regard to indebtedness, savings and investment.

On the other hand, Asobancaria-Cifin has a database of financial system debtors where information on all the debts people have contracted with the entities in the system has been registered. Meanwhile, the Asobancaria-Cifin Risk Management office developed a model of neuronal networks by means of which it is possible to determine the level of income an individual has in order to estimate his level of indebtedness (Asobancaria-Cifin, 2011).

This box shows the results of the indicators built to monitor the state of household indebtedness by using the information from Iefic and Asobancaria-Cifin.

1.   Indicators of financial burden and indebtedness

The goal of the financial indicators for households should be to evaluate their capacity to meet the obligations that were contracted with the financial system while taking two factors into account: i) the availability of funds allocated to debt service over a specific period and ii) the amount of debt (Cifuentes and Cox, 2006). In order to achieve this goal, three indicators were built following the guidelines of Gutierrez et al. (2011). The first is an indicator of traditional financial burden (FBI) which seeks to quantify the percentage of income set apart for debt service. The other two indicators are designed to measure the level of indebtedness with respect to both annual income (DBI) and wealth (DBW). Therefore, the indicators are defined as follows:

$$FBI = \frac{debt\ service}{total\ income}$$

$$DBI = \frac{total\ debt}{total\ annual\ income}$$

$$DBW = \frac{total\ debt}{total\ wealth}$$

where servicing the debt corresponds to the sum of debt repayment and the payment of interest[3] on the loans. The income is calculated as the aggregate of wages received by

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1   The consumer loan portfolio is riskier than that for housing because it does not have suitable collateral to back the loans.

2   The decision to carry out the first stage in Bogota was made by taking into account the fact that the loans granted there represent close to 44% of the total loan portfolio.

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3   The partial payment against the principal and payment of interest include the mortgage loans, credit cards, unspecified use loans, loans from pawn shops, credits granted by cooperatives, loans from friends and buying on credit at neighborhood stores.

an individual from the different jobs he has.[4] The wealth is defined as the sum of income, real estate properties as well as movable assets, and investments in the financial market.[5]

In addition, the availability of micro-data makes it possible to break down these indicators in order to analyze them in more detail. Indicators that differentiate by gender and level of income are built with the information provided by Iefic. Also, the Asobancaria data are used to classify the indicators by type of credit: i) consumer loans excluding credit cards, ii) credit cards and iii) housing purchase.
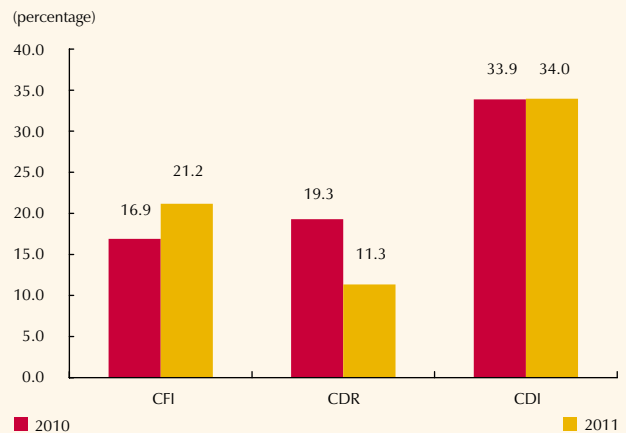
2.   Results

This section presents the results for the indicators of financial burden and indebtedness. It is important to note that the indicators built with the information from Iefic reflect the financial conditions of households in Bogota whereas the Asobancaria-Cifin indicators show the situation of households at the national level.[6]

When the aggregated indicators were analyzed, it was found that the financial burden of households rose in the first half of 2011 and came to 21.2% as of June 2011. This indicates an increase of 4.3 pp with respect to what was seen in 2010 (Graph B9.2). Regarding the indicators of indebtedness, there was a drop in the indicator with respect to wealth (DBW) in the period under analysis and it was at 11.3% in June 2011 while the indicator with respect to income (DBI) remained relatively stable (around 34%). This outcome suggests that the households accumulated wealth in the first half of 2011.

By gender of the head of the household, women registered the largest increase in debt service relative to income (Graph B9.3, panel A). The FBI for women went from 13.5% in 2010

4   The calculation of household income refers to income derived from job activities (income from the main job, a second job, work paid in kind and income from work done by unemployed and inactive people) and income derived from other sources (interest, dividends, pensions, retirement benefits, money transfers, severance pay, rent and other types of income).

5   The definition of household wealths considers the total household income, the real estate property (apartments, industrial facilities, farms, storefronts, lots, offices, warehouses, parking lots, hotels and hostels), vehicles (motorcycles, private vehicles, public service vehicles, ships and airplanes), machinery, equipment and livestock.

6   Despite the fact that the Iefic is done in Bogota, the indicators built by using this information are representative because 44.8% of the total loan portfolio has been granted in that city. Likewise, it is important to mention that these indicators are not comparable to those presented in the section of the Financial Stability Report on households because they are calculated with data that has been broken down and consider only the indebted households.

Graph B9.2
Indicators of Financial Burden and Indebtedness

(percentage)

Sources: Iefic, DANE and Banco de la República.

to 21% by the end of June 2011 while that for men went from 18.1% to 21.2% during the same period. The growth of women's indebtedness was reflected by the surge in their DBI, which came to 32.3% in June 2011 (panel C). In the case of the DBW indicator, there was a drop for both genders which suggests that men as well as women accumulated wealth in the first half of 2011 (panel B).

In terms of income level, the FBI for households belonging to the fifth quintile registered the largest rise by going from 13.3% in 2010 to 19.6% in June 2011 (Graph B9.4, panel A). Also, the households in the first and second quintiles are still the ones that make the most effort to service their debt (27.7% FBI on average). The DBI analysis reveals that the households in the first quintile had the largest increase in indebtedness while the ones in the second, third and fourth quintiles experienced drops (panel B). As in the case of the aggregate, the DBW for all of the quintiles of income showed reductions.

By type of loan, consumer loans excluding credit cards are the ones that represent the largest financial burden for households. In the first half of 2011, the FBI registered a decline by going from 22.7% in December 2010 to 20.0% six months later (Graph B9.5). However, debt as proportion of annual income showed a growth trend over the last year and a half. It was 20.5% in December 2009 and it reached 22.9% in June 2011. The drop in the FBI and the growth in the DBI can be attributed to an upswing in the duration of the terms for this type of loans. Thus, the monthly installments are reduced by spreading the payments on the debt out over a larger number of periods while at the same time bringing about a higher outstanding balance.

When the indicators for credit cards were analyzed, it was found that the households allocated 12.8% of their monthly income to debt servicing in June 2011 (Graph B9.6). It is

Graph B9.3
Indicators of Financial Burden and Indebtedness by Gender

A.   (FBI)

(percentage)

■ 2010   ■ 2011

B.   DBW

(percentage)

■ 2010   ■ 2011

C.   DBI

(percentage)

■ 2010   ■ 2011

Sources: Iefic, DANE and Banco de la República.

Graph B9.4
Indicators of Financial Burden and Indebtedness by Quintile of Income

A.   FBI

(percentage)

■ 2010   ■ 2011

B.   DBW

(percentage)

■ 2010   ■ 2011

C.   DBI

(percentage)

■ 2010   ■ 2011

Sources: Iefic, DANE and Banco de la República.

noteworthy that this indicator remained at levels similar to those in late 2010 (12.7%) in spite of the growth in the loan portfolio. The DBI, in turn, experienced a slight uptick as it went from 4.1% at the end of 2010 to 4.2% in June 2011. This reflects a rise in the indebtedness of households which is consistent with the changes in this loan portfolio that took place in the first half of 2011. In addition, the FBI was approximately three times larger than the DBI because of the shorter term nature of credit card indebtedness compared to other types of loans.

Graph B9.5
FBI and DBI for the Consumer Loan
Portfolio Excluding Credit Cards

(percentage)

Sources: Asobancaria, CIFIN.
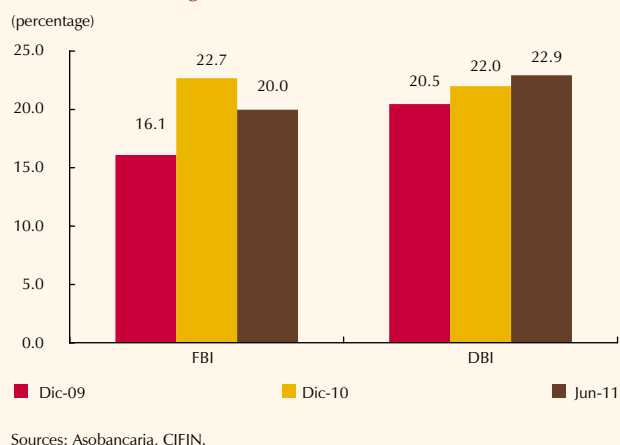
Furthermore, the financial burden in the case of mortgage loans has remained practically unchanged over the last year and a half and represented 10.8% of the monthly income of households in June 2011[7] (Graph B9.7). The DBI, in turn, shows that the debt represented 56.5% of the annual income of households in this same period. This means a 65 bp increase with respect to the results seen six months before. The trends in these indicators are due to the structure of the housing loans in which large amounts are disbursed with payments spread out over fifteen years on average.

