FINANCIAL STABILITY REPORT

March 2011

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Executive Summary

The year 2010 was one of economic recovery on the global level. The worldwide economy grew at a rate that was close to 5% annually, a figure that is higher than had previously been expected by the market. The rise in the prices for commodities together with the higher degree of risk aversion with respect to the developed economies as a consequence of their slow rate of expansion contributed to a significant flow of capital towards emerging economies. In Colombia, the high terms of trade, the improvement in the confidence levels and the favorable conditions of financing led to a rapid recovery of output growth, fueled especially by investment and consumption. The above also contributed to the recovery of traditional intermediation activities after the slowdown in lending that occurred as a consequence of the international crisis of 2009.

Intermediation activities showed a positive trend over the last year and it is expected that they will continue to do so given the better performance of the economy. All of the types of loan portfolios grew moderately in 2010, which translates into a real annual increase of 13.1% of the gross loan portfolio. This growth was mainly due to the commercial and consumer loan portfolios, which rose 17% and 12.7% respectively. It is worth emphasizing the fact that housing loans with securitizations also saw a positive performance (12.7%). However, due to an important securitization process towards the end of last year, the non-securitization portfolio presented a real reduction of 2.4%. The liability side of the balance was based on the growth of deposits, especially those in checking and savings accounts (15.6% and 15.4% respectively). The increase in bonds issued by financial entities, which grew 44.8% in 2010 also stands out.

The credit institutions and the Non-banking Financial Institutions (NBFI) increased their investment portfolio significantly in 2010 (18.9% and 19.3% respectively). This portfolio is still concentrated in public debt securities and stock which translates into a higher level of potential exposure to market risk for these institutions. However, the shorter duration of the NBFI portfolio should be emphasized. This makes it less sensitive to adverse changes in market conditions. Moreover, it should also be mentioned that, in the second half of 2010, market risk did not materialize due to the low volatility in the market.

With respect to liquidity risk, holdings of more liquid assets such as the public debt securities have made it possible for credit institutions to count on the necessary resources to take care of possible adverse shocks to their sources of funding. Regarding credit risk, the quality and default indicators have continued to diminish in spite of the surge in the rate of growth for the loan portfolio. In particular, the loan portfolio quality index (risky loan portfolio/gross loan portfolio) went from 9.3% to 7.8% between June and December 2010 while the default index (nonperforming loan portfolio/gross loan portfolio), which represents the materialization of risk, went from 4.4% to 3.2% in the same period. Last of all, emphasis must be made of the fact that the higher levels of the gross loan portfolio have gone hand in hand with not only a better quality of this loan portfolio but also better hedging of the risky portfolio.

To summarize, the Colombian financial system has gone through an important consolidation process that has translated into better growth of the loan portfolio, better levels of quality and capital adequacy, stable profitability and a moderate exposure to the different risks over the last year. However, it should be mentioned that, in times of expansion, it is necessary to keep up constant, strict monitoring of the changes in prices and quality of the main financial assets in order to prevent possible imbalances that could lead to instability in the system.

Board of Directors
Banco de la República
(Central Bank of Colombia)

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, a high degree of uncertainty can be seen on the international scene. Nevertheless, Colombia's main trading partners are continuing to recover, which will be favorable for the national economy through the increase in exports, improvement in the terms of trade and capital flows towards our economy.

A.   BACKGROUND OF THE INTERNATIONAL ENVIRONMENT

In 2010, the worldwide economic growth showed a better performance than expected at the beginning of the year. Specifically, the advanced economies showed a performance that was better than projected in the beginning. Nevertheless, in the euro zone, low rates of growth were registered in comparison to the rest of the developed economies. In spite of that, global expansion, estimated at 5%, was driven primarily by the strength of the emerging economies.

The slow recovery of the developed countries is due to weak private demand and a drop in capital flows towards those economies. Even though the governments have stimulated economic growth through fiscal and monetary policies, their applicability in the future could be restricted given the difficulties several developed countries are having in that area. As a consequence, there is a motive for private capital flows towards emerging economies that have good fundamentals. This could increase the risk of economic overheating for some of them, including Colombia.

With this panorama, the growth projections for 2011, which were made in October 2010, were corrected upward in January of this year by the International Monetary Fund (IMF) for the majority of the countries (Table 1).

In spite of the above, the perception of risk held by investors in the European markets remains high and this is reflected in the higher premiums for credit

Table 1
Economic Growth
(annual percentage variation)

	Actual		Current projections		Differences with respect to Oct. 2010 projections	
	2009	2010	2011	2012	2011	2012
World output	**(0.6)**	**5.0**	**4.4**	**4.5**	**0.2**	**0.0**
Advanced economies	(3.4)	3.0	2.5	2.5	0.3	(0.1)
United States	(2.6)	2.8	3.0	2.7	0.7	(0.3)
Euro Zone	(4.1)	1.8	1.5	1.7	0.0	(0.1)
Japan	(6.3)	4.3	1.6	1.8	0.1	(0.2)
United Kingdom	(4.9)	1.7	2.0	2.3	0.0	0.0
Canada	(2.5)	2.9	2.3	2.7	(0.4)	0.0
Other emerging markets and developing countries	2.6	7.1	6.5	6.5	0.1	0.0
Latin America	(1.8)	5.9	4.3	4.1	0.3	(0.1)
Brazil	(0.6)	7.5	4.5	4.1	0.4	0.0
Mexico	(6.1)	5.2	4.2	4.8	0.3	(0.2)
Developing countries in Asia	7.0	9.3	8.4	8.4	0.0	0.0
China	9.2	10.3	9.6	9.5	0.0	0.0
India	5.7	9.7	8.4	8.0	0.0	0.0
Colombia	0.8	3.9[a/]	4.5			

a/ projected.
Sources: International Monetary Fund (World Economic Outlook, January, 2011) and Banco de la República.

default swaps (CDS).[1] It should be noted that Germany and France show stability, but Greece and Ireland, who suffered a major impact on the crisis, have greater increases in this indicator (Graph 1).

In contrast, the premiums of the CDS for the Latin America countries have remained stable since mid-2010 at values that are the lowest for the last two years (Graph 2). Likewise, the VIX[2] has demonstrated progressive decline and reached a historical minimum (15.4) in December of last year (Graph 3). The results seen on these

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1   A CDS is a financial contract agreed upon by 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 his obligations. The value of a CDS is directly related to the investors' level of risk aversion.

2   The VIX (composite volatility index) is an indicator of implicit volatility in the options on the S&P 500 index. A rise in the VIX indicates greater uncertainty in the stock market, which is reflected in higher prices for options. Thus, this index can be interpreted as another measurement of risk aversion.

(basis points)   (basis points)

Source: Bloomberg.

Graph 2
Five-year Credit Default Swaps in some Latin America Countries

(basis points)
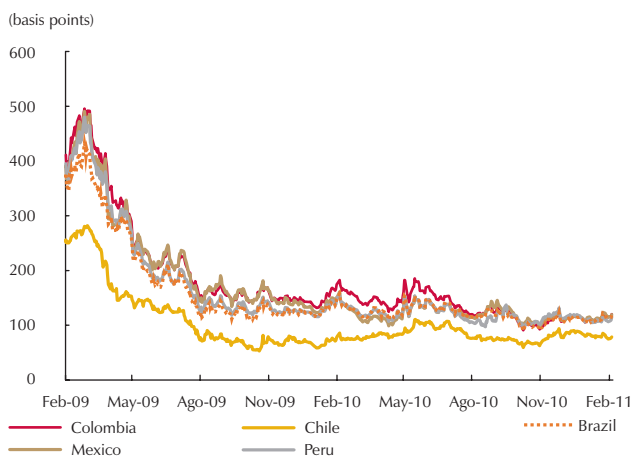
Source: Bloomberg.

Graph 3
Risk Aversion Index (VIX)

(index)

Source: Bloomberg.

indices make it evident that there is a low perception of risk with respect to Latin American markets on the part of international investors.

In conclusion, in spite of the signs of recovery and improvement in economic growth expectations for developed countries, investors continue to feel a high level of uncertainty about some of them. This could turn into an opportunity for some of the emerging countries to receive foreign capital and assume the possible risk of their economy overheating.

When the performance of global economic growth is analyzed, especially the sustained demand of Asian economies and some of the emerging ones, it can be seen that, in 2010, the prices of commodities rose thus favoring producing countries (Graph 4). This trend is expected to continue in 2011 because of the performance of worldwide demand. At the same time, it should be emphasized that this could generate increases in the prices of some regulated goods such as petroleum which could cause inflationary pressures on some of these products.

With respect to food commodities, the increase seen in demand with a limited supply is expected to continue to the benefit of the producing countries. This could generate inflationary pressures at the same time.

Graph 4
Commodity Prices

(January 2006 = 100)
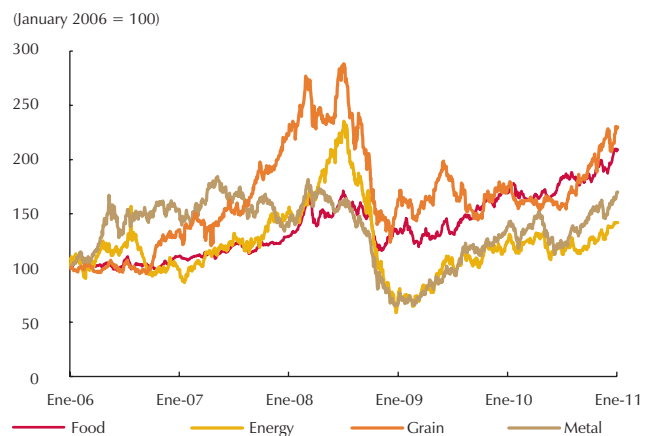
Source: Bloomberg.

B.   STRENGTH OF THE REAL SECTOR

Since the third quarter of 2009, the Colombian economy has shown signs of recovery with positive, annual rates of growth. The year 2009 closed with a real expansion of 0.8% and 2010 is expected to end with one of 3.9%.

When the gross domestic product is broken down into its expenditure components, the rise in exports turns out to have been significant and sustained over the course of 2010. It went from an annual rate of -10.7% in September 2009 to one of 5.4% a year later.

Household consumption, in turn, showed a growth trend over the course of the previous year. In fact, in the third quarter of 2010, its growth was at 4.3% when a year prior to that, it had been 0.8%.
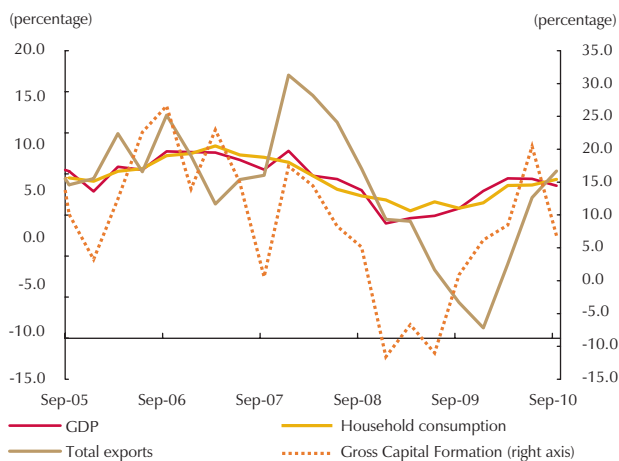
With respect to the strength of gross capital formation, the performance was very favorable until the second quarter of 2010. However, it tightened for the third quarter of the year. In spite of that, the performance was better in comparison to what had been seen in 2009 (Graph 5).

The deficit in current account as a percentage of the GDP climbed to 4.6% as of September 2010 compared to a deficit of 2.4% the year before (Graph 6). This is due to a larger increase in the imports in comparison to the exports. As a consequence, a deficit in the balance of trade was registered for the third quarter of 2010, something that had not occurred since the last quarter of 2008. This situation, just as has been stated in previous Financial Stability Reports, increases the Colombian economy's vulnerability to international shocks, specifically to reductions in liquidity.

With respect to the labor market, the year 2010 saw a reduction in the unemployment rates in annual terms, which were at 10.7% for the national total and 11.0% for the thirteen urban areas[3] for the October to December average. However, it is important to point out that the type of work that showed the most growth was in the underground economy,[4] which surpassed regular employment in spite of the fact that the latter showed a positive performance in the third quarter of the year.

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3   The thirteen metropolitan areas are: Medellin, Bogotá, Cali, Barranquilla, Bucaramanga, Montería, Manizales, Ibagué, Pereira, Pasto, Cúcuta and Villavicencio.

4   The National Bureau of Statistics (Departamento Administrativo Nacional de Estadística, DANE) defines the employers, private employees and workers who work in companies that employ up to five people as underground employment as well as the unremunerated workers in family businesses, domestic workers and unpaid workers.

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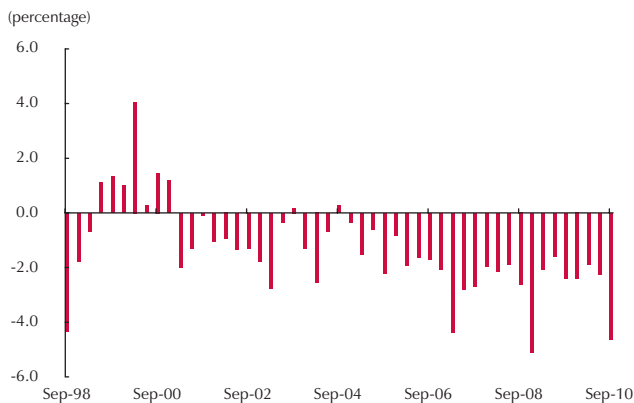
Source: DANE, Banco de la República calculations.

This situation is not optimal if we consider the fact that economic activities carried out in the underground economy are generally characterized by shortcomings with respect to quality, stability and income. In spite of this, the decline in unemployment could be another factor that would continue to strengthen private consumption and demand for credit (Graph 7).

In conclusion, the elements that will strengthen the economic recovery in Colombia in 2011 will be the strengthening of consumption and investment. In addition, the rise in public expenditures, which are designated for dealing with the emergencies caused by winter weather, could have a positive effect on economic growth and the labor market.

C.   OUTLOOK FOR THE FINANCIAL SYSTEM

The performance of the Colombian financial system in 2011 will depend on the strength of the economic growth and the strategies that the financial institutions implement to manage the risks that they face. Factors such as the risk aversion of international investors, the prices of commodities and the exchange rate will determine the capital flows towards emerging economies like ours.

The risk position held by the emerging economies on the international markets shows a declining trend, which is expressed in reductions in the EMBI+.[5] It should be emphasized that the EMBI+ for Colombia was below the EMBI+ Latam with a difference of more than 170 basis points (bp) as of February 2011 (Graph 8).

Furthermore, just as can be seen in Graph 9, the Latin American stock markets maintained their growth dynamic in 2010 and only changed their trend in November of this year. The general index of the Colombian Stock Market (IGBC), in turn, showed a decline and was at a level below what was seen in the Latin American index (MXLA[6]).

The outlook for the regional financial system is favorable as a result of the positive impact that the merger of the local stock markets[7] could have. This could increase

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5   The emerging market bond index plus (EMBI+) is an indicator that measures country risk. This is calculated as the difference between the returns on the government bonds issued by emerging countries and the return on Treasury Bonds (risk free). High EMBI+ values imply high probabilities of default in the payment of the sovereign debt.

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

7   As is the case with the merger of the Chilean, Colombian, and Peruvian stock markets called Integrated Latin American Market (MILA in Spanish).

Graph 7

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

(percentage)

| | | Seasonally adjusted UR | | National UR |
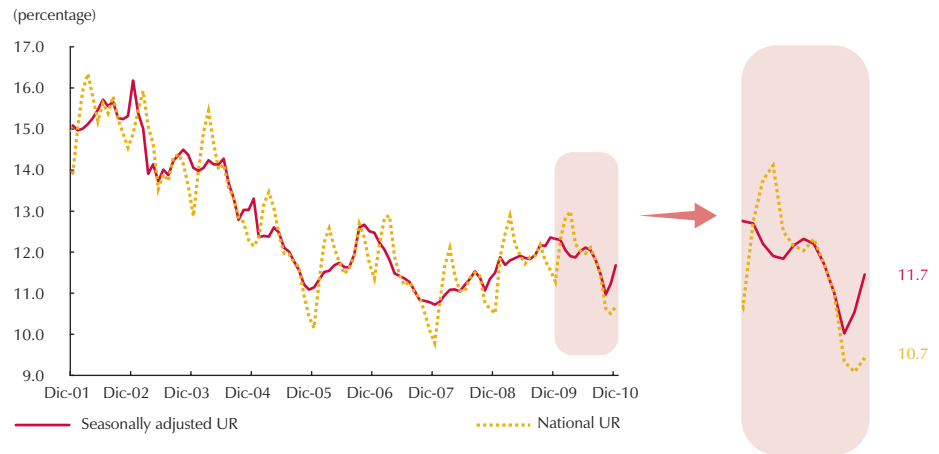
B. Formal and Underground Employment in the 13 Urban Areas
    (seasonally adjusted series)

(thousands of people)

Formal   Underground
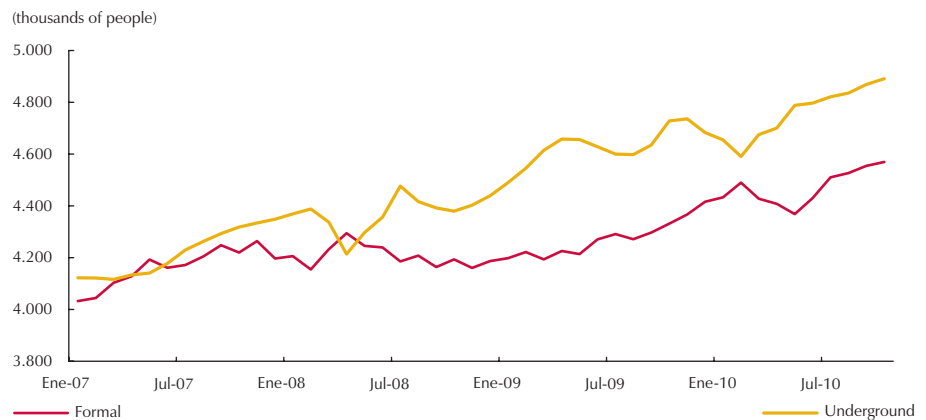
Source: DANE (GEIH), Banco de la República calculations.

the volume of stock market transactions and strengthen the market in 2011. Like-wise, the expected rise in the prices of commodities could generate a greater rise in the value on the stock market of the producing companies.

In reference to the strength of the gross loan portfolio, which was driven mainly by commercial and consumer loans, the fact that it was favorable must be empha-sized. Likewise, credit risk showed an improvement in the loan portfolio quality index (QI) and in the default index for the majority of the modalities except for housing loans. The reduction in the risky portfolio also had a positive effect on the hedging indicators.

With respect to the exposure to market risk, there are a variety of trends to be found among the entities in the financial system. While the managers of pension and severance pay funds (PFM) as well as the financial cooperatives (FC) have reduced their exposure by a shorter duration in the loan portfolio for the first and

Graph 8
EMBI+ Margin for Colombia, Latin America and Other Emerging Countries

(basis points)

Source: Bloomberg.

Graph 9
Stock Market in Latin America

(January 2009 = 100)

Source: Bloomberg.

a drop in the TES holdings in the second case, the risk exposure for commercial banks has risen mainly due to an increase in the duration of their loan portfolio. In spite of this, it is important to continue the monitoring given that a change in the volatility along with larger holdings of securities could have adverse effects on the balance of the financial entities.

Credit risk continued on its declining trend in 2010, especially for the commercial, consumer, and micro-credit loan portfolios in which the loan portfolio quality index (QI) and default index (DI) showed an improvement. Nevertheless, the housing loan portfolio showed a slight increase on this indicator, which is mainly due to the securitization process. When the exposure to funding liquidity risk is analyzed, all of the credit institutions are found to have stable and positive levels on their indicators.

From this panorama, the outlook for the Colombian financial system will depend to a large degree on the strength of the growth of the Colombian economy and of the recovery of the international economies. Likewise, the developments in unemployment and the decisions with respect to the fiscal area that the government could take responsibility for along with inflationary pressures and their impact on the interest rate could all have consequences on the risks that the financial system faces.

The results with respect to the strength of the loan portfolio and exposure to risks are favorable. Nevertheless, constant monitoring of them is fundamental for the development of the financial sector in 2011.

II.   FINANCIAL SYSTEM

In the second half of 2010, the positive trend in the performance of gross loan portfolio continued primarily due to the performance of the commercial and consumer loans. The rise in securitizations, in turn, led to a decline in the balance of the housing loan portfolio by December 2010. In addition, investments were seen to grow at a slower pace compared to what had been registered in the first half of the same year. In terms of credit risk, there was an improvement in the indicators for all of the types of loan portfolios excepting that of housing. The performance of that loan portfolio was affected by the securitizations.

A.   CREDIT INSTITUTIONS

1.   General Balance Sheet Positions

a.   Asset Accounts

Graph 10
Credit Institution Assets

(trillions of pesos, June 2010)   (percentage)

— Real level   — Real annual growth (right axis)

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

In the second half of 2010, the upsurge in the growth of assets, which was mainly due to the greater strength of the loan portfolio, stands out. As of December 2010, the real annual growth rate of the credit institutions' assets was 11.5% and they registered a level of COL$270.5 trillion (t) (Graph 10).

In the second half of 2010, there was an upswing in the rate of growth of the loan portfolio which continued the positive trend it had been showing since December 2009. The total value of the loans registered an increase of COL$25.4 t taking it to a level of COL$176.8 t. This represents a real annual expansion of 13.1% as of December 2010 (Graph 11). This performance is related to the economic growth and the low interest

(percentage)

Commercial   Consumer   Housing

Housing plus securitizations   Total
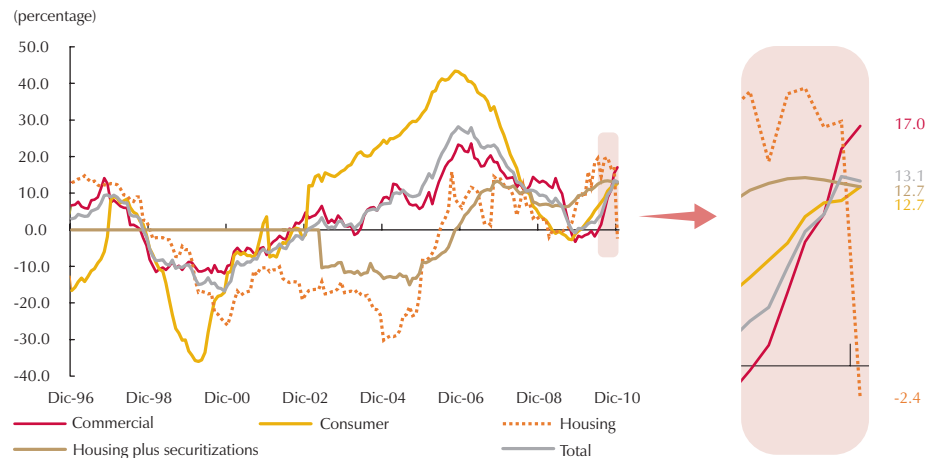
Source: Financial Superintendency of Colombia, Banco de la República calculations.

rates seen in the last six months of 2010. Going by type of loan, one sees that the commercial and consumer loan portfolios drove the upswing in the gross loan portfolio as they registered real annual rates of 17.0% and 12.7% in December 2010 compared to -0.3% and 6.3% respectively six months before.

In the second half of 2010, there was a stable trend in the real annual growth of the housing loan portfolio, including securitizations, which stayed at around 12.7%. Nevertheless, the housing loan portfolio excluding securitizations experienced a sharp slowdown with a real annual rate of -2.4% as of December 2010 compared to the rate from six months before (19.5%). This drop was primarily due to the increase in securitizations done in December of that year.

This rise in securitizations is related to the expiration of the benefits and tax exemptions associated with holdings of mortgage securities.[8] The securitization portfolio rose COL$2.4 t in the month of December and reached a level of COL$7.3 t. It is also notable that the majority of the securitizations were done by national entities and that most of the securitized portfolio corresponds to loans with high ratings (Graph 12). The annualized monthly disbursements, in turn, of the housing loan portfolio continued to climb in the second half of 2010 and came to a level of COL$5.2 t in December of the same year (Graph 13).

When the performance of the gross loan portfolio by type of intermediary is analyzed, it can be seen that the commercial banks showed a rate of growth of 19.5% for December 2010, which was higher than the rate reported in June of the

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8   The income tax exemptions on the returns from mortgage securities were deferred by Act 964/2005 article 81. This period ended on December 23, 2010. During that month, the Colombian mortgage securitization company carried out two issues of mortgage securities in units of real value (UVR in Spanish), which resulted in an increase of COL$298 billion (b) and COL$2.1 t in the securitization portfolios denominated in UVR and in pesos respectively. These issues were done with the banks' highest rated loan portfolio.

Graph 12
Securitizations

A.   By type of capital

(trillions of pesos)

- Foreign
- National
- Total

B.   By type of Security

(trillions of pesos)

- UVRTIPS
- TECH
- Peso TIPS
- Total
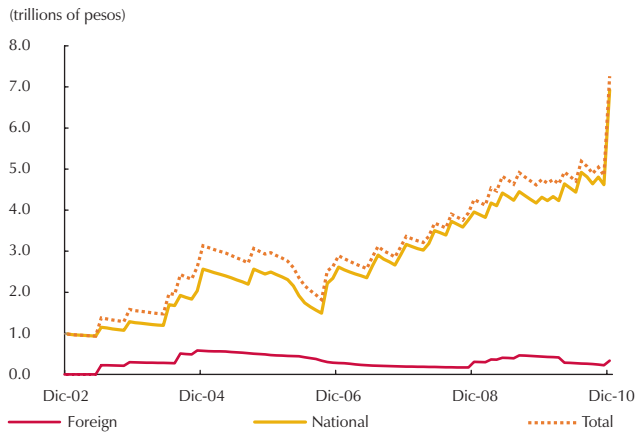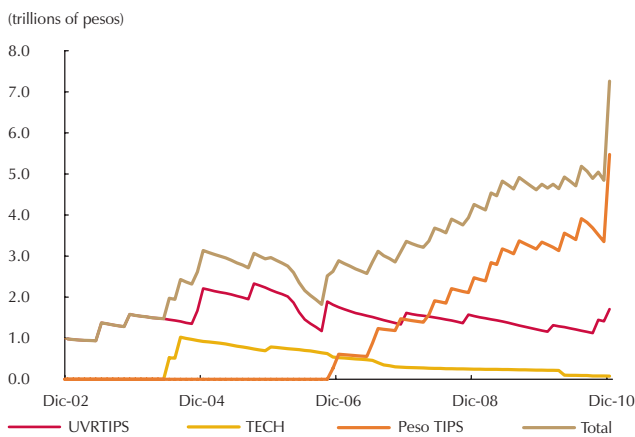
Source: Colombian Mortgage Securitization Company.

Graph 13
Monthly Disbursements for Purchase of Housing

(trillions of pesos June 2010)   (percentage)

- Disbursements
- Annual growth (right axis)
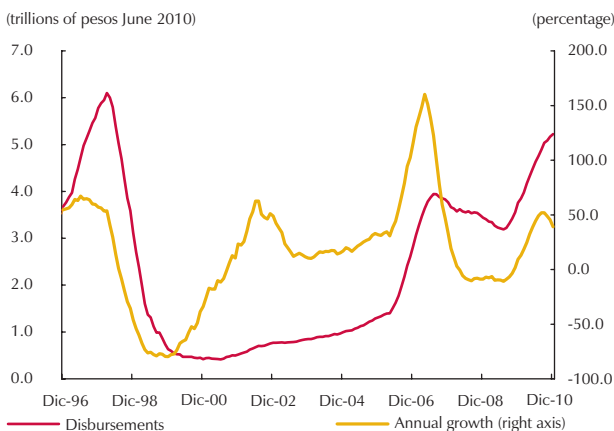
Source: Asobancaria, Banco de la República calculations.

same year (7.1%). Also, both the financing companies (CFC) and those specializing in leasing continued to show negative growth in their gross loan portfolios (-11.6% and -41.5% respectively). This was due to the sale of the CFC loan portfolio to the commercial banks in their conglomerates and to the fact that there are still mergers going on between some commercial banks and their leasing companies.[9]

In contrast, there has been a slowdown in the growth of investments in the second half of 2010 although this is still in positive territory. Investments registered an increase of COL$5.6 t and reached a level of COL$60.3 t as of December 2010 as they went from a real annual growth rate of 16.7% in June 2010 to one of 15.2% for the last month of the same year (Graph 14).

As a result, the share of the gross loan portfolio and the investments in the total assets held by the credit institutions rose slightly given the growth seen for these two items. They were at 65.2% and 22.3% as of December 2010 compared to the 64.2% and 22.0% that had been recorded six months earlier (Graph 15).

The expansion of the gross loan portfolio occurred in a context of greater economic growth. Nevertheless,

Graph 14
Credit Establishment Investments

(trillions of pesos June 2010)   (percentage)

- Investments
- Real annual growth (right axis)

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

9   It should be remembered that the financial reform put into effect through Act 1328/2009 authorized commercial banks to do leasing operations.

Graph 15
Investment and Gross Loan Portfolio as a Percentage
Share of the Total Assets of Credit Institutions
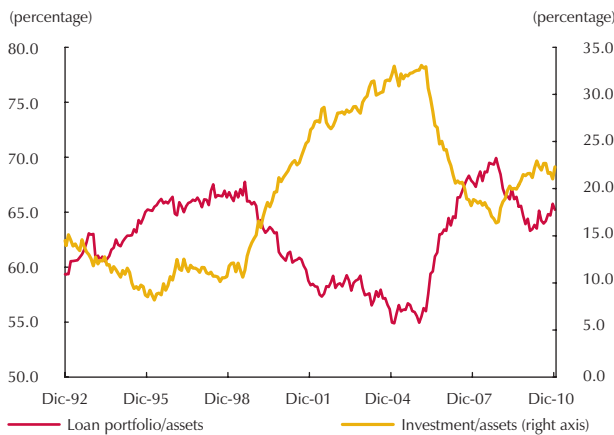
Source: Financial Superintendency, Banco de la República calculations.

Graph 16
Financial Depth (Loan Portfolio/GDP)
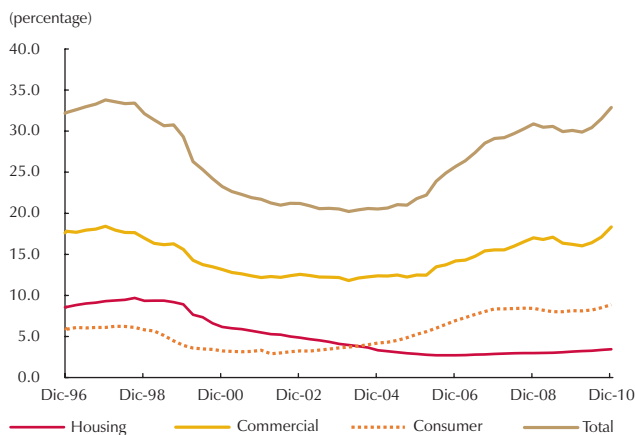
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 17
Deposits with Credit Institutions
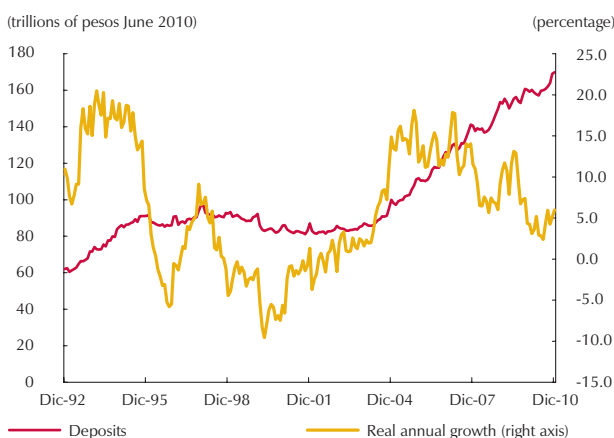
Source: Financial Superintendency of Colombia, Banco de la República calculations.

the performance of lending was better than that of the GDP. This is the reason the financial deepening index – measured as the proportion of the loan portfolio to the GDP – registered a higher level in December 2010 than the one seen six months previously (32.9% compared to 30.6% which was reached in June of the same year). Looking at loan portfolios by type, the indicator for the commercial one presented a more accentuated rise as it went from 17.1% in June 2010 to 18.3% in December 2010. The indicator for the consumer loan portfolio, in turn, grew slightly going from 8.0% to 8.9% in the same period while the indicator for the housing loan portfolio remained relatively stable (Graph 16).

b. *Liability Accounts*

As of December 2010, the liabilities in the financial system had come to COL\$232 t, which reflects a real annual rate of growth of 11.5% while in June of the same year, it was only 5%. This performance is due to the fact that issues of bonds rose 44.8%, the financial obligations rose 33.2%, and deposits from the public rose 6.0%. The shares of these items in the total liabilities are 7.0% for the first, 10.9% for the second, and 73.0% for the last ones.[10]

With respect to deposit-taking by credit institutions, these were at COL\$169.8 t in December 2010 (Graph 17). However, this variation was not the same among the different types of intermediaries. In Graph 18, it can be seen that the banks were the ones that drove this increase since they were the only ones that had a positive rate. This was a real annual rate of 8.1% in December 2010. At the same time, the CFCs and leasing showed declines, which corresponded to rates of -20.9% and -26.2% respectively. It should be mentioned that these decreases are also due to the mergers of some of these entities with their banking subsidiaries.

Based on types of deposits, the checking and savings accounts grew at real annual rates of 15.6% and 15.4%

10 With respect to the previous Financial Stability Reports, in this edition the issuance of bonds was separated from total deposits due to the high pace of growth seen during the most recent year.

Real Growth of Deposits by Group of Intermediaries

(percentage)

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

respectively. This corresponds to increases that are higher than 5.9 percentage points (pp) for the checking accounts and 45 bp for savings accounts compared to the figures for six months before. The CDs, in turn, dropped to a real annual 10.5% thus continuing the negative trend seen in the first half of 2010 (Graph 19).

As was stated in the previous Financial Stability Report, the reasons behind the decline in the CDs are their lower deposit rates, the elimination of remuneration on the reserve requirements in August 2009[11] and the increase in the issuing of bonds by the financial system.

2. Exposure of Credit Institutions to Their Main Debtors

In December 2010, the exposure of the financial intermediaries rose 12.6% in comparison to December of the previous year as it went to a value of COL$204.3 t. As a percentage of the assets, this figure is 75.5% (Table 2).

Graph 19
Real Annual Growth of Deposits with Credit Institutions by Type of Deposit
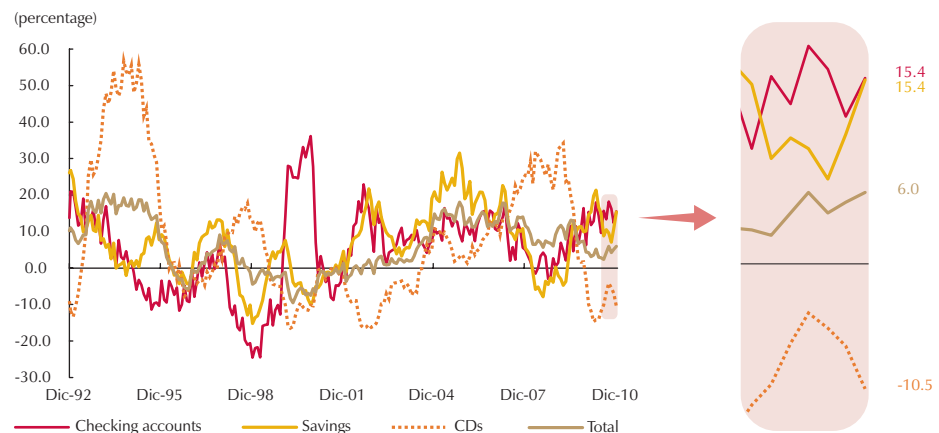
(percentage)

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

With respect to the composition, there are increases in the amount exposed for all of the sectors, especially for the private corporate sector, which went from COL$80.5 t to COL$94.6 t. Households, in turn, rose to COL$65.5 t and the public sector to COL$44.2 t in December 2010.

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11 The External Resolution of the Board of Directors on July 2009 eliminated remuneration for CD reserve requirements. This went into effect as of the twice-weekly reserve requirement adjustment which was on August 5, 2009.