In summary, the household financial burden rose in the first half of 2011 and both women and households in the fifth quintile registered the highest upswings in their debt service. In terms of indebtedness, there also were increases when it was measured against the annual income. However, this was not the case when it was analyzed with respect to wealth. By type of credit, there was a drop in the financial burden for consumer loans other than credit cards. In addition, an

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7   This value is considerably above the one presented in chapter III.B of the Financial Stability Report because this indicator includes only the income of the households that have this type of loan while the one usually presented in the report takes into account the overall wages in the entire economy.

Graph B9.6
FBI and DBI for Credit Cards

(percentage)

Sources: Asobancaria, CIFIN.
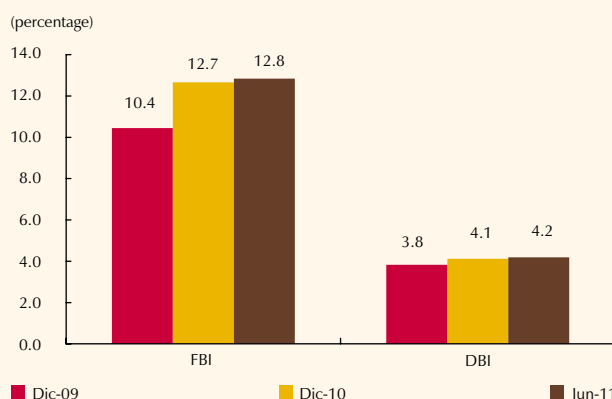
Graph B9.7
FBI and DBI for the Mortgage Loan Portfolio

(percentage)

Sources: Asobancaria, CIFIN.
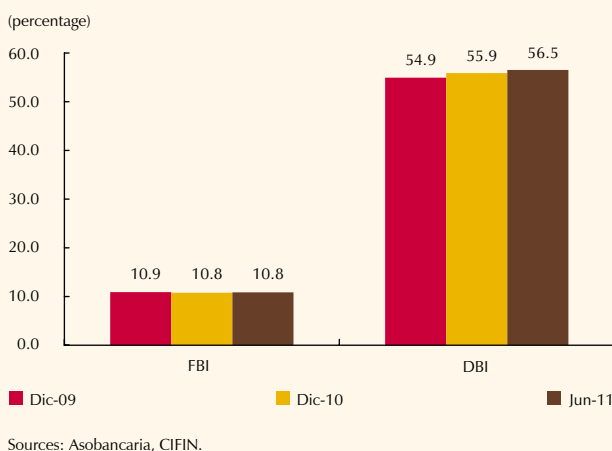
upswing in the level of indebtedness for all types of loans was registered.

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Cifuentes, R.; Cox, P. (2006). "Indicadores de deuda y carga financiera de los hogares en Chile: metodología y comparación internacional," internal document, Banco de Chile.

Risk Management (Asobancaria-Cifin) (2011). "Estimación de la carga financiera en Colombia," Financial Stability Issues, Financial Stability Report, Banco de la República, March.

Gutierrez Rueda, J.; Capera Romero, L.; Estrada, D. (2011). "Un análisis del endeudamiento de los hogares," Financial Stability Issues, Financial Stability Report, Banco de la República, September.

Box 10
CoVaR

This box shows the implementation of the methodology developed by Adrian and Brunnermeier (2010) called conditional value at risk (CoVaR), which is a measurement of systemic risk[1] that shows the contribution of an institution to the risk in the system as well as the risk that can take place between institutions. When the relationship present in the financial system is known, it is possible to identify the institutions that are most systemic[2] and most vulnerable[3] to changes in the market.

The CoVaR measurement is estimated for the market of domestic public debt and seeks to explain the co-changes[4] present in the portfolio returns of the institutions in a situation of stress. As in the case of VaR, this measurement is a quantile defined for both a forecast horizon and a confidence level, but it is established for the distribution of profits and losses of an institution that is conditioned to the level of stress experienced by another institution.

In order to implement this methodology, it is necessary to calculate the VaR in different quantiles for the sectors to be analyzed. In this case, the commercial banks, financial corporations, commercial financing companies, pension management funds, stock brokerage firms, insurance companies, trust companies and the system in general are studied.[5] The VaR estimates considered in the market risk section of this Financial Stability Report and another estimates calculated by means of quantile regression[6] will be used in this box based on the proposal of the abovementioned authors.

1. Methodology

The methodology is based on knowledge of the returns for each sector as well as for the whole system. They are calculated as the weighted sum of the returns from each entity multiplied by the proportion of the balance exposed to the total for the respective sector. Similarly, the returns of the different sectors are weighted to find the returns from the system, which is calculated as follows:

$$X_{i,t} = \sum_j^{N_i} \frac{S_{j,t}}{S_{i,t}} X_{j,t} \ , i = \{BC,....\}, t = \{1,...,T\}$$

Where: N_i denotes the number of entities that sector i is made up of and S the exposed balance of the entities or sector as indicated by the sub-index. These returns make it possible to calculate the VaR and CoVaR. It is assumed that the VaR of a sector i depends on both the returns of the respective sector and a set of nf factors (F)[7] that represent the dynamics of the financial sector. The CoVaR also depends on these same factors as well as on the returns from a sector j. Formally, it can be expressed as:

$$X_{i,t}^{\alpha} = \beta_1^{\alpha} + \beta_2^{\alpha} F_{1,t} + ... + \beta_{nf+1}^{\alpha} F_{nf,t} + u_t^{\alpha}$$

$$X_{i,t}^{\alpha} = \beta_1^{\alpha|j} + \beta_2^{\alpha|j} X_{j,t}^{\alpha} + \beta_3^{\alpha|j} F_{1,t} + ... + \beta_{nf+2}^{\alpha|j} F_{nf,t} + u_t^{\alpha|j}$$

$$VaR_{i,t}^{\alpha} = \hat{\beta}_1^{\alpha} + \hat{\beta}_2^{\alpha} F_{1,t} + ... + \hat{\beta}_{nf+1}^{\alpha} F_{nf,t}$$

$$CoVaR_{i|j,t}^{\alpha} = \hat{\beta}_1^{\alpha|j} + \hat{\beta}_2^{\alpha|j} C(X_{j,t}) + \hat{\beta}_3^{\alpha|j} F_{1,t} + ... + \beta_{nf+2}^{\alpha|j} F_{nf,t}$$

For $i, j \in \{BC,...\}$, $i \neq j$ and a quantile $\alpha \in (0,1)$. The $CoVaR_{j|i,t}^{\alpha}$ is interpreted as the VaR for sector i with a confidence level[8] α, conditioned to event $C(X_{j,t})$, for institution j. An interesting case takes place when the existing co-changes between the returns in a scenario of financial stress are analyzed, i.e., when $C(X_{j,t}) = VaR_{j,t'}^{\alpha}$ with α evaluated at a high value.

It is possible to calculate the contribution of institution i to the risk of institution j by means of this methodology. This value is defined as $\Delta CoVaR_{j|i,t'}^{\alpha}$ and it is calculated as the difference between the level of stress of institution j given that another institution i is under stress minus the level of stress

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1   Based on the Basel II regulations, the level of risk for each institution is measured separately. This ignores the relationships that exist between the institutions that are part of the system. A systemic risk measurement must consider the spillover and contagion effects between the institutions. The authors focused on measuring the spillover effect, but in future studies, an effort will be made to consider both effects.

2   Defined as the institutions that contribute the most to the risk in the system.

3   These are the institutions most affected by a given level of risk in the system.

4   The authors state that the Co prefix must be interpreted as contribution, co-changes and conditional all at the same time.

5   Sectors that will be written respectively as i={ CB, FC, CFC, PMF, Coop, SBF, IC, TC, GS }.

6   The quantile regression system was proposed by Koenker and Basset (1978). The steps outlined by Koenker (2005) were followed in implementing it.

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7   F represents the first nf main components in a set of exogenous variables.

8   This value depends on the decision regarding how the distribution of profits and losses of the entities is taken. In this case, a multiplication by minus one was done to find the largest losses on the right tail of the distribution.

of institution j since institution i is experiencing an average situation $(C(X_{i,t}) = VaR_{i,t}^{0.5})$, which means that their returns are at their respective averages. The above can be expressed as follows:

$$CoVaR_{j|i,t}^{\alpha} = CoVaR_{j|C(X_{i,t})=VaR_{i,t}^{\pm}}^{\alpha} - CoVaR_{j|C(X_{i,t})=VaR_{i,t}^{0.5}}^{\alpha}$$

If j is taken as equivalent to the system, it is possible to calculate which institutions contribute the most to the risk in the system and this is defined as $\Delta CoVaR_{j|i,t}^{\alpha}$. This is a criterion that makes it possible to determine which institutions are more systemic. Furthermore, $\Delta CoVaR_{iSF,t}^{\alpha}$ is calculated to see which institutions are more vulnerable to the risk in the system.

2.   Data

The VaR values for the domestic public debt portfolio referred to in the market risk section of this Financial Stability Report and calculated for the sectors mentioned above were taken to implement the methodology. Also, the VaR was estimated by means of a quantile regression for $\alpha = 99\%$, which includes a set of exogenous variables that are expected to reveal the performance of the financial sector.

The set of exogenous variables taken to do the analysis are the returns from the general index of the Colombian stock exchange (IGBC in Spanish), returns from the market exchange rate (TRM in Spanish), inflation expectations at one, five and ten years, CDS Colombia at five-years, the EMBI for Colombia, the VIX, the slope of the zero-coupon curve for TES in pesos and in UVR, the growth in the loan portfolio, the IDXTES returns and the interbank interest rate (IIR). All these series were calculated from February 2003 to August 2011 on a weekly basis.

The variables mentioned above are not directly examined in the VaR estimate by quantile regression. Instead a set of factors are extracted by means of the analysis of main components[99] where the factors are supposed to represent the general trends implicitly contained in the variables.

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9   The standardized series were used to calculate the main components and the criteria for choosing the number of factors used is that 80% of the total variance in the series will be explained by the factors found. This is calculated as the accumulated sum of the first nf values that belong to the matrix of variances and co-variances of the analyzed data which, when divided by the total variance, results in a figure close to the value of explanation sought. Four factors were chosen in this application in order to calculate the VaR through quantile regression.

Graph B10.1
Value at Risk in the Financial System TES Portfolio

(percentage)
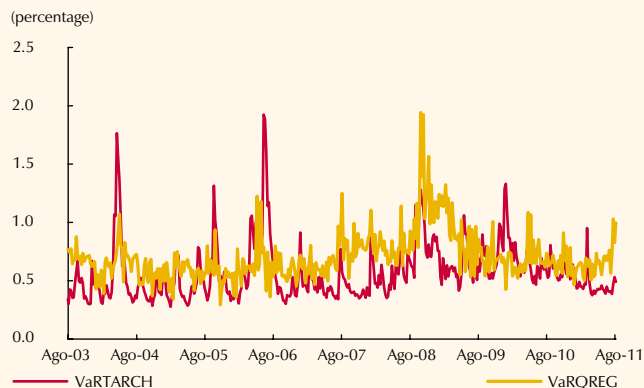
Sources: Banco de la República and Bloomberg.

3.   Results

As shown in Graph 10.1, the VaR series that considers only the TES market information better reflects the crises that took place in this market. This fact has been verified by the high value registered in 2006, which was due to the sharp devaluation which occurred that year. Also, since the estimate by quantile regression includes variables that represent the trends in the financial system, it shows the potential risks generated by adverse effects in the general system on the market analyzed. Therefore, this indicator has increased in the years of the recent international crisis and has been growing over the last half year due to the uncertainty in those markets. This situation also affects the performance of the national financial sector and increases the risk of the returns from the system suffering negative effects.

Finding out which sectors contribute the most to the risk in the system is also of interest as well as which are the most vulnerable and this is possible through the use of the *CoVaR calculation. Since the CoVaR is a measurement of endogenous systemic risk in which changes in the market conditions modify the measurement, it is important to note the trend of the indicator over time and not just to hold to the incomplete picture rendered by the current value. Thus, the decision was made to analyze the average for the entire sample (Table B10.1) for the last four years (Table B10.2) and for the last two years (Table B10.3).

The last row and the last column in each table show the values to be analyzed. The first indicates the contribution of a sector under stress to the VaR of the system, which makes it possible to identify the most systemic sectors. These are: trust companies, insurance companies, pension management funds and banks respectively. The last column indicates how a stress event in the system contributes to the VaR of the different sectors and the most vulnerable in every case were the pension management funds.

Table B10.1
Average Delta CoVaR for the Entire Sample[a/]

	CB	FC	CFC	PMF	Coop	SBF	IC	TC	System
CB		0.38	0.41	0.46	0.30	0.37	0.42	0.49	0.49
FC	0.32		0.24	0.29	0.20	0.22	0.29	0.29	0.29
CFC	0.30	0.28		0.30	0.27	0.29	0.36	0.36	0.33
PMF	0.82	0.62	0.66		0.65	0.75	0.77	0.82	0.96
Coop	0.68	0.41	0.50	0.60		0.52	0.68	0.65	0.66
SBF	0.51	0.42	0.43	0.46	0.42		0.52	0.50	0.52
IC	0.51	0.44	0.43	0.52	0.31	0.40		0.50	0.54
TC	0.44	0.30	0.38	0.42	0.35	0.34	0.40		0.45
System	0.59	0.45	0.53	0.60	0.42	0.49	0.63	0.64	

a/ Figures as a percentage.
Source: Banco de la República.

Table B10.2
Average Delta CoVaR for the Last 4 Years[a/]

	CB	FC	CFC	PMF	Coop	SBF	IC	TC	System
CB		0.39	0.41	0.47	0.30	0.34	0.47	0.51	0.51
FC	0.29		0.24	0.29	0.20	0.20	0.32	0.30	0.30
CFC	0.27	0.29		0.31	0.26	0.27	0.39	0.38	0.34
PMF	0.74	0.64	0.65		0.65	0.68	0.85	0.84	1.00
Coop	0.61	0.42	0.50	0.61		0.48	0.75	0.67	0.68
SBF	0.46	0.43	0.43	0.47	0.42		0.58	0.52	0.54
IC	0.45	0.46	0.43	0.53	0.31	0.37		0.51	0.56
TC	0.39	0.31	0.38	0.42	0.35	0.31	0.44		0.46
System	0.53	0.47	0.52	0.61	0.41	0.45	0.69	0.66	

a/ Figures as a percentage.
Source: Banco de la República.

Table B10.3
Average Delta CoVaR for the Last 2 Years[a/]

	CB	FC	CFC	PMF	Coop	SBF	IC	TC	System
CB		0.48	0.42	0.46	0.28	0.29	0.45	0.53	0.51
FC	0.28		0.25	0.28	0.19	0.17	0.31	0.32	0.30
CFC	0.26	0.35		0.30	0.25	0.23	0.38	0.39	0.33
PMF	0.71	0.78	0.67		0.61	0.58	0.83	0.88	0.99
Coop	0.59	0.51	0.51	0.59		0.40	0.72	0.70	0.68
SBF	0.44	0.53	0.44	0.46	0.39		0.56	0.54	0.53
IC	0.44	0.56	0.44	0.52	0.29	0.32		0.54	0.56
TC	0.38	0.38	0.39	0.41	0.33	0.26	0.43		0.46
System	0.52	0.57	0.54	0.59	0.39	0.38	0.67	0.69	

a/ Figures as a percentage.
Source: Banco de la República.

Box 11
COLOMBIAN COMPANIES' INDEBTEDNESS IN FOREIGN CURRENCY

The private corporate sector has significantly increased its indebtedness denominated in foreign currency in recent years, and that is why it is relevant to do an analysis of the financial situation of the most exposed companies. In undertaking this study, all the indebtedness in foreign currency must be considered, i. e., both that which is transacted directly with institutions abroad and which is handled locally by financial entities as intermediaries.

The goal of this box is to determine if the recent growth in this variable has been driven by solid companies or if, on the contrary, they are vulnerable firms that could default on the payment of their obligations. The first section refers to the companies that have debt in foreign currency with entities abroad (external debt) based on the information provided by the Superintendency of Corporate Affairs as the main source. The second section analyzes the companies that have debt in foreign currency through the intermediaries in the foreign exchange market (IFEM) based on information supplied by the Financial Superintendency.