Table 2
Exposure of Credit Institutions to their Major Debtors

Type	December 2009		December 2010		Percentage real annual growth
	Trillions of pesos December 2010	Percentage share	Trillions of pesos December 2010	Percentage share	
Public sector [a/]					
Loan portfolio	8.7	4.8	9.2	4.5	5.3
Securities	34.4	18.9	35.0	17.1	1.8
Total	**43.1**	**23.8**	**44.2**	**21.6**	**2.5**
Private corporate sector					
Loan portfolio	79.4	43.8	93.7	45.9	17.9
Securities	1.0	0.5	0.9	0.4	(9.8)
Total	**80.5**	**44.4**	**94.6**	**46.3**	**17.6**
Household sector					
Loan portfolio	53.8	29.7	58.9	28.9	9.5
Consumer	42.3	23.3	47.7	23.3	12.7
Housing	11.5	6.4	11.3	5.5	(2.4)
Securitizations	4.0	2.2	6.6	3.2	64.2
Total	**57.8**	**31.9**	**65.5**	**32.1**	**13.3**
Total amount exposed	**181.4**	**100.0**	**204.3**	**100.0**	**12.6**
Amount exposed as a share of assets (percentage)	74.8		75.51		

a/ The data for the public sector loan portfolio are as of September 2010.
Sources: Financial Superintendency of Colombia and Banco de la República, Banco de la República calculations.

Regarding shares, the exposure to the private corporate sector went from 44.4% of the total amount exposed to 46.3% between December 2009 and the same month in 2010. Given that this sector was the one that had the highest increase, the share of exposure to households alone went from 31.9% to 32.1% as the public sector declined from 23.8% to 21.6%.

3. Loan Portfolio and Loan-loss Provisioning Quality

In real terms, the recovery of the loan portfolio that was registered in the second half of 2010 included an improvement in the credit risk indicators compared to what had been seen six months before that. However, this performance differs from one type of loan to another. While the quality indicators for the commercial, micro-credit, and consumer loan portfolios saw positive performance, the housing loan portfolio deteriorated due to the above-mentioned securitization process.

The quality indicator (QI) – measured as the ratio between the risky and gross loan portfolios – improved during the last six months of 2010 as it went from 9.3% in

June to 7.8% in December (Graph 20). This performance is the result of both the decrease in the risky loan portfolio and the increase in the gross loan portfolio.

Going by types, the QI improved in the second half of 2010 for the loans other than those for housing. The consumer loan portfolio showed the largest reduction in its indicator as it went from 9.9% in June 2010 to 7.8% in December of the same year. During the same period, the QI for the commercial and micro-credit loans dropped (Graph 20). The indicator for housing loans, in turn, showed a tendency to improve between June and November 2010, which was the date when it started to deteriorate as a consequence of the increase in securitizations in the last month of the year.

Graph 20
Loan Portfolio Quality by Type of Credit: Risky Loan Portfolio/Gross Loan Portfolio
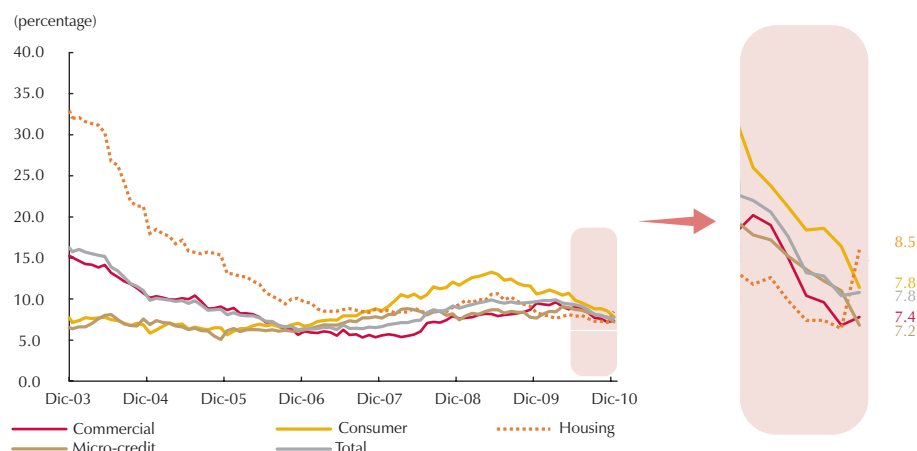
Source: Financial Superintendency, Banco de la República calculations.

The performance of the QI is primarily a result of the behavior of the risky loan portfolio,[12] which declined. It thus registered a real annual growth rate -9.4% (Graph 21). Going by type of loan, the risky commercial loan portfolio and risky micro-credit portfolio were the ones that saw the largest drop as they went from a growth of 13.5% and 9.8% in June 2010 to -9.1% and 1.9% respectively in December of the same year. There was a moderate slowdown with respect to consumer loans in the decline of the risky consumer loan portfolio during the same period as it went from a real annual rate of -19.3% to a rate of -16.7% as of December 2010.

This trend was more accentuated for the risky housing loan portfolio. Its real annual rate was -0.6% in December 2010 compared to the -11.2% that had been recorded six months before.

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12   The risky loan portfolio is defined as the loans with ratings other than A.

Graph 21
Real Annual Growth of the Risky Loan Portfolio
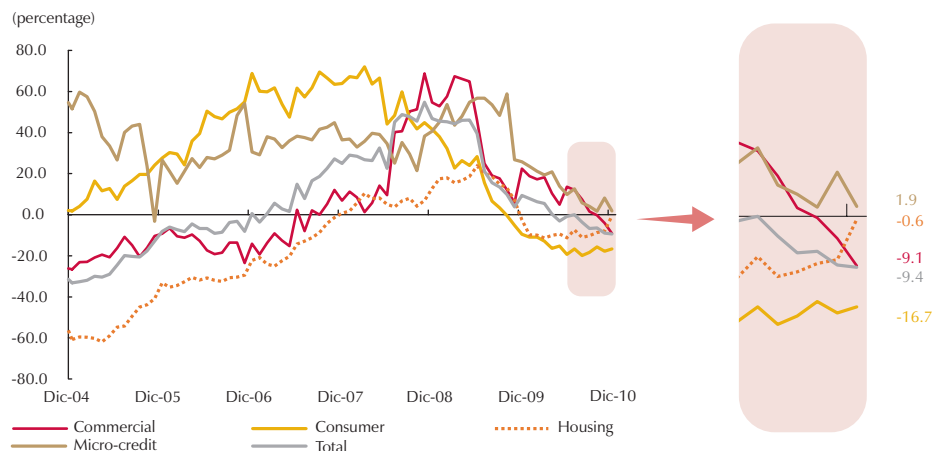
(percentage)

Commercial   Consumer   .... Housing
Micro-credit   Total

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

With respect to the default indicator (DI) – measured as the ratio between the loan portfolio in default[13] and the gross loan portfolio – a generalized improvement was seen for all of the types of loans. This indicates a low materialization of credit risk. As of December 2010, the DI was at a rate of 3.2%, which is the lowest figure in the last 15 years and represents a decline of 1.2 pp in comparison to the data from June 2010 (Graph 22). The QI for the housing loan portfolio is still the highest (9.3% as of December 2010) in spite of the fact that it showed a tendency to decrease in the second half of the same year. This declining trend is more pronounced for the other types of loans.

When the QI by type of capital, in turn, is analyzed, a convergence between the defaults of foreign entities and of national ones is still seen. They were at levels of 3.0% and 2.9% respectively in December 2010 (Graph 23).

The hedging indicator[14] – measured as the ratio between loan-loss provisioning and the risky loan portfolio – showed a slightly upward trend in the last six months of 2010 as it rose from 43.4% in June 2010 to 47.1% in December of the same year (Graph 24). When the hedging indicator is analyzed by type of lending, the marked growth of the one for micro-credit stands out. That one went from 46.8% in June 2010 to 64.8% six months later. This was due to the increase in the loan-loss provisioning for this type of loan along with a reduction in its risky portfolio.

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13   The loan portfolio in default is the one that shows a failure to make payments on a loan for 30 or more days.

14   Starting in April 2010, the counter-cyclical provisions are entered on the books in a separate account under the Unified Accounting Plan (PUC in Spanish) for credit institutions. Furthermore, this account now includes the counter-cyclical provisions of the loan portfolio and the financial leasing operations. In order to enter what is related to leasing operations on the books in both the numerator and the denominator, the decision was made to modify the indicator in such a way that it would include not only the loan portfolio and financial leasing loan-loss provisioning but also the risky portfolio for both the loan and financial leasing operations.

Graph 22
Default Indicator: Non-performing Loan Portfolio/Gross Loan Portfolio
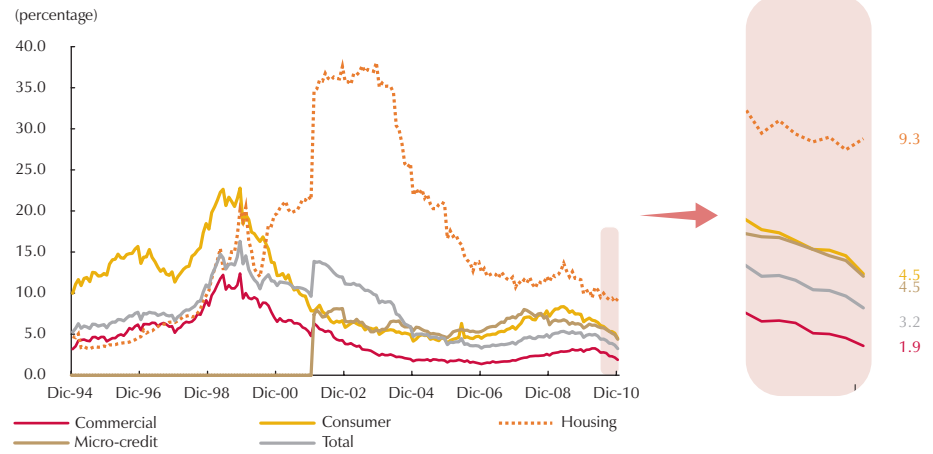
(percentage)

Commercial   Consumer   Housing
Micro-credit   Total

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

Graph 23
Default Indicator by Type of Capital

(percentage)

Foreign   National

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

The hedging indicators for commercial and consumer loans saw growth trends during the same period as they rose 5.2 pp and 4.6 pp and went to levels of 49.5% and 62.1% respectively. In the case of the housing loan portfolio, the securitizations that were carried out in December 2010 led to a fall in the loan-loss provisioning that resulted in a decrease in the indicator that hit a level of 35.7% in the last month of 2010.

4. Income, Profitability and Soundness of Net Worth

The credit institutions ended the year 2010 with a profit of COL$5.9 t, which represents a real annual growth of 4.8%. This performance corresponds to a reduction in payments on interest (a real annual -43.1%) and a drop in the outlays on loan-loss provisioning (a real annual -19.3%). Nevertheless, the rate at which the profits expanded was 5.5 pp lower than what had been seen six months before. This slow-down was because of a smaller increase in financial income.

Going by type of intermediary, the banks showed a 6.5% growth in their real annual profits in December 2010. The cooperatives, in turn, recovered from their negative trend that had been seen in the first half of the previous year and increased their profits by a real annual 9.5% as of December of the same year. Also, the positive performance of the CFC, which multiplied their profits by approximately 12 times the value they had reported in 2009, should be emphasized. This was the result of a process of loan portfolio sales by means of which they reduced their expenditures on loan-loss provisioning COL$151 b and which explains 97% of the increase in their profitability. Last of all, the leasing companies showed a plunge of

(percentage)

| | Commercial | Consumer | Housing |
| Micro-credit | Total | | |
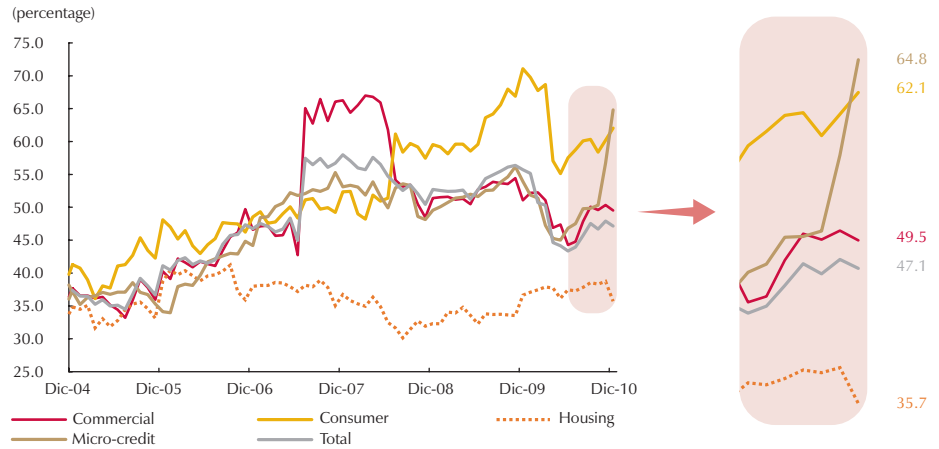
Source: Financial Superintendency of Colombia, Banco de la República calculations.

a real annual 22.1% in their profits as of December 2010 which was a result of the fact that some of these companies were removed from the market when they were absorbed by their parent companies.

The financial income of the credit institutions, in turn, came to a value of COL$27.9 t as of December 2010 thus presenting a real annual growth rate of -15.7%. The main components that drove this decline were the lower income from interest and the more limited appreciation of the investments, which fell at real annual rates of 16.6% and 16.7% respectively. The fact that the effect that the drop in income from interest had on the total financial income was stronger than the effect of the appreciation of financial income should be emphasized. This was due to their share: 61.4% of the financial income was due to the first (interest) while 11.1% was due to the second (appreciation). Commission income, in turn, stands out as it continued to rise throughout the second half of the year and showed a real annual rate of growth of 7.9% as of December 2010, which contributed 12.7% of the total financial income (Graph 25).

'Other commissions', which saw a real annual increase of 23.5% as of December 2010, was the item that contributed the most to the growth of commissions. This raised its share to 27.4%. This includes, among other things, income from user fees on credit and debit cards.

As a result of the performance of the credit entities in the second half of 2010, when assets grew faster than the profits, the return on assets (ROA) declined as it went from 2.44% to 2.36% between June and December 2010 (Graph 26). The soundness of the system, in turn, measured by means of the capital

Graph 25
Components of Financial Income

(percentage)

| Appreciation of investments | Commissions | Interest | Other |

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

Graph 26
Return on Assets
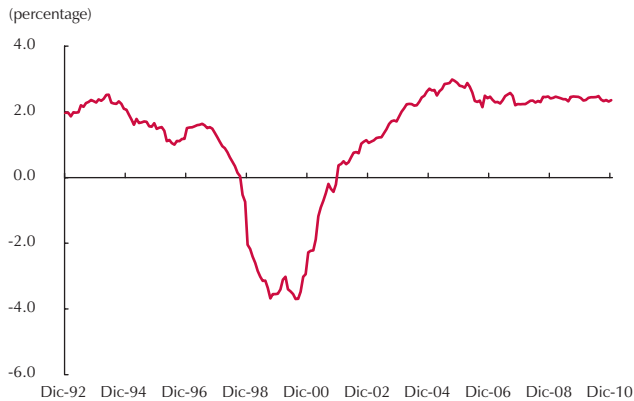
(percentage)

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

Graph 27
Capital Adequacy Ratio of Credit Institutions

(percentage)

| System | .... Minimum capital adequacy ratio | —— Average for the decade |
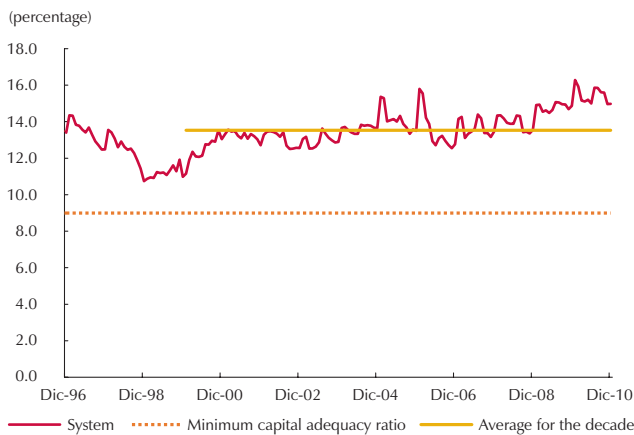
Source: Financial Superintendency of Colombia, Banco de la República calculations.

adequacy ratio,[15] continues to stay above the average for the decade (13.5%) and of the regulatory minimum (9%). It came to an average level of 15.5% for the financial system in the second half of 2010. This figure is higher if it is compared to the average registered, which was 15.4%, in the previous six months (Graph 27).

This capital adequacy analysis of the entities with subsidiaries should be complemented by a consolidated capital adequacy indicator, which would include the leveraging levels of not only the mother company but also its dependent companies.[16] The consolidated capital adequacy (weighted by each establishment's share of the equity) declined moderately as it went from 13.5% in December 2009 to 13.4% in June 2010. The performance of this indicator shows that when the credit institutions' balance sheets are consolidated with their subsidiaries, their position is not as weak as it seems when individual capital adequacy is considered. As should be pointed out, the difference between the two types of capital adequacy is diminishing.

5. Intermediation Spreads

In the second half of 2010, the Board of Directors of the Banco de la República (JDBR) maintained its monetary policy posture. As a result, the effects of the gradual declines in interest rates continued to be seen where the declines for interest rates on lending dropped more than the interest rates for deposits.

In Graph 28 the ex-ante intermediation spread[17] for the entire system can be seen. This has decreased 30 bp in comparison to June 2010 and was at 5.4% in December of the same year. Based on type of credit, this spread stayed on a downward trend in the second half of 2010 for the consumer and commercial loan portfolios as they went to 13.3% and 4.0% respectively. At the same time, the spreads for the

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15   The capital adequacy indicator corresponds to the ratio between technical equity and assets weighted by risk in which the technical equity is the sum of core equity and additional equity (Decree 2360/1993 article 4).

16   According to the Financial Superintendency of Colombia regulations, credit institutions that have subsidiaries in which they have a controlling interest (more than 50%) are required to present the consolidated capital adequacy for the group. However, if the entity's interest in the subsidiary is less than 50%, its technical equity should be subtracted.

17   The ex-ante spread corresponds to the difference between the rates that intermediaries charge for the different types of loans and the average rate of the CD deposits.

Graph 28
Ex Ante Intermediary Spread Calculated with the CD
Interest Rate
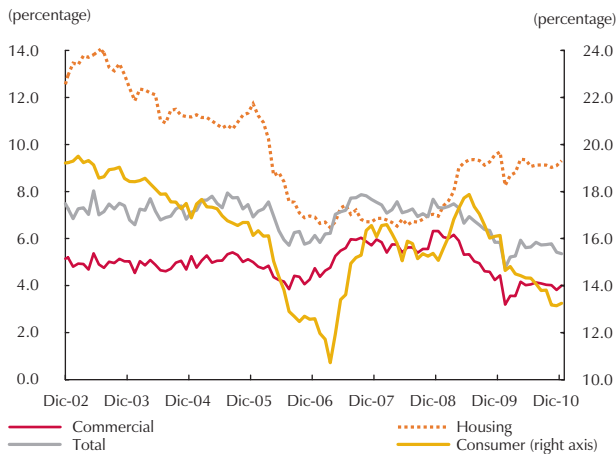
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 29
Ex Post Intermediary Spread

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

housing and micro-credit portfolios presented rises as they went to 9.3% and 27.0% respectively.

Likewise, the ex-post intermediation spread[18] continued its declining trend in the second half of 2010 and was at a value of 7.1% in December. This was 60 bp lower than what had been seen six months prior to that (Graph 29). On one hand, the implicit asset rate changed from 12.6% in June 2010 to 10.8% in December of the same year. This reduction is due to lower income from interest and a higher performing loan portfolio. On the other, the interest rate on deposits went from 4.9% to 3.7% between June and December 2010, a variation that is due to lower interest expenditures and higher liabilities with cost.

To summarize, in the second half of 2010, the gross loan portfolio had higher rates of growth driven by the performance of commercial and consumer loans. With respect to credit risk, there was an improvement in the QI and in the DI for all of the modalities except for housing loans. Likewise, the drop in the risky loan portfolio had a positive effect on the hedging indicators that were seen. It should also be noted that the atypical performance in securitizations is the reason behind the changes in the housing loan portfolio.

Credit institutions, in turn, presented increases in their profits mainly through a reduction in expenditures on interest rates and loan-loss provisioning. These were also the result of an increase in commissions in spite of the deterioration in financial income. Meanwhile, the intermediation spreads continued to decline moderately and the ratio of capital adequacy has remained stable.

B.   NON-BANKING FINANCIAL INSTITUTIONS

The analysis of non-banking financial institutions (NBFI) is vitally important for the objective of this Financial Stability Report since they are entities that could have an influence on financial stability. On the one hand, they are economic agents, who are vehicles for savings and investment for households and the public

18   The ex-post intermediation spread is calculated as the difference between the implicit asset rates and implicit liability rates where the first are earned interest plus monetary correction as a percentage of the performing portfolio and the second are the outlays on interest plus monetary correction as a percentage of the liabilities with cost.

in general through portfolio management. On the other, they are entities that are closely linked to the other financial agents whether this is because they are the counterparts in their market operations or due to the fact that they belong to some financial group. As a consequence, they can act as systemic agents in certain contingencies. The NBFIs that are analyzed in this section correspond to the managers of pension and severance pay funds (PFM), life insurance companies (LIC), general insurance companies (GIC), the trust companies (TC), the stock brokerage firms (SBF), and the 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 within that sector is given in Table 3. As can be seen, the investment portfolio of the financial institutions rose 18.3% in 2010 and, in December, was at COL$481.4 t, which is equivalent to 89.5% of the GDP. This performance was the result of both the NBFI investment portfolio growing COL$39.4 t (which is equivalent to an annual change of 19.3%) and the COL$35.1 t increase in the portfolio of credit institutions (which corresponds to an annual growth of 17.3%).

The expansion registered by the NBFI investments was primarily due to the growth of the portfolio of the mandatory pension funds and of the trust accounts managed by the TCs. These resources saw an increase of COL$19 t and COL$13.3 t respectively in 2010. The insurance companies, the SBFs together with the IMCs also saw a rise in the value of their investment portfolio although to a smaller degree. These entities increased the value of their portfolios by COL$2.9 t and COL$1.7 t respectively (Table 3).

To be specific, the high concentration of the resources managed by the NBFIs (especially the PFMs and TCs) in local securities and public debt securities make them more sensitive to changes in the international and foreign market conditions. In conclusion, the appreciation of the stocks that was seen throughout most of 2010 allowed a significant rise in the value of their portfolio.[19]

1.   Managers of Pension and Severance Pay Funds (PFM)

In the second half of 2010, the value of the funds managed by the PFMs showed a positive performance and was slightly better than what was observed in the first half of the year. This was due primarily to the high appreciation in the national variable income market. Unlike what had been seen in the first half of the previous year, this period was characterized by a restructuring of the public debt portfolio towards real sector securities and demand deposits. However, the first continue to hold the largest share.

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19   In the month of November, the Colombian stock market registered a sharp devaluation, which was evident in the fall of the IGBC (in Spanish) which went from 16,004 to 14,936 over the course of that month.

Table 3
Financial Institutions Investment Portfolio

	2007		2008		2009		2010	
	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	35.0	8.1	38.75	8.12	50.77	10.06	60.34	11.22
Portfolio	125.1	29.0	147.79	30.98	151.32	29.98	176.80	32.87
Total credit institutions	**160.1**	**37.1**	**186.54**	**39.11**	**202.09**	**40.04**	**237.14**	**44.08**
Non-banking Financial Institutions								
Mandatory Pensions	51.1	11.9	58.38	12.24	79.90	15.83	98.90	18.39
Voluntary Pensions	7.1	1.6	7.52	1.58	9.47	1.88	11.29	2.10
Severance Pay	3.8	0.9	4.01	0.84	4.92	0.98	5.72	1.06
General Insurance	3.6	0.8	3.96	0.83	4.61	0.91	5.26	0.98
Life Insurance	6.9	1.6	11.90	2.49	14.33	2.84	16.56	3.08
Trust companies	68.4	15.9	74.73	15.67	88.14	17.46	101.40	18.85
Brokerage Firms and Investment Management Companies	3.3	0.8	2.60	0.54	3.41	0.68	5.09	0.95
Total Non-banking Financial Institutions	**144.2**	**33.5**	**163.09**	**34.19**	**204.78**	**40.58**	**244.22**	**45.40**
Total	**304.3**	**70.6**	**349.63**	**73.30**	**406.87**	**80.62**	**481.36**	**89.48**

(proj) projected to December 2010.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

The rise in the value of the portfolio belonging to the funds managed by the PFM was COL$13.9 t in the second half of 2010 and it came to COL$115.9 t in December of that year (Graph 30). However, the real annual growth of the portfolio showed a moderate decline as it went from growing at rates of 21.2% in June 2010 to 19.1% in December of the same year. During the same period, the mandatory pension funds (MPF) saw the value of their portfolio rise a real annual 20%; the voluntary pension funds (VPF), 15.5%; and the severance pay funds (SF), 12.7%. Towards the end of 2010, the value of these funds came to COL$98.9 t, COL$11.3 t and COL$5.7 t respectively. Note, however, that the increase in the value of the MPFs was more the result of the appreciation of the portfolios than an increase in contributions. The value of the SFs, in turn, was characterized by the seasonal adjustment they showed in which deposits were registered in the two first months of the year and disbursements in the months afterward (Graph 31).

The rise in the portfolio managed by the PFM corresponds to a greater profitability in their investments. In the case of the MPF, the tri-annual profitability has shown
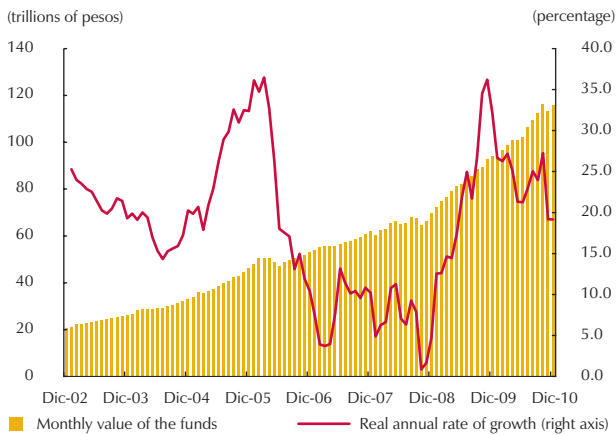
(trillions of pesos) (percentage)

Monthly value of the funds ■ Real annual rate of growth (right axis) ——

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

(trillions of pesos) (trillions of pesos)

Voluntary —— Severance Pay ········· Mandatory (right axis) ——

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

(percentage)
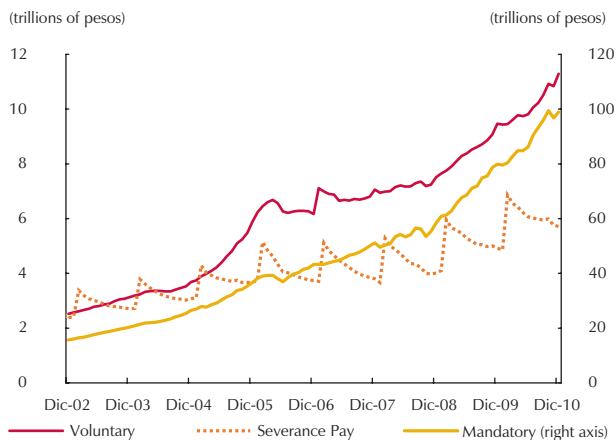
Average ■ Minimum profitability ——
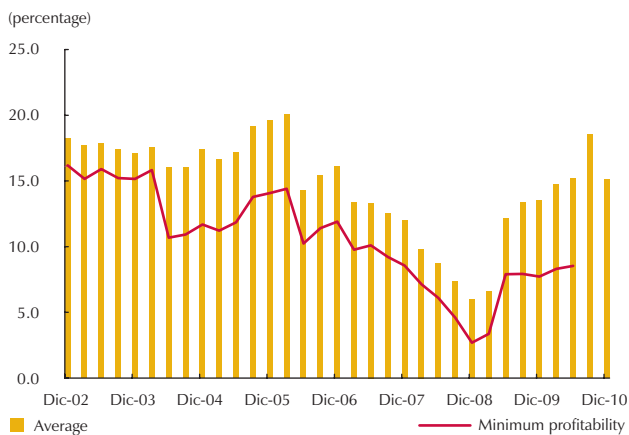
Source: Financial Superintendency of Colombia, Banco de la República calculations.

a growth trend in the most recent two years. Nevertheless, in the last quarter of 2010, this registered a drop that was due, in part, to the devaluation of stocks on the local market during that period. However, the positive trend shown in the previous months (especially in the third quarter of 2010) put the tri-annual return at 15.1% last December. This value is very similar to the value seen six months earlier (15.2%) (Graph 32).

It should also be mentioned that, starting in the month of September 2010, the transition regime towards the multi-fund system went into effect. Therefore, starting that month, the MPFs were set up as moderate funds within that plan.[20] Thus, minimum profitability of the MPFs is calculated up to August 2010 (the month in which it was at 9.9%) and for the moderate fund, the first revision of this indicator will be done as of August 31, 2013.

In addition, the biannual return of the SF showed an increase in the second half of 2010 as it reached 16.6% in comparison to the 14.6% that had been registered six months before (Graph 33). This profitability was largely due to the long term funds which represented 96.7% of the total SF.

With respect to the composition of the portfolio managed by the PFMs, these are still concentrated in domestic public debt instruments. Nevertheless, in the second half of 2010, the share of these types of investments within the portfolio declined as they went from 42.8% in June 2010 to 38.9% in December of the same year. Likewise, the investments in securities from issuers in the financial sector[21] showed a decline with respect to the total amount of resources managed. They were at a proportion of 14% in December in comparison to the 16.1% registered in June. These smaller shares that the investment in public debt and in assets of the financial sector had within the portfolio were offset by increases in assets from

20 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.

21 Bonds, CDs and stocks with high stock market liquidity.

(percentage)

(percentage)

(percentage)   (percentage)
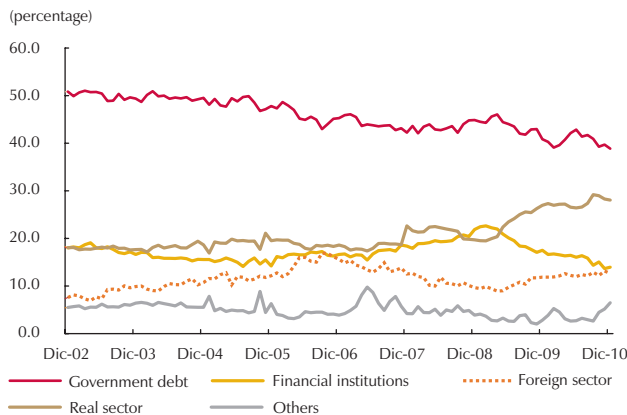
the real sector,[22] the foreign sector,[23] and other types of investments.[24] In December 2010, shares of these assets were 28%, 12.6%, and 6.5% while they had been 26.4%, 12% and 2.7% respectively in June (Graph 34). It should be noted that, starting in September, the share of the investments in national variable income saw a slowdown as a consequence of the multi-fund plan going into effect. This plan establishes a maximum ceiling on this type of investment that is lower than the existing one[25] (Graph 35).

In the second half of 2010, the preferences of the PFM for securities denominated in pesos also continued. These represented 72.3% of the value of the portfolio as of December. Nevertheless, there was a slight restructuring of 1.7 pp towards portfolios in dollars and these came to 13.5% (Graph 35). The share of investments in foreign currency excluding hedging, in turn, showed a slight improvement as it went from 6.2% to 7.5% between June and December 2010. However, these levels are still well below the regulatory maximum (35%) for the moderate fund (Graph 36).

2.   Life and General Insurance

a.   *Profitability and Value of the Portfolio*

In the second half of 2010, the ROA of the LIC was 3.1%, which represented an increase of 25 bp compared to the previous six months. In the case of the GIC, the return on these came to 3.3% thus showing a decline of 72 bp during the same period (Graph 37).

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22   Mainly bonds and stocks with high stock market liquidity.

23   The majority of these are shares in funds representative of stock indices, shares of mutual funds or international investment, the objective of which is to invest in stocks, etc.

24   Among these are: demand deposits in national and foreign entities, structured products of protected capital from national or foreign issuers, remunerated deposits in the Banco de la República and financial derivative instruments.

25   The maximum limit on investments in national variable income in a moderate fund is 35%. This is lower than the previous limit (40%) (Decree 2955/August 2010.)

Graph 36
Percentage of Unhedged Portfolio Value Denominated in
Foreign Currency
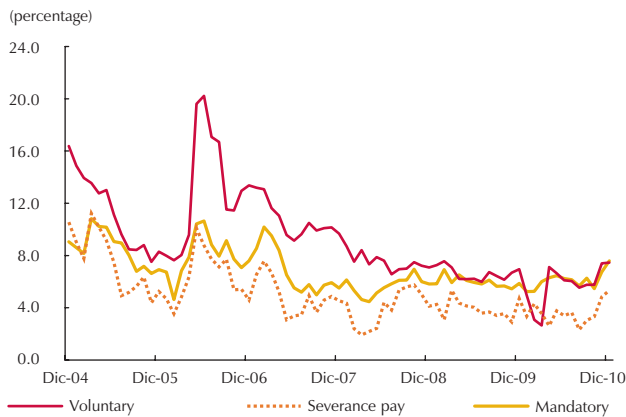
(percentage)

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

Graph 37
ROA for General and Life Insurance Companies

(percentage)

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

Furthermore, the upswing in the values of the GIC and the LIC investment portfolios which had been seen since 2002 continued. As of December 2010, the value of these resources came to COL$16.6% t and COL$5.3% t for the LIC and the GIC respectively. This constituted a six-month variation of 8.6% for the first and 9.8% for the second. The life insurance companies' investment portfolios not only bring together the largest quantity of resources but they also grow at the highest rate.

With respect to the makeup of the portfolio, this was still concentrated in public debt instruments for the last quarter of 2010. The preceding was followed by assets from the real sector which showed an upward trend within components of the portfolio and surpassed the share of the financial system instruments.

In the case of the LICs, the share of real sector securities within the investment portfolio rose 5 pp and closed the year 2010 at 24.6%. However, the proportion of public debt securities within the portfolio declined 3.6 pp in the second half of the year and was at 55.2% last December. Likewise, there was a shift from financial sector securities to real sector assets in the GIC investment portfolios. As of December 2010, the share of these items was 17.7% and 23% respectively. Meanwhile, as of June of the same year, these proportions were 22% and 17.7% respectively (Graph 38).

In conclusion, in the case of both the GIC and the LIC, the investment portfolio is still concentrated in government securities. Nevertheless, during the second half of 2010, there was a restructuring towards real sector securities. In the case of the LIC, the rise in profitability is primarily explained by an increase in the return on investments in this sector. The better growth that the LIC investment portfolio has had in comparison to the growth of the GIC portfolio should also be emphasized. In other words, between 2007 and 2010, the value of the investment portfolio for the former rose COL$9.6 t while value only grew COL$1.67 t for the latter. This performance is mainly due to the increase in pensions within the life annuity plans.