1.   Debt with entities abroad

The companies analyzed in this section are those with external debt that were overseen by the Superintendency of Corporate Affairs in the period from 2005 to 2010. These firms are classified on the basis of their leveraging abroad (measured as the external debt divided by the total assets) and are grouped as follows (Table B11.1):

Table B11.1

Class	Percentile	Values
Group 1	Less than 50	Less than 4.7%
Group 2	50 to 70	4.7% to 13.6%
Group 3	75 to 95	13.6% to 44.1%
Group 4	95 to 99	44.1% to 80.45%
Group 5	Greater than 99	Greater than 80.4%

Sources: Superintendency of Corporate Affairs, Banco de la República calculations.

Some features of the sample obtained were: first, the companies distributed in the percentiles represented just 26.2% of all the companies overseen by the Superintendency. Second, the companies most indebted abroad (groups 4 and 5) represented a significantly reduced percentage of the total sample with just 196 in group 4 (1% of the sample) and 49 in group 5 (0.26%). Finally, a low percentage of the companies with external debt (13%) are indebted to financial institutions

abroad and thus, the sample is mostly made up of firms that only have liabilities with foreign suppliers (87%).

a.   *Financial Situation of the Most Exposed Companies*

The financial analysis of the most exposed companies (groups 4 and 5) was done based on the traditional indicators that measure performance and indebtedness.[1] Graph B11.1 presents the indicators analyzed by groups for the period from 2005 to 2010.

In general, the companies in the most indebted groups showed profitability levels far below those for the total sample and the companies in group 5, in particular, had negative profitability. As in the case of profitability, the liquidity indicator suggests that liquidity levels for companies in groups 4 and 5 are below the levels for the total sample. What is more, in the case of the group of companies with the highest debts abroad, said indicator was less than 1 in 2010.

As was expected, the degree to which these companies are leveraged is greater than the level observed for the rest of the sample. The companies in group 4 have liabilities that represented almost 80% of their assets in 2010. Meanwhile, this ratio was above 100% for the companies in group 5 since there were more liabilities than assets.[2]

With regard to the composition of the total indebtedness by term, group 5 is more exposed to short term (ST) indebtedness compared to the rest of the companies[3] with an indicator of 50% for group 5 and one of 7.6% for the total sample. With respect to group 4, the indicator is higher than that for the total sample, but it is far below that for group 5 (12.7%).

In order to analyze the backing the ST debt with foreign agents has, the ratio of external ST debt to current assets

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1   The financial indicators analyzed are the following: return on assets (ROA) = earnings before interests and taxes/total assets; current ratio = current assets/current liabilities; debt ratio = total liabilities/total assets; ST financial indebtedness = ST financial obligations/total assets; LT financial indebtedness = LT financial obligations/total assets; ST external debt = ST external debt/current assets; external debt = total external debt/current assets; percentage of the ST external debt = ST external debt/total external debt. Where LT stands for long term and ST for short term.

2   Although those percentages have remained relatively stable, it is noteworthy that this indicator reached 106% for group 5 in 2009.

3   This indicator was highly volatile over the entire period given the reduced number of companies that the group is made up of.

Graph B11.1
Financial Indicators: Most Indebted Companies

A.   ROA (return on assets)

(percentage)

| | 4 | | 5 | Total |

E.   Long-term financial indebtedness

(percentage)

| | 4 | | 5 | Total |

B.   Current ratio

(percentage)

| | 4 | | 5 | Total |

F.   Percentage of short-term external debt

(percentage)

| | 4 | | 5 | Total |

C.   Debt ratio

(percentage)

| | 4 | | 5 | Total |

G. External debt /current assets

(percentage)

| | 4 | | 5 | Total |
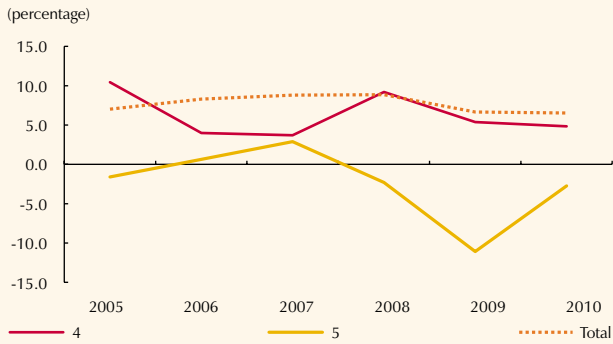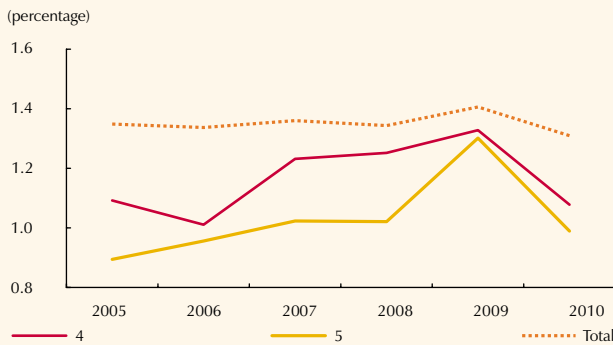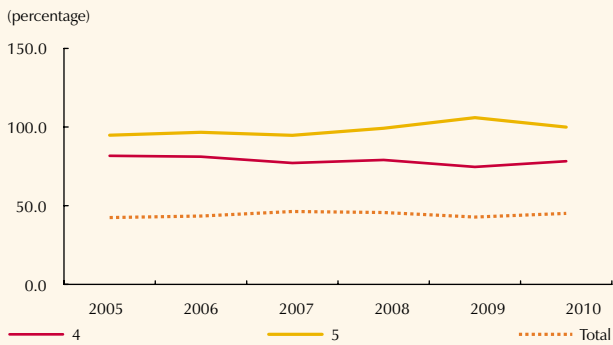
D. Short-term financial indebtedness

(percentage)

| | 4 | | 5 | Total |
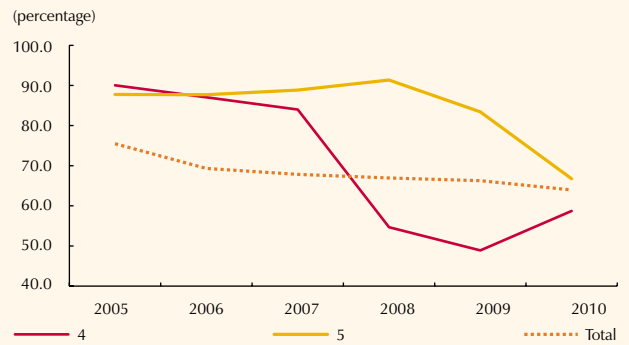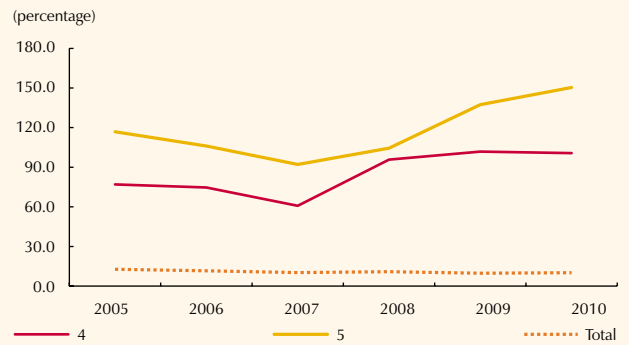
H.   Short-term external debt / current assets

(percentage)

| | 4 | | 5 | Total |
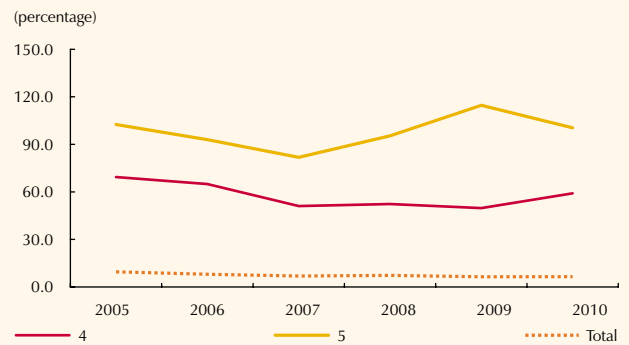
Sources: Superintendency of Corporate Affairs, Banco de la República calculations.

was calculated. The results for groups 4 and 5 far surpass those for the total sample: 59% and 100% respectively (compared to 6.5% for the total number of companies). Assuming a more stressed scenario in which the companies have to cover their total indebtedness abroad (ST and long term [LT]) using their current assets, one sees that the companies in group 4 can provide exactly what is needed for their external debt while in the case of group 5, the indicator is above 150%.[4]

Last of all, it is important to note that the share of the external ST debt that group 5 owed was significantly larger than that for the rest of the sample for most of the period in which the study occurred but that percentage has converged toward levels that are similar for all the companies. As of December 2010, the share was 64% for the total sample, 67% for group 5, and 59% for group 4.

b.   Indebtedness of the Most Exposed Companies to Colombian Financial Entities

In order to analyze the possible vulnerability of the Colombian financial institutions in the presence of adverse changes that affect the companies most indebted abroad, a review of the amount of indebtedness that companies in groups 4 and 5 had with credit establishments as of June 2011 was done.[5] The companies in group 4 (196) had a loan portfolio of COP$322 b with the Colombian financial system, which represented 0.27% of the total commercial loan portfolio. In the case of group 5 (48 companies), there was COP$25 b in indebtedness to local entities or 0.021% of the commercial loan portfolio.

In addition, the most vulnerable companies[6] in group 4 were selected and it was found that most of them were part of the commercial sector and were mainly large-sized or medium-sized companies. Their total external debt was more than twice the value of their ST assets and 9 of the 27 companies were all foreign equity firms. Concerning their relationship with the financial system, the results showed that these companies had an average of three banking relationships (ranging

from 1 as minimum to 5 as maximum) and their total loan portfolio ($33 b) represented 0.029% of the total commercial loan portfolio as of June 2011.

When the same procedure was applied to group 5, 19 companies were chosen and in 90% of the cases they were medium-sized or small-sized companies. Their external debt is 1.6 times their ST assets and 6 out of 19 are capitalized with 100% foreign resources. Their relationship with the financial system is low because their loan portfolio (COP$12.4 b) represented 0.01% of the total commercial loan portfolio as of June 2011. They also have an average of three banking relationships (ranging from 1 as minimum to 5 as maximum).

In conclusion, in spite of the serious financial situation that some of the most leveraged companies abroad are in, the amount loans from the Colombian financial system is quite reduced, so they are not a destabilizing factor for the financial system. Furthermore, almost the entire foreign indebtedness of these companies has been contracted with suppliers rather than with financial entities.

c.   Foreign Exchange Hedging by Companies

In Colombia, the exchange rate forwards are instruments that are not often used by the companies in the productive sector.[7] Table B11.2 shows that the companies in group 3 are the ones that hedge the most with these instruments, but the percentage does not surpass 21.5%. It is noteworthy that the percentage declines substantially for the most indebted groups and just 2% of the companies in group 5 use them.

These contracts are short term since the median of their maturity is 56 days. This could be associated with the fact that the companies prefer to protect cash flows (for instance, the payment of debt retirement or interest) rather than the balance account (or total balance). It could also be related to the exposure horizon the companies have, which is probably ST.[8]

Although the hedging with forwards is limited, it is important to keep in mind the fact that a company can cover its indebtedness operations with future income in dollars, for example, from export revenue. Likewise, the companies may hold assets overseas such as checking accounts or in-

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4   This same ratio was 10% for the total number of companies with foreign debt. Furthermore, it has risen continually for groups 4 and 5 since 2007 while, at the same time, it has remained stable for the total sample.

5   This information is contained in form 341 of the Financial Superintendency.

6   Specifically, the total number of companies in the group was taken and a new group of companies that met the following criteria was determined: negative profitability, current liquidity below 1, and an indicator for total leveraging above 0.8. The companies left after these selection factors were applied are 27 out of a total of 196.

7   According to the survey on exchange risk given by Banco de la República in March 2011, only 23% of the companies in the industrial sector that are exposed to the exchange rate used this instrument.

8   In the previous section, it was stated that 64% of the external debt is under a ST contract. In addition, the maturity for the purchase contracts was found to be slightly above that for the sale ones. These fluctuate between 70 and 110 days in the case of the first and between 36 and 94 in the second.

Table B11.2
Use of Forwards and Average Maturity

Category	Forwards 2010[a/] (percentage)		Average maturity (days)	
	Purchase	Sale	Purchase	Sale
Group 1	17.2	7.2	110.4	93.5
Group 2	18.6	5.2	98.9	88.1
Group 3	21.5	4.9	88.8	74.7
Group 4	13.3	3.6	76.6	50.3
Group 5	2.1	2.0	70.4	35.7

a/ Corresponds to the percentage of companies that carried out an operation in 2010.
Sources: Superintendency of Corporate Affairs and Banco de la República.

Graph B11.2
Percentage of Companies with Each Type of Coverage

Sources: Financial Superintendency of Colombia, Banco de la República.

vestments in dollars which help to hedge on the liabilities denominated in foreign currency.

Graph B11.2 shows, based on their degree of exposure, the percentage of companies that hedge with each one of the following mechanisms: purchasing forwards, export revenue or assets abroad. As can be seen, 47% of the companies on average do not hedge with any of the mechanisms mentioned above and group 4 has the lowest hedging percentage (56%).

It was also found that an average of 39% of the companies could be hedging their exposure with income from exports or financial assets overseas less fewer than 10% on average use forwards to do so. The above takes place mainly in the case of the companies in group 5. In this group, 56% are exporters and 2.1% use forwards.

Finally, the currency mismatch for December 2010 was calculated for the companies in the sample.[9,10] As can be seen in Table B11.3, the higher the external indebtedness, the lower the proportion of sales backing the currency mismatch is. Specifically, the mismatch for the companies in group 5 is equivalent to 159% of their sales. When the percentage of foreign sales is examined, there is no clear relationship between leveraging and the mismatch. However, apart from

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9   The indicator is defined as: external debt – financial assets abroad + (forward purchase – forward sale). This mismatch was compared to the total sales in order to get an estimate of the percentage that would support these differences between the external liabilities and the external assets excluding the forward positions. Likewise, the percentage of sales that originated abroad was calculated since, in the presence of a currency devaluation, the companies with a positive mismatch could see the effects of this change mitigated if a sizable proportion of their income came from overseas. Last of all, the percentage of companies with more than 50% foreign capital is presented.

10   It is important to clarify the fact that this indicator can over-estimate the currency mismatch because it only considers the balance in financial assets abroad.
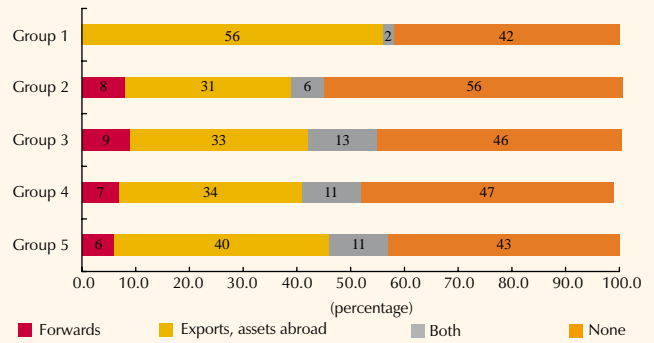
the degree of exposure, the median of the mismatch is zero, which implies that, in at least 50% of the cases, a devaluation would negatively affect the companies since if they do not receive income from abroad, then they would have no way to offset the losses caused by a foreign exchange disparity. Likewise, the companies with higher exposure also have stronger backing from foreign capital. Therefore, 46% of the companies that have significantly high exposure have more than 50% in foreign capital.

In summary, the companies with external debt are far less profitable, have less liquidity, and are more leveraged than the total number of companies overseen by the Superintendency of Corporate Affairs. When their relationship with the financial system is evaluated, the companies do not represent a serious threat to the system because the percentage of the total commercial loan portfolio they hold is low. Finally, very few of these companies hedge with exchange rate forwards in spite of the fact that a substantial percentage of them are exporters. This would indicate that some can hedge their cash outflows going abroad with future revenue from exports.

2.   Debt in Foreign Currency Intermediated by Credit Establishments

To analyze the debt in foreign currency that has been intermediated, the information on active lending operations from the Financial Superintendency was used. As shown in Table B11.4, there has been a sharp growth in the amount of the commercial loan portfolio in foreign currency since December 2010 and it has reached real annual growth rates of above 80%. Specifically, the balance for this loan portfolio was COP$13.7 t in June 2011 and a total of 13,000 debtors was registered. Thus, the average amount per debtor came to COP$1,054 m, a figure which is COP$757 m above the average amount of the loan portfolio denominated in domestic currency (pesos).