Graph 38
Investment Portfolio by Issuer

A.   Life Insurance Companies

(percentage)
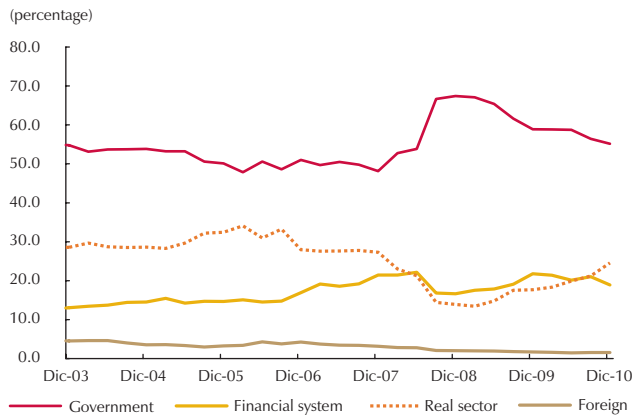
B.   General Insurance Companies
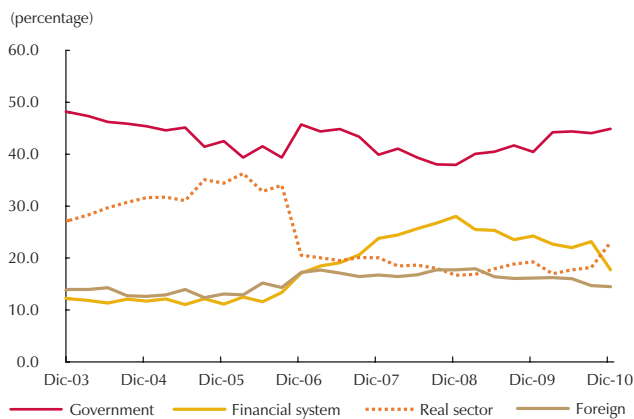
(percentage)

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

Graph 39
Return on Investments (RI) and Operating Results (OR) for
General Insurance Companies

(percentage)   (percentage)
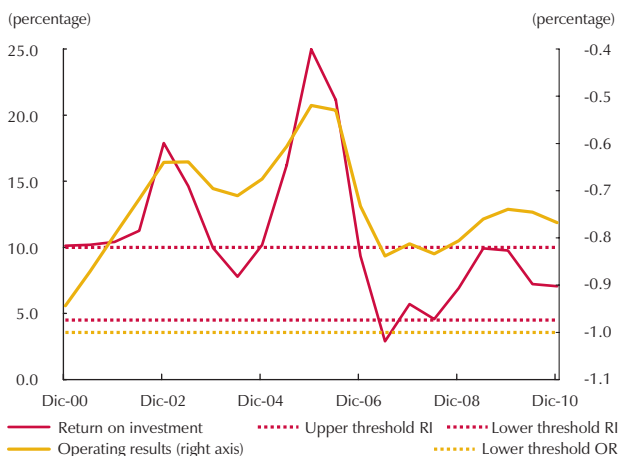
Source: Fasecolda.

b.   *Performance Indicators*

Below a set of indicators is presented to analyze the performance of the GICs. These are used to observe the performance of these entities from different aspects such as profitability, liquidity and the general performance of the companies.[26]

The return on investment indicator shows that, as of December 2010, the return on the investments had remained practically unaltered with a reduction of a nominal 0.2% compared to what had happened in June of the same year. The indicators of technical and financial aspects are combined in the operational result and this, which has a high correlation with the returns on investment, also showed a decline – in this case of 3% – in the second half of 2010. The above is in line with the performance registered by the ROA. The decrease in the operating result could be due to the drop in the return on investment. However, the possibility that the efficiency of the companies has dropped or that it is due to payment on claims should also be studied (Graph 39).

With respect to the change in net worth, this was found to have declined 4.3% as of December 2010 compared to its value in June of the same year. Again, the drop in net worth could be due to the lower return on investments (Graph 40). In conclusion, even though the insurance business is not purely financial, the return on its investment plays an important part in the earnings and losses of the industry.

With respect to the liquidity of the companies, the liabilities indicator as a percentage of the liquid assets was found to have remained stable over the last three years. As of December 2010, the liabilities of the GIC corresponded to 95.2% of their liquid assets. Based on the international thresholds, a company is in the danger zone when the liabilities surpass 105% of the liquid assets (Graph 41).

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26   For more details with respect to the formulation of each indicator, see the box on "Early Warning Indicators for General Insurance Companies."
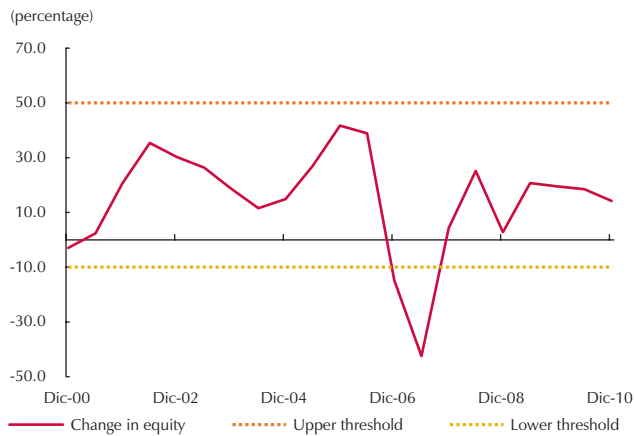
(percentage)

Source: Fasecolda.

(percentage)

Source: Fasecolda.

51.8%

33.4%

14.0%

0.8%

■ Social Security   ■ Mutual Funds
■ Voluntary Pension Fund   ■ Other Trust assets

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

In general, the indicators show that the insurance industry is experiencing stable performance since none of them had surpassed the established international danger thresholds as of December 2010.
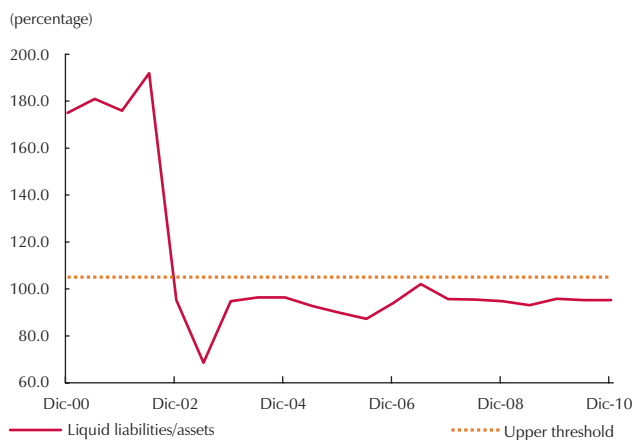
3. Trust Companies

As of December 2010, the TCs managed funds that had a value of COL$168.3 t, which represents a six-month growth of 10%. Among these assets, 33.4% correspond to funds managed for social security and 14% for mutual funds. Among other trust company assets, there are real estate and investment trusts, etc. (Graph 42).

Of the total assets managed by the TCs, the investments represented 62.8% as of December 2010,[27] and were at COL$101.4 t, a figure that is COL$9.9 t higher than the value recorded six months earlier. As can be seen in Graph 43, investments have seen continuous growth over the course of time. Just as with assets, the most important items are found in the social security and mutual fund portfolios.

Towards the end of 2010, the share of the resources invested for social security reached a value of COL$53.5 t, which represented 52.7% of the total investment portfolio. The mutual funds managed by the TCs had a value of COL$16.5 t, which translated into a 16.3% share (Graph 43).

The rating of the investment portfolio managed by the TCs is seen in Graph 44. As of December 2010, the private debt securities were 37.8% of the assets in the investment portfolio for these entities while the share held in public debt securities was 34.9%. At the same time, the investments in national variable income were 24.3%. Nevertheless, it must be emphasized that the share of the portfolio held in this last type of asset rose 4 pp in the second half of last year largely due to the

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27   The remaining assets are mainly represented by available, accounts receivable, realizable and received goods in lieu of payment, property and equipment, etc.

Changes and Composition of Trust Company Portfolio

(trillions of pesos)

Mutual Funds
Other assets
Social Security
Voluntary pension fund
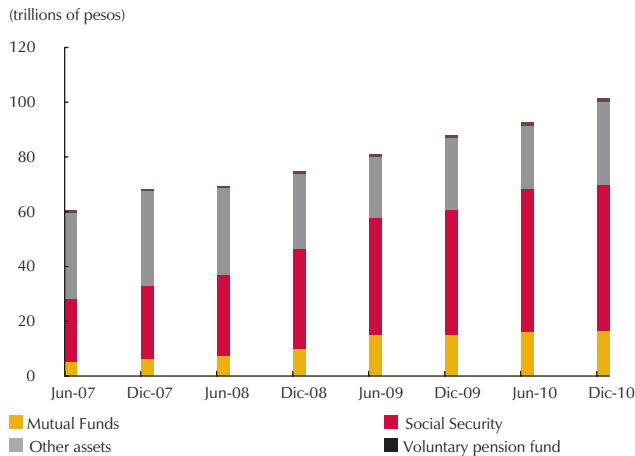
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 44
Classification of the Investment Portfolio Managed by Trust Companies

(percentage)

Government debt
Foreign variable income
Private debt
National variable income
Foreign fixed income
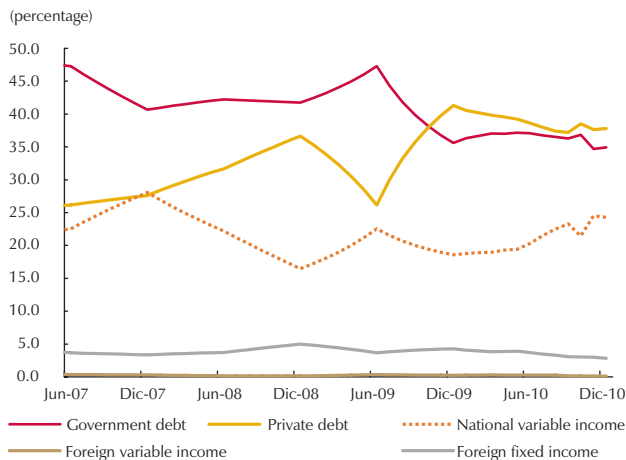
Source: Fogafín.

Graph 45
ROA of Brokerage firms and Investment Management Companies

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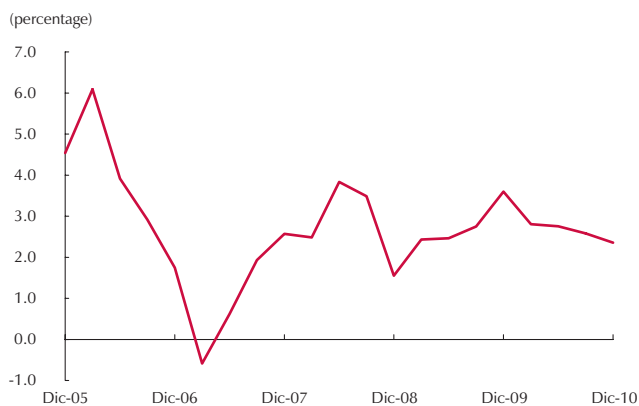
Source: Financial Superintendency of Colombia, Banco de la República calculations.

appreciation that these experienced. Thus, the high preference for national investments can be seen since those in foreign assets only represent 3% of the total.

4. Stock Brokerage Firms and Investment Management Companies

The value of the investment portfolio managed by the stock brokerage firms and the portfolios of the investment management companies was at COL$5.1 t as of December 2010. It was higher by 36.3% with respect to what had been seen three months before. The ROA of these entities, in turn, continued on the downward trend which had been registered in the first half of 2010 and went from 2.8% in June to 2.4% in December. This is mainly due to a more than proportional increase in the assets compared to the profits (Graph 45).

The general trend registered by the ROA is not necessarily similar to the individual performance of the majority of the entities in this sector where a varied performance in the returns on assets in the second half of 2010 is evident. In Graph 46, panel A, 41 entities, whose returns increase their value in proportion to the distance from the circumference to the center, are considered. There it can be seen that 51.2% of the entities had an ROA that was higher than the one they had had in June last year.

Just as was observed in the previous Financial Stability Report, the entities with a significantly negative ROA do not have excessive levels of leveraging. In fact, these are entities that have an investment to net worth ratio that is below the average for the sector. This average was 5.1 times as of December 2010.

When analyzing the performance of the NBFI, the conclusion can be drawn that, in spite of the fact that some entities had decreases in their levels of profitability, in general terms, the second half of 2010 was positive for the sector. The positive performance registered in the price of stocks in the third quarter of the year (which was checked in the fourth quarter) together with the high stability that the prices for government debt securities had led to the levels of profitability that were seen as similar to those from the first half of the

Graph 46

A.   ROA of Brokerage Firms and Investment Funds

Dic-09	Mar-10	Jun-10	Sep-10	Dic-10
◉ -40%		○ 0%		◉ 40%
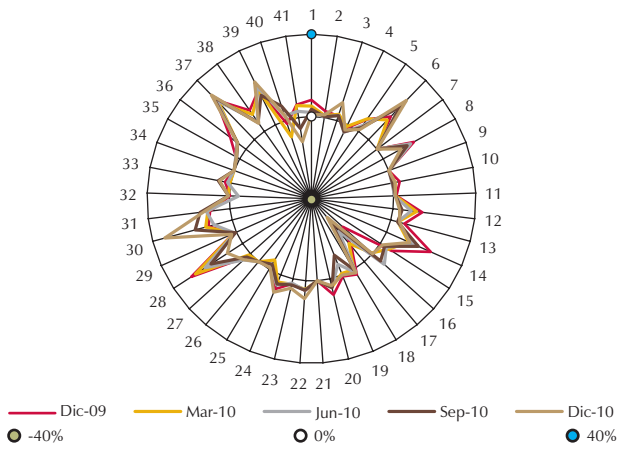
B.   Investment/Net Worth of Brokerage Firms and Investment Funds

(times)

■ June of 2010   ■ December of 2010
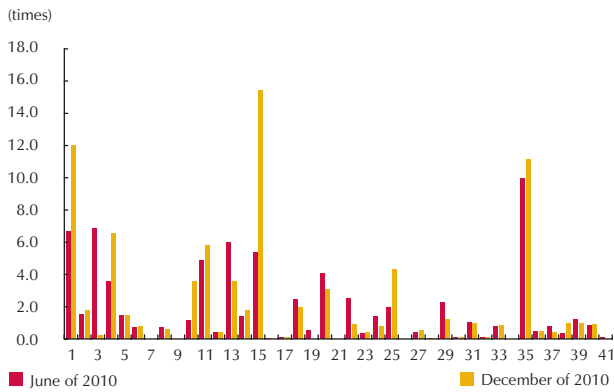
Source: Financial Superintendency of Colombia, Banco de la República calculations.

year. In general, there was a restructuring of the NBFI investment portfolios towards real sector assets and the share held in government debt securities and financial sector securities was reduced. The investment portfolios with the most growth were the MPFs, those managed by the TCs, and the BF investment portfolio together with the IMCs. These represent 40.5%, 41.5% and 2.1% respectively of the total NBFI.

Box 1
INTERNATIONAL INDICATORS

The financial systems in Latin America registered a positive outlook during the first three quarters of 2010. The evidence of this fact is the presence of a rally in the growth of the loan portfolio, increases in the hedging for credit risk and the reduction of the default rate for the loan portfolios. The main financial indicators for some of the countries in Latin America are analyzed in this box in order to evaluate the performance of variables such as profitability, efficiency and risk.

At the end of the third quarter of 2010, the real growth of the loan portfolio registered a positive balance for all the countries analyzed with the exception of Venezuela. The ones that had the largest expansions were Brazil (30.3%), Argentina (14.7%), Peru (11.0%), and Colombia (10.1%) and their average increase was 16.6% (Graph B1.1). Chile and Mexico, in turn, had moderate increases with 6.2% and 5.1% respectively while the figure for Venezuela was -11.9%. This performance of the loan portfolio is compatible with the growth projections for the output for each one of those economies in 2010.

In terms of the loan portfolio quality, the default indicator (DI) showed slight variations during 2010 and had an average of 3.4% in September of that year (Graph B1.2). The indicators for Brazil and Colombia were the ones that showed the largest drops (1.2 pp with respect to September 2009). However, they remained above the average. Also, during the last three years, the indicator for Venezuela has shown a growth trend with an increase of 2.4 pp which must be highlighted. Chile, Mexico and Peru, in turn, are still the ones with the lowest default indicators and the ones that have seen the least changes.

Regarding the efficiency of the financial intermediaries (which is measured as the ratio obtained

when the administrative and work-related expenses are divided by the assets), the indicator registered a relative stability in relation to what was seen in September 2009 (Graph B1.3). It is noteworthy that Argentina (5.7%), Brazil (3.9%), Colombia (4.4%), and Venezuela (4.6%) continue to register the least efficient positions among the analyzed countries with values close to 4%. In turn, Chile, Mexico and Peru are keeping this indicator at a level close to 2%.

During the analyzed period, the hedging indicators for Argentina, Mexico and Colombia registered the most significant increases and were at 201.6%, 135.0% and 196.4%

Graph B1.1
Annual Real Growth of the Gross Loan Portfolio
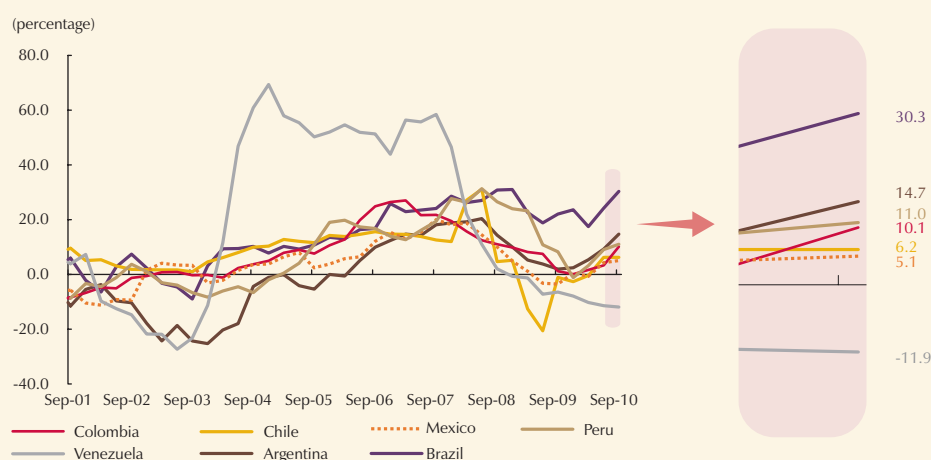
Sources: Central banks and banking superintendencies of each country, Banco de la República calculations.

Graph B1.2
Default Indicator: Nonperforming Loan Portfolio/Gross Loan Portfolio
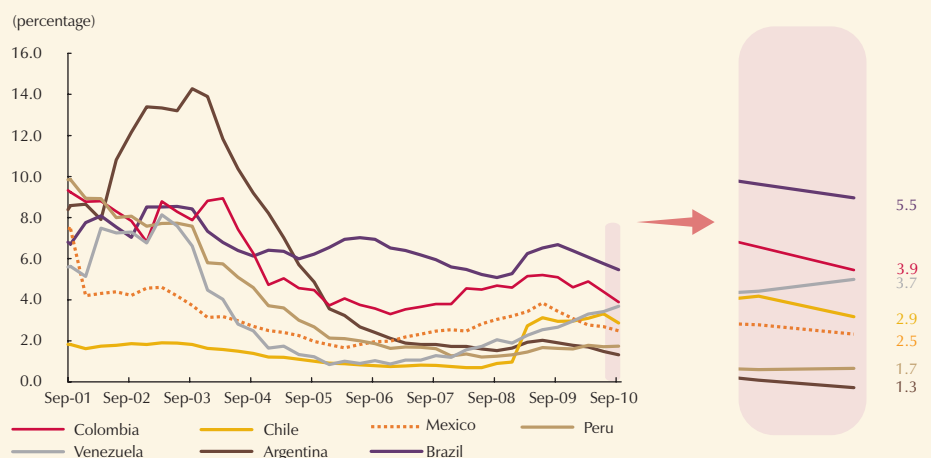
Sources: Central banks and banking superintendencies of each country, Banco de la República calculations.

Graph B1.4
Coverage: Loan-loss Provisioning/Nonperforming
Loan Portfolio

(percentage)
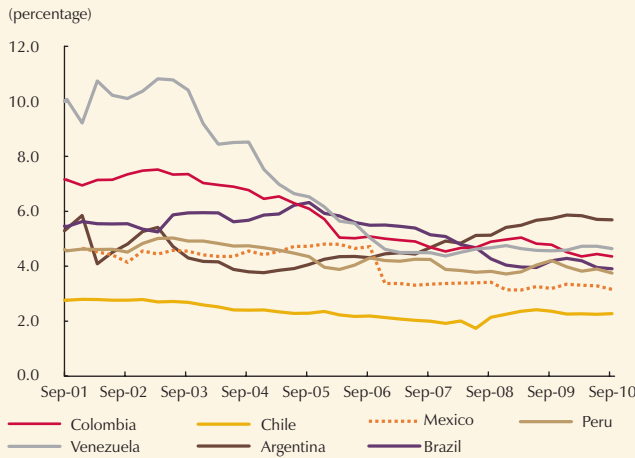
Sources: Central banks and banking superintendencies of each country, Banco de la
República calculations.

respectively (Graph B1.4). In Argentina and Colombia, this change is because of an increase in the loan-loss provisioning and a drop in the nonperforming loan portfolio. In the case of Mexico, the change is due only to the second cause. The indicator for Venezuela was the only one that declined (7.8 pp) and this generated an increase in the level of exposure to credit risk. The indicators for Brazil and Peru did not present substantial changes although Brazil is still the country with the lowest hedging indicator in the sample.

Graph B1.5 shows the ex-post intermediation spreads. In September 2010, the countries that showed the highest intermediation spreads were Argentina and Mexico (15.6% and 14.6% respectively). In contrast, Peru and Colombia presented the lowest ones (7.3% and 9.5% respectively).

Graph B1.5
Ex-post Intermediation Spread

(percentage)

Sources: Central banks and banking superintendencies of each country, Banco de la
República calculations.

To summarize, the condition of the financial systems in some Latin American countries is positive in spite of the presence of some heterogeneous items in the sample. On one hand, Argentina, Brazil and Colombia showed a significant improvement in the growth rate of their loan portfolios at the same time that there were declines in the levels of default and increases in the loan portfolio hedging.

Mexico and Chile, likewise, registered a reduction in the default indicators and increases in the loan portfolio hedging although the growth of the latter was moderate. On the other hand, the indicators for Venezuela showed a rise in the fragility of the system, which has been characterized by negative growth rates in the loan portfolio and increases in default and the exposure to credit risk.

Box 2
BANCARIZATION INDEX IN COLOMBIA

In general, bancarization is defined as people's access to financial services. However, bancarization will only have a significant impact on economic growth if long term relationships are established between the users and the financial entities. This is the reason why a bancarization index for Colombia, which incorporates several aspects such as both the coverage and the intensity of the use of financial services, is developed in this box. This goal is achieved by taking information from the department level with regard to transactions carried out through non-banking correspondents (NBC) and bank offices.

In previous versions of the Financial Stability Report, bancarization indicators were presented in which the financial activity of each one of the departments was measured based on the information about deposits, loan portfolios, number of offices and NBC's. The data was weighted by the population in each department to make them comparable to each other. These indicators are associated with the concept of coverage and generally show what access to financial services is like although they do not make it possible to determine the degree of linkage on an individual level. This can be measured by applying intensity indicators of the use of financial instruments.

The intensity indicators seek to measure the dynamics of the financial system by monitoring the performance of the new loans that have been granted and the regular use of the demand accounts.

1.   Bancarization Index

In order to calculate the coverage indicators, information related to net loan portfolio,[1] deposits, bank offices, NBC's and employees of the system was included. Meanwhile, to calculate the intensity indicators, the ones disbursed by type of credit, the number of new loans, and the ratio of active bank accounts to new bank accounts for the period were used. The indicators were expressed in terms of people per department in order to control for department size.

A set of data that contains monthly information for 33 departments[2] from May 2007 to December 2010[3] was used to construct the index. The weight for each one of the indicators[4] was found by applying the methodology of main components (Table B2.1). This table shows that the indicators associated with the access to and use of credit have more weight, especially the ones related to households. The results

Table B2.1
Weights of the Variables in the Bancarization Index
(percentage)

Indicator	Type of indicator	Weights
Loan Portfolio per Inhabitant	Coverage	10.7
Employees per Inhabitant	Coverage	10.6
Consumer Loans Disbursed	Intensity	10.4
Housing Loans Disbursed	Intensity	9.8
Number of New Housing Loans	Intensity	9.6
Deposits per Inhabitant	Coverage	9.4
Commercial Loans Disbursed	Intensity	9.3
Savings Account Balance per Inhabitant	Coverage	7.0
NBCs and Bank Offices per Inhabitant	Coverage	6.6
Proportion of Active Checking Accounts	Intensity	4.8
Number of New Consumer Loans	Intensity	4.5
Checking Account Balance per Inhabitant	Coverage	2.8
Micro-credit Loans Disbursed	Intensity	2.2
Number of New Micro-credits	Intensity	2.1
Number of New Commercial Loans	Intensity	0.1
Proportion of Active Savings Accounts	Intensity	0.0

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

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1   Due to problems in the availability of information, the total net loan portfolio was used as it is not possible to differentiate between the loan portfolios for companies and the one for individuals broken by department.

2   Bogota and Cundinamarca are considered different entities.

3   The information contained in form 398 (non-banking correspondents and banca de oportunidadess) as well as in the form for lending and borrowing operations per municipality from the Financial Superintendency of Colombia were used.

4   These weights correspond to those for the first component, which explains 53.2% of the variance in all the series.

of the estimates show that it is necessary to take the entire set of indicators into account because using them separately to interpret the bancarization could lead to error.

Traditionally, the analysis of the bancarization requires the study of the performance of a few coverage indicators, but the results of Table B2.1 emphasize the importance of including the intensity of use analysis given that these indicators explain 52.9% of the index and reflect the existence of a long-term relationship between the consumers and the financial entities.

With the index constructed, an analysis can be done of both the development of bancarization in Colombia and the main factors involved in it. However, it is necessary to establish some standard of comparison in order to define whether or not the level of bancarization is high or low. Graph B2.1 presents the index for Colombia, which shows that bancarization has been gradually growing since the beginning of the period under analysis in spite of the presence of high volatility.
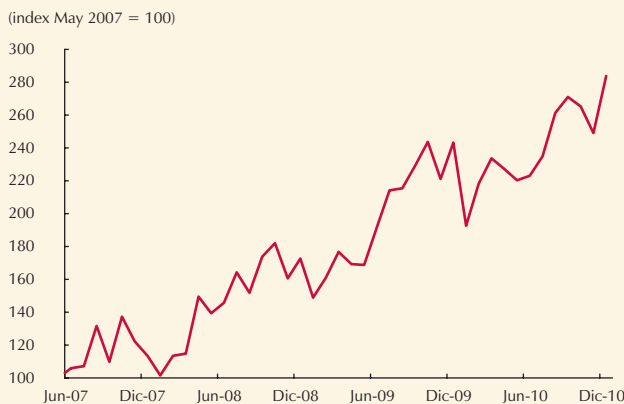
(index May 2007 = 100)

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

Significant changes in the index could be expected if the policies contemplated in the framework for the Banco de las Oportunidades program are implemented. The goal of these policies is to increase access to financial services for the consumers by means of strategies such as the creation of the NBC and the electronic bank accounts,[5] promotion and incentives, and agreements with the financial sector as well as the implementation of financial education programs. Nonetheless, the implementation of the policies for bancarization by the government has not brought about

structural changes. Therefore, it will be necessary to analyze the additional policies required to reach the objectives stated in the development plan for 2006-2010.

2.   Indicator by Regions

In this particular case, standardized data were used in order to implement the methodology of main components. This was done to construct an indicator that can be compared between departments so that the performance of bancarization in each one of the Colombian regions can be analyzed. The regions included in the analysis were Caribe,[6] Central,[7] Pacific,[8] Amazon,[9] Orinoquia,[10] and Bogota.

The results show that the bancarization is not uniform among the departments (Graph B2.2). This is because some departments present substantial lags when compared to Bogota or the Central region as is the case of those located in the Amazon. Although all of the regions have seen the index grow during the period under analysis, some have experienced a faster expansion than others. Particularly, the
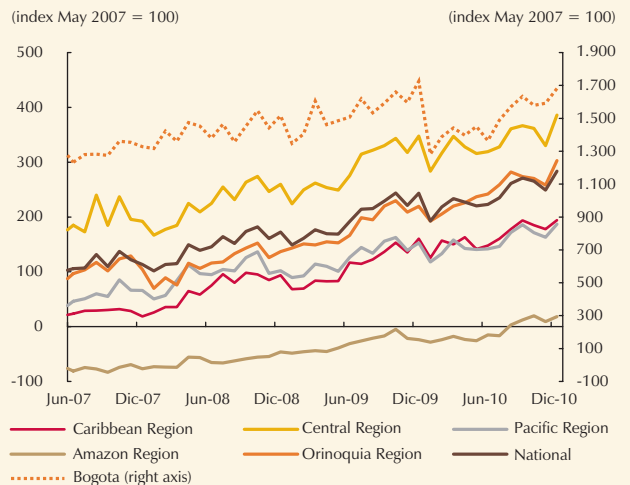
(index May 2007 = 100)   (index May 2007 = 100)

Caribbean Region   Central Region   Pacific Region
Amazon Region   Orinoquia Region   National
Bogota (right axis)

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

5   The electronic bank accounts or low-amount bank accounts are given to vulnerable populations (Sisben 1 and 2). They do not have a monthly use fee, minimum balance and opening requirements, but they provide two free transactions per month.

6   Atlántico, Bolívar, Cesar, Córdoba, La Guajira, Magdalena, San Andrés and Sucre.

7   Antioquia, Boyacá, Caldas, Cundinamarca, Huila, Nariño, Norte de Santander, Quindío, Risaralda, Santander and Tolima.

8   Cauca, Chocó and Valle del Cauca.

9   Amazonas, Caquetá, Guainía, Guaviare, Putumayo and Vaupés.

10   Arauca, Casanare, Meta and Vichada.

highest levels and increases have been registered in Bogota which is followed by the Central region, whereas the Amazon has the lowest index in the sample.

Finally, the comparison with the national index shows that most of the regions are below the national level. Therefore, the evolution of the country-wide indicator is being driven by Bogotá. This is the reason why it is necessary to break down the information by departments. Otherwise, there could be misunderstanding regarding the process of bancarization in Colombia.

In spite of the advances at the national level, the results of the bancarization index reveal that it is important to focus the policies on the regions that have experienced less progress at this point. Thus, it is essential to continue with the development of new strategies and products that make it possible to increase the access to and the use of financial products, especially the credit-related ones because they are fundamental to the process of bancarization. In addition, the policies of Banca de Oportunidades must be revised in order to incorporate procedures that would have a stronger impact on users' access to financial services.

The insurance business is a part of the financial sector that has progressively become more important in the analysis of financial stability due to its swift expansion in the most recent decade. Over the last ten years, the premiums issued[1] grew at a rate of more than 200% for Latin America even when there was a contraction of 36% for the United States in the same period (Graph B3.1). It is important to analyze the financial indicators for the insurance companies as well as to seek their stability because their operations allow the market agents to transfer different types of risks.

Graph B3.1
Evolution of the Premiums Issued Annually

(millions of dollars)
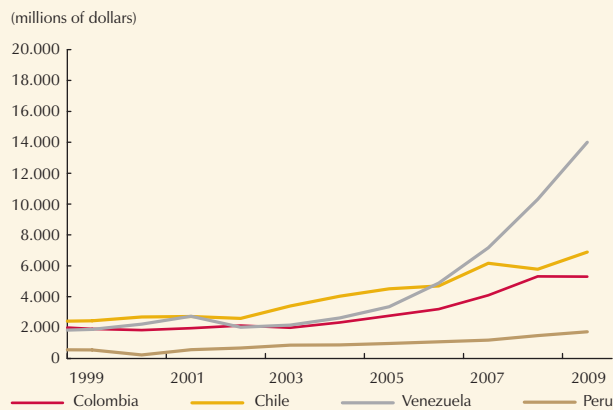
Source: Sigma, Swiss Re.

In spite of being a sector that has been characterized by relative stability compared to other players in the financial system, the insurance business is not entirely bulletproof. Particularly, it is worth remembering that the 2008 crisis drove the largest insurance company in the world, AIG, into a position of serious financial difficulties. Although the origin of this crisis did not arise out of the traditional lines of insurance, this situation sets a precedent with regard to the importance of monitoring the insurance companies in order to have a timely warning with respect to the risks that may undermine the correct functioning of the system.

The Colombian Association of Insurance Companies (Fasecolda in Spanish) has worked on compiling and building indicators of financial soundness based on the companies' accounting information. This will make it possible to properly follow up on the business' situation with respect to the risks

they face. This box will do a review of some of the indicators considered to be appropriate for analyzing the stability of general insurance companies (GIC)[2] and the international thresholds that have been determined for those indicators. At this time, the analysis will be done to the aggregate for the GIC. However, it is important to emphasize the fact that from the supervisor's point of view, the analysis must be done on each company individually due to the different ways they function and the different business lines each company has.

It should be mentioned that there are two kinds of insurance contracts by means of which the insurance companies transfer or distribute a portion of the risk which they assume–reinsurance and coinsurance. Reinsurance is a mechanism used by an insurance company to cede a portion of the underwritten risk of the insured to a reinsurer while coinsurance makes reference to a situation in which two or more insurance companies agree to cover the same risk (Figure B3.1).

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

1. General Indicators

A characteristic of insurance activity is that it is cyclical and that one of its basic elements of success is the ability to estimate not

Figure B3.1
Reinsurance and Coinsurance Contracts

Source: Banco de la República.

1 The premiums issued correspond to the money received by the insurer from the insured parties as payment for the risk coverage offered by the insurance company.
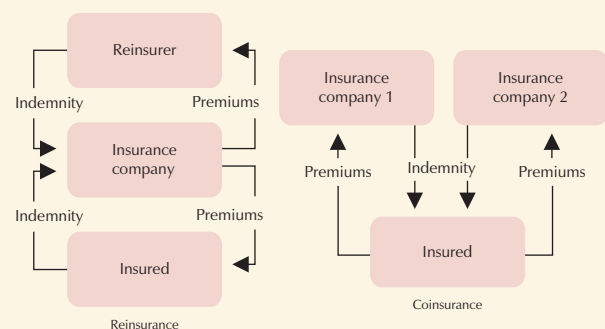
2 In spite of the fact that the life insurance companies (LIC) hold a majority share (76%) of the total investment portfolio of the insurance companies, the LICs are not analyzed because it is not possible to apply the international standards to calculate the formulas for the indicators in the case of Colombia due to the lack of accounting details. The insurance sector is working on the adoption and adjustment of the international standards.

only the indemnity but also the moment when future claims will take place.

As is normal, periods in which there are sharp upswings in the purchase of insurance policies are followed by periods with high levels of claims against the policies. Unlike other types of businesses, the growth of insurance purchases is expected to be moderate and sustained in this sector. Abrupt rises in the number of new policies[3] may be interpreted as a symptom of illiquidity. As was mentioned before, these abrupt increases imply a spike in the rate of claims and this can generate significant upswings in cost that should be well quantified.

Based on the international experience, Fasecolda has considered monitoring the growth rate of net insurance purchases to be important. This is measured as the annual fluctuation in net insurance policies. Graph B3.2 shows the development of this variation for the combined total of general insurance companies from 2001 to 2010. When this indicator is above 33% or falls below -33%,[4] this is a warning signal and an analysis should be done on other variables such as liquidity and sufficiency of reserves (Graph B3.2).

In the last ten years, the growth rate in sales of insurance policies in Colombia has remained at levels that are well shy of hazardous ones. On average, the insurance business grew at an annual, nominal rate of 13% between 2001 and 2010 (well below the threshold of 33%).

Graph B3.2
Net Insurance Policy Growth Rate

(percentage)
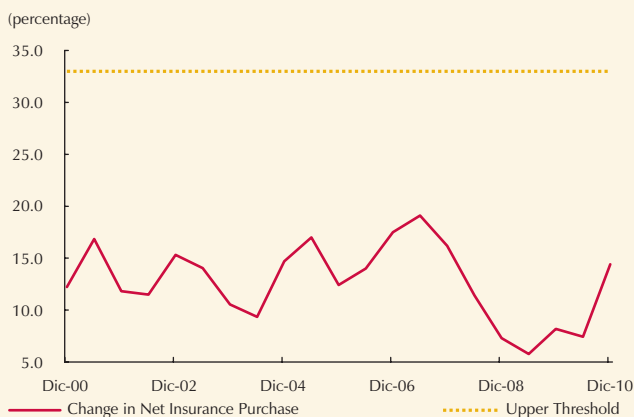
Source: Fasecolda and thresholds (NAIC).

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3   The term 'net policies' used here refers to the portion of the business retained by an insurance company after reinsurance and coinsurance deals are contracted.

4   These are internationally standardized limits. For additional information, see National Association of Insurance Commissioners (NAIC, 2002), and Insurance Regulatory Information Systems (IRIS).

Furthermore, it is a given that the equity is the backing that an insurance company relies on to comply with unexpected obligations and the premiums are equivalent to the amount expected to be paid for claims against the policies. Therefore, the indicator for the gross rate of risk, defined as the ratio of the premiums issued and accepted to the equity, measures whether or not a company has sufficient equity in an extreme situation in which it has to cover claims for the value of the abovementioned premiums. Given that the premiums ceded to the reinsurer are not taken into account, this indicator contemplates a scenario in which there is a high probability of noncompliance on the part of the reinsurer. In that regard, this indicator measures the sufficiency of the equity as well as the vulnerability of the company with respect to its reinsurers.

If the indicator registers values above 900%, the thresholds calculated for the insurance business in the United States establish that the retention policy of the company, i.e., the amount in premiums that the company cedes to reinsurers, must be revised. Also, this latter situation could be studied when this indicator is analyzed along with that for the net rate of risk. This will be discussed below.

The indicator for the net rate of risk —which is calculated as the ratio of the retained premiums[5] to the equity of the company— reveals the sufficiency of the equity in the extreme case in which the company must comply with the payment of obligations for the value of the retained premiums charged against its equity. In other words, this case is equivalent to the previous one except for the fact that in this one the effect of a possible default on the part of the reinsurer is not included.

In a case in which the indicator for the gross rate of risk is very high while the indicator for the net rate of risk is not, the equity of the insurer is able to bear losses equivalent to the retained premiums charged against it but not an additional default on the part of the reinsurer (Graph B3.3). In a case like this, it would be worth studying the vulnerability of the reinsurers and the structure of the reinsurers' portfolio by company.

Again, Colombian GICs have never surpassed the international limit established for the indicators of both the gross rate and net rate of risk.

Finally, the indicator of reinsurance income shows the income received for reinsurance commissions as a share in the equity of the company. When the companies reinsure other insurers, they act as business intermediaries which is why

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

(percentage)

(percentage)
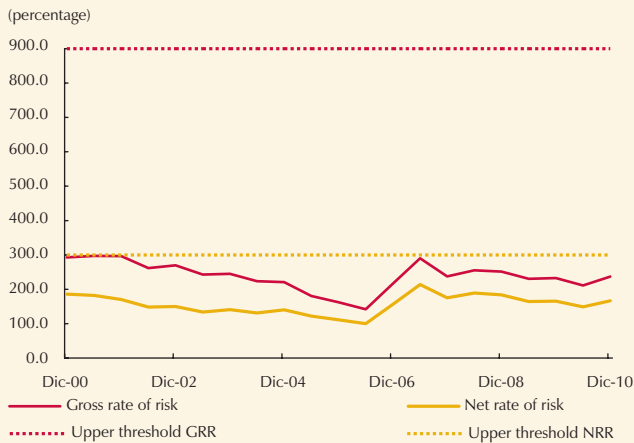
they receive a commission for the assignment of the risk. As in the case of the relationship between the net rate of risk and gross rate of risk, the indicator of reinsurance income makes it possible to determine the structure of premium assignment that a company has. If this value is very high, it could mean that the company does not have sufficient equity or that the income for reinsurance is very high. In the second case, the company is more vulnerable in the presence of conditions that threaten the sustainability of the reinsurers. Just as in the case of the previous indicator, the portfolio of the reinsurers should be studied by company (Graph B3.4).

2.   Profitability Indicators

The profitability of reinsurance companies is due to the management of risk with respect to the technical aspects of the business and also with respect to the investment of the reserves in compliance with the current regulations.[6]

Because of the above, the importance of taking into account a profitability indicator that measures the profits of investments as well as the profits from sales and the accumulated earnings must be considered. In addition, the operating income indicator measures technical and financial factors and is built with data gathered over a period of two years in order to eliminate distortions caused by temporary situations.

Below, the operating income indicator is shown as the sum of four indicators, three of which capture the performance in technical aspects and the fourth which captures the financial performance:

Operating income =
Investment results
- claim against policy index
- commission index
- expense index

The claims against policy index measures the proportion of the premiums earned[7] that are set aside to pay claims. The indices of commissions and expenses capture the proportion of the retained premiums used to pay for commissions and administrative expenses respectively. Finally, the results from investment measure the return on the retained premiums as percentage of the earned premiums.

The indicators for return on investment and operating income show a highly correlated performance from 2002 to 2010. In spite of the fact that the investment yields were positive for almost the entire range of analysis, the operating income indicator is negative from 2002 to 2010, which is not a reason for alarm.

When the value of the operating income is less than -1, it is necessary to find out which of the indices it is made up of is causing the deterioration of this indicator. If the indices for expenses or commissions are very high, the conclusion is that the company is being inefficient in its expenditures. If the index for claims against policy has deteriorated, the conclusion could be drawn that company should improve its process of underwriting risk or review the mechanisms for calculating the value of the policies (Graph B3.5).

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6   The Financial Superintendency of Colombia issued the Decree 255/2010 which establishes the investment regime for the technical reserves of the insurance companies.

7   The earned premiums are the money set aside by the insurance company to pay for claims against policies and operating expenses. Mathematically, it is equal to the difference between the premiums issued and the premium reserves.

When the values found for Colombia are compared with the international thresholds, it is evident that operating income has never fallen below the threshold limit. At the same time, the return on investment indicator was above the upper threshold in 2002 and 2005. The increase in the return on investment for 2005 was particularly high and was the result of the liquidation of the Colombian Reinsurer (Reacol in Spanish), which consisted of the main insurance companies in the country.
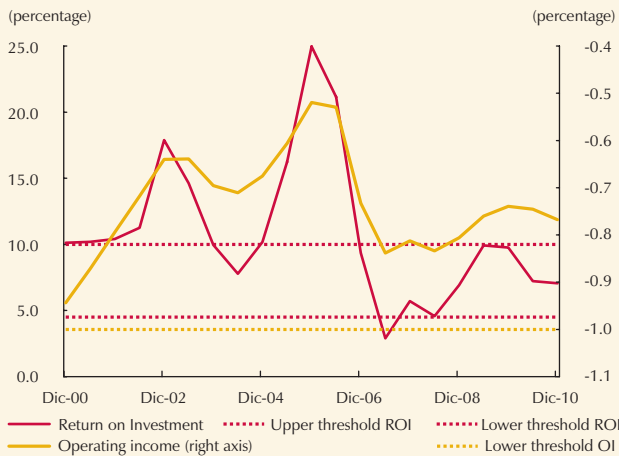
Finally, to conclude this part on profitability indicators, it is important to analyze the changes in the equity of insurance companies. The international experience shows that companies that have gone through financial difficulties have also undergone drastic changes in their equity. Just as with the changes in net insurance policies, it is expected that the equity will gradually increase over the course of time (Graph B3.6).

The values of the changes in the equity are within the international thresholds for the entire period analyzed with the exception of the results for late 2006. This drop corresponds to a contraction in the investment yield for this period, which could be related to the fall in the prices for TES.

3. Liquidity Indicators

The calculation of the ratio between liquid liabilities and liquid assets makes it possible to determine the capacity of the insurance sector in the event of an extreme situation in which the companies must back all of their liabilities –both the short and long term ones– in a specific period of time in which they can only depend on liquid assets. Although it is quite unlikely, this scenario is useful for estimating how much coverage the liabilities have with respect to their most
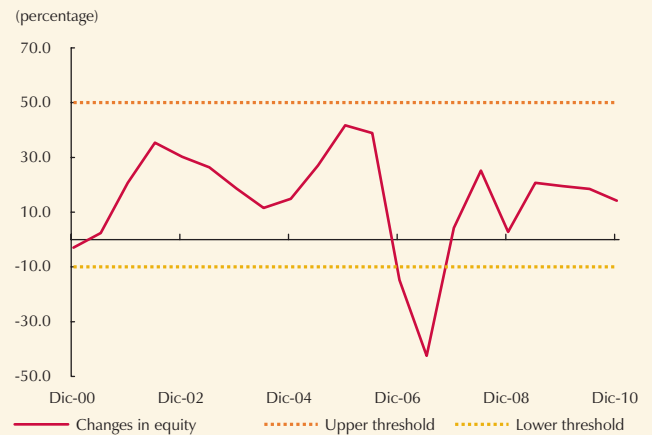
liquid assets. This indicator is of special interest to the GICs because most of the branches in the general insurance sector are made up of short term liabilities. Concerns with regard to the liquidity of the companies may take place if the ratio between liquid liabilities and assets is above 1.05 (Graph B3.7).

With respect to the international thresholds, the indicator of liabilities as a percentage of liquid assets has been within what is considered the normal range since 2003. In spite of this, in 2001 and 2002, the indicator showed a different performance that surpassed the established threshold and this could have been due to changes in the accounting classification of the investments made by the insurance companies.

Finally, the two-year indicator of reserves to equity makes it possible to quantify the changes in the values reserved for claims as a percentage of the equity. This indicator is calculated as the difference between the values paid and
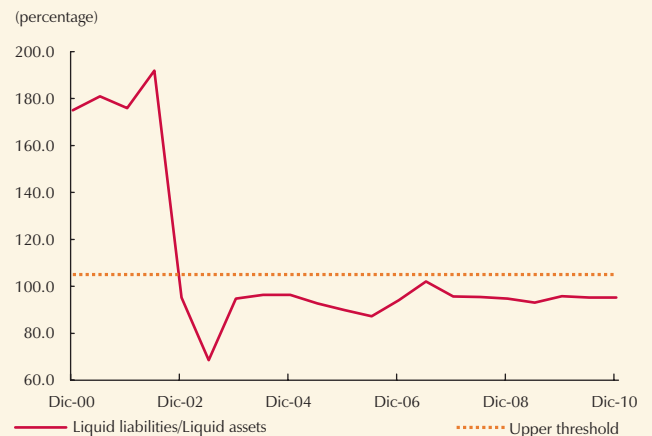
the values reserved as a percentage of the equity from one period to another. High volatility in this indicator would bring to light scenarios in which the companies would be vulnerable in the presence of extreme events due to the fact that they have poorly estimated their reserves. This indicator is calculated by using information gathered over a period of two years in order to eliminate marginal deviations. As of December 2010, the value of this indicator was above though still close to the threshold (Graph B3.8).

As was mentioned above, the insurance business has achieved prominence within the financial sector and it is important to work with indicators that, in the future, will make it possible to implement early warning models, which should be monitored frequently. Fasecolda has worked on setting up the above-mentioned indicators by using the international experience while, at the same time, linking it to Colombian reality. Although there has been no crisis that undermines the sustainability of the insurance business in Colombia yet, it is important to set up the foundations in order to mitigate the effects of a potential crisis by constantly monitoring the figures that are registered.

(percentage)
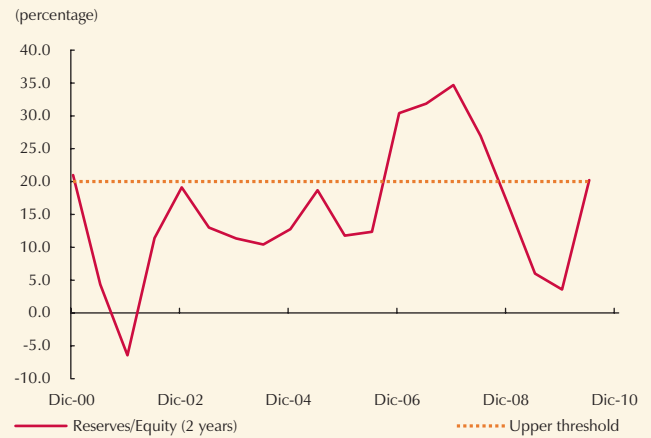
Sources: Fasecolda and thresholds (NAIC).

In summary, after reviewing the changes registered in the general indicators for profitability and liquidity over the last decade, it is evident that the GICs have shown stability with respect to those measurements of risk.

III. CURRENT SITUATION AND OUTLOOK FOR FINANCIAL SYSTEM DEBTORS

The current outlook and businessmen's expectations suggest an improvement in terms of the demand expected in 2011 as well as a rise in liquidity and availability of credit. The household financial conditions showed improvements over the course of 2010. The performance of indebtedness was accompanied by negative rates of growth for the nonperforming loan portfolio. Likewise, the reduction in lending rates contributed to alleviating the financial burden for households thus increasing their ability to pay.

A. CORPORATE SECTOR

Business Owner Expectations

The results of the surveys done in 2010 show an improvement in businessmen's expectations with respect to economic growth and the perception of credit availability. In contrast to the above, a larger number of business owners expressed their concerns about the changes in the exchange rate.

a. *Economic Activity, Monetary and Loan Conditions*

According to the survey on economic expectations that the Banco de la República did in January 2011, business owners believe that the growth of the economy in 2011 will be within a range of 3.7% and 4.6%. This result is the highest of the expectations reported over the course of 2010 (Graph 47).

Likewise, the Fedesarrollo business opinion survey (EOE in Spanish) given in December 2010 shows an optimistic balance with respect to the economic

Graph 47
Expected Growth of the GDP for 2011

(percentage)
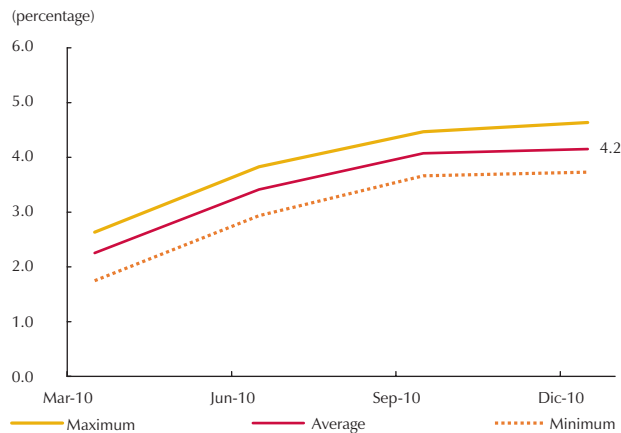
Source: Banco de la República (Quarterly Survey of Economic Expectations).

Graph 48
Business Expectations Regarding Economic Situation

(percentage)
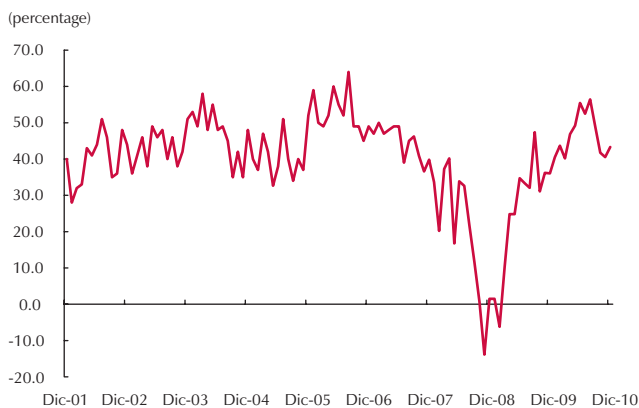
Source: Fedesarrollo (Survey of Businessmen's Opinion).

situation for the next six months. Upon contrasting this result with the same month in 2009, an increase in the number of agents that expect their situation to be favorable (43.3%) is seen. A growth trend since last part of the third quarter of 2008 can be seen in Graph 48. This includes a slight recession in the last few months of 2010.

This result could be associated with the rise in output expectations and the outlook for growth of sales. With respect to production, the Fedesarrollo survey shows that the expectations for three months from now have recovered after a fall in November and showed levels that were similar to those registered in 2007 (Graph 49, panel A). Respecting sales, the Banco de la República's regional survey shows evidence of a rise in the outlook for sales growth in the aggregate for the industrial, commercial, transportation, agricultural, and construction sectors (Graph 49, panel B).

The Banco de la República's survey of expectations, in turn, shows that for 2011 those consulted expect the TDR to rise gradually. Thus, the predicted values are: 3.6%, 3.8%, 3.9%, and 4% for March, June, September, and December respectively all of which equals an average rise of 14 bp. Regarding the outlook for credit availability, the survey shows that 85.2% see access to financing as easy. This datum is consistent with the growth trend that has been seen since December 2008, when the indicator hit its minimum (19.8%) (Graph 50).

The fact that the current high availability of credit is mostly seen by the large chains of stores and financial intermediation sectors must be emphasized. At the same time, the unions see a low availability to a greater degree.

b.   *Exchange Rate*

With respect to the changes in the nominal exchange rate, business owners see this as the main obstacle for their normal business management according to the ANDI Combined Industrial Opinion survey (EOIC in Spanish) from December 2010. The above result was obtained for the entire second half of 2010 while the problems associated with the lack of demand and cost of supplies and raw materials lost importance (Graph 51).

When this result was contrasted with the one obtained in the economic expectations survey of the Banco de la República (done in January 2011), those surveyed

A. Seasonally Adjusted Expectations for Production in Three Months

(percentage)

Legend: — Trend   — Balance

B. Perception of Growth in Sales Volume

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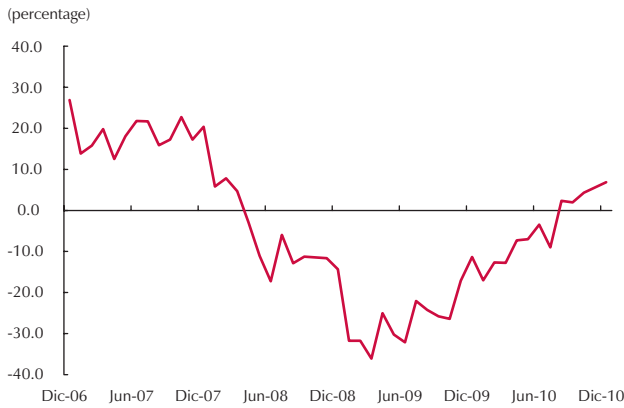
Sources: Fedesarrollo and Banco de la República, Banco de la República calculations.

Graph 50
Current Perception of Credit Availability in Economy

(percentage)

Legend: — High   — Low   — None   ····· Did not respond
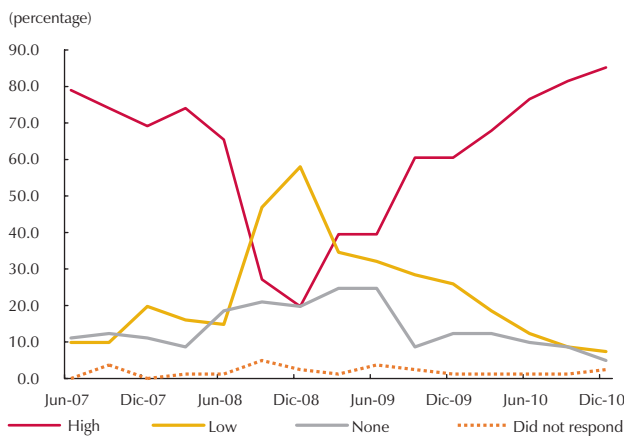
Source: Banco de la República (Quarterly Survey of Economic Expectations).

forecast an annual revaluation of 2.7%, 1.8%, and 0.6% for the months of March, June and December 2011. Thus, at the close of this year, the business owners estimate that the rate will be at COL$1,903 (Graph 52).

In spite of this result, it is important to emphasize the fact that, in the last few quarters, the values predicted for the exchange rate have had an upward adjustment so the revaluation expected by business owners is minor. In particular, the value of the nominal exchange rate in December 2010 was higher than the value

Graph 51
Obstacle According to Businessmen: Exchange Rate

(percentage)

Legend: — Percentage of businessmen   ····· Annual average
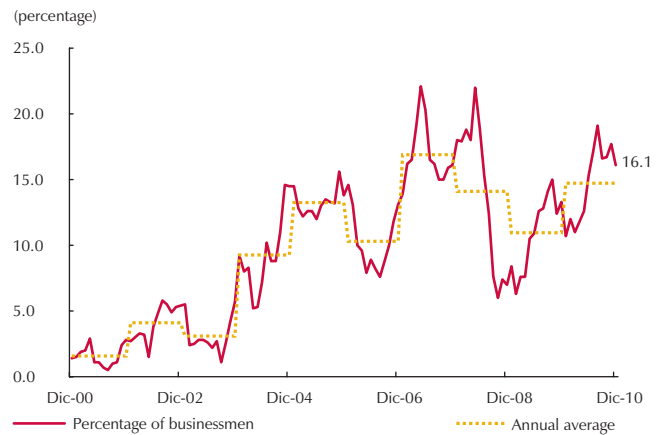
Source: ANDI (Industrial Opinion Survey).

Graph 52
Observed and Expected Nominal Exchange Rate and Expected Ranges

(pesos per dollar)

Legend: — Observed   ····· Minimum expected   ····· Maximum expected
— Average expected   — Survey, Oct-10
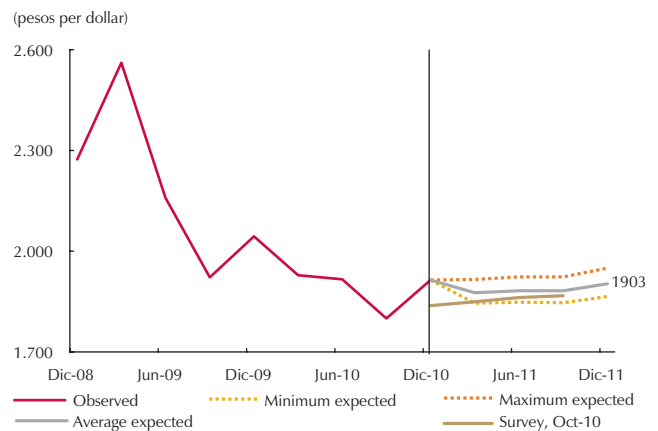
Source: Banco de la República (Quarterly Survey of Economic Expectations).

expected. The observed value was COL$1,914 and COL$1,838 was the value predicted in the October 2010 survey.

Therefore, the surveys show that the exchange rate is seen as a problem, which is associated with the expectation of a revaluation of the peso compared to the dollar. Nevertheless, it should be emphasized that currently, the expected revaluation is minor.

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. Their outlook on the purchase of housing and durable goods is also examined in order to understand the current financial situation of households and their future perspective.

1.   Household Indebtedness

The level of indebtedness for households (defined as the total housing and consumer loans/GDP) has shown an upward trend and is close to 12.4%. This increase could be related to the lower level that the lending interest rates have seen and the take off of economic activity. Together these factors could have allowed indebtedness to grow faster than the GDP (Graph 53). In spite of the fact that this level of debt is higher than the levels seen over the last decade, it is still low if it is compared to the 15.6% registered in the third quarter of 1998. Also in the second half of 2010, the growth trend of the combined loan portfolio (housing with securitizations and consumption) continued and hit a real annual rise of 12.7% (Graph 54).

When the composition of household debt is analyzed, it can be seen that the consumer loan portfolio again took a larger share of indebtedness in December 2010 after the declines that had been seen since the last part of 2008. Given its rapid recovery, the total indebtedness was at a level of 72% during that year (Graph 55).

This structure of household debt exposes the financial system to a higher credit risk derived from the consumer

Graph 53
Consumer and Housing Loan Portfolio/GDP
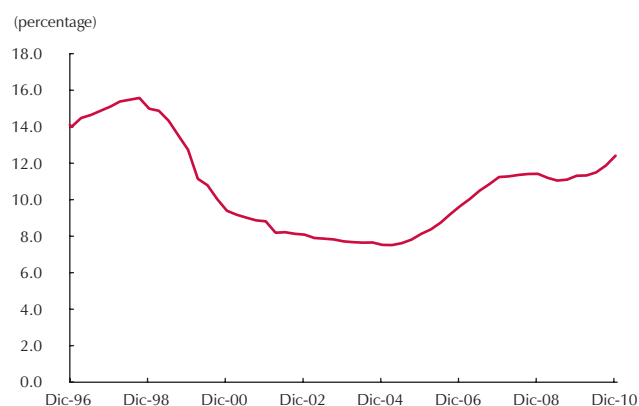
Sources: DANE and Financial Superintendency of Colombia, Banco de la República calculations.

Graph 54
Real Annual Growth of Household Indebtedness

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

Graph 55
Consumer Credit Share of Total Household Indebtedness

(percentage)

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

Graph 56
Ratio of Housing Debt Growth Index and NHPI, and NHPI/
CPI Ratio
(January 1994= 100)

(index)   (index)

—— Loan Portfolio/ Housing prices   —— Real NHPI (right axis)
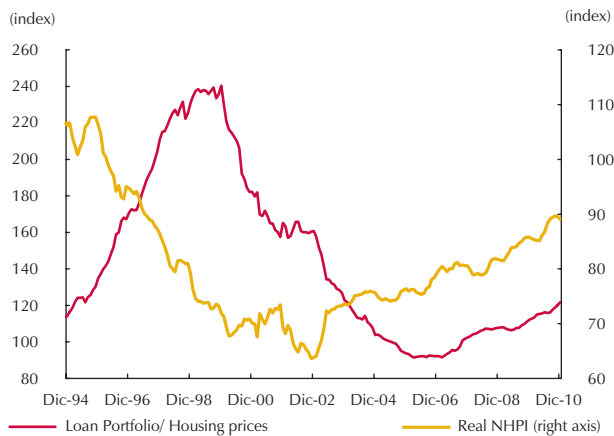
Sources: DANE, DNP and Financial Superintendency of Colombia, Banco de la República calculations.

loan portfolio as well as to a higher loss given the possible default due to the more limited collateral that this type of credit demands in comparison to the mortgage loan portfolio.

In the case of the housing loan portfolio, the disbursements denominated in pesos registered a share of 93.7% of the total[28] in December 2010. This is 1.8 pp lower than what was seen during the same month in 2009. The concentration in this type of disbursements implies that the credit institutions have a higher exposure to interest rate risk given that the deposit rates may vary while the lending rates remain fixed.

The ratio between the index of housing debt growth and the index of new housing prices (NHPI) continued to rise in the second half of 2010 and was at a level of 121.7 points (p) in December of that year. This trend is due to the greater strength that the housing loan portfolio showed in comparison to the prices for new housing. However, the indicator levels remained relatively low compared to the levels reached towards the end of the nineties when the ratio went to levels above 200 p (Graph 56).

The ratio of the NHPI and the consumer price index, in turn, also showed an upswing in growth in 2010, which stabilized in the last three months of the year. This performance was due to the stable evolution that the NHPI showed towards the end of the year (7.2% annually in December) and the increase in the inflation rate in the fourth quarter of 2010 (3.2% in December).

For September 2010, the Loan to value (LTV) –ratio between the value of the disbursements and the value of the guarantees– was at a higher level than what had been seen a year earlier in the loans granted for the different types of housing. For the low-income housing (LIH), this indicator remains stable at 57.3% and shows an increase of 1.4 pp. Meanwhile the housing other than LIH showed a value of 51%, thus registering a change of 3.6 pp with respect to the previous year (Graph 57).

Likewise, household consumption showed more strength as it hit a real annual growth rate of 4.3% for the third quarter of the year. This contrasts with the low level that was seen a year before when household consumption was at a rate 0.8% (Graph 58). In addition, real wages also rose at a rate of 2.3% in September,

28   In Colombia, the housing loan portfolio is invested in pesos (fixed rate) and in UVR (variable rate).

Graph 57
Loan to Value

(percentage)
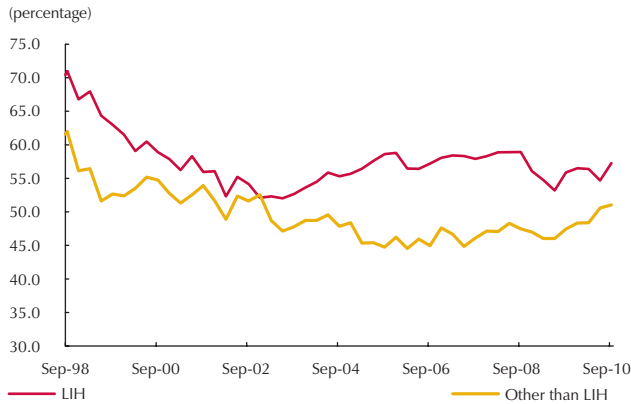
Graph 58
Real Annual Growth of Household Consumption and of Real Salaries

(percentage)
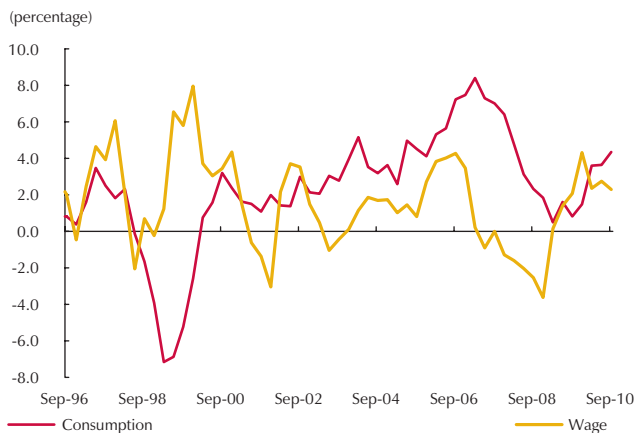
Graph 59
Real Annual Growth of the Non-performing Portfolio
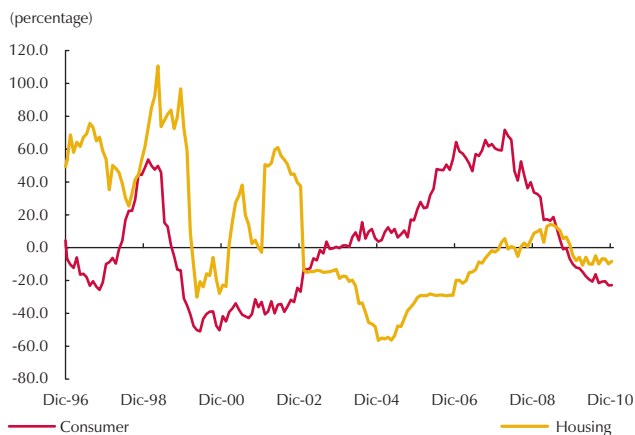
(percentage)

which is above what had been reported for the same month in 2009 (2.1%). This suggests a better financial situation for households as a result of their higher income. In general, both aggregate consumer performance and real wage performance facilitated the better performance that consumer loans have shown in the second half of 2010.

With respect to default, the dynamics of the loan portfolio in default shows a favorable performance for both the consumer and housing loan portfolios. Both loan portfolios showed negative rates of growth for all of 2010. While the consumer loan portfolio registered a real annual rate of -22.9% in December, the housing one showed a change of -8.3% (Graph 59). This decline along with the increase the two types of loans saw shows an improvement in terms of credit risk associated with households.

2.   Household Financial Burden

In 2010, the household financial burden (HFB)[29] continued to follow the declining trend that it showed in 2009. Towards the end of December, this indicator was at a level of 16.4% which meant a reduction compared to what had been seen a year before (16.7%) (Graph 60). This trend was mainly explained by the decline in the interest payment component as a result of the drop in lending rates for consumer and housing loans.[30] When the financial burden indicator that excludes debt repayments is analyzed, this fact is confirmed since it went from 6.2% in December 2009 to 5.4% a year later.

_____

29   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 2000 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 (1994-1999), growth was estimated by interpolating the old series with the new one. Remuneration for 2008 and 2009 was projected using the increases in the real wage index for the manufacturing industry.

30   In December 2010, the weighted rate for consumer and housing loans was at 16.2% which means a reduction of close to 3 pp compared to what had been seen for the same month in 2009. This rate is also at historically low levels.

The drop in household indebtedness contributes to easing their ability to pay which, in turn, is reflected in the reduction in the loan portfolio defaults for this sector as was described in Chapter II of this Report.

When the components of the financial burden are separated by type, one sees that debt service for households is determined mainly by the consumer loan portfolio as it represented 14.6% of the wages in December 2010 (Graph 61). Nevertheless, this component registered a decline of 25 bp compared to what had been seen a year previously. At the same time, debt service for the housing loan portfolio showed a slight change as it went from 1.9% to 1.8% during the same period.

Another type of indicator of household financial burden is 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. Therefore, this indicator measures that portion of the household financial expenditure that reduces their wealth.

In 2010, this indicator continued to show the declining trend that it had been presenting since 2009 and was at 5.0% towards the end of December 2010. This reflects a reduction compared to what had been seen a year earlier (6.5%) (Graph 62). This performance is mainly due to the fall in lending rates, which has generated a decline in interest payments.

In spite of the reduction in the household financial burden, the results of the December 2010 Report on the Credit Situation in Colombia (RSCC in Spanish) indicated that the creditworthiness of existing clients is still the biggest hurdle to a larger volume of lending to households from the standpoint of banks and CFCs. Therefore, the intermediaries continue to perceive the borrowers' ability to pay their debts as weak.

Graph 60
Household Financial Burden
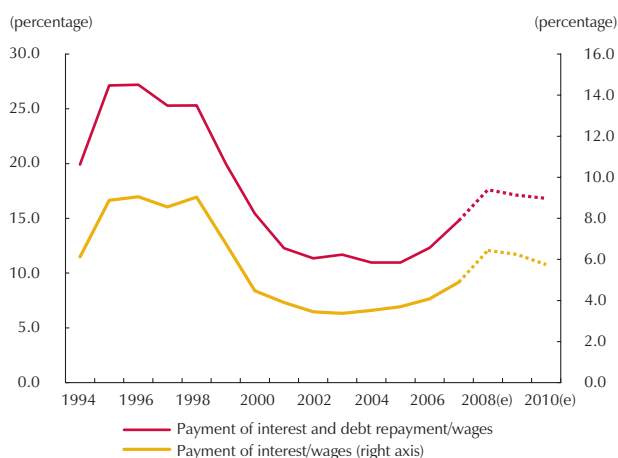
(e) estimated.
Sources: Financial Superintendency of Colombia and DANE, Banco de la República calculations.

Graph 61
Household Financial Burden
(including debt repayment)
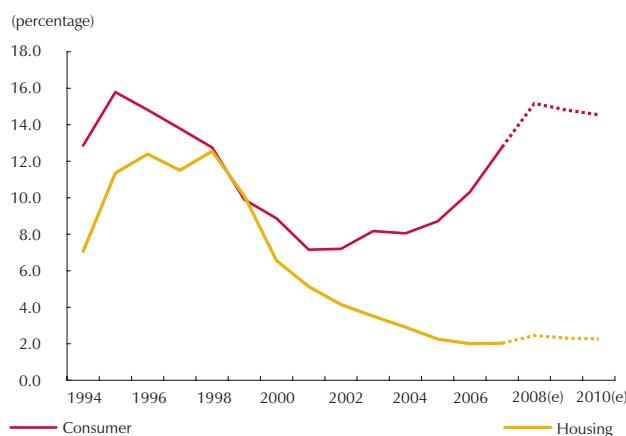
(e) estimated.
Sources: Financial Superintendency of Colombia and DANE, Banco de la República calculations.

Graph 62
Household Financial Burden: Real
Component of Interest/Wages

(percentage)

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

Graph 63
Financial Burden for Colombia and United States

(percentage)

CFID Colombia   DSR United States
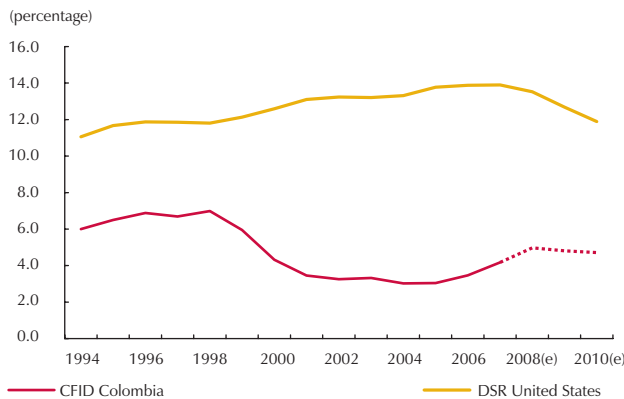
(e) estimated.
Sources: Financial Superintendency of Colombia, DANE and US Federal Reserve, Banco de la República calculations.

For this edition of the Financial Stability Report, an indicator of financial burden that is comparable to those of other countries was built. Graph 63 shows 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 to available income. As can be seen in the graph, the CFID is at a lower level than the one registered in the crisis during the last part of the nineties. That was the period when it reached its maximum and it was at 4.7% towards the end of 2010. The DSR, in turn, has shown growth since 1998 and was at its maximum during the financial crisis of 2008 (13.9%). At that point, it began to diminish and was at 11.9% in September 2010.

3. Outlook

Over the course of 2010, the favorable performance of the expectation indicators for households was evident. Nevertheless, in the last few months of the year, there was a lower confidence among consumers with respect to their economic situation. The consumer expectation index CEI[31] came to a level of 21.8 p in January 2011, a result that is 12.7 p lower than the one seen in July 2010. However, the indicator is at positive levels that are similar to those seen in 2007 when consumption was growing at rates of above a real 6% (Graph 64). The economic condition indicator (ECI),[32] in turn, registered a decline and was at a level of 8.2 p in January 2011. The positive values of those indicators are in line with the performance of household consumption which grew at a rate of 4.3% in the third quarter of 2010.

The indicators of intention to purchase a house and durable goods continued to show a positive balance in spite of its decline in the second half of 2010 (Graph 65). The intent to purchase housing indicator reached a level of 33.7 p while the one for durable goods was at 15.9 p.

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31 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 over the next 12 months? 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 situation at present?