Table B11.3
Currency Exchange Mismatch and Natural Hedging

Category	Currency Exchange Mismatch (sales percentage)		Exports (sales percentage)		Foreign capital (above 50%) (percentage)
	Aggregate	Median	Aggregate	Median	
Group 1	(0,2)	0,8	11,7	0,0	25,0
Group 2	4,6	6,4	11,4	0,0	24,0
Group 3	21,0	16,0	7,4	0,0	29,0
Group 4	41,4	51,6	40,2	0,0	41,0
Group 5	159,3	121,0	20,8	0,0	46,0

Sources: Financial Superintendency of Colombia, Superintendency of Corporate Affairs, Banco de la República calculations.

This information was as used as input for three exercises:

- Description of the indebtedness of companies in the foreign currency that was intermediated.
- Cross-reference with the information from the Superintendency of Corporate Affairs in order to evaluate the soundness financial of these companies.[11]
- Based on the cross-reference with said Superintendency, a sub-sample made up of companies whose financial situation is fragile was made.

a.   Characteristics of the Indebtedness

In order to analyze the exposure of the financial entities, the companies were classified into five groups based on their amount of indebtedness denominated in foreign currency (Table B11.5).

As of June 2011, the total loan portfolio (legal tender + foreign currency) of these companies was COP\$44.8 t. This amount represents 37% of the commercial loan portfolio in the Colombian financial system. Of the total amount of debt these companies have, COP\$13.7 t are in foreign currency (30%) (Table B11.6). In addition, this share, denominated in foreign currency, is equal to 11.3% of the total commercial loan portfolio.

When the levels of indebtedness are analyzed by group, groups 4 and 5 have the highest indebtedness in foreign currency and also the highest total debt and the highest debt denominated in pesos. These groups concentrate 80.3% of the total loan portfolio of the companies analyzed.

In addition, if the relationship with the financial system is measured as the number of entities with which a company

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11   Due to the frequency at which the Superintendency of Corporate Affairs gathers information, this analysis could only be done up to December 2010.

Table B11.4
Commercial Loan Portfolio Capital
Denominated in Foreign Currency

Date	Balance[a/]	Number of debtors	Average amount per debtor[b/]
Jun-08	8.2	9,073	907.3
Sep-08	9.1	9,708	936.8
Dic-08	8.7	10,021	871.5
Mar-09	8.1	9,999	808.3
Jun-09	5.7	10,003	569.8
Sep-09	5.1	10,025	511.2
Dic-09	5.9	10,545	556.3
Mar-10	5.8	11,031	525.9
Jun-10	7.5	11,804	633.3
Sep-10	9.1	11,120	814.3
Dic-10	12.5	11,888	1,049.5
Mar-11	13.9	12,313	1,129.5
Jun-11	13.7	13,000	1,053.8

a/ Balances in trillions of June 2011 pesos.
b/ Balances in millions of June 2011 pesos.
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

has contracted loans, one finds that, on average (measured by the median), the companies in this sample have three relationships. Likewise, as indebtedness increases, the number of relationships does also. Therefore, the company that belongs to groups 4 and 5 have five or six relationships respectively while the average company in group 1 has only two.

Finally, the balance of debt denominated in foreign currency is concentrated (more than 80%) in just six entities out of a total of 42 that grant loans in the commercial loan portfolio. These financial entities are notably exposed to the companies with debt in foreign currency due to the fact that they are granting substantial loans to the latter in national currency as well.

Table B11.5
Classification of Companies Based on
their Debt Amount in Foreign Currency
(thousands of pesos)

Classification	Percentile	Debt amount
Group 1	Less than 25	Less than COP$355
Group 2	25 to 50	$355 to COP$1,736
Group 3	50 to 75	COP$1,736 to COP$14,236
Group 4	75 to 95	COP$14,236 to COP$2,720,291
Group 5	More than 95	More than COP$2,720,291

Sources: Financial Superintendency of Colombia, Banco de la República calculations.

b.   Financial Situation of the Companies in the Sample

The financial situation of the companies with debt in foreign currency was analyzed by comparing the information on them collected by the Financial Superintendency with the data stored by the Superintendency of Corporate Affairs. Of 13,000 companies with debt in foreign currency (Table B11.4), 4,296 are overseen by that Superintendency, i.e., 33%. These also account for 70% of the total balance of debt denominated in foreign currency.

In order to classify the companies, the ratio of debt in foreign currency to total assets was calculated. After that, the companies were classified into one of the fire percentiles based on the value for their ratio as shown in Table B11.7. As can be seen, more than 75% of the companies belong to group 1. The companies that have debt denominated in foreign currency that represents less than 4.7% of their assets are the ones which are classified into this group. For approximately

23%, this indicator ranges between 4.7% and 44% and it surpasses 44% for only 33 companies (or 0.77%).[12]

The results show that the relationship between indebtedness in foreign currency and profitability is not clear. The least profitable companies are those in group 4, which have high levels of debt in foreign currency. However, group 5 is the second most profitable group in the sample and includes those companies that are the most indebted in foreign currency. It is noteworthy that no group in this sample has negative profitability (which does happen in the case of the companies with external debt) although their average profitability is far lower than that for the total number of companies registered with the Superintendency of Corporate Affairs (4.3% vs. 6.5%).

With respect to liquidity, the companies with higher debt in foreign currency also have a lower current ratio although the difference is not significant. All of the groups have suitable levels of liquidity which guarantees that the companies can cover their current liabilities with their most liquid assets. Although this is only a hypothesis since the data is not classified by term, the lower liquidity of the companies in the sample with respect to that of the total overseen by the Superintendency of Corporate Affairs (which is equal to 1.3) could be related to the fact that a sizable amount of this debt in foreign currency has been contracted at short term. As could be expected, the relationship with the leveraging indicator is direct: the higher the debt in foreign currency, the higher the leveraging. The level of leverage the companies in this sample have stands out, particularly for groups 2 to 5 which have leverage levels that are above those for the total

12   The companies were distributed into 5 groups by using the same criteria for the sample of companies with external debt. The fact that this classification differs from what was considered in the prior section should be kept in mind because, in that one, the amounts of debt denominated in foreign currency were distributed and furthermore, the sample was made up of all the companies with debt in foreign currency.

Table B11.6
Classification by Amount of Debt of the Companies with Intermediated Loans in Foreign Currency

Group	Total debt with the financial system	Debt in dollars	Debt in national currency	Percentage of debt in dollars	Banking relationships[a]
1	1.366.728	412	1.366.316	0.0	2.0
2	3.335.324	2.905	3.332.419	0.1	2.0
3	4.111.328	15.242	4.096.086	0.4	3.0
4	9.092.649	1.224.312	7.868.337	13.5	5.0
5	26.953.092	12.436.407	14.516.685	46.1	6.0
Total	44.859.122	13.679.279	31.179.843	30.5	3.0

a/ Corresponds to the median of the number of banking relationships.
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

Table B11.7
Companies with Debt Denominated in Foreign Currency (DFCURR)[a/]
(weighted averages)

| Group | Distribution of the Sample | | | Debt in foreign currency (DFCURR) / assets (percentage) | Financial indicators | | |
| | Range (DFCURR) / assets | (number) | (percentage) | | Liquidity | ROA | Leveraging |
						(percentage)	
1	Less than 4,7%	3,261	75.9	1.3	1.19	4.0	36.7
2	4,7% to 13,6%	639	14.9	8.4	1.29	4.7	53.8
3	13,6% to 44,1%	363	8.4	22.9	1.26	6.6	58.7
4	44,1% to 80,4%	26	0.6	61.3	1.08	2.3	58.6
5	Greater than 80,4%	7	0.2	91.8	1.09	5.4	63.6
Total		**4,296**	**100.0**	**4.2**	**1.22**	**4.3**	**40.7**

a/ Data as of December 2010 excluding that for debt in foreign currency which is as of June 2011.
Sources: Financial and Corporate Affairs Superintendencies, Banco de la República calculations.

Table B11.8
Companies with Debt Denominated in Foreign Currency (DFCURR)[a/]
(median)

| Group | Distribution of the Sample | | | Debt in foreign currency (DFCURR) / assets (percentage) | Financial indicators | | |
| | Range (DFCURR) / assets | (number) | (percentage) | | Liquidity | ROA | Leveraging |
						(percentage)	
1	Less than 4,7%	3.261	75,9	0,1	1,53	7,5	55,3
2	4,7% to 13,6%	639	14,9	7,8	1,44	7,5	56,1
3	13,6% to 44,1%	363	8,4	21,1	1,38	8,2	61,9
4	44,1% to 80,4%	26	0,6	51,1	1,30	11,3	66,2
5	Greater than 80,4%	7	0,2	93,1	1,53	6,1	60,1
Total		**4.296**	**100,0**	**0,3**	**1,50**	**7,6**	**56,3**

a/ Data as of December 2010 excluding that for debt in foreign currency which is as of June 2011.
Sources: Financial and Corporate Affairs Superintendencies, Banco de la República calculations.

companies registered with the Superintendency of Corporate Affairs (45%).