32 This is built on the basis of the following questions: Is 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?

(points)   (percentage)

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

——— Index of Consumer Expectations
——— Index of Economic Conditions
········· Growth of Annual Consumption (right axis)

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

(puntos)

Ene-02 Ene-03 Ene-04 Ene-05 Ene-06 Ene-07 Ene-08 Ene-09 Ene-10 Ene-11
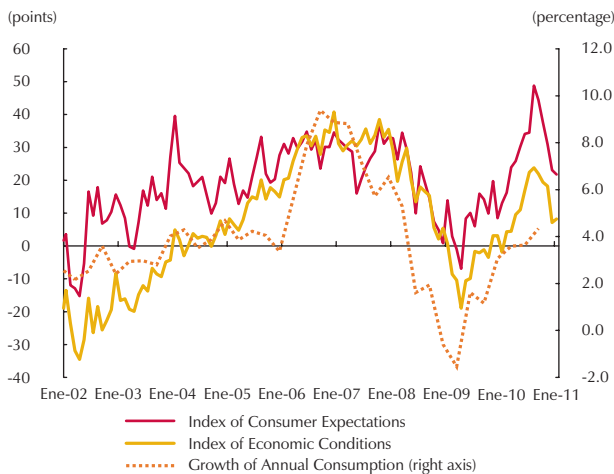
——— Index for Consumer Intentions to Purchase a Household
——— Index for Consumer Intention to Purchase Durable Goods
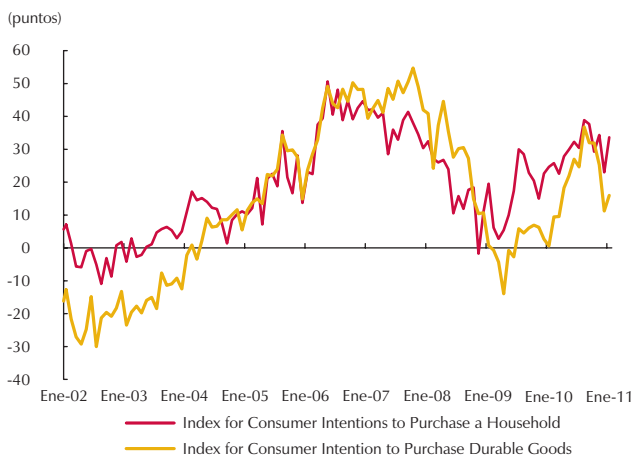
Sources: Fedesarrollo and DANE; Banco de la República calculations.

Finally, according to the RSCC for December 2010 it can be seen that a majority of the banks kept their requirements for granting new loans unaltered and they are expected to remain at those levels for the next three months. Also, a significant percentage of the CFC hardened their policies for approving new loans as a result of a lower tolerance for risk and these requirements are expected to continue rising over the next few months. In spite of this, the banks have indicated that in a scenario of excess resources, they would be willing to grant a larger number of consumer loans.

In conclusion, the financial conditions of households showed improvements over the course of 2010. The trend of indebtedness went along with the negative rates of growth for the nonperforming loan portfolio. Likewise, reductions in the lending rates contributed to alleviating the financial burden of households and raising their ability to pay their debts. The expectations indicator is still showing a positive balance in spite of the reductions that were registered in the second half of 2010. As a result, a favorable performance in this sector could be expected in the next few months.

C.   NONFINANCIAL PUBLIC SECTOR (NFPS)

1.   Fiscal Balance

This section was based on the revision of the Financial Plan 2011 written by the Ministry of the Treasury and Public Credit in February of the current year.[33] In this edition, the numbers for 2010 are updated and the projections for 2011 are presented.

The new numbers show important modifications for the two years, primarily in terms of the NFPS deficit as well as the government's financing needs.

In the previous edition of the Financial Stability Report, attention had been drawn to the increase in the deficit for 2010 by 1 pp of the GDP with respect to 2009 (from 2.6% to 3.6%) mostly caused by the low surplus in the decentralized sector. The most recent review of the Financial Plan shows an improvement of 0.6% of

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

Table 4
Fiscal Balance: Non-financial Public Sector

Balance (including emergency)	Billions of pesos		Percentage of the GDP	
	2010	2011[a/]	2010	2011[a/]
1. Non-financial public sector	(16.836)	(20.011)	(3.0)	(3.5)
1.1 Central National Government	(21.018)	(23.794)	(3.9)	(4.1)
1.2 Decentralized sector	4.182	3.783	0.8	0.6

a/ These data correspond to Financial Plan 2011 updated in February 2011.
Source: Confis and Ministry of the Treasury and Public Debt (Confis).

the GDP in the deficit of the NFPS compared to what had been projected and it is now 3% for 2010 (Table 4). This change was due primarily to the fact that the tax collection surpassed the goal that had been set by the national government and to the careful management of the budget due to the lower income that was expected. For 2011, a 3.5% deficit of the NFPS is expected, which will be higher than the one for 2010 as a consequence of the higher outlays to cover the losses resulting from winter weather. The balance sheet of the central national government (NG) is the one that reflects this higher expenditure, which is the reason the government's deficit will deteriorate by 0.2% of the GDP in 2011.[34] Thus, although the projections show a significant recovery of income, the fiscal balance will be affected due to the increase in expenditures. Moreover, the surplus held by the decentralized sector will be reduced by 0.2% of the GDP thus contributing to the higher deficit projected for 2011.

The sources for financing the winter emergency costs will come from broadening the base for the equity tax and a portion of the duty on financial transactions.[35] For more long term projects, a part of the shares of Ecopetrol held by the State will be sold in order to avoid the serious consequences of winter like the ones experienced during the past year.[36]

2.   Creditworthiness and Dynamics of the Debt

Even when a lower pace of growth in public debt was seen during the last year compared to the two immediately preceding years (9.4% as of December 2010 vs. 13.5% and 11.3% in 2009 and 2008 respectively), this increase was in agreement

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34   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 -3.7% 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.

35   In addition, based on DIAN concept 098797, an additional 2% will be added to the surcharge on income tax for those companies that were exempt from paying that tax.

36   Ministry of the Treasury and Public Credit, Fiscal Result 2010 and Updated Financial Plan 2011.

with the government posture to give economic activity a greater boost as the private sector could not do it and to diminish that boost to the degree that the Colombian economy reactivated.

As is illustrated in Table 5, there has been a systematic increase in the domestic debt while the external debt has shown a volatile performance. This has finally translated into a restructuring of foreign into domestic debt. In fact, the latter increased its share by 3 pp last year (from 68% in December 2009 to 71% a year later). Thus, although the higher fiscal dynamics are financed with more issues of domestic debt, the low, stable level of the interest rates makes it possible to handle it at a more reduced cost.

Graph 66
NG Creditworthiness

(trillions of pesos)   (percentage)

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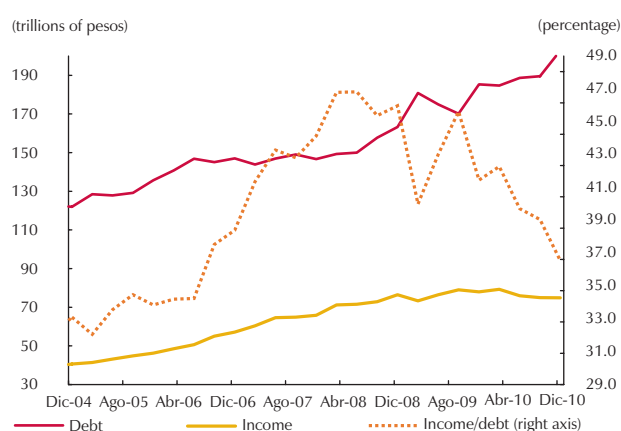
Sources: Ministry of the Treasury and Public Credit and Banco de la República.

As a result, if the fact that the ratio of income to debt fell from 46.5% in September 2009 to 36.9% in December 2010 is taken into account, the creditworthiness of the NG (Graph 66) has been deteriorating. This result is due to a sustained increase in government debt and to a slight dip in its income for the above-mentioned period. In spite of the increase in the NG revenue that is projected for 2011, the additional increase in expenditures generated an increase in bond issues which went from COL$25.5 t in 2010 to COL$28 t in 2011.

The duration of the total NG debt (Graph 67) declined slightly in the four most recent months. However, if all of 2010 is considered, it could be said that it has

Table 5
Gross Debt of the NG

	Domestic	Foreign	Total	Domestic	Foreign	Domestic	Foreign	Total
	(billions of pesos)			(share)		(nominal annual growth) (percentage)		
Dic-05	88.060	47.626	135.686	64.9	35.1	28.3	(10.7)	11.2
Dic-06	94.399	52.613	147.012	64.2	35.8	7.2	10.5	8.3
Dic-07	99.062	47.653	146.715	67.5	32.5	4.9	(9.4)	(0.2)
Dic-08	108.714	54.593	163.307	66.6	33.4	9.7	14.6	11.3
Mar-09	115.975	64.876	180.850	64.1	35.9	10.2	47.2	21.1
Jun-09	118.384	56.582	174.966	67.7	32.3	11.5	29.1	16.6
Sep-09	118.265	51.883	170.148	69.5	30.5	11.0	1.4	7.9
Dic-09	125.640	59.694	185.334	67.8	32.2	15.6	9.3	13.5
Mar-10	129.199	55.542	184.742	69.9	30.1	11.4	(14.4)	2.2
Jun-10	131.337	57.356	188.694	69.6	30.4	10.9	1.4	7.8
Sep-10	134.280	55.240	189.521	70.9	29.1	13.5	6.5	11.4
Dic-10	143.534	59.306	202.840	70.8	29.2	14.2	(0.6)	9.4

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

Graph 67
Duration of NG Debt

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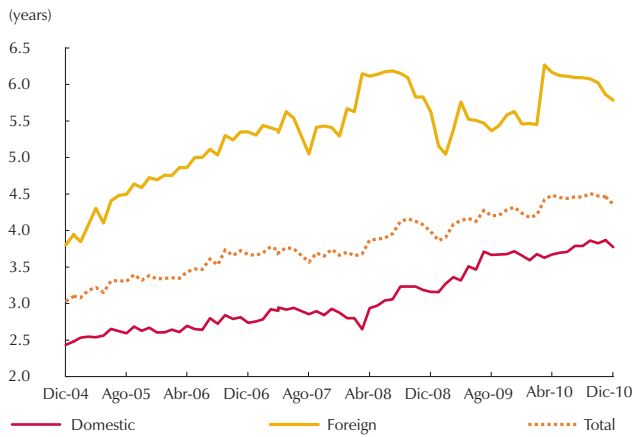
Source: Ministry of the Treasury and Public Credit.

Graph 68
Maturity Profile in Pesos

(trillions of pesos)
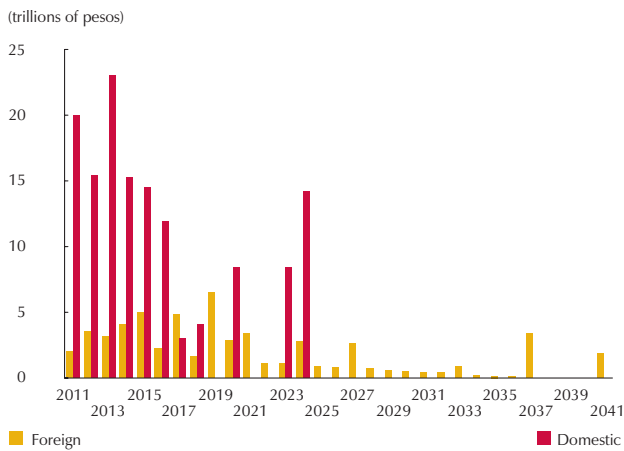
Source: Ministry of the Treasury and Public Credit.

Graph 69
Maturity Profile of the Domestic Debt

(trillions of pesos)
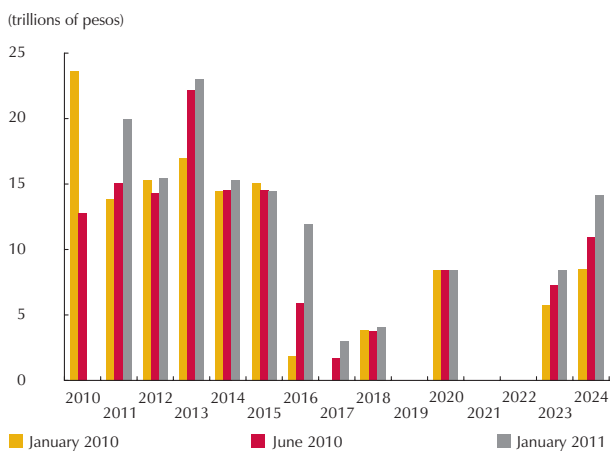
Source: Ministry of the Treasury and Public Credit.

remained practically stable for around 4.2 years. That is due to a relatively constant growth in the duration of the domestic debt in comparison to the drop in foreign debt, which has been seen since March 2010. In general, the gradual increase in the duration of the total debt in recent years could make it more sensitive to the changes in interest rates even if it makes it easier to repay it by lowering the risk of refinancing.

Just as was mentioned in the previous Financial Stability Report, more than half of the outstanding NG public debt (61.3%) will be redeemed within the next five years (Graph 68). Therefore, it can be stated that the maturity profile of the NG public debt has not been noticeably modified compared to what was seen in the September 2010 edition of the Financial Stability Report. Of this 61.3% that will be redeemed in the next five years, the foreign debt represents only 16.7% due to the fact that it is distributed over a much longer period than the domestic debt. Indeed, while the first has a maturity profile that goes up to 2041 the last date for domestic debt is 2024.

Graph 69 illustrates the change in the maturities for domestic debt for the last year. In the last year, it can be seen that there was an increase in the maturities in 2011 from COL$13.9 t to COL$20 t, which indicates that additional short term bonds were issued in 2010. Another significant increase in maturities, which grew COL$6.1 t (from COL$17 t to COL$23.1 t) is registered for 2013. The rises in maturities in 2016, 2023, and 2024 also draw attention. Thus, the fact that the government issued new short term bonds last year as well as additional medium and long term ones is worth emphasizing.

It has been estimated that the total issuance of TES came to COL$28 t towards the end of 2011. This amount is higher than what was presented in the immediately preceding two years (COL$25.5 t and COL$25.8 t in 2010 and 2009 respectively). The debt service for domestic debt, in turn, is expected to come to COL$25.8 t, an amount that is COL$2.9 t higher than what was presented last year. With this, the roll-over of the debt will be at 108%.[37] This indicates that the new issues of TES are

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37   This is slightly lower than the roll-over of the debt for 2010, which was equal to 111%.
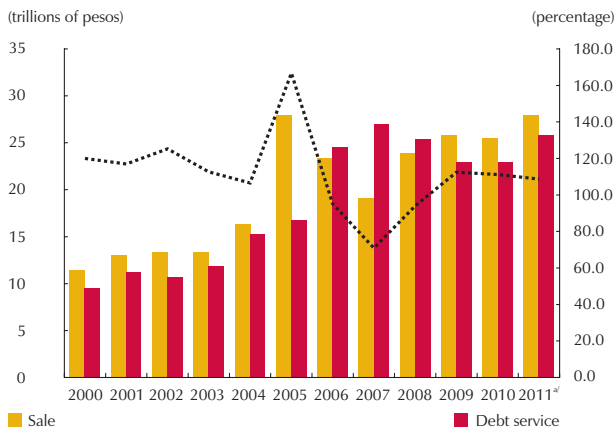
a/ projected numbers (Financial Plan 2011, February 2011 revision)
Source: Ministry of the Treasury and Public Credit.
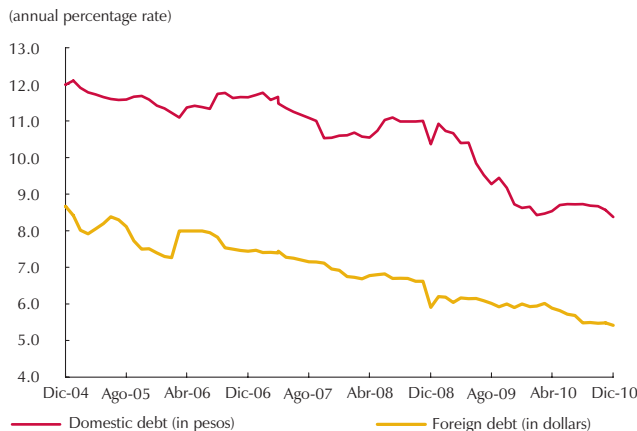
Source: Ministry of the Treasury and Public Credit.

financing items other than the payment of interest and debt repayment (Graph 70).

Graph 71 shows the path followed by the coupon interest rate from 2004 to the end of 2010. Even when the path for the two types of debt shows a declining trend, the one for domestic debt shows more fluctuations. In particular, in the first half of last year, the coupon rate for domestic debt rose slightly and reached 8.7% in June. Nevertheless, in the second half of the year, the historical trend was re-established which placed it at 8.4% towards the end of 2010. The coupon rate for foreign debt has continued to decline systematically and was at 5.4% in December 2010. As a result, the government has been favored by the decline in these rates. No doubt this will free up a small part of the budget so that it can be used for other things.

3.   Outlook

The deterioration of the NG deficit for 2011 is primarily due to the higher outlays to help meet the needs of victims of winter flooding throughout the country. This increase in the deficit is necessary in spite of the significant recovery of income that is expected in 2011 through a higher tax collection from better economic growth.

The financing needs will climb to COL$42.7 t in 2011. The majority of this corresponds to the deficit to be financed (COL$24.3 t) and to repayments on domestic and foreign debt (COL$16.2 t). The deficit to be financed includes the cost of financial restructuring which will be only COL$281 b this year.

The sources projected for satisfying this financing will be disbursements from domestic and foreign debt for COL$28 t and COL$7.1 t respectively and other items such as floating debt (COL$1.7 t) and the surplus from the 2010 outstanding balance (COL$3.9 t). The issuing of long term TES will be carried out: COL$6 t through agreed operations, COL$18 t through auctions on the local market and COL$4 t in forced operations.

In spite of the government's effort to improve its finances in 2011 by taking advantage of the higher momentum of economic growth, the winter flooding generated new expenditure items that will deteriorate its fiscal balance for the present year. The deficit to be financed will be higher than the deficit last year and so will the payments on debt. As a result of this, the government will be forced to increase its marketing of TES during the present year. As has been mentioned in previous editions of this Financial Stability Report, higher levels of government indebtedness could impose barriers on monetary policy decisions to the degree in which it 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 portfolio with investments.

Box 4
LOAN PORTFOLIO AND PERFORMANCE OF HOUSING PRICES IN COLOMBIA

One of the main sources for potential financial and economic instability is the financial accelerator, which refers to the mechanism by means of which economic growth and changes in the asset prices could affect decisions with respect to private investment and indebtedness. The possible negative effects associated with the financial accelerator take place when there are imbalances and high volatility simultaneously in the price cycles for assets and credit.

It is important to identify situations in which there are permanent increases in the asset prices casued by feedback from an excessive level of lending, which is associated with larger financing needs on the part of the debtors.[1] Therefore, it is relevant to follow up on the variables that affect the behavior and the expectations of the debtors in order to analyze the impact on their ability to pay. This box describes the performance of credit in the light of the financial deepening[2] as well as its trends. At the same time it analyzes the cycles for the housing market in Colombia.

1.   Credit Market

This section studies the performance of the ratio between credit and GDP 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] That makes it possible to do a descriptive analysis in which the observed level of the series is compared with its respective trend.

The higher growth in the total loan portfolio (14.2% real annually) with respect to that of the economic activity in December 2010 caused the deepening indicator of the total loan portfolio –total loan portfolio/GDP– to show more strength and reach a level similar to what was observed for the estimated trend. This shows that the loan portfolio did reactivate after the economic slowdown that this country went through in 2009 (Graph B4.1).

Graph B4.1
Total Loan Portfolio/GDP and its Trend

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

By analyzing the performance of the indicators for both the consumer and mortgage loan portfolios, we see that in both cases, higher growth is registered (12.7% for both) and this is explained by the better performance of these types of loans with respect to the GDP. In the case of the consumer loan portfolio, the deepening indicator is converging towards its trend line although it is still below that level (Graph B4.2), whereas the ratio for the housing loan portfolio is above the trend and the gap continues to widen (Graph B4.3).

Also, the positive growth in the disbursement of loans granted to purchase houses in 2010 caused the indicator for disbursements to GDP to rise above its trend. In the second half of this period, the trend of the disbursements remained favorable although slightly below what had been registered at the beginning of the year (39.1% in December vs. 44.5% in June) so the gap between the indicator and the trend stayed the same (Graph B4.4).

It is important to mention that the spike in the ratio of mortgage disbursements relative to GDP has been more gradual with respect to what took place in the beginning of the crisis in the late 1990's. The reactivation in the housing market has caused the growth of this type of loan from mid-2009 until now. This emphasizes the importance of monitoring the performance of this loan portfolio and its disbursements given that the gap between the ratios for these variables with respect to GDP is positive and may continue to widen.

2.   Housing Market

As was mentioned, it is important to analyze the performance of the housing prices along with what has seen with

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1   For more details about the financial accelerator and how the imbalances and the volatility in both the price of assets and loans are generated, see the Financial Stability Report for September 2007.

2   This refers to the ratio between lending and GDP.

3   The series for total loan portfolio, consumer loan portfolio and housing as percentage of GDP from December 1994 to December 2010 were used. The GDP for December was projected by assuming a 3.3% real annual growth.

Graph B4.2
Consumer Portfolio/GDP and its Trend
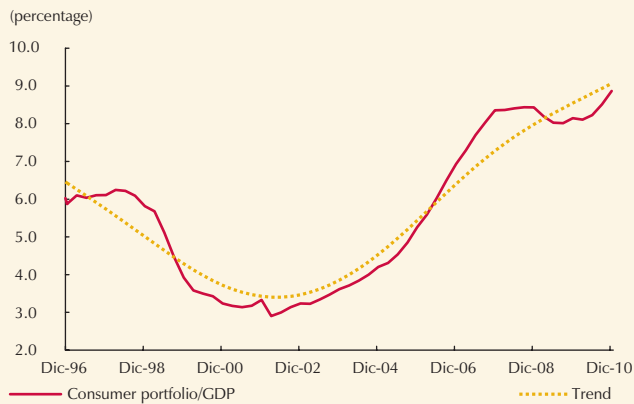
(percentage)

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

Graph B4.3
Mortgage Loan Portfolio/GDP and its Trend
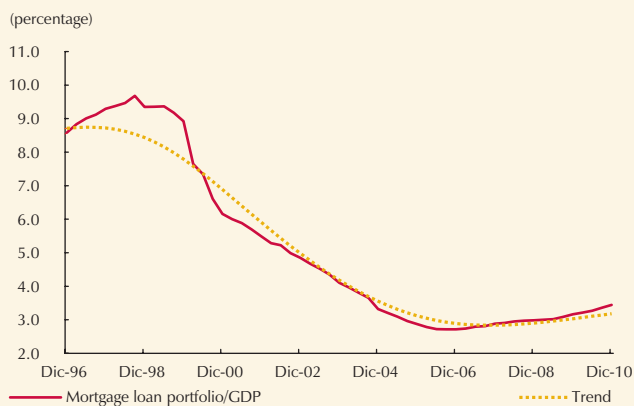
(percentage)

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

Graph B4.4
**Disbursements of Mortgage Loan
Portfolio/GDP and their Trend**
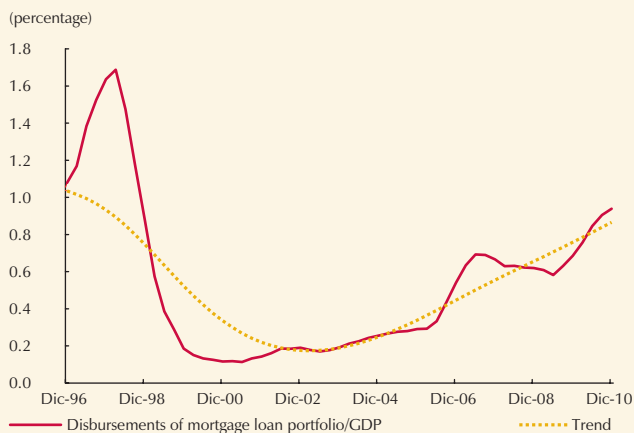
(percentage)

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

respect to the disbursements of mortgage loans in order to identify periods in which there is excessive growth in these two variables simultaneously.

Graph B4.5 analyzes 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 cost of housing construction index (CHCI).[5] The objective is to compare the dynamics of the housing prices to the performance of the profits and costs respectively. The data show that the indicators have similar variations within the period under analysis and have registered a growth trend starting in the first half of 2001. Likewise, since the last part of 2008, the ratio between NHPI and CHCI has shown a larger spike with respect to the performance of the third indicator.

The stabilization of the indicators during the second half of 2010 is noteworthy after the marked increase they experienced during the first six months of the year. It is worth mentioning that the current levels of the new housing indicator in relation to rent are above the levels registered prior to the mortgage crisis in the late 1990's. However, those levels have been reached through gradual increases rather than through abrupt changes.

Graph B4.5
**Ratio of NHPI to RI and to CHCI, and Their Trends
(index January 2009 = 100)**

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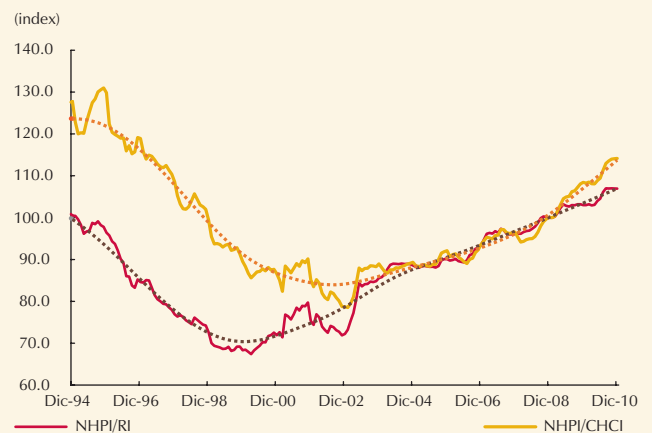
Sources: DANE and NDP, Banco de la República calculations.

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4   The rent payments for housing are regulated by the Government through Act 820/2003, in which an annual increase that is higher than the inflation projected by Banco de la República is forbidden. This may create a distortion when the index is compared for the periods before and after that law went into effect. To be specific, given that the rent payments have an established limit, the ratio of NHPI to RI tends to be lower before the restrictions were applied.

5   The cost of housing construction index does not include the price of land. It only considers the cost of labor and materials.

The ratio between the used housing price index (UHPI) and the RI shows a performance that is similar to the ration of the NHPI to the RI (Graph B4.6). However, the UHPI has been growing at a faster pace than the NHPI in the most recent four years. Also, the used housing indicator is currently at levels that are above those registered in the years immediately preceding the mortgage crisis occurred at the end of the last century. This trend for the used housing could be related to scarcity in urban areas where there is high demand. The restrictions on the supply of land have been one of the main components contributing to the increase in prices in the housing market. UHPI, as should be mentioned, is an index that is built on the basis of a methodology of repeated sales.[6] Therefore, the comparison of the sale of a house at two different points in time may be influenced by the purpose underlying its purchase. If the goal of the purchase is to build a new house, its price could be higher compared to the price of a house bought to be lived in without any plans to make significant modifications to it.

These variables in prices are not exclusive to the case of Colombia but rather are a response to the interaction between the supply and demand of housing in big urban centers. Given that the construction of the UHPI restricts it to the analysis of information for three big cities in the country (Bogota, Medellin and Cali), this fact could explain its performance in recent years.

When the performance of the ratio between the new housing price index (NHPIC) calculated by the Colombian Chamber of Construction (Camacol)[7] and the RI is analyzed, the indicator shows a trend that is similar to the one exhibited by the ratio between NHPI and RI. In 2010, the two series showed a stable performance although the indicator calculated by Camacol has more variations.

Meanwhile, the positive growth of the NHPIC since late 2007 has been caused by an upward trend of the prices for housing in the lower socioeconomic layers. In addition, there has been a higher relative share due to the increase in the constructed area. Likewise, the higher volatility in the series can be attributed to the combination of the changes in prices and weights for each socioeconomic layer considered in the methodology[8] (Graph B4.7).

Graph B4.6
Ratios of NHPI to RI and UHPI to RI, and Their Trends
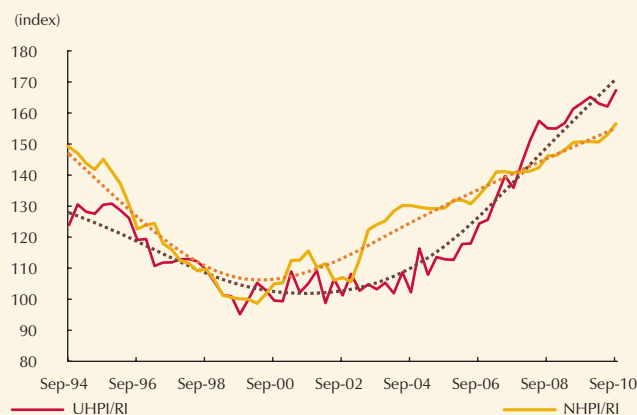
Sources: NDP, DANE, and Financial Superintendency of Colombia, Banco de la República calculations.

Last of all, indicators constructed based on the ratio of disbursements, which were divided into new and used housing and their respective price indices, are analyzed. These indicators warn of an excessive growth in the size of mortgage disbursements in comparison to the changes in the prices and should be of concern when high prices for housing are present.

Graph B4.7
Ratios of NHPI/RI and NHPIC/RI
(average March 2006 to December 2010 = 100)
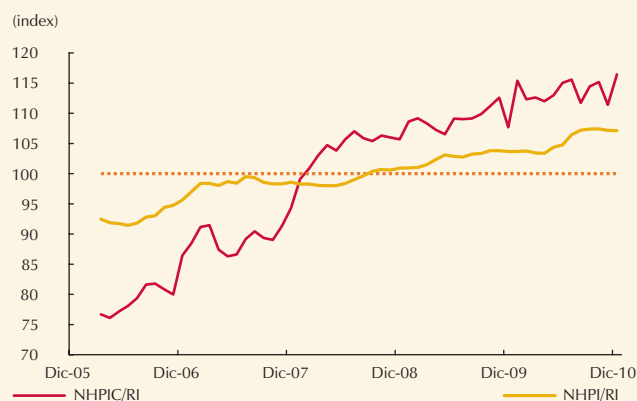
Sources: Camacol, NDP, and DANE, Banco de la República calculations.

The shaded areas in Graph B4.8 show the periods in which the ratios of NHPI and UHPI to RI were above their historical average. In the third quarter of 2010, the increase in the disbursements for used housing could have influenced the increase in the indicator, which registered levels similar to those reached in December 1997.

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6   See the document, "Indice de precios de la vivienda usada en Colombia–IPVU," Banco de la República, 2005.

7   The series is analyzed starting from March 2006 in order to use the monthly data that has been collected only since that date.

8   A more complete description of this indicator was presented in the box about cycles and prices of assets in the Financial Stability Report for September 2010, p. 81.

Since the rise in this indicator takes place in a context of high prices for housing, it is necessary to monitor carefully the performance of the market for previously owned housing in order to identify an overvaluation influenced by higher leveraging on the part of the households. Nonetheless, the supply restrictions may be contributing to the increase in the prices for this type of housing and the disbursements follow the growing demand for this type of housing. Likewise, in 2010 the indicator for new housing reached levels that were similar to those registered in the period prior to the mortgage crisis although its growth is lower compared to that for the used housing (Graph B4.8).

3. Final comments

The price and housing loan indicators are still showing a growth trend although it is lower than what was registered in the first half of 2010. The indicators for used housing showed the highest growth, which could be associated with the market conditions for this type of housing and also not unrelated to the performance of real estate prices in large cities. However, it is important to monitor the prices of used housing along with the disbursements in order to identify any exces-

Graph B4.8
Ratio of Disbursements by Type of Housing to Prices
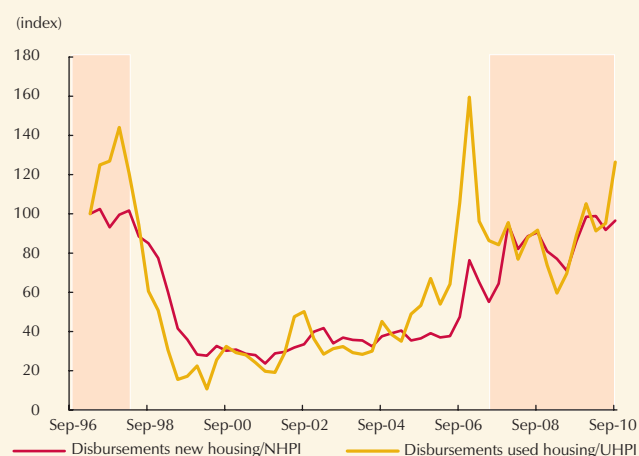
Sources: DANE, NDP and Banco de la República, Banco de la República calculations.

sive overvaluation of these assets in the economy since this situation could generate difficulties in the financial system with respect to changes in the macroeconomic environment or variations in household expectations.

Box 5
RECENT CHANGES IN THE COLOMBIAN STOCK MARKET

The changes in the Colombian stock market since the beginning of 2009 show a performance characterized by strong valuations and placed the general index of the Colombian Stock Exchange (IGBC in Spanish) at its highest historical level in October 2010. The rise in prices registered during this period could partially be a response to demand factors. These include the growing interest foreign investors are showing in assets of emerging markets, the adoption of the multi-fund system, and the integration of the stock markets of Colombia, Chile and Peru. In addition, it is also the result of the current scarcity in the supply of variable income assets on the market.

In spite of the presence of these factors, the remarkable appreciation of both the IGBC and some shares in private companies makes it necessary to do a more detailed analysis with regard to a possible overvaluation in this market. This kind of exercise faces an important limitation because there is no exclusive perspective or model that is considered appropriate for measuring the possible deviations of prices from their fundamental values in the literature. Because of the uncertainty with respect to what model should be used, different approaches for evaluating the existence of an overvaluation event in the market are considered in this box.

The first approach evaluates the recent performance of IGBC in real terms as well as the performance of the price-to-earnings multiple (P/E), which represents the ratio between the price of a share and the cash flow generated by it in 12 months compared to its historical performance. This makes it possible to determine if the current levels depart significantly from their long term average (i.e., the historical average).

The real IGBC rose significantly throughout most of 2010 only to register a substantial price correction in the most recent months (Graph B5.1). This trend was evident in all the Latin American countries that were part of the sample (Brazil, Chile, México and Peru). The fact that the real index of the Chilean Stock Market has shown the most expansionary trend of all the countries under analysis is noteworthy although all of the indices are currently between one and two standard deviations from their median for the last five years. Finally, it is important to emphasize the fact that even if the levels of the real indices are high compared to their historical averages, the impact of factors such as the development and deepening of these markets on the structure of prices cannot be overlooked. In addition, the upward trend that has been evident since 2009 was accompanied by low levels of volatility in the indices. Moreover, the subsequent correction that took place in the last quarter has been progressive.

Graph B5.1
Real Indices for some Latin American Countries
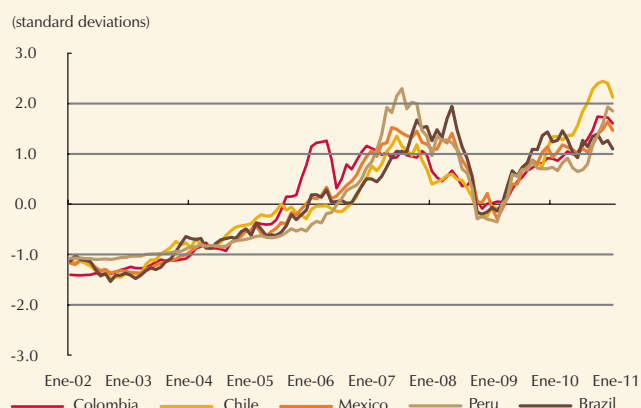
Sources: Colombian Stock Exchange, Bloomberg and DANE, Banco de la República calculations.

When the P/E for Colombia and for some its peers in Latin America (Chile, Mexico and Brazil) are analyzed, the data show the same upward trend found in both the real indices for 2010 and the later price correction period during the most recent months (Graph B5.2). As a matter of fact, the P/E for Colombia came close to two standard deviations from its median for the last five years although it has been gradually adjusting downward since November 2010. The levels registered by the multiple in 2010 did not have a pattern of abrupt changes in spite of being similar to those registered in years of high volatility such as 2006 and 2008. Rather, the changes have shown a gradual increase since the beginning of 2009.

Chile and Mexico, in turn, still registered levels that were close to one standard deviation from their medians by the end of 2010. Brazil shows a more moderate performance compared to the levels observed at the end of 2009 and the beginning of 2010, when their ratios were two standard deviations above their medians for the last five years. Last of all, note the presence of a common trend for the ratios of the countries under analysis, especially since the beginning of 2009.

When some of the individual Colombian stocks are analyzed (Bancolombia, Ecopetrol and Isagen) it is possible to see that their multiples have registered a performance similar to that of the general index (Graph B5.3).[1] In the financial sector, Bancolombia is close to its long term median while Santander (Chile), which fluctuated at around two standard deviations

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1   In this case, the Price-to-book (P/B), which measures the ratio between the price of a share and the book value of its equity is analyzed. This is because there is no P/E series that applies to each Colombian company relevant for our analysis.

(standard deviations)
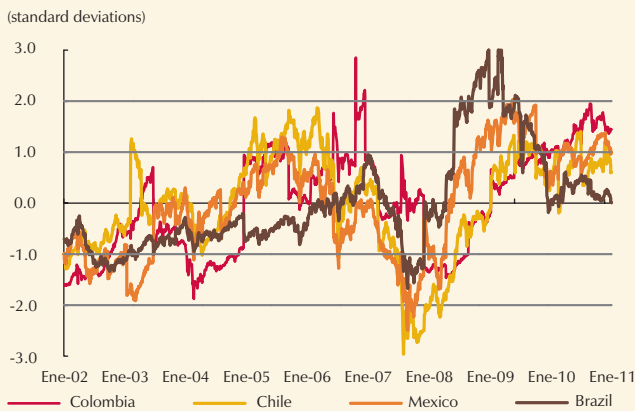
Sources: Colombian Stock Exchange and Bloomberg, Banco de la República calculations.

over the course of 2010, began to correct this towards the end of that year (Graph B5.3, panel A). Both Isagen and Ecopetrol, in turn, are now close to one standard deviation above their median after having been two deviations above it previously (Graph B5.3, panels B and C). In addition, there is a common trend among companies within the same industry that should be emphasized. This reinforces the suspicion that there are similar factors affecting the performance of the prices for the entire region.

It is important to note that the generalized upward trend seen in the emerging markets in Latin America seems, in fact, to be a reaction to structural changes made since January 2009. This fact was corroborated by using the Chow test for the P/E of the stock indices and for the P/B (Price to book) of the individual Colombian stocks.[2] In this regard, the comparison of the current values for the multiples with their historical values must be done carefully because the fundamentals during the most recent period can be different.

The second approach used, which is intended to complement the analysis done of both the multiple and the real index, consists of applying a Hodrick-Prescott (H-P) filter to each one of the series in order to evaluate the possible deviations of the series studied compared to their trend component. As of January 2011, the index is above its trend in terms of the real IGBC (Graph B5.4, panel A). However, that difference is at less than one standard deviation, which makes it not statistically significant. The results are similar in the cases of Chile, México and Brazil while the index of the

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2   There was evidence of a structural change in the sample at the beginning of 2009.

Graph B5.3
Price to Book for some Stocks by Sector

A.   Financial Sector

(standard deviations)

B.   Service Sector
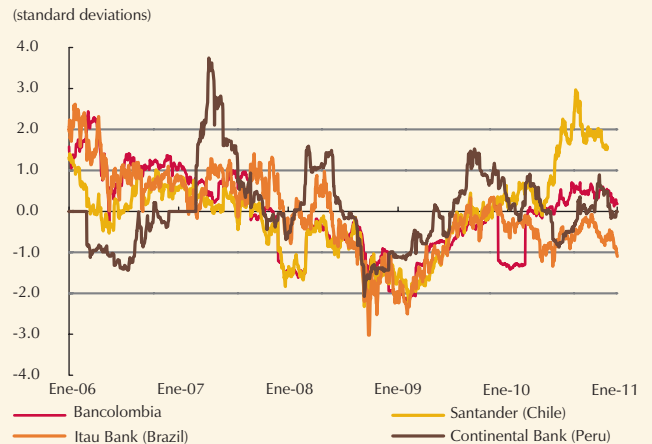
(standard deviations)
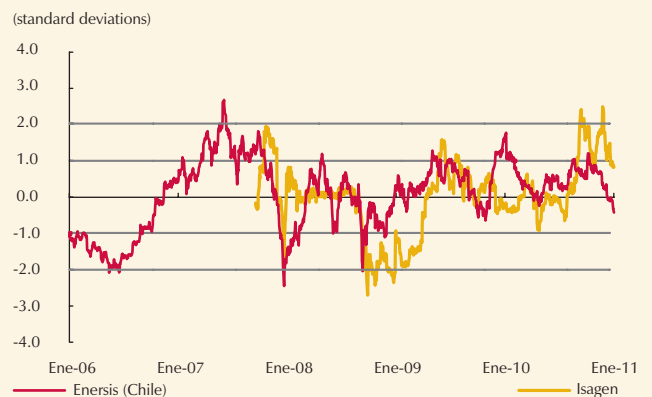
C.   Mining and Energy Sector

(standard deviations)
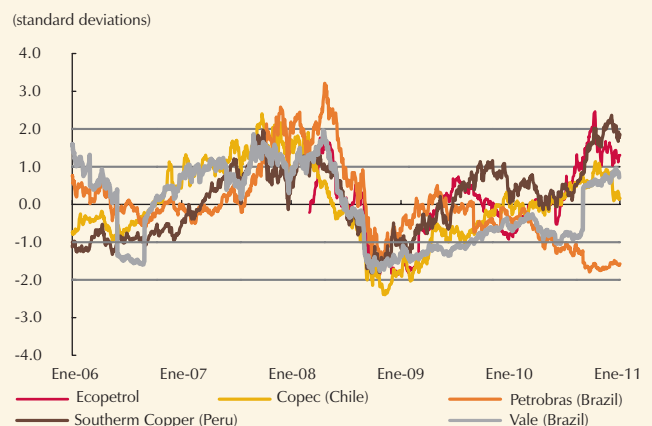
Sources: Colombian Stock Exchange and Bloomberg, Banco de la República calculations.

Peruvian Stock Exchange is at more than one standard deviation above its trend component.[3]

The analysis of the H-P filters for the P/E samples, in turn, shows identical results for all the countries in the sample. Specifically, all countries were below the long term component. This is not surprising if the progressive adjustment undergone by the multiples since late 2010 is taken into account. This adjustment was strengthened in the first month of 2011 (Graph B5.4, panel B). It is significant that the P/E for Colombia is not only below its trend, but almost one deviation below it. These results imply that the upward tendency of the prices, which has become evident in the outcome of the exercise for the real IGBC, has been accompanied by a significant increase in profits.

The third model that was considered is the one known as the "United States Federal Reserve (Fed) model" (1997),[4] This model assumes that there is a stable relationship between the real profitability of a long term bond and the ratio of the expected return to the stock price. When the difference between these rates is above its historical average, it is assumed that the prices are showing symptoms of overvaluation because they are above their long term value. For this exercise, both the ten-year rate for TES denominated in UVR and the inverse of the P/E ratio of IGBC[5] were taken into account (Graph B5.5).

In spite of the fact that the difference between these two returns is above the average, we see that it is by less than one standard deviation. In fact, it seems to have been converging toward its long term value since late 2010.

Finally, the IGBC level is estimated by using a CAPM model in order to compare those estimates with the observed value afterwards. To be explicit, the CAPM can be expressed as:

$$R_t - rf_t = \beta \left(R_{M,t} - rf_t \right) + e_t$$

Graph B5.4

A.   IGBC/CPI

(Hodrick-Prescott filter)

B.   Price to earnings (P/E) of IGBC
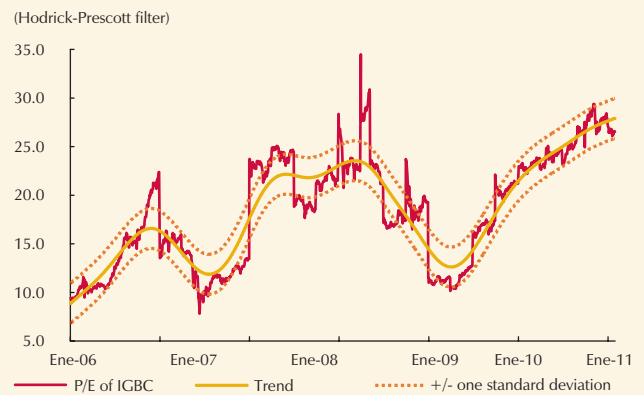
(Hodrick-Prescott filter)

Sources: Colombian Stock Exchange, Bloomberg and DANE, Banco de la República calculations.

This model relates the excess of return for the IGBC to both a free rate of risk[6] $\left(R_t - rf_t \right)$, and the excess of return for the market index $\left(R_{M,t} - rf_t \right)$, scaled by a factor that captures the sensitivity to systematic shocks (β).[7] The residuals for these estimates correspond to the part not explained by the model and, therefore, a positive (negative) value suggests overvaluation (undervaluation). This same approach was applied in the cases of other emerging economies (Brazil, Chile, Mexico and Peru).

As shown in Graph B5.6, the results indicate that there are no overvaluation symptoms in the domestic stock market. In fact, all the countries that were analyzed register values that are lower than those expected by the model, with the

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3   The graphs for the other countries in the sample are not included because of space restrictions. However, the gap value (the ratio between the level observed and the trend component) for Brazil, Chile, Mexico and Peru was 0.96, 1.03, 1.07 and 1.31 respectively as of January 2011.

4   The third and fourth models mentioned are based on the exercises presented in the Financial Stability Report issued by the Central Bank of Chile for the second half of 2010 (Box III.3: "Determinantes de la evolucion del mercado accionario local").

5   Ideally, a measurement of expected profits should be used such as the one calculated by Bloomberg for Colombia. Unfortunately, that series has only been available since April 2008, so we use the profits observed instead.

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6   The rate for the one-month T-bills of the United States was used.

7   All the indices used in this exercise are denominated in dollars and were constructed by Morgan Stanley. The market index used is a regional index for Latin America (MXLA).

exception of Mexico and Colombia. Nevertheless, the difference between the observed value and the estimated value for these two countries is not statistically significant because both are at less than one standard error from the CAPM forecast. In addition, it is noteworthy that as in the cases of the other indicators studied, a correction in the level of stock market prices seems to have taken place since late 2010. In the context of this model, the above results are reflected by stock returns close to (and sometimes lower) those expected by the CAPM model.

In summary, even though the domestic stock market presented strong valuation levels in 2009 and over the first three quarters in 2010, that trend seems to have gradually reversed since late last year. The first group of indicators perfectly reflects this performance and shows that even though the P/E and the real index are still above their long term average, the gap between the two series has been reduced and, in most of the cases, they are at less than one standard deviation. Furthermore, the performance and level of these indicators are similar to those for other countries in the region.

Also, the performance of the P/E multiple for Colombia registered a gradual increase and lower levels of volatility since the beginning of 2009, which could mean that the fundamentals of the economy could be different from those registered during periods of high volatility such as 2006 and 2008. This was demonstrated by using a Chow test and implies that any comparison of the current levels with the historic data should be done cautiously.

In addition, both the Fed and the CAPM models suggest that the IGBC is slightly above the value estimated by these approaches. However, as a result of the magnitude of the deviations (less than one standard deviation) those differences are not statistically significant.

Finally, it should be mentioned that the share of stock held by households as part of their assets and as assets of both companies and financial intermediaries is still limited. Thus, any possible adverse developments in this market would not represent a direct source of instability for the financial system.

Graph B5.5
Excess of Return Based on the Fed Model[a/]

(percentage)
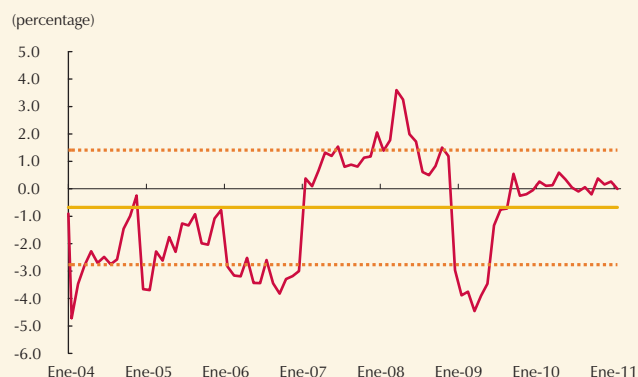
a/ Ten-year TES denominated in UVR minus the ratio of profitability/IGBC price. The dotted lines correspond to +/- one standard deviation with respect to the average.
Sources: Colombian Stock Exchange and Banco de la República, Banco de la República calculations.

Graph B5.6
Unexplained Component of the Stock Indices Based on the CAPM Model

(decimals)
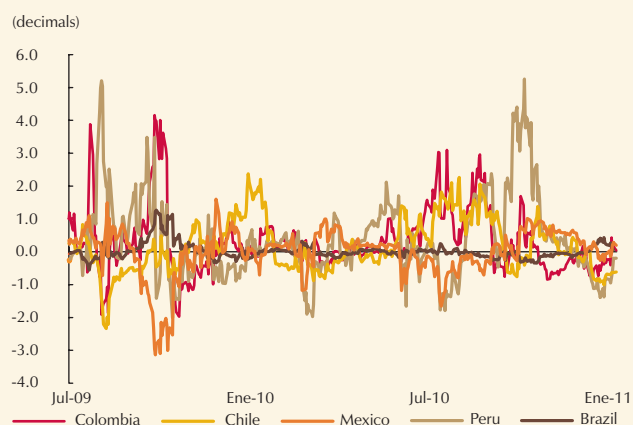
Colombia = 0.04; Peru = -0.19; Chile = -0.61; Brazil = -0.08; Mexico = 0.20.
Source: Bloomberg, Banco de la República calculations.

The Basilea Committee has proposed a set of changes to the current capital requirements and to the risk models of the financial entities as a response to the latest global financial crisis.[1] Specifically, the modifications are focused on not only increasing the level of capital required to calculate the capital adequacy ratio but also improving its quality. By having "better" capital, the entities would be more soundly positioned in the presence of adverse situations and at the same time, they would face lower losses which taxpayers would have to pay for. With respect to the risk models, the goal is for the financial entities to implement proper models and carry out stress tests periodically that would allow them to have a more conservative perspective in the case of potential risks.

Table B6.1 presents the new capital requirements proposed by the Basilea Committee. In agreement with Basilea II, the minimum level of total capital that the entities must maintain would not change but remain at 8% of the weighted assets. However, the structure of that capital would be substantially modified. The common equity would go from 2% to 4.5% and level 1 capital, which also includes preferred stock and retained earnings, would rise from 4% to 6%. As a complement, the Committee suggested two additional types of capital: conservation and counter-cyclical. The first should be 2.5% and be made up of only common equity.

The conservation capital would serve as "cushion" on the minimum regulatory 8% and would help the banks to withstand future stress episodes and restrict their discretion with respect to the management of their profits. It would also raise

Table B6.1
Basilea: New Capital Requirements

	Common equity	Level 1 Capital	Total Capital
		(percentage)	
Minimum	4.5	6.0	8.0
Conservation Capital	2.5		
Minimum + Conservation Capital	7.0	8.5	10.5
Counter-cyclical Capital	0 - 2.5		

Source: BIS.

the total level of capital to 10.5%. The counter-cyclical capital must be approved by each one of the regulators depending on the circumstances and will be used to avoid excessive growth of credit. Likewise, it must be made up of only common equity and could come to as much as 2.5%.

These modifications to the capital requirements will compel the financial entities to start a intense process of capitalization over the next few years. The Committee established that the reform would have to be approved in each country by 2013 and that the entities would have until 2019 to complete the process of complying with the new requirements. With these new levels of capital, the total capital could be as high as 13% of the assets weighted by risk (8% previously) and the common equity as high as 9.5% (2% previously). To put the increase in the regulatory capital into context, 99% of the losses experienced by the financial institutions during the crisis were within a range of 4% to 5% as a proportion of the assets weighted by risk.

In Colombia, it is important to emphasize that the quality of capital does not correspond to what is stipulated in the Basilea III proposal, in spite of the presence of a capital adequacy ratio that is higher than the one suggested by Basilea II. This is because the level 1 capital in Colombia is less restrictive than that proposed by the Committee. If the type of capital held by the financial institutions in Colombia were compared to the level 1 capital proposed by Basilea, the latter would not reach 4% of the assets weighted by risk. Therefore, a revision of the type of capital maintained by the financial institutions to calculate their capital adequacy ratio would be fundamental in order to improve their position in the event of adverse situations in the financial markets.

In reference to the handling of risk, Basilea thinks that the models must be modified, specifically by including more stringent exercises and stress tests to keep the financial system alert and well-prepared to face high volatility scenarios or crisis situations. With respect to the liquidity risk, the Committee suggests that the entities should closely monitor two indicators, one for short term and the other for long term. In the first case, the idea is that the financial entities should hold highly liquid instruments (reserves in the central bank and public debt securities) to back their liquidity expenses for a short period of time (one month). The second indicator is mostly taking measures to organize the assets in the system by means of which the institutions will be able to quantify the financing sources required to guarantee their long-term operations (one year). The liquidity risk in Colombia is monitored through the liquidity risk management system (SARL in Spanish). This was implemented in January 2009 and helps to quantify the minimum level of liquid assets denominated in both national and foreign currencies that make it possible

1   The United States Treasury also introduced a set of changes into the regulations of its financial entities. For more information, see the Financial Stability Report for September 2010.

for the entities to meet their payment obligations fully and on time. Following the recommendations of Basilea, it would be interesting to monitor the liquidity indicators over longer terms given that, in Colombia, the entities monitor them only for short periods of time.

The models for both credit and market risk, in turn, should be modified to include longer term horizons and periods of high volatility. In the case of the credit risk, the default probability must be estimated by considering a longer period of time in order to allow for the inclusion of changes in the risk conditions debtors have over the course of the cycle. Likewise, modifications in the calculation of the loss due to default are necessary since default would not be constant but rather would change considerably during recessionary periods. In addition, the new capital requirements modify credit risk to some degree in that they combat both the pro-cyclical problems caused by the capital requirements and the excessive growth of credit. In Colombia, the Credit Risk Management System (SARC in Spanish) currently operates in the case of both the commercial and consumer loan portfolios and has reference models for each one of them. However, the calculation used in those models, for example, for loss due to default does not include the new guidelines suggested by the committee.

With respect to the models for market risk and in addition to the conventional VaR, a stressed VaR would have to be calculated by using a twelve month period of high volatility which is relevant for the financial entity. The capital estimated by market risk will be a weighted average of these two calculations. In Colombia, it would be interesting to consider the use of stress tests to calculate the capital as proposed by Basilea. The inclusion of those tests could reduce both the vulnerability of the agents in the presence of adverse shocks and the pro-cyclical nature of the risk measurement.

Thus, it would seem to be appropriate for the regulatory authorities in Colombia to monitor the levels of capital and the risk models currently implemented by the financial institutions. Although the capital adequacy ratio in Colombia is well above the regulatory maximum (15.5% as of December 2010), it must be subjected to review, mainly with respect to the types of capital used to calculate it. This could be done by using the new proposal from Basilea as the starting point but without disregarding the Colombian context. Also, the risk models currently implemented could include additional stress tests as proposed by Basilea.

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Box 7
ANALYSIS OF THE FINANCIAL FEATURES OF THE RURAL SECTOR

The Financial Stability Report for September 2010 included a box on the survey of the financial burden and education of households (lefic in Spanish) done by the Banco de la República and DANE. That box incorporated information related to different indicators that make it possible to analyze the financial burden of Colombian households by age, gender, level of income, etc. However, it is not possible to differentiate between the rural and urban sectors using that information.

The survey given by the Program for Rural Opportunities of the Ministry of Agriculture and Rural Development is used to analyze the performance of the rural sector. This survey makes it possible to build indebtedness and financial education indicators similar to those of lefic and also provides information about the characteristics of the financial services used by rural households.

1.   Survey Information

The goal of the survey is to gather information about the general features of the producer and the project he belongs to, characteristics of the family in terms of expenditures, income and wealth, characteristics of the production and the housing before and after the proposal or the productive project was introduced as well as access to technical services for the product, and access to financial services and financial education.

The survey was taken of rural households that are part of the different organizations associated with the Program for Rural Opportunities[1] and differentiated between those that have and have not received benefits from the program. In general, districts in Caldas, Cauca, Chocó, Córdoba, Huila, Nariño, Risaralda and Sucre were included and 988 people were interviewed[2] who supplied the needed information concerning the structure of the households and the people who belong to them.

Different questions related to credit, savings accounts and insurance policies were asked in order to analyze the financial services. In general, the proportion of households with loans (43.8%) is higher than the proportion of those that have

savings accounts (25.6%) or insurance policies (12.5%). With respect to credit, the results show that of the households that requested loans (54.3%) almost 89% received them and that these were mainly granted by the Banco Agrario (44.4% of the households received at least one loan from this entity), followed by NGO's or other institutions (17.8%) and private banks (16.4%).[3] Also, the results show that the loans were mainly used to finance productive activity.

2.   Financial Indebtedness

Because the survey given by the Ministry of Agriculture and Rural Development does not provide detailed information with respect to debt repayment and interest payments made by the households and which is necessary to construct the financial burden indices, indicators are developed in this box that make possible to analyze the indebtedness level of the households in relation to both their income (III) and their wealth (IIW).

$$III = \frac{total\ amount\ of\ loans\ granted}{annual\ income\ of\ the\ household}$$

$$IIW = \frac{total\ amount\ of\ loans\ granted}{wealth\ of\ the\ household}$$

These indicators can provide information on the level of indebtedness for individual households and thus generate a more accurate measurement than can be obtained when working with aggregate levels of indebtedness, income and wealth. The indicators were analyzed by taking into account different characteristics of the head of the household such as age, gender, educational level and the size of the household.

It is important to mention that the indebtedness indicators in this box are not comparable with those published in the Financial Stability Report for September 2010 because the latter are related to the households' expenditures for payment of loans (debt repayment and interest) as proportion of their income whereas, in this study, the goal is to determine how much the household loans represent with respect to both their income and their wealth.

The loans represent 27% of the total income and 4.7% of the wealth of households at the aggregate level. However,

1   Program for Development of Investment Opportunities and Capitalization of Assets in Rural Micro-Companies from the Ministry of Agriculture and Rural Development.

2   Expansion factors that show how representative a household in the sample was were used in order to make the survey representative. This makes it possible to estimate the behavior of the population under analysis based on the answers of the surveyed households.

3   Information about the loans granted by the official bank, private banks, cooperatives, any financial intermediary, NGO and related institutions, friends or relatives, private lenders and otherss was included.

the data is very dispersed when the information is analyzed based on the characteristics of the head of the household.

Graph B7.1 shows information broken down by the age ranges of heads of households and indicates that the higher indebtedness levels as proportion of income are concentrated in the age ranges of 30 to 39 and 40 to 49. Meanwhile, the indicator as a proportion of wealth drops as the age goes up. That is why, the age range that has the lowest level of IIW is that for 60 years or older (2.3%).

When the differentiation is by gender, it is clear that men have higher levels of indebtedness than women in both the indicators for income and those for wealth (Graph B7.2). This pattern of lower indebtedness for women is consistent with the information from Iefic presented in the Financial Stability Report for September 2010, in which the financial burden indicators for women registered lower levels.

If the analysis is differentiated by educational level, a positive relationship between the head of the household and the borrowing capacity is found as long as the head of the household has completed high school studies (Graph B7.3). Nevertheless, there are high indebtedness levels for households where the head of household does not hold any educational degree other than perhaps elementary level. For this analysis, it is necessary to take into account the fact that many rural loans belong to special lines created for a vulnerable population and that the educational level is not a decisive factor for granting credit.

Finally, when the financial indebtedness indicators are analyzed based on the size of the household, the outcome in the case of the small households (up to three people) shows that the more people there are in the home, the higher the level of indebtedness is as a proportion of both the income and the wealth (Graph B7.4). However, in the case of households with more people (three to fifteen people) the indicators decline. This performance is due to the fact that in most of the surveyed households (65%) the other members are engaged in other productive activities that make it possible for them to achieve higher levels of income and wealth.

3. Perception of Indebtedness and Financial Education

In terms of the perception of indebtedness, the surveyed households generally thought that their level of indebtedness was appropriate although they would like to reduce it (89.5%). When questioned about their expenditures to cover debts, 44.7% answered that the expenditures were lower than their total monthly income, 34.7% considered them higher than their monthly income, and 17.1% thought they were equal to their total monthly income. Similarly, when asked to grade their level of indebtedness, 35.1% of

Graph B7.1
Indebtedness by Age

(percentage)
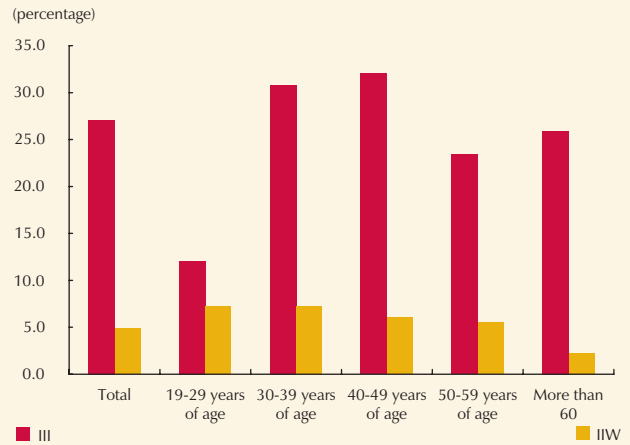
Sources: Rural Opportunities Survey from the Ministry of Agriculture and Rural Development, Banco de la República calculations.

Graph B7.2
Indebtedness by Gender
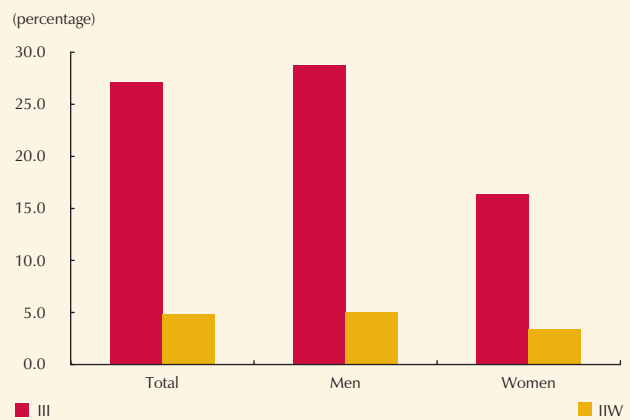
(percentage)

Source: Rural Opportunities Survey from the Ministry of Agriculture and Rural Development, Banco de la República calculations.

Graph B7.3
Indebtedness by Educational Level

(percentage)

Source: Rural Opportunities Survey from the Ministry of Agriculture and Rural Development, Banco de la República calculations.

(percentage)

Graph B7.5
Answers to the Questions on Financial Education

(percentage)
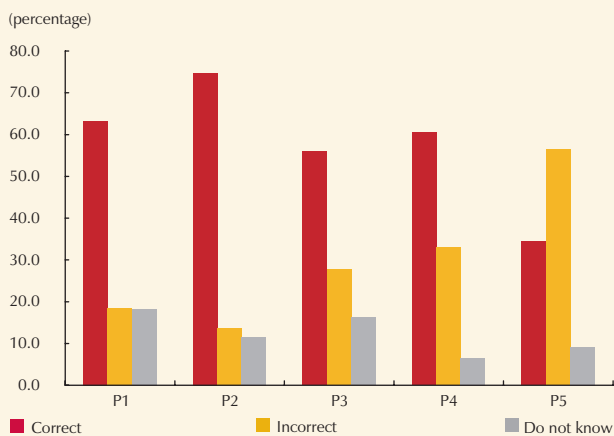
Q1. Compounded Interest
Q2. Simple Interest
Q3. Inflation
Q4. Inter-temporal Value of Money
P5. Money Illusion

the households said they had an appropriate level, 34.4% thought their level was low, 22.2% considered it high, and 5.7% said it was excessive.

With respect to financial education, the questions included in this survey corresponded to the first five ones from lefic.[4] The results show that the rural households have a level of knowledge that is similar to those surveyed by DANE and Banco de la República with an average of 63.6% correct answers to the questions related to inflation, interest rate and inter-temporal value of money. However, in reference to the question about money illusion only 34.4% of the households answered it correctly (Graph B7.5).

Although the level of rural education does not differ from that of the other households significantly, the results that were found show that it is necessary to implement strategies that will make it possible to elevate the financial education in that sector in order to increase the access to other financial services and improve the borrowing capacity of the households.

4   The questions included refer to simple interest, compounded interest, inflation, inter-temporal value of money and money illusion.

IV.   POTENTIAL RISKS

In the second half of 2010, there was an improvement in the risk for the consumer, commercial and micro-credit loan portfolios which is reflected in both the transition matrices and the harvests. In contrast, the risk indicators for the housing loan portfolio worsened but this situation is related to the securitizations carried out at the end of last year. Furthermore, the low volatility in the prices for public debt securities continued and this leads to lower market risk. However, commercial banks and pension funds are still showing relatively high levels of exposure due to their holdings of government bonds.

A.   MARKET RISK

1.   Financial System Exposure to Public Debt Securities

The PFMs, trust companies (TCs)[38] and commercial banks are the entities within the financial system that manage and bring together the largest quantity of public debt securities. As for the credit entities, the commercial banks had accumulated 95.9% of the outstanding TES as of February 2011 and this change with respect to six months before was -3 pp (Graph 72, panel A). The PFMs and TCs, in turn, held a share of 88.6% (46.9% and 41.7% respectively) of the total government bonds held by the NBFI. This had been 87.9% in August 2010.

The insurance companies' share of the NBFI investments in government debt was 10%, a level they maintained between August 2010 and February 2011 (Graph 72, panel B).

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38   In this edition of the Financial Stability Report, the portfolio managed by the trust companies for third parties will be analyzed and not only the one that belongs exclusively to them as was done in previous versions.

Graph 72
Share of Outstanding Peso and UVR-denominated TES in
Loan Portfolios

A.   Credit Institutions

(percentage)

Financial corporations	Financing companies
Cooperatives	Banks

B.   Non-banking Financial System

(percentage)
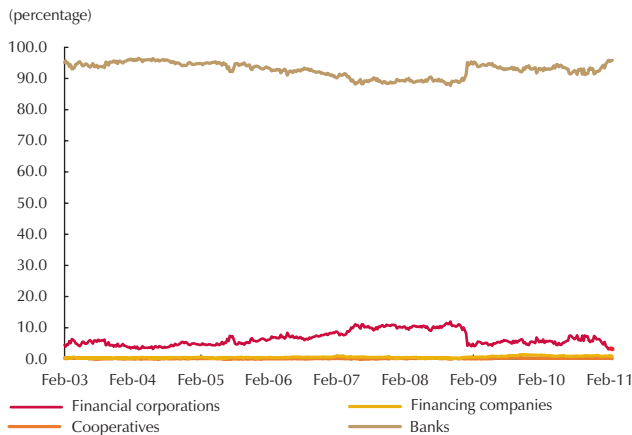
Brokerage firms	Trust companies
Insurance companies	PFM
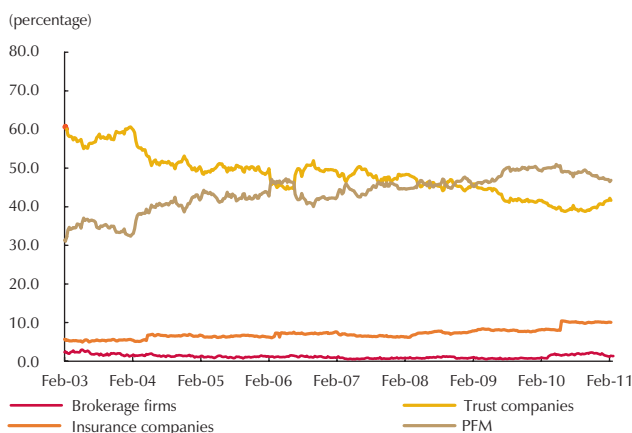
Source: Banco de la República.

Graph 73
Outstanding Peso and UVR-denominated TES Held by
Commercial Banks, PFM and Trust Companies

(trillions of pesos)

Banks	PFM	Trust Companies
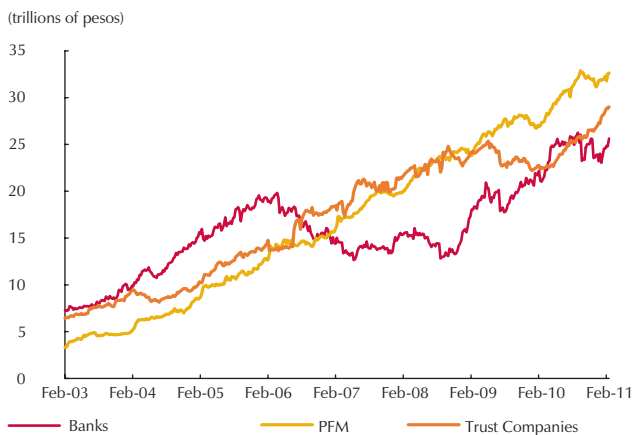
Source: Banco de la República.

The outstanding TES managed by the PFMs and TCs rose COL$833 b and COL$3.8 t respectively between August 2010 and February 2011. During the latter month, it reached a value of COL$32.6 t for the PFMs and COL$29 t for the TCs. The commercial banks, in turn, decreased their holdings of TES by COL$144.5 b during the same period and ended up with COL$25.6 t in February (Graph 73).

In the case of the banks, not all of the investments are exposed to changes in market prices.[39] That is why it is important to analyze the change in the amount exposed[40] to market risk for these entities. During the last six months, the amount that commercial banks have which is exposed rose COL$347 b and was at COL$18.8 t in February 2011. This increase is because of the larger proportion of negotiable securities (73.5%) compared to what had been registered six months before (72.6%) (Graph 74). As a result, the levels at which commercial banks are exposed to market risk continue to rise and are within their highest levels for the period under analysis.

With respect to the composition of the portfolio by currency, it can be seen that both the commercial banks and the PFMs and TCs are holding to their preference for securities in pesos. As of February 2011, their share within the portfolio was 88.8%, 62.2%, and

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39   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.

40   The amount that is exposed is defined as the balance of the public debt securities that is subject to changes in the market price. Thus, this corresponds to the total negotiable securities plus those that are available for sale.
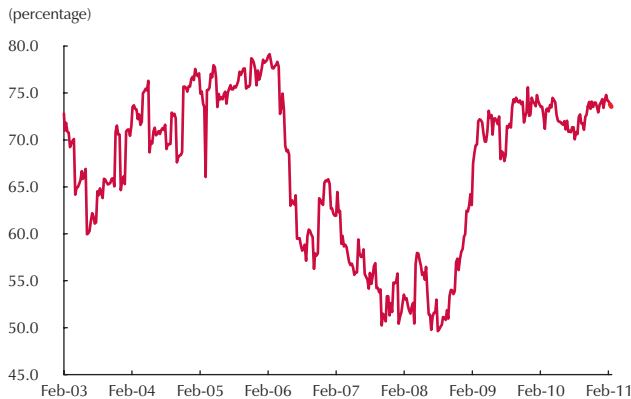
83.2% respectively. The commercial banks and TCs, in turn, increased their holdings in peso-denominated securities between August 2010 and February 2010 by 6.2 pp and 2.6 pp. However, the PFMs registered a re-structuring towards UVR-denominated securities. The share of these within the TES portfolio rose 2 pp (this corresponds to an increase of COL$945 b), and came to 37.8% in February of this year (Graph 75).

Going by maturities, the banks, PFMs and TCs have different components in their portfolios as a consequence of the structure of their businesses. Graph 76, panels A and C, shows that the securities held by banks and TCs are primarily medium and short term ones while securities that the PFMs hold are either long or medium term ones (panel B).

Between August 2010 and February 2011, commercial banks registered a shift in the make-up of their portfolios from short term assets[41] to medium term ones. During this period, the share of the medium term ones in the portfolio rose as they went from 41.7% to 52.8% while the share of the short term saw a decline from 52.8% to 38.3% (Graph 76, panel A). This led to an increase in the duration of the TES portfolio belonging to these entities.[42] This was 2.5 years in February of the current year while it had been 2.2 years in August of last year. This indicates a rise in the interest rate risk (Graph 77).

The PFMs, in turn, continue to hold long term securities and as of February of this year, the share was 52.3%. However, these showed a decline of 4.5 pp for the previous six months and short term securities were substituted for them first of all. The share of short term securities rose 2.7 pp and came to 6.7% of the total portfolio in February. Secondly, they were replaced by medium term securities, which rose 1.8 pp and came to 41.0% during the same month (Graph 76, panel B). The above is consistent with a drop in the duration of the portfolio for these entities. This duration went from 5.7 years in August 2010 to 5.4 years in February of the current year, which led to a decline in the interest rate risk (Graph 77).

Furthermore, between August 2010 and February 2011, the TCs registered a shift in their portfolio from short term securities to medium term ones. The share of the former declined 5.5 pp and was at 24% in February. Meanwhile, the share of the latter rose 5.6 pp and came to a 60% proportion. The long term securities, in

---

41 Based on maturities, investments are classified into short, medium and long term. The first ones correspond to those that have a maturity that is less than or equal to two years; the second, between two and eight years; and the last, to those that reach maturity after more than eight years.

42 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.

Graph 75
Composition of Investment in TES by Monetary Unit

A.   Commercial banks

(percentage)

Pesos   UVR

B.   PFM

(percentage)

Pesos   UVR

C.   Trust Companies

(percentage)

Pesos   UVR
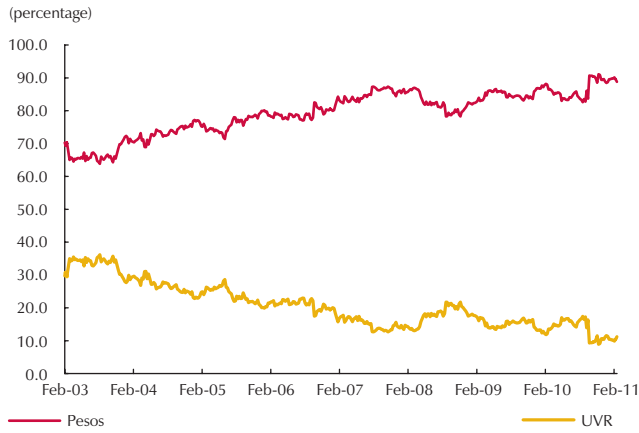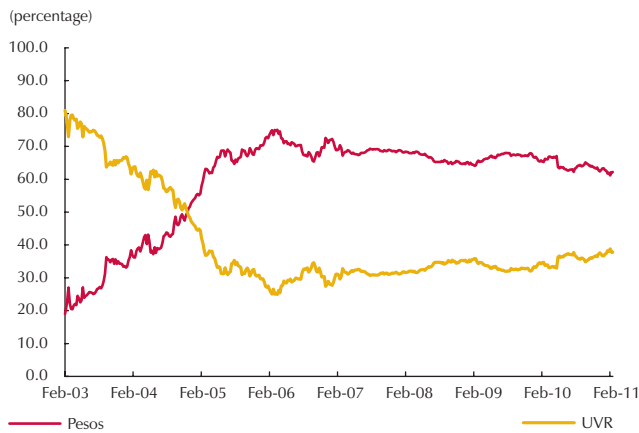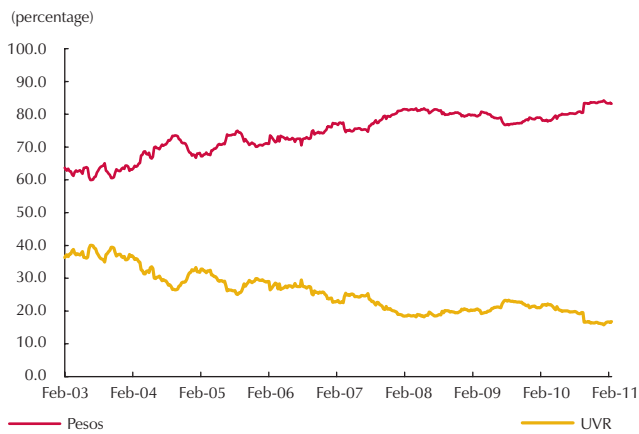
Source: Banco de la República.

Graph 76
Composition of Investment in Peso and UVR-denominated
TES by Maturity

A.   Commercial banks

(percentage)

Less than two years   Between two and   More than eight years
                        eight years

B.   PFM

(percentage)

Less than two years   Between two and   More than eight years
                        eight years

C.   Trust Companies

(percentage)

Les s than two years   Between two and   More than eight years
                        eight years
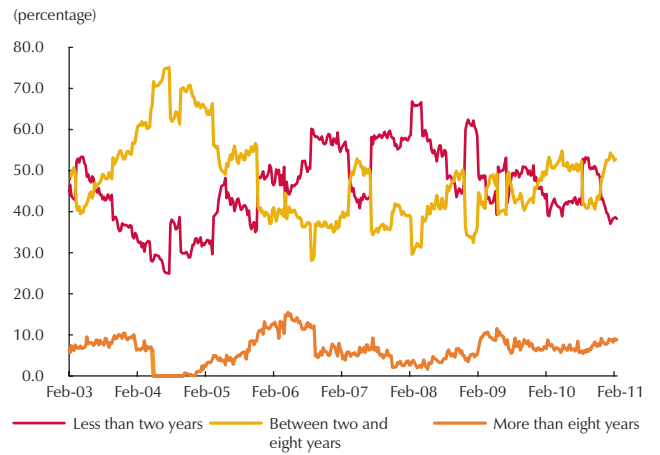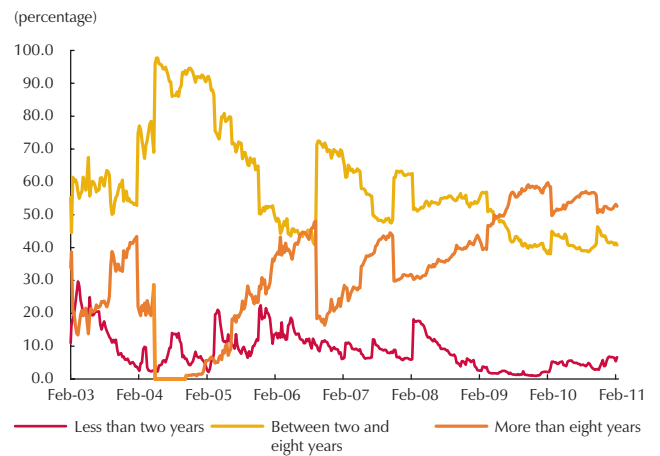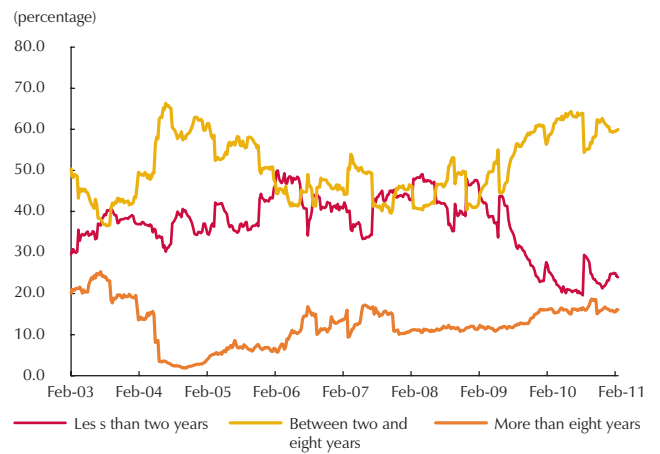
Source: Banco de la República.

Graph 77
Duration of Commercial Bank, PFM, and Trust Company TES Portfolios

(years)
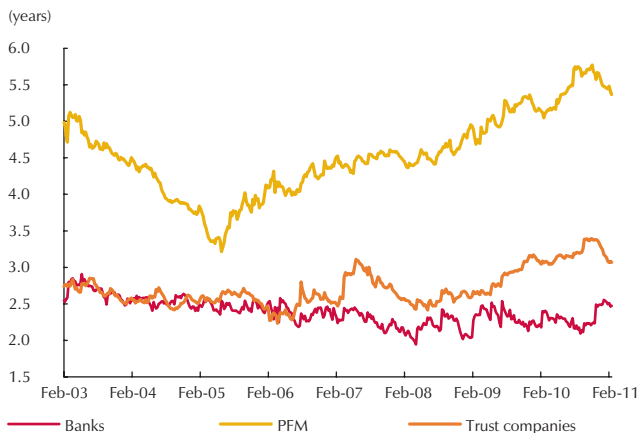
Graph 78
Appreciation Losses with a 200 bp Increase

A.   Credit Institutions

(billions of pesos)   (billions of pesos)

B.   NBFI

(trillions of pesos)
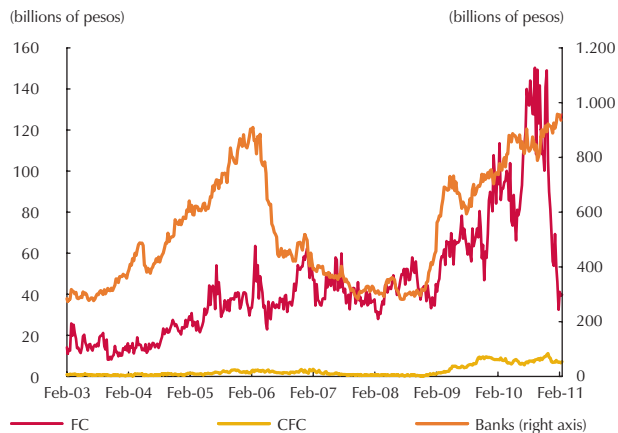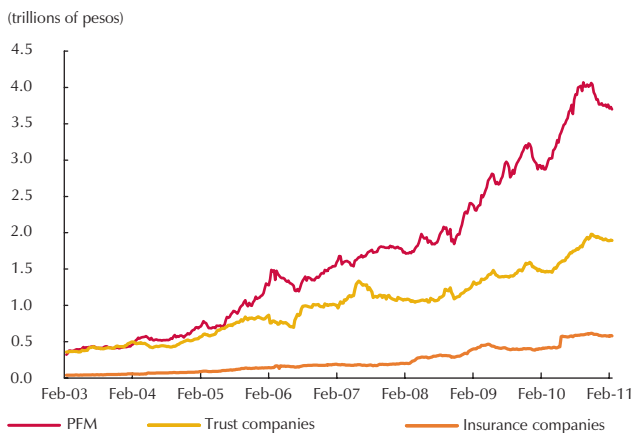
turn, registered a stable share of the portfolio which was 16% as of February of this year. With respect to the duration of the TC portfolio, this indicator was 3.2 years as of February 2011, which is close to what had been registered six months before (3.1 years) (Graph 77).

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.[43] 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 increase 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. Here, a dynamic performance on the part of the entities is taken into account.

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

Graph 78 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 pertains 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, given their higher share of negotiable securities and the increase in the duration, a rise

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43   For the UVR-denominated TES, an increase in the real spread over 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 does not change.

in their exposure to market risk can be seen. As of February 18, 2011, the losses came to COL\$959.5 b, a figure that surpasses the losses that would have been incurred if the shock had occurred six months before by COL\$121 b. It must be emphasized that this level of exposure is the maximum within the period analyzed. During the last six months, the financial corporations (FC) considerably reduced their exposure to market risk as a result of the sharp fall in their exposed outstanding TES. These were COL\$2.1 t as of August 2010 while in February of this year they were only COL\$785 b. This led to lower losses in this exercise for these entities. For this date, the losses would have been COL\$39.8 b while six months before they would have been COL\$136 b.

In panel B, the losses resulting from an interest rate shock for the NBFI is shown. As of February 2011 according to the exercise, these would have been COL\$6.2 t, which is COL\$185 b lower than they would have experienced six months before. This decrease is primarily due to the potential losses of the pension funds, which would have been COL\$3.7 t on the same date. This is COL\$300 b less than the ones they would have had in August 2010. This reduction in exposure to market risk is mainly due to the above-mentioned decline in the duration of the portfolio. The TCs and insurance companies, in turn, registered levels of exposure that were similar to those seen six months earlier. As of February 18, 2011, these entities would have lost COL\$1.9 t and COL\$582 b respectively.

When analyzing the losses in the exercise as a percentage of the credit institutions' profits, a small rise is seen in the last six months. As of February 2011, the losses represented 17.1% of the earnings, a figure that is 10 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 by 19.9% (this is 2.8 pp higher than what they would have been in August 2010). The CFs, in turn, would have suffered a devaluation that would have represented 6.2% of their profits, a number that is 21.5 pp lower than the one from six months ago. Thus, there is a varied performance in the exposure to market risk for the banks and CFs with respect to profits (Graph 79, panel A).

When the losses in relationship to the value of the total NBFI portfolio[44] are considered, the PFMs are the institutions that are the most exposed to a shock in the interest rates for the TES. As of February 2011, they would have lost 3.2% of their portfolio while the TCs and insurance companies would have lost 1.9% and 2.6% respectively. The fact that the last two sectors exhibited a stable level in their exposure over the last six months while the exposure of the PFMs declined needs to be emphasized.

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44   Due to a change in the methodology, the results for the NBFI are not comparable to those in the previous Financial Stability Report. In that one, the losses from the NBFI exercise were compared to the value of their equity while in the current edition, they are compared to the value of their portfolio or of the portfolio they manage.

Graph 79

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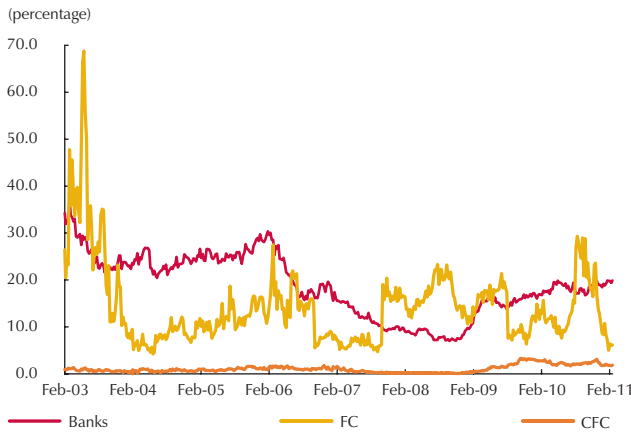
(percentage)

B. Appreciation Losses with a 200 bp Increase as a Percentage of Portfolio Equity for NBFI[a/]

(percentage)
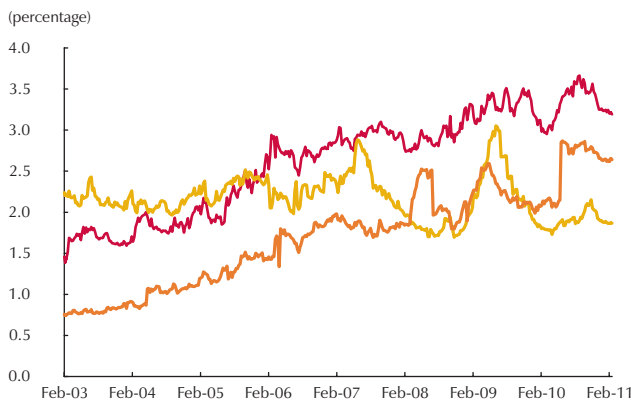
a/ Annualized profits and portfolio value as of December 2010 are being used for the 2011 calculations.
Source: Banco de la República.

b. *Exercise 2: A Parallel Shift in the Zero-coupon Yield Curve for TES Considering Changes in Duration and in the Outstanding Balance[45]*

In this exercise, different scenarios of changes in the government bond rates are considered. These correspond to the 99, 80, and 60 percentiles of the annual increases that have been seen in the zero-coupon curve denominated in pesos 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 6.

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 medium and moderate scenarios, in turn, these changes were calculated through econometric estimates.[46] For this exercise, the public debt portfolios as of February 18, 2011 were taken. The results for this are presented in Table 7.

In the case of the credit entities, in the event of a 300 bp increase in the TES rate, the banks and FCs would lose 18.1% and 9% respectively of their annualized earnings

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45 It is worth noting that the two exercises that were done were defined differently and, as a result, they 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.

46 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 curve. The sample considered has 399 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 88 monthly observations.

Table 6
Scenarios Used for the Stress Test

A. Credit Institutions											
	Scenarios										
	1. Extreme[a/]				2. Medium[b/]				3. Moderate[c/]			
Type of entit	BC	FC	CFC	Coop	BC	FC	CFC	Coop	BC	FC	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	PFM	Other	PFM	Other	PFM	Other
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.

Table 7
Results of Stress Test

A. Credit entities												
Type	Duration (years)	Negotiable securities (percentage)	Total balance	Exposed balance	Market price	Annualized profit	Scenario 1		Scenario 2		Scenario 3	
				(trillions of pesos)			($b)	(%)[a/]	($b)	(%)[a/]	($b)	(%)[a/]
Commercial banks	2.19	0.74	25.36	18.85	20.51	4.81	(872)	(18.1)	(803)	(16.7)	(619)	(12.9)
FC	2.38	0.92	0.85	0.78	0.87	0.65	(58)	(9.0)	(39)	(6.1)	(30)	(4.6)
CFC	1.91	0.77	0.23	0.17	0.20	0.39	(9)	(2.4)	(7)	(1.7)	(5)	(1.3)
Financial cooperatives	3.21	0.86	0.03	0.03	0.03	0.06	(3)	(4.7)	(2)	(3.2)	(2)	(2.4)

B. NBFI										
Type	Duration (years)	Total balance	Market price	Equity value	Scenario 1		Scenario 2		Scenario 3	
			(trillions of pesos)		($b)	(%)[b/]	($b)	(%)[b/]	($b)	(%)[b/]
PFM	5.36	32.63	37.87	115.91	(5.885)	(5.1)	(3.969)	(3.4)	(2.988)	(2.6)
Trust companies	3.07	29.03	32.63	101.40	(3.006)	(3.0)	(2.004)	(2.0)	(1.503)	(1.5)
Insurance companies	3.97	6.97	7.89	22.03	(939)	(4.3)	(626)	(2.8)	(470)	(2.1)
Brokerage firms	1.66	0.94	1.04	5.09	(52)	(1.0)	(34)	(0.7)	(26)	(0.5)

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

as of December 2010. Meanwhile, given their low balance of TES, the CFCs and cooperatives would lose 2.4% and 4.7% respectively.

Among the NBFI, the pension funds are the entities that would have the largest losses in each one of the scenarios. In the most extreme one, these institutions would lose around COL$5.9 t, which represents 5.9% of the value of their portfolio as of December 2010. In the same scenario, the TCs, insurance companies, and stock brokerage firms would lose 3%, 4.3% and 1% respectively of the value of their portfolio.

To summarize, varied trends in exposure to market risk are seen among financial system institutions. The commercial banks have increased their exposure given the longer duration of their portfolio and the larger percentage of negotiable securities that are available for sale. The PFMs and the FCs, in contrast, have reduced their exposure due to a more limited duration in the portfolio for the former and smaller holding of TES for the latter. The TCs and insurance companies, in turn, are maintaining stable levels of exposure.

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 period. 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.[47]

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,[48] these factors were established for specific maturities for both the zero-coupon curve for TES denominated in pesos and for the one denominated in UVR between January 3, 2003 and February 18, 2011. The results of the annualized volatility of the returns that were obtained using the constant correlations (model CCC) are presented in Graph 80.

Just like what was observed in the first half of 2010, between August 2010 and February of this year 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. This performance is derived from a stable trend in the benchmark interest rates and in inflation (Graph 80).

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47   The details of the methodology used can be found in O. Martinez and Uribe, J.M. (2008), "Una aproximación dinámica a la medición del riesgo de mercado para los bancos comerciales en Colombia," Financial Stability Issues, Banco de la República, p. 31.

48   Risk Metrics (1996), Technical Document, J.P. Morgan/Reuters, Fourth Edition, December 1996.

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 February 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 81).

With respect to the credit institutions, the VaR was calculated for the banks and for the financial corporations (panel A). Between August 2010 and February 2011, given the low levels of volatility, this indicator presented a reduction as a percentage of the portfolio. In February, the overnight VaR for banks was at 0.03% unlike the 0.04% registered in August. For the FCs, in turn, this indicator went from 0.08% to 0.01% during the same period.

In the case of the NBFI, the overnight VaR was estimated for the PFMs, insurance companies, and TCs. As can be seen in panel B, a characteristic of the second half of 2010 was the decline in the VaR for all of the entities. In February of the current year, the overnight VaR for PFMs was at 0.24% of the portfolio value, it was 0.09% for the insurance companies, and 0.06% for the TCs.

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 composition of the portfolio of this type of entity from the standpoint of maturities in the sense that not only the insurance companies but also the TCs and the PFMs 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 the longest duration have a more noticeable change in the value of their portfolio in response to negative events in the yields of TES. Therefore, the PFMs and the insurance companies are more sensitive to market risk.

With the analysis done in this section, it can be concluded that exposure to market risk has risen for commercial banks and has declined for PFMs and the FCs. Between August 2010 and February 2011, the low volatility in the price for these securities led to lower levels of VaR as a percentage of the portfolio. Nevertheless, it is important to continue closely monitoring this risk given that a change in volatility along with

Graph 80
Annualized Daily Volatility of the TES Zero-coupon Curve

A.   In pesos
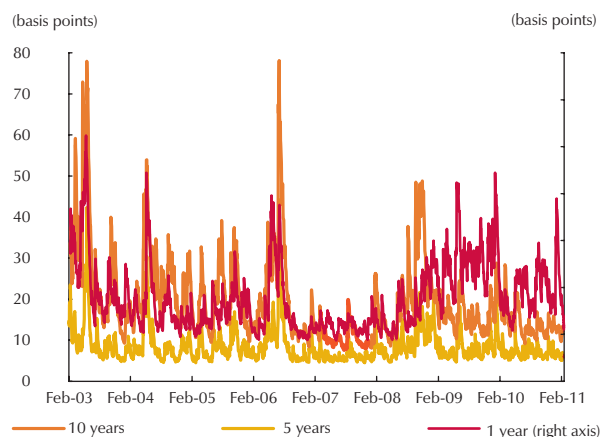
B.   In UVR

Source: Colombian Stock Market, Banco de la República calculations.

Graph 81
VaR as a Percentage of Value of Exposed Balance

A.   Credit Entities
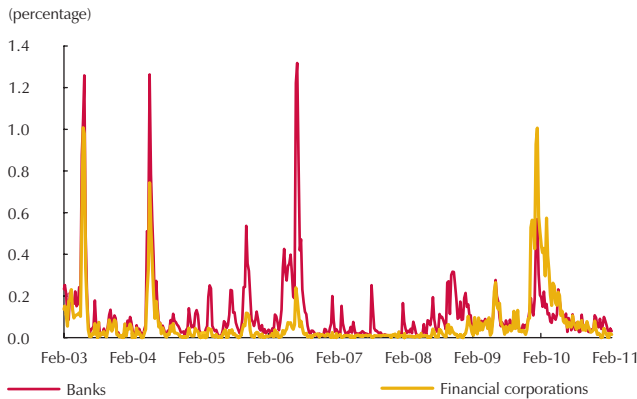
(percentage)

B.   Non-banking Financial Entities

(percentage)
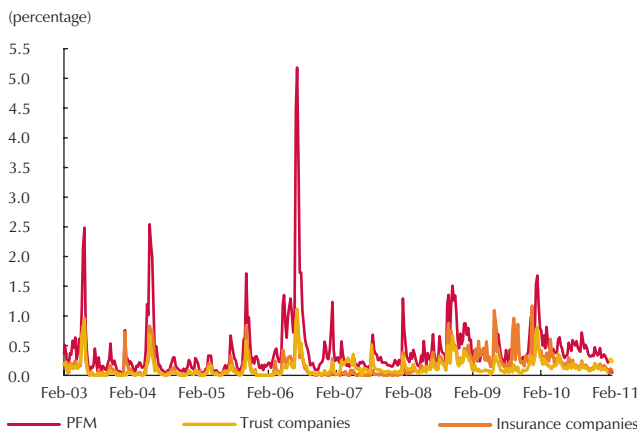
Source: Colombian Stock Market, Banco de la República calculations.

larger holdings of securities could show adverse results for the financial institutions' balance sheets.

B.   CREDIT RISK

1.   Credit Institutions

In the second half of 2010, a significant recovery in the rate of growth for the gross loan portfolio was registered. It was accompanied by declines in the default indicators and in those for 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 8.

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.[49] The shocks in the macroeconomic variables

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49   For more information on these methodologies, see "Un análisis de cointegración para el riesgo de crédito" in the Banco de la República "Financial Stability Issues," Financial Stability Report, September 2008.

Table 8
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
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
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.

increase the non-performing loan portfolio for the different types of loans. This means 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 a rise in the costs of deposits along with higher earnings for the loans issued at variable rates. Depending on the size of the growth of the lending and borrowing rates, this effect on the banks' profits will be positive or negative.[50]

The results of the moderate scenario indicate that the macroeconomic shocks have a substantial effect on the profitability of banks (Table 9). Likewise, when these results are compared to those obtained in the previous Financial Stability Report, one sees that the profitability declines by a larger quantity for all of the shocks. When the aggregate shock is evaluated, we see that the profitability of the banks would drop from COL$6.4 t before the shock to COL$2.9 t afterwards. This represents a plunge of 54.2% in profit. In this case, the effects of the macroeconomic changes are not sufficient for the profit to be negative in any of the banks.

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 2.9% to 0.2%, which would represent a 91.1% reduction in profits. Likewise, if there is an increase in the unemployment rate, the ROA would go from 2.9% to 1.6%. When a simultaneous shock is considered, it can be seen that the earnings of the banks would be reduced COL$6.9 t. This would cause nine institutions to register a negative profitability as a result of the shock (Table 10).

Table 9
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 December 2010 (percentage)	2.91	2.91	2.91	2.91
ROA after the shock to each loan portfolio				
Commercial	2.15	2.59	2.51	2.09
Consumer	2.31	2.49	2.29	2.26
Housing	2.87	2.89	2.87	2.83
Total loan portfolio	1.56	2.12	1.89	1.33
Profit as of December 2010 (b)[e/]	6.423	6.423	6.423	6.423
Stressed profit (b)	3.451	4.688	4.163	2.940
Decline in profit	2.973	1.735	2.260	3.483
Number of banks with negative profit due to the shock	**0**	**0**	**0**	**0**

a/ Domestic demand (commercial and consumer) or GDP (mortgage).
b/ Interest rates (consumer and commercial) or housing prices (mortgage).
c/ Unemployment.
d/ Combination.
e/ Test done on profit before taxes.
Source: Banco de la República.

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

Table 10
Stressed ROA, Stressed Profits, and Number of Banks with Negative Profitability after the Extreme Shock

	Shock 1[a/]	Shock 2[b/]	Shock 3[c/]	Shock 4[d/]
ROA seen as of December 2010 (percentage)	2.91	2.91	2.91	2.91
ROA after the shock on each loan portfolio				
Commercial	1.44	2.84	2.45	1.76
Consumer	1.66	2.57	2.14	1.36
Housing	2.84	2.90	2.80	2.74
Total loan portfolio	0.24	2.22	1.63	(0.23)
Profit as of December 2010 (b)[e/]	6.423	6.423	6.423	6.423
Stressed profit (b)	520	4.898	3.592	(506)
Decline in profit	5.904	1.525	2.831	6.929
Number of banks with negative profit due to the shock	**5**	**0**	**0**	**9**

a/ Domestic demand (commercial and consumer) or GDP (mortgage).
b/ Interest rates (consumer and commercial) or housing prices (mortgage).
c/ Unemployment.
d/ Combination.
e/ Test done on profit before taxes.
Source: Banco de la República.

2. Analysis of Loan Portfolio Concentration and Credit Risk

a. Commercial Loan Portfolio

As of December 2010, the commercial loan portfolio represented 55.9% 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 12.3%, a figure that is similar to the average for the period under analysis but significantly above that seen in June 2009 (0.9%). However, the number of debtors continued to follow the declining trend it has been showing in the last two years and, as of December 2010, the average amount per debtor was at 309.7 m (Table 11).

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 December 2009, the five largest financial institutions accounted for 55.7% of the loan portfolio, a year later, they accounted for 64.3%. This trend is also seen when the ten largest entities are analyzed. In this case, the share went from 74.6% towards the end of 2009 to 85% in December 2010. This is because of the absorption of the leasing companies by their parent companies in 2010 (Graph 82).

The concentration level of the loan portfolio could, in turn, also be evaluated by debtors and the size of the loans. When the borrowers are organized from larger

Table 11
Commercial Loan Portfolio Capital

Date	Balance[a/]	Number of debtors	Average amount per debtor[b/]
Jun-04	51.6	263.478	195.7
Dic-04	59.7	274.543	217.5
Jun-05	60.8	289.018	210.4
Dic-05	61.9	312.687	198.0
Jun-06	68.3	333.934	204.4
Dic-06	76.2	362.943	210.0
Jun-07	80.8	395.963	203.9
Dic-07	89.7	432.588	207.4
Jun-08	89.8	431.552	208.1
Dic-08	102.6	415.472	247.0
Jun-09	103.4	401.073	257.7
Dic-09	101.7	394.741	257.6
Jun-10	104.3	384.561	271.3
Dic-10	114.2	368.666	309.7

a/ Balances in trillions of December 2010 pesos.
b/ Balances in millions of December 2010 pesos.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

to smaller, it is clear that the number of debtors[51] that represent 90% of the loan portfolio has declined since it went from 7.9% to 7% between December 2009 and the same month in 2010 (Graph 83).

The rise in concentration could be associated with the economic slowdown that has been seen since 2007 and the preference to stay with debtors that have high risk ratings. This result is consistent with what is seen in Table 11 where it is evident that while the number of debtors in the commercial loan portfolio has fallen (-6.6%), the amount of capital had risen to a real annual 12.3% in December 2010.

Finally, when an aggregate analysis is done between companies that produce tradable goods and those that produce non-tradable ones, there is a drop in the concentration which reduces the gap between these sectors (Graph 84). For December 2010, the share of the non-tradables fell 3.4 pp and was at 57.6%. The lower concentration obtained within this analysis is consistent with the results from the survey of the current credit situation in Colombia where a recovery of access to credit for the industrial sector is seen in 2010.

Graph 82
Commercial Loan Portfolio Concentration in the Largest Financial Entities

(percentage)

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

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51   This refers to the borrowers with the largest loans.

Graph 83
Percentage of Debtors Accounting for 90% of the
Commercial Loan Portfolio
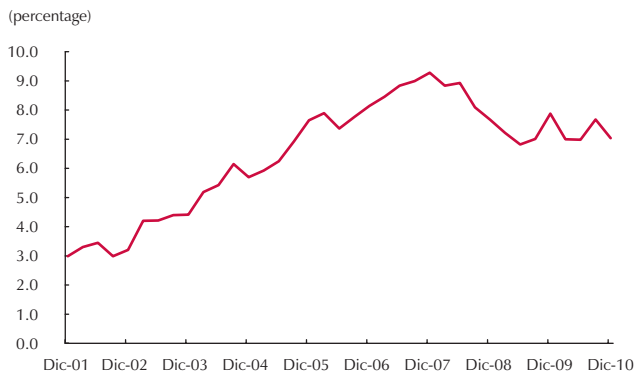
(percentage)

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

Graph 84
Share by Type of Sector

(percentage)

— Non-tradables   — Tradables
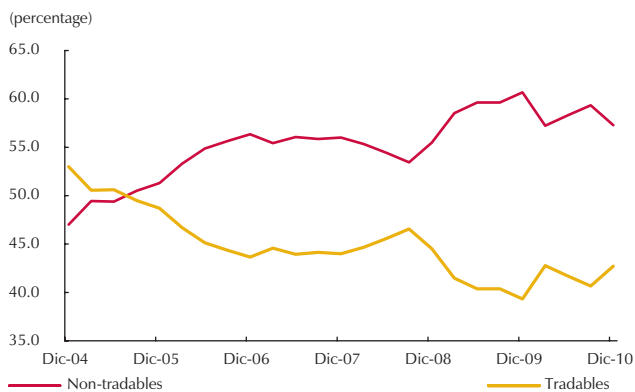
Source: Financial Corporate Superintendency of Colombia, Banco de la República calculations.

Graph 85
Share of Risky Loan Portfolio by Rating
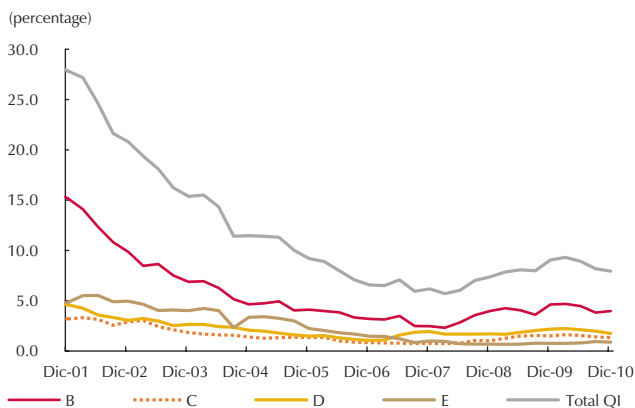
(percentage)

— B   ···· C   — D   — E   — Total QI

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

2)   Credit Risk

When the changes in the loan portfolio quality index are analyzed, one sees that it declined as it went from 9.1% in December 2009 to 7.9% a year later. This was due to shrinkage in the number of loans rated as B, C, and D (Graph 85). Moreover, the fact that the share of loans that are considered high risk (rating E) in the risky portfolio rose must be emphasized as they went from 8.4% to 11.2% during the same period of analysis.

Although this 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 using other indicators based on the number of loans. Two indicators are constructed for this: one of quality based on the number of operations (OQI) measured as the ratio between the risky loans and the total loans and another that shows the ratio between the nonperforming loans based on the number of operations and the total (NLIO).

Graph 86 shows the QI for the tradable and non-tradable sectors. When the performance of this indicator is analyzed by sector of the economy, it can be seen that while the QI for the non-tradables declined in 2010 as it went from 6.9% in December 2009 to 4.4% a year later, in the case of the tradables, there was a contraction only in the last quarter of the year and the QI was at 8.6%.

The measurements for the OQI and NLIO are given in Table 12 where it can be seen that although they have higher values than those for the amount of loan indicators, their performance is similar since they showed substantial increases in 2009 and declines in 2010. The difference between the amount of loan indicator and debtor 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

Graph 86
Loan Portfolio Quality Indicator by Type of Sector

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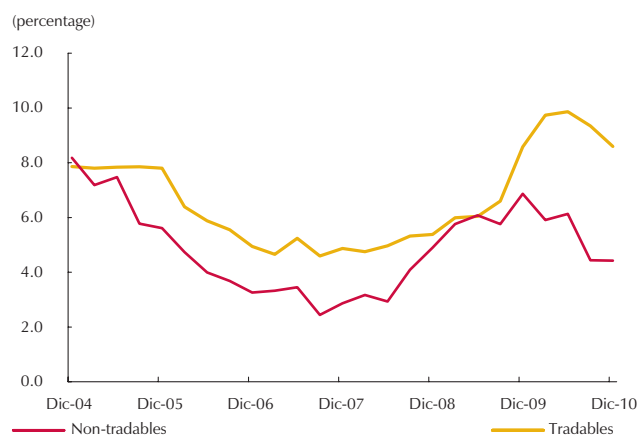
Sources: Financial Superintendency and Superintendency of Corporate Affairs of Colombia, Banco de la República calculations.

another. Those on the diagonal have a 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 risk levels.

The average transition matrix between March 2002 and December 2010 is found on panel A of Table 13. 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 are higher than the ones in the lower triangle so the probability of deterioration is higher than the probability of improvement.

The transition matrices for September and December 2010, 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 intermediate ratings, which shows lower mobility between ratings. Nevertheless, although the probabilities of remaining at the A, B, and C ratings were seen to decline when these last two matrices are compared, the percentages in the upper triangle were higher in September 2010 so the probabilities below the diagonal for the last quarter of the year were higher.

Table 12
Quality and Default Indicator by Number of Commercial Loans

Date	Totals	Risks	In default	ICO	IMO[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

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 13
Transition Matrices for the Total Commercial Loan Portfolio
(percentage)

A. Average Transition Matrix between March 2002 and December 2010					
	A	**B**	**C**	**D**	**E**
A	95.0	3.9	0.8	0.2	0.1
B	33.4	42.5	18.0	5.5	0.7
C	12.2	8.3	31.0	44.9	3.6
D	5.5	1.9	2.1	68.3	22.3
E	3.1	0.9	0.8	3.2	92.0
B. Transition Matrix for September 2010					
	A	**B**	**C**	**D**	**E**
A	94.8	4.2	0.9	0.1	0.0
B	26.3	52.5	13.9	7.0	0.3
C	6.6	10.4	47.4	33.1	2.5
D	1.5	0.6	3.2	82.0	12.7
E	1.2	0.7	1.9	1.4	94.8
C. Transition Matrix for 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

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

The above shows that, compared to the average, the probability of persistence is higher but that between September and December 2010, the probability of moving to a better rating had risen. This trend is consistent with the recent change in the QI for the commercial loan portfolio.