Table B11.8 presents the same results when the medians of the indicators are analyzed. The values for debt in foreign currency are similar. However, the average company in each group is more profitable than the overall average, and even more profitable than those from the Superintendency of Corporate Affairs (with the exception of the median firm in group 5). The median firm, in addition to having higher profitability, is also more liquid and more leveraged.

c.   Analysis of the Financial System's Exposure to the Riskiest Companies

Once the exposure of the financial system to the companies with debt in foreign currency was analyzed along with the state of their balance sheets, an exercise that consisted of

doing a detailed analysis of the firms with a fragile financial situation was done.[13]

Of the 4,296 companies with debt in foreign currency which were also identified in the Superintendency of Corporate Affairs database, only 57 firms were in financial stress. If these results are compared to those from the same exercise done for the companies indebted to entities abroad —which as was mentioned above are mostly foreign suppliers (87%)— the conclusion can be drawn that those companies indebted in foreign currency to intermediaries in the foreign exchange market are generally better debtors. This is because the percentage of risky firms declines considerably in comparison to the exercise in which the companies with external debt are

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13   This was done by using the same criteria as in the first part of this box: negative ROA, current ratio below 1 and indicator of debt ratio higher than 0.8.

considered.[14] This could imply that being highly leveraged overseas is by itself a sign of a financial stress.

The following are the main features of the companies that were identified rishy:

- They are not necessarily the most indebted ones. The distribution of this sub-sample in the five groups is similar to that for the total of firms indebted in foreign currency with EIM.

- They are divided into similar shares by size (37% are small-sized, 32% are medium-sized and 32% are large sized).

- 46% belong to the commercial sector and 25% to the manufacturing sector. The rest are in the sectors of agriculture and fishing, transportation, real estate activities, etc.

- The total exposure of the financial system to these entities comes to COP$428 b, which represents 0.35% of the commercial loan portfolio.

- They also have a substantial amount of debt denominated in national currency. Their total indebtedness is similarly apportioned between national (COP$224 b) and foreign currency (COP$204 b).

- The average number of banking relationships is four, with one being the minimum and fifteen, the maximum.

In conclusion, the total indebtedness that the companies have with debt denominated in foreign currency repre-

sents a significant share of the total commercial loan portfolio (37%). However, when the information contained in their most recent financial statements is analyzed, it can be concluded that they are generally companies in that are financially sound. When the information is filtered to find the most fragile companies, it can be seen that there are few and that they represent only 0.35% of the total commercial loan portfolio. Although this percentage would not mean a significant threat to the system, the amount involved is substantial if we consider the fact that it has been contracted with just 57 companies.

3. Hedging of Financial Obligations Contracted in 2010

A more detailed study was done in order to evaluate how well the credit operations contracted in foreign currency between June and December 2010 were covered. It examined the coverage with both the Colombian financial sector and offshore entities.[15] It should be clarified that only the monetized loans granted by either financial entities or the company headquarters are included. In addition, unlike what happened in the previous analysis, only the information regarding disbursements (money flow) was considered this time. Table 9 presents the results of this study. As is evident, the percentage of hedging with purchase forwards was above 86% every month. This suggests that these companies are protected from a devaluation in the exchange rate and, therefore, the ability to pay their debts is hedged with respect to those fluctuations. This outcome, although different from what was obtained in the first section of this box, could be associated with the fact that only information regarding balances was taken into account in this section and, as was mentioned above, the companies may prefer to hedge cash flow (for instance, payment of amortization or interest), but not the balance account (or total balance).

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14   In the exercise for the companies with external debt, 27 out of 196 firms turned out to be fragile in group 4 and so did 19 out of 48 in group 5. In this case, for those with debt denominated in foreign currency, the filter was applied to the total number of companies rather than to each group and the result was only 57 firms out of 4,296.

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15   Non-resident financial institutions.

Table B11.9
Hedging for Loan Disbursements in Foreign Currency

Millions of dollars	2010							
	Jun	Jul	Ago	Sep	Oct	Nov	Dic	Jun-Dic 2010
Total loan disbursements in f/c	737	1.051	1.077	1.269	1.106	800	705	6.745
Loan disbursements in f/c of the companies analyzed[a]	658	923	926	1.038	853	560	501	5.460
Hedging (purchase forwards) with the financial sector	658	914	856	868	753	482	452	4.984
Hedging (purchase forwards) offshore	0	0	41	25	0	50	0	116
Percentage of loan hedging in f/c with forwards	100	99	97	86	88	95	90	93

a/ Corresponds to the companies that received between 72% and 87% of their total loans in f/c between July and December 2010.
Source: Banco de la República.

FINANCIAL STABILITY ISSUES

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Banking Concentration And Financial Stability: A Study For Colombia
Concentración y estabilidad financiera: el caso del sistema bancario colombiano
   Miguel Ángel Morales

Financing The Agricultural Sector: Status And Prospects
Financiamiento del sector agropecuario: situación y perspectivas
   Diana Lucía Fernández
   José Hernán Piñeros
   Dairo Estrada

Measuring Systemic Risk In The Colombian Financial System: A Contingent Claims Approach
Una medición del riesgo sistémico en el sistema financiero colombiano
   Mariana Laverde
   Esteban Gómez
   Miguel Morales
   Laura Capera

BANKING CONCENTRATION AND FINANCIAL STABILITY: A STUDY FOR COLOMBIA

MIGUEL ÁNGEL MORALES

This paper analyzes the relationship between banking concentration and financial stability in the Colombian financial system during the period 1994-2009. In order to evaluate this relation empirically, an unbalanced dynamic panel is used. The model includes a financial stability index, financial and concentration indicators and some macroeconomic factors. Results show that during the last two decades, the Colombian banking sector presented higher levels of financial stability when concentration increased. However, there is an optimum level of concentration due to the U-shape exhibited by the relationship between financial stability and concentration.

CONCENTRACIÓN Y ESTABILIDAD FINANCIERA: EL CASO DEL SISTEMA BANCA-RIO COLOMBIANO

Este documento analiza la relación entre estabilidad financiera y concentración banca-ria en la economía colombiana para el período 1994-2009. Para evaluar esta relación, se construyó un panel dinámico desbalanceado donde se relacionan indicadores de estabilidad financiera y concentración, controlando por factores macroeconómicos. Los resultados muestran que se presentaron mejorías en términos de estabilidad financiera a medida que el sistema bancario se concentró durante las dos décadas más recientes; sin embargo, también se encuentra que existe un nivel de concentración óptimo, dada la forma de *U* que presenta la estabilidad financiera a medida que el sistema bancario se concentra.

FINANCING THE AGRICULTURAL SECTOR: STATUS AND PROSPECTS

DIANA LUCÍA FERNÁNDEZ
JOSÉ HERNÁN PIÑEROS
DAIRO ESTRADA

In this paper we analyze the characteristics of credit to the agricultural sector. In Colombia, despite the growth observed in this sector in recent years as well as its important socio-economic component, development has been sluggish compared to other countries in Latin America. Financial insertion in the agricultural sector has been key to the development of the latter in the last decade, significantly increasing resources available to the sector. Nonetheless, an increment in available funds has come at the expense of higher risk exposures, a situation which has improved in the last two years. Utilizing binary and multinomial logit models for the probability of access to agricultural loans we find that collateral, such as durable assets, increases access to financing, especially through formal financial intermediaries. Finally, empirical evidence suggests that there is a high degree of dependence between financing to this sector and resources obtained through compulsory investments, which implies that alternative funding sources must be secured to allow growth in agricultural loans to be endogenous to the performance of this sector.

FINANCIAMIENTO DEL SECTOR AGROPECUARIO: SITUACIÓN Y PERSPECTIVAS

En este documento se analiza el crédito agropecuario. En Colombia, pese a que este sector ha crecido en los años recientes y tiene un alto componente social y económico, su desarrollo no ha sido tan dinámico en comparación con otros países de América Latina. La penetración del sector financiero en el agropecuario ha sido importante para su desarrollo en la última década, aumentando considerablemente los recursos al sector. No obstante, el crecimiento de estos estuvo acompañado de un aumento en el riesgo, situación que ha mejorado en los dos años más recientes. Al realizar un modelo de probabilidad de acceso al crédito se encontró que contar con garantías como títulos de propiedad o bienes durables aumenta el acceso al crédito agropecuario, en especial con los intermediarios formales. Finalmente, existe una dependencia de la financiación del sector a los recursos de inversión forzosa, por lo que resultaría pertinente buscar alternativas que permitan un crecimiento del crédito agropecuario endógeno al desempeño del sector.