The risk indicator for harvests of debtors[52] 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 the first half of 2008 is shown in Graph 87. Here the bars represent each one of the harvests evaluated for different six month periods. When the evolution of this indicator is analyzed, it can be seen that the loans granted in the second half of 2010 showed a lower QI (3.5%) than the QI for the other harvests at the time they originated. These showed an average indicator of 4.5%. However, in the latest six months, there has been a general deterioration of the rest of the harvests.

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

(percentage)
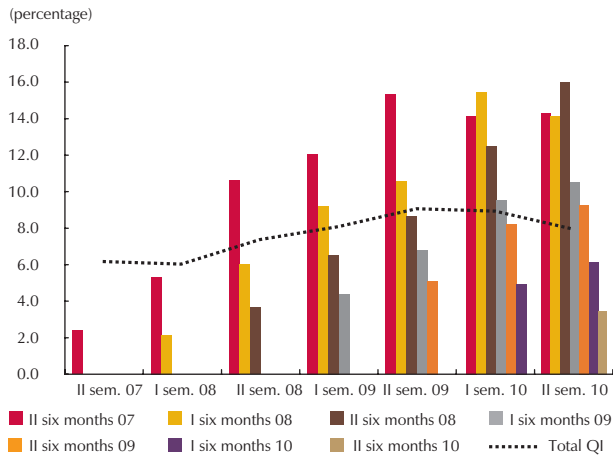
When comparing these results with the harvests analyzed in previous editions of the Financial Stability Report, it is clear that loans tend to deteriorate during the two years following their issuance and that, starting on that date, their quality indicator declines. Nevertheless, the velocity at which the loans deteriorate each six months is not the same for all of the harvests and those granted in 2008 showed a faster deterioration. This performance is explained by the fact that these loans were granted during the credit boom when the financial institutions lowered their requirements and allowed riskier debtors to enter the system. That is why the harvests of loans granted at later dates after the requirements were raised, showed a slower deterioration.

In general terms, the commercial loan portfolio showed real, positive growth rates after the negative ones that were evident in the second half of 2009. At the same time, increases in the concentration by intermediary and debtors were registered. In terms of risk, the quality indicators, transition matrices, and harvests show an improvement.

b. *Consumer Loan Portfolio*

Consumer loans are classified into three types: credit cards, loans for the purchase of vehicles, and other consumer credit.[53] Each one of these categories has different average amounts, average loan duration, type of collateral, and evolution in its quality. The consumer loan portfolio and the risk profile for each one of its modalities is described in this section.

1) *General Characteristics of Consumer Loans*

The consumer loan portfolio amounted to COL$48.2 t[54] towards the end of December 2010. Of this total, 22.5% pertained to credit cards, 12% to loans for automobiles and other private use vehicles while 65.5% belonged to the category of other consumer loans (Graph 88, panel A). In the second half of 2010, the larger share that loans for automobile purchase and credit cards had acquired to the detriment of loans for other consumption stands out.

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53 In the category of "other consumption," we see the following: unspecified use loans, revolving credit, overdrafts, portfolio purchase and school loans.

54 This 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.

Graph 88

A. **Share of the Amount of the Consumer Loan Portfolio by Type**

(percentage)   (percentage)

— Automobiles   — Credit cards   ······ Other consumption (right axis)
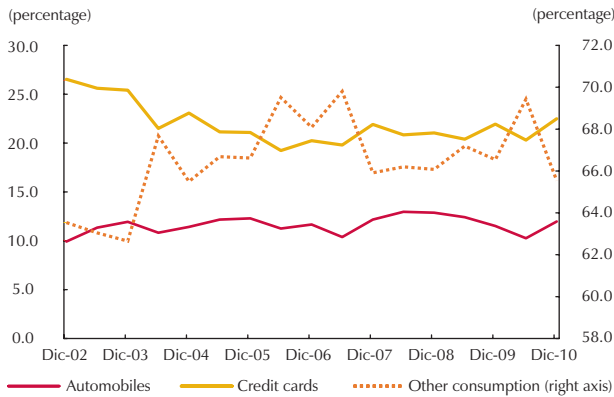
B. **Share of the Number of Consumer Loan Portfolio Transactions by Type**

(percentage)   (percentage)

■ Other consumption   ■ Credit cards   — Automobiles (right axis)
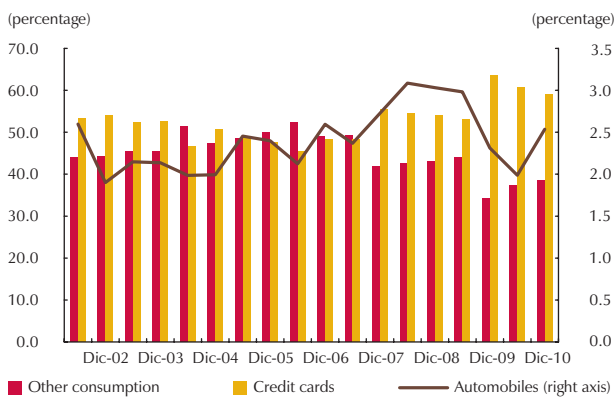
Source: Financial Superintendency of Colombia, Banco de la República calculations.

As can be seen in panel B, Graph 88, credit cards represented 58.9% of the total number of consumer loans (COL$13.8 m) as of December 2010 whereas the loans for the purchase of vehicles and other consumer loans represented 2.5% and 38.5%[55] respectively. Thus, this recent development confirms the greater importance that the number of credit card operations has. Nevertheless, the increase that other types of consumer credit and loans for automobile purchase showed should be emphasized.

The average amounts per loan differ based on the types of lending (Table 14) and depending on their different uses and characteristics. As of December 2010, the highest average amount of debt was that of vehicle purchase with COL$16.5 m in comparison to credit cards (COL$1.3 m) and other consumption (COL$5.9 m). The real annual growth of the average amounts per type of lending was 15.8%, 34.8%, and 6.6% for automobiles, credit cards, and other consumer loans respectively.

2) Credit Risk and Loan Portfolio Quality

As can be seen in Graph 89, the loan portfolio quality indicator continued to show a declining trend for all of the types of consumer loans. As a result, as of December 2010 the QI was at 9.3%, 7.4%, and 7.5% for credit cards, other consumption, and vehicle purchase respectively. These values are significantly lower than those registered a year earlier (11.8%, 10.2%, and 10.3% respectively). It should be emphasized that the level of the indicator for credit cards is still higher than the total consumption (7.8% as of December 2010). 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 Table 15[56] the change in the number of total loans, risky loans and loans in default for the consumer loan portfolio since 2006 is analyzed. As can be seen, the OQI and NLIO have a growth trend and reach their maximum in the first half of 2009. This performance by these indicators is similar to what was seen with the traditional QI (Graph 89). However, the QI by number of loans is always higher,

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55   The growth in credit cards is due to a change in the way one entity reports format 341 to the Financial Superintendency.

56   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 the credit card transactions.

Table 14
Average Amount of Debt by Type of Loan as of December each Year
(millions of pesos)

Date	Automobiles	Credit cards	Other consumption	Total consumption
2002	9.59	0.90	2.64	1.83
2003	10.97	0.95	2.71	1.96
2004	13.07	1.04	3.16	2.28
2005	12.82	1.10	3.33	2.50
2006	12.16	1.13	3.75	2.70
2007	13.62	1.20	4.81	3.05
2008	14.22	1.30	5.15	3.35
2009	13.81	0.96	5.41	2.78
2010	16.50	1.33	5.95	3.50

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

Graph 89
Loan Portfolio Quality Indicator by Type of Consumer Loan
(risky loan portfolio/gross loan portfolio)
as of December of each Year
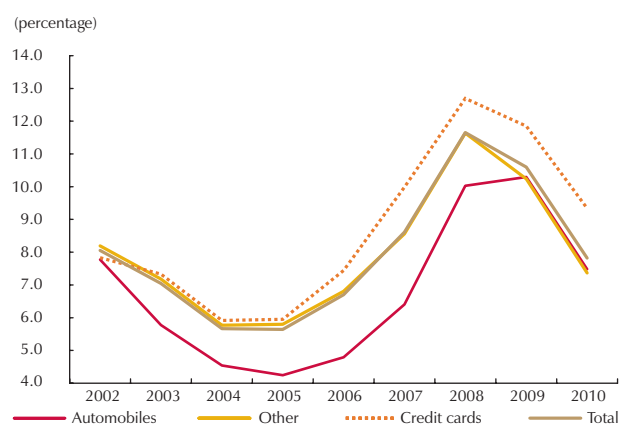
Source: Financial Superintendency of Colombia, Banco de la República calculations.

which indicates that the loans for higher amounts within this loan portfolio are less risky.

In order to analyze the change in credit risk, in turn, a calculation of transition matrices for quarterly periods was done for the total consumer loan portfolio. Table 16 shows the average for the transition matrices between March 2002 and December 2010 (panel A), for September 2010 (panel B), and December of the same year (panel C). The higher percentages below the diagonal are associated with improvements in ratings while those that are above it are related to deteriorations in ratings or, in other words, increases in exposure to credit risk. When the transition matrix for the fourth quarter of the previous year is compared to the matrix for the historical average (2002-2010) (panel A) and with the third quarter of 2010 (panel B), lower probabilities of migrating towards worse ratings are seen as well as better probabilities that a debtor will continue to have an A rating and lower probabilities of staying at an E rating. Thus, all of this reflects improvements in the credit risk.

For each type of consumer credit, an analysis of the change 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 six-month period (harvest) and, in addition, makes it possible to distinguish between the risk profiles of new loans compared to old ones.

Table 15
Default and Loan Portfolio Quality Indicator by Number of Loans for the Total Consumer Loan Portfolio

Date	Totals	Risks	In default	ICO	IMO[a/]
	(number of loans in thousands)			(percentage)	
Jun-06	8,366.6	734.7	424.3	8.8	5.1
Dic-06	10,190.2	938.8	567.8	9.2	5.6
Jun-07	11,128.3	1,180.2	699.2	10.6	6.3
Dic-07	11,654.4	1,256.3	770.7	10.8	6.6
Jun-08	11,582.3	1,393.7	831.8	12.0	7.2
Dic-08	12,173.3	1,691.9	1,107.0	13.9	9.1
Jun-09	12,057.1	1,856.9	1,188.3	15.4	9.9
Dic-09	15,095.9	2,246.2	1,564.0	14.9	10.4
Jun-10	15,687.0	2,278.8	1,604.0	14.5	10.2
Dic-10	13,791.7	1,569.3	1,098.1	11.4	8.0

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 16
Transition Matrices for the Total Consumer Loan Portfolio

A. Average of the Transition Matrices Between March 2002 and December 2010					
	A	B	C	D	E
A	95.2	2.9	1.1	0.6	0.1
B	45.4	26.7	9.1	17.9	0.9
C	24.0	11.3	18.1	44.1	2.4
D	12.3	4.6	6.0	33.5	43.5
E	5.7	1.4	1.7	3.9	87.4
B. Transition Matrix for September 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	29.7	37.6	5.3
D	3.4	2.5	8.3	59.6	26.2
E	6.3	1.3	2.6	6.8	83.0
C. Transition Matrix for December 2010					
	A	B	C	D	E
A	96.0	2.5	0.8	0.6	0.0
B	33.8	35.9	10.7	17.1	2.5
C	12.0	13.4	32.5	33.8	8.3
D	1.9	2.0	8.0	60.4	27.7
E	3.2	0.8	1.9	5.0	89.1

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

Graph 90 shows the quality of the loan portfolio based on the harvests and by type of consumer loan.[57] For all of the modalities of this type of loan, better quality indicators were registered for loans that originated in the second half of the previous year. Indeed, the new loans showed a QI of 1.8% for loans for the purchase of automobiles, 3.9% for credit cards, and 3.5% for other consumer loans. These numbers are lower than the data registered in the June harvests for the same year (2.6%, 5.3%, and 4% for each type respectively).

Panel A in Graph 90 reflects the performance of the automobile purchase loan portfolio. As can be seen, in addition to the improvement mentioned in the new harvest, the pace of deterioration for harvests from the two most recent six-month periods is lower when they are compared to the deterioration of harvests from previous years. This trend can also be seen in the risk indicators for credit cards and other consumption (panels B and C), which helps explain the general improvement in the levels of risk for the loan portfolio (panel D).

To summarize, an improvement is seen in the credit risk for the consumer loan portfolio in the second half of 2010. This is reflected in the lower levels of QI and OQI with respect to 2009. Furthermore, the probability that the credit rating would deteriorate is lower than the same average probability measured since 2002. At the same time, this decline in the risk is seen in the lower QI of the harvest that originated in the second half of 2010.

c.   *Housing Loan Portfolio*

1)   *Credit Risk*

When the composition of the housing portfolio is analyzed, we see that the share of securitizations in the total rose and went from 24.1% in June 2010 to 34.2% in December of the same year (Graph 91). This performance in securitizations is related to the expiration of the tax benefits and exemptions in December associated with the holdings of mortgage loan portfolios. During that month, the loan portfolio with securitizations rose COL$2.4 t and reached a level of COL$7.3 t.[58] This performance reduces the exposure to credit risk which the financial intermediaries are subject to.

Given the effect on the outstanding housing loan portfolio generated by the securitization process, we see that the QI showed an increase as it went from 7.7%

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57   The graphs for harvests are read as follows: The horizontal axis shows the six-month evaluation period of the harvest. The colors of the bars are related to each harvest. The line, in turn, is the quality indicator for the total loan portfolio for each type of loan in each period. When analyzing the quality of a loan portfolio harvest several six-month periods after the harvest is issued, it is important to remember that the riskiest loans account for a larger share of the outstanding balance. However, that bias is common to all the harvests and, therefore, they can be compared to each other.

58   The majority of the securitized loan portfolio was classified as A.

Graph 90
Graph 90
Analysis of Consumer Loan Portfolio Quality by Harvests

A.   Automobiles

(percentage)

B.   Credit cards

(percentage)
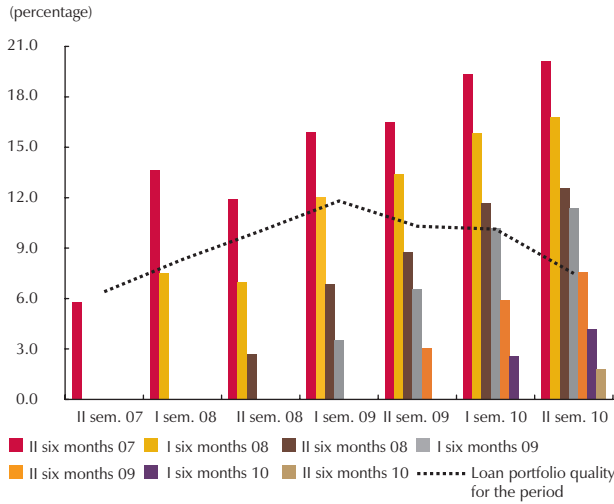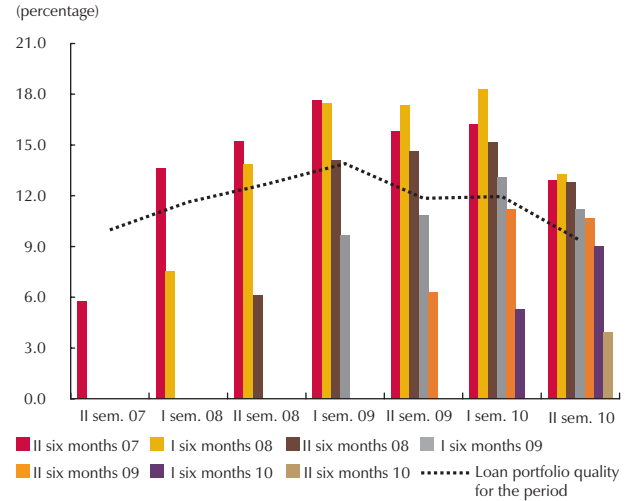
C.   Other consumption

(percentage)
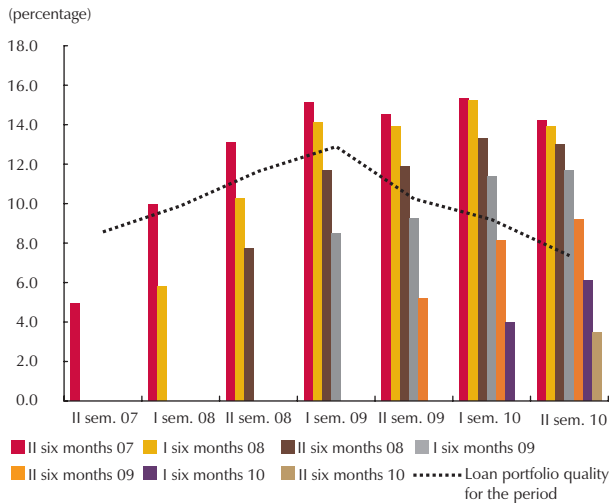
D.   Total consumption

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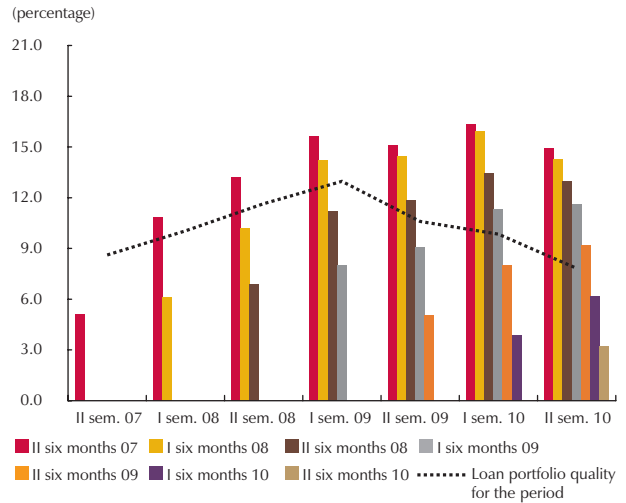
Source: Financial Superintendency of Colombia, Banco de la República calculations.

in June 2010 to 8.5% six months later. In addition, when the risky housing loan portfolio is analyzed by ratings, it is clear that, with the exception of D which remained relatively stable, its share rose in the period under analysis (Graph 92).

When the number of loans in the housing loan portfolio is analyzed, we find that this has been declining since the first half of 2004 (561,745) and was at 387,896 in December 2010[59] (Table 17). The fact that the reduction that occurred in the second half of 2010 was mostly due to the securitization of the loan portfolio that was done in October and November must be emphasized. In addition, when the

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59   on the books as a commercial loan. This type of loan has become an alternative for acquiring housing because it offers better conditions in some cases than the traditional housing loans. The leasing portfolio for the purchase of housing, in particular, grew a real annual 27.4% on average in 2010.

Graph 91
Composition of the Mortgage Loan Portfolio by Loan
Portfolio and Securitization in Pesos

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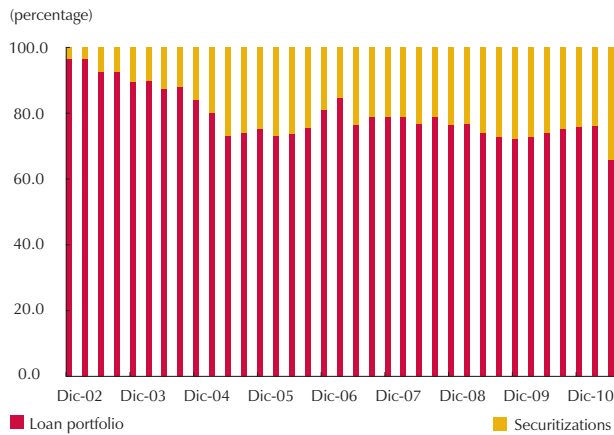
Source: Financial Superintendency of Colombia and Colombian Securitization, Banco de la República calculations.

number of loans is evaluated based on the risk level, it can be seen that both the OQI and the NLIO have dropped over the course of the period under analysis. While the OQI was at 22.5% in June 2004, this proportion fell and was at a value of 10.3% towards the end of 2010. The NLIO also went from 13.4% to 5% during the same period. It is noteworthy that these indicators are slightly higher than those calculated with the outstanding loan portfolio. This could be due to the fact that the largest loans have better ratings than the small ones.

In order to analyze the evolution of credit risk, the transition matrices were calculated for this loan portfolio. Table 18 shows the average transition matrices between June 2007 and December 2010 (panel A) as well as the matrix for September (panels B) and December 2010 (panel C). Positive values above the main diagonal line (upper triangle) represent increases in the probability of moving towards worse ratings while the positive values below the main diagonal line (lower triangle) indicate rises in the probability of going to better ratings. When the matrix for December is compared to the average, a rise in the persistence to remain at the A and B ratings together with a decline in the probability of remaining at C, D, and E was seen.

Graph 92
Share of the Risky Loan Portfolio by Rating

(percentage)
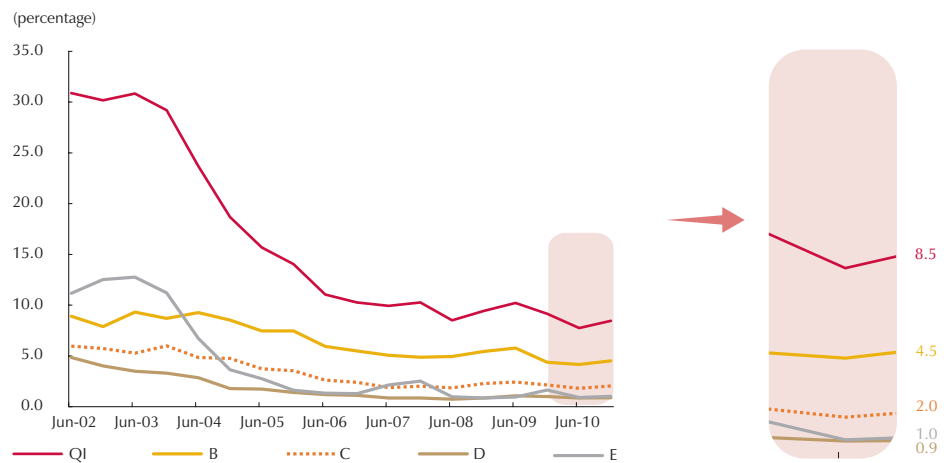
Source: Banco de la República calculations.

Likewise, there was a sharp rise in the probability of migrating to worse ratings at the same time as the probability of improving a rating fell. This indicates a slight deterioration in the credit risk for this loan portfolio.

In order to do a risk analysis of the new loans, the harvests from each six-month period since December 2007 were evaluated. This makes it possible to study the

Table 17
Number of Loans Based on Risk Level

Date	Total loans	Risks	In default	ICO	IMO*
		(number of loans)		(percentage)	
Jun-04	561.745	126.185	75.533	22.46	13.45
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

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.

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, the harvest from the second half of 2010, which registered a QI of 1.5%, shows a risk level that is higher than those from the most recent two years (Graph 93). However, this performance could be partly explained by the securitization of a portion of the A rated loan portfolio belong to the loan intermediaries. The loans that were granted in the second half of 2009 are the ones that registered the least deterioration in comparison to the harvests from other periods. It is worth pointing out that the harvest from the first half of 2007 is the one that has shown the worst deterioration of the sample.

2)   Credit Risk Combined with the Consumer Loan Portfolio

In this section, an analysis of the exposure of the financial institutions to the credit risk of agents that have more than one type of loan is presented. 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 December 2010, the agents with the two types of loans represented 69.7% of the total housing loan debtors and 6.3% of the consumer loan debtors.

Graph 94 compares the quality indicator for the loan portfolio for consumer and mortgage loans of agents with both types of loans compared to the total loan portfolio. When the results for each one of these is analyzed, the QI of the debtors with the two types of loans is seen to be lower than that for the total sample. However,

Table 18
Transition Matrices for the Mortgage (Housing) Loan Portfolio
(percentage)

A. Average Transition Matrix between June 2007 and December 2010					
	A	B	C	D	E
A	96.3	3.5	0.1	0.0	0.0
B	30.1	50.5	18.6	0.4	0.5
C	14.1	7.9	59.8	17.3	0.9
D	8.1	2.2	5.7	55.4	28.6
E	5.5	1.2	1.7	3.2	88.5
B. Transition Matrix for September 2010					
	A	B	C	D	E
A	97.4	2.5	0.1	0.0	0.0
B	26.4	55.1	18.1	0.2	0.2
C	13.0	9.0	62.0	15.4	0.7
D	5.2	2.2	5.9	63.1	23.7
E	4.9	0.6	2.1	3.8	88.6
C. Transition Matrix for 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

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

Graph 93
Analysis of House Mortgage Loan Portfolio Quality by
Harvests

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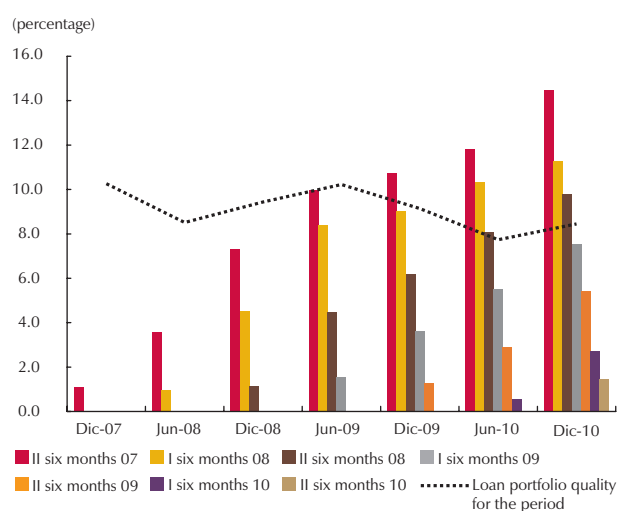
Source: Financial Superintendency of Colombia, Banco de la República calculations.

the distance between the indicators declined in the second half of 2010. This implies that the debtors that have two classes of loans are, on average, less risky than the debtors in the total loan portfolio. This could be due to a greater ability to pay.

In conclusion, a slight increase is seen in the credit risk that the housing loan portfolio faces as the result of an increase in the probability that the loans could migrate towards worse ratings and a deterioration in the QI of the most recent harvest. 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.

Graph 94
QI Comparison Between Sample and Total

A.   Consumer Loan Portfolio

(percentage)
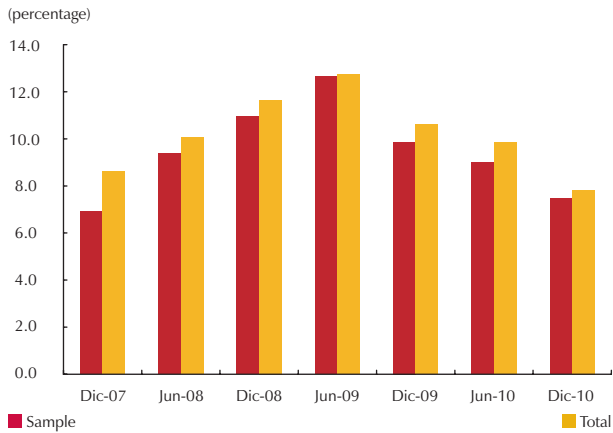
B.   Mortgage Loan Portfolio

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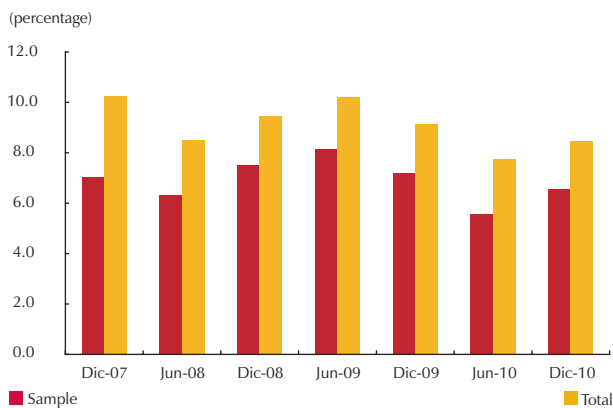
Source: Financial Superintendency of Colombia, Banco de la República calculations.

d.   *Micro-credit Loan Portfolio*

Even though the micro-credit loan portfolio still shows positive, real annual rates (as of December 2010, it reached 8.7%), the substantial growth that it had in previous years, and which carried it to a balance of COL$4.3 t towards the end of last year, is not seen any longer (for the period between 2005 and 2009 this rate was 30% on average). The number of debtors, in turn, was lower in December 2010 compared to the immediately preceding year. The fact stands out that, for the first time since the beginning of the study period (2002), there is a decline in the number of debtors. In fact, the number of small businessmen who were favored by the receipt of loans from the financial system dropped 1.5% between December 2009 and twelve months later. These results raised the average amount as it went from COL$3.8 m to COL$4.2 m respectively during the above-mentioned period (Table 19).

In spite of the fact that the growth of the micro-credit loan portfolio slowed down noticeably during the past year with respect to both the amount and the number of debtors, the types of agents that micro-credit is directed towards remained the same. In general, micro-credit is oriented towards individuals even when many of them have informal small businesses set up. These have not been legally constituted due to the fact that the costs in terms of procedures and other requirements are high as was pointed out in the previous Financial Stability Report.

1)   *Micro-credit Loan Portfolio Concentration*

Graph 95 shows the evolution that micro-credit concentration has had in the largest financial institutions. The larger share that the largest entity has acquired since 2008 is evident there (almost 55%). This is in spite of the fact that new financial intermediaries which specialize in micro-credit have entered this market niche since that year.[60] Likewise, the share of the market held by the five largest entities which grant loans to small businesses has remained practically stable for the last two years (around 90%).

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60   In the last three years, six loan institutions which specialize in micro-credit have entered the market.

Table 19
Micro-credit Loan Portfolio: Capital and Debtors

Date	Balance[a/]	Number of borrowers	Average amount per borrower[a/]
Dic-02	533.102	136.506	3.9
Dic-03	707.275	190.872	3.7
Dic-04	1.107.620	272.868	4.1
Dic-05	1.571.069	398.892	3.9
Dic-06	2.017.554	540.209	3.7
Dic-07	2.242.836	631.161	3.6
Dic-08	3.246.607	897.340	3.6
Dic-09	3.960.877	1.037.664	3.8
Dic-10	4.304.382	1.022.333	4.2

a/ Balances in millions of pesos as of December 2010.
Source: Financial Superintendency of Colombia, Banco de la República calculations.

Graph 95
Concentration of Micro-loans in the Largest Entities
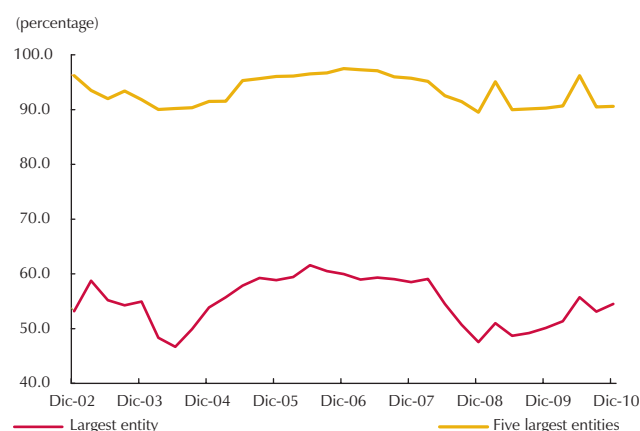
(percentage)

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

2)   Credit Risk

Graph 96 illustrates the loan portfolio quality indicator (risky loan portfolio/total gross portfolio) for micro-credit as well as the categories in the risky loan portfolio and the share that each one has in the total gross loan portfolio. An improvement in the indicator was seen in the last year as it dropped to 7.2%, a number that is 150 bp lower than what had been registered in June 2010. Although this same trend was seen in all of the categories, the largest drops occurred in category E, which went from 3.8% to 3.1%, followed by category B (from 2.3% to 1.8%) in the above-mentioned period of time. This has a more important connotation if we consider the fact that the portion of the loan portfolio classified as category E is the largest one within the risky micro-credit portfolio and as such, demands higher loan-loss provisioning.

Table 20 shows the total number of loans, the number of risky ones and the ones in default in the micro-credit loan portfolio. Both the OQI and the NLIO seem to have had a seasonal trend in recent years (since late 2007). In other words, these indicators become exacerbated towards the end of the first half of the year and drop in the second half. As a result, the first indicator was at 9% whereas the default indicator was at 6.9% for the second half of 2010. These percentages are lower than those registered in late 2007, late 2008, and late 2009. This trend is similar to what was seen for the traditional QI. However, notice that for the entire period analyzed, the OQI is higher than the same quality indicator based on amount. This suggests that micro-credit loans that are for larger amounts have lower risk levels.

Graph 96
Share of the Risky Loan Portfolio by Rating

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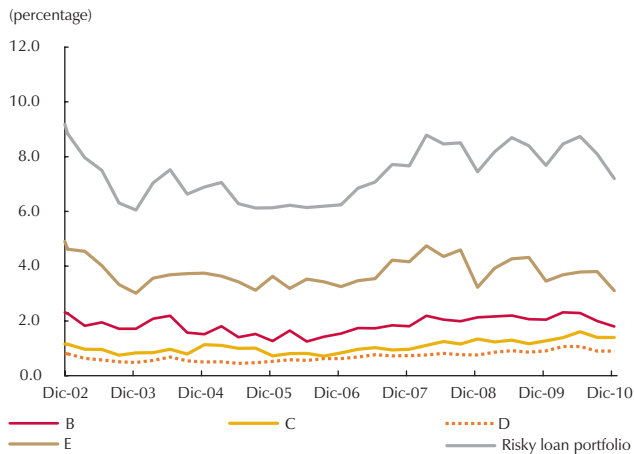
Source: Financial Superintendency of Colombia, Banco de la República calculations.

In order to analyze the development of credit risk, a transition matrix calculation was done for the micro-credit portfolio for quarterly periods. Table 21 shows the transition matrices for: the average between March 2004 and December 2010, the third quarter of 2010, and the fourth quarter of the same year. The higher percentages below the diagonal are associated with improvements in the rating while those that are above it are related to deterioration or, in other words, increases in the exposure to credit risk. When comparing the transition matrix for the fourth quarter of 2010 with the one for the third quarter, and with the historical average, lower probabilities of migrating to lower ratings are seen, which reflects improvements in credit risk.

Furthermore, the lower probability of moving from any category to category E (the last column in the matrices) for the last quarter of 2010 stands out compared to the probability of moving to category E in the immediately preceding quarter and the one for the historical average.[61] Indeed, the percentages for migration from the B, C, and D categories in the micro-credit portfolio to E dropped to 22.0%, 36.2%, and 60.2% respectively. Likewise, the probability that the different categories would remain at the same state (persistence) becomes stronger in the transition matrix for the fourth quarter of 2010 (Table 21).

Table 20
Default and Loan Portfolio Quality Indicator by Number
of Loans for the Total Micro-credit Loan Portfolio

Date	Totals	Risky	In default	ICO	IMO
	(number of loans in thousands)			(percentage)	
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

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

61 In the above-mentioned column the one sees the large concentration of change towards category E issuing from the rest of the categories, a characteristic that is typical of the micro-credit portfolio.

Table 21
Transition Matrices for the Micro-credit Loan Portfolio
(percentage)

	A	B	C	D	E
A. Average Transition Matrix between March 2004 and December 2010					
A	96.4	1.9	0.9	0.6	0.1
B	28.7	25.5	11.0	8.0	26.8
C	12.6	5.5	19.5	8.5	53.8
D	7.4	2.2	2.5	15.1	72.8
E	2.6	0.5	0.4	0.6	95.9
B. Transition Matrix for September 2010					
A	96.1	2.0	1.1	0.7	0.0
B	17.9	30.6	19.0	7.5	24.9
C	5.0	6.9	26.9	12.5	48.8
D	7.1	2.4	6.9	18.4	65.2
E	1.2	1.4	0.8	1.4	95.2
C. Transition Matrix for December 2010					
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

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

Last of all, analyzing the performance of the credit risk through the segmentation of the sample by harvests turns out to be interesting. With respect to these harvests, a follow up of the QI was done of the loans granted in each six-month period since 2007. This made it possible to differentiate the risk profiles of the new clients from the previous ones.

Just as can be seen in Graph 97, one of the best harvests or the one with the lowest risk in the period being studied (2007-2010) is the one with its origin in the second half of last year. In terms of risk, this harvest has less than half the risk of the one that was born in the first six months of 2010 and its risk is lower than the new harvests for previous