MEASURING SYSTEMIC RISK IN THE COLOMBIAN FINANCIAL SYSTEM: A CONTINGENT CLAIMS APPROACH

MARIANA LAVERDE
ESTEBAN GÓMEZ
MIGUEL MORALES
LAURA CAPERA

The financial crisis of the late 2000's triggered a renewed interest in the relationship between financial and sovereign risk. Particularly, it underscored the importance of identifying systemically significant institutions and developing mechanisms for the latter to internalize the externalities they create on the economy should they fail. Using monthly data for the period comprised between September, 2001 - March, 2011, we calculated bank-specific probabilities of default and expected losses given default. Subsequently, we estimated the joint distribution of such expected losses and found the aggregate cost of the implicit bailout option for the government. Our results suggest that even though systemic risk is currently not a major concern in the Colombian banking system, it is necessary to enhance the supervisory and regulatory framework to include quantitative measures of this risk. We believe that continually monitoring the joint expected losses given default, should assist in anticipating future stress scenarios, and as such constitutes a powerful macroprudential tool for policymakers.

UNA MEDICIÓN DEL RIESGO SISTÉMICO EN EL SISTEMA FINANCIERO COLOMBIANO

La crisis financiera de 2008-2009 generó un renovado interés en la relación entre el riesgo soberano y el riesgo financiero. Particularmente, resaltó la importancia de identificar a instituciones sistemáticamente importantes y de desarrollar mecanismos para que estas internalizaran las externalidades que crean en la economía ante una eventual quiebra. Utilizando datos mensuales entre septiembre de 2001 y marzo de 2011, calculamos probabilidades de *default* y pérdidas dado un incumplimiento individual para un grupo de bancos comerciales. Consecuentemente, estimamos la distribución conjunta de dichas pérdidas y encontramos el costo agregado de la opción implícita de rescate de parte del gobierno. Nuestros resultados sugieren que, si bien en la actualidad el riesgo sistémico no parece ser una preocupación mayor en el sistema bancario, es necesario fortalecer el marco de supervisión y regulación para incluir medidas cuantitativas de este riesgo. Creemos que el continuo monitoreo del desarrollo *conjunto* de las pérdidas dado incumplimiento es útil en el pronóstico de futuros escenarios de estrés, y como tal, constituye una herramienta macroprudencial poderosa para los hacedores de política.

A HOUSEHOLD DEBT RISK ANALYSIS

JAVIER GUTIÉRREZ
DAIRO ESTRADA
LAURA CAPERA

In this paper we analyze debt conditions and the determinants of the probability of default of Colombian Households using information from the Household Financial Burden and Education Survey (Iefic). In doing so, we build three indicators to analyze household's debt service, financial burden, and indebtedness. Moreover, we estimate two probability models to identify the determinants of household credit risk and indebtedness. Results show that the main determinants of the probability of default are income, age, financial burden and employment.

UN ANÁLISIS DEL ENDEUDAMIENTO DE LOS HOGARES

En este documento se utilizó la información de la encuesta de carga y educación financiera de los hogares (Iefic) para analizar las condiciones de endeudamiento y los determinantes de la probabilidad de incumplimiento de los hogares. Para esto se construyeron tres indicadores de carga financiera, los cuales buscan medir el servicio de la deuda y el endeudamiento con respecto al ingreso y a la riqueza. Adicionalmente, se estimó un modelo de probabilidad de *default* y otro de sobreendeudamiento que incluyen, por primera vez para Colombia, información socioeconómica de los hogares. De acuerdo con los resultados, los principales determinantes de la probabilidad de *default* son el ingreso, la edad, la carga financiera y el empleo.

CODEPENCE IN SYSTEMIC RISK BETWEEN FINANCIAL SYSTEM AND REAL SECTOR

WÍLMAR CABRERA
JAVIER GUTIÉRREZ
JUAN CARLOS MENDOZA

In this paper we analyze the codependence between the risk of the real sector and the financial system. We do so by estimating a FAVAR model that includes a set of variables that reflect the common dynamics of different sectors in the economy and an idiosyncratic factor. With the data generating process found, we construct two risk indicators using quantile regression, one for the real sector and another for the financial system. Moreover, we use the measure of *CoVaR* proposed by Adrian and Brunnermeier (2011) to quantify the degree of codependence between the risks of these sectors. Results show that the risk indicators capture the main financial and real sector turmoils. Additionally, we performed impulse response exercises using the FAVAR to analyze spillovers between sectors.

RELACIÓN ENTRE EL RIESGO SISTÉMICO DEL SISTEMA FINANCIERO Y DEL SECTOR REAL

En este documento se analiza la relación existente entre los riesgos del sector real y del sistema financiero. Para esto se estima un modelo FAVAR en el cual se incluye un conjunto de variables que reflejan la evolución de la dinámica común de las series de los diferentes sectores de la economía y un componente idiosincrásico. Con el proceso generador de datos identificado en el modelo mencionado es posible estimar las medidas de riesgo del sistema financiero y del sector real utilizando la metodología de regresión por cuantiles. Posteriormente, se usa la medida de CoVaR, propuesta por Adrian y Brunnermeier (2011) para medir el grado de codependencia entre los riesgos de estos sectores. Los resultados muestran que los indicadores de riesgo reflejan las situaciones de estrés que se han presentado en los sectores real y el financiero de la economía colombiana. Adicionalmente, mediante las estimaciones del modelo FAVAR se realiza un análisis de impulso-respuesta para analizar cómo se trasmiten choques adversos entre un sector y otro.

SECTORIAL CONCENTRATION AND CREDIT RISK OF THE CORPORATE LOAN PORTFOLIO

ADRIANA CORREDOR
WÍLMAR CABRERA
ÁNGELA GONZÁLEZ

Commercial loan concentration can be explained by significant exposures to a small group of debtors, to few business sectors, and by the high correlation between sectors. This paper uses the Herfindahl-Hirschman Index, Entropy Index and the default probability to analyze the last two dimensions. The default probability it is modeled with a set of financial and real variables in order to establish the relationship between adverse macroeconomic shocks and the losses from the credits granted to economic sectors.

CONCENTRACIÓN Y RIESGO DE CRÉDITO POR SECTOR ECONÓMICO DE LA CARTERA COMERCIAL

La concentración de la cartera comercial se explica por exposiciones significativas a pocos deudores, a pocos sectores económicos, y por la correlación del desempeño entre algunos sectores. En este documento se utilizan diferentes medidas para analizar las dos últimas dimensiones, entre las cuales se encuentra el índice de Herfindahl-Hirschman, el índice de entropía, y la probabilidad de incumplimiento por sector. Esta última se estima en función de un conjunto de variables de los sectores real y financiero, lo que permite relacionar las posibles pérdidas por el impago de los créditos, con choques macroeconómicos adversos que afectan el desempeño de los sectores.

AN INDEX OF BANCARIZATION IN COLOMBIA

ÁNGELA GONZÁLEZ
LAURA CAPERA

This paper analyses the evolution of bancarization in Colombia using an index which includes traditional measures of financial development and other associated with the intensity of use of financial services in each region. The methodology used here is Principal Component Analysis (PCA). The behavior of the indicator suggests that even when bancarization has improved in the last years, most of the recent advances are concentrated in the Central region and Bogota, while some regions reveal significant delays. Also, the results highlight the importance of considering intensity of use measures in the analysis of bancarization, given their contribution in revealing the real integration of these services in the economic activity of individuals.

UN ÍNDICE DE BANCARIZACIÓN PARA COLOMBIA

El objetivo de este documento es analizar la evolución de la bancarización en Colombia mediante un índice que reúne medidas tradicionales de cobertura y otras asociadas con la intensidad de uso de los servicios financieros por parte de la población de cada departamento. La metodología utilizada es la de componentes principales. El análisis del indicador calculado para cada región sugiere que, aunque se ha incrementado la bancarización en el país, los principales avances se concentran en la región central y en Bogotá, mientras que en algunos departamentos revelan rezagos significativos. Adicionalmente, los resultados resaltan la importancia de incluir indicadores de intensidad de uso, en la medida en que estos permiten establecer con mayor precisión el grado de integración de los servicios financieros en la actividad cotidiana de los individuos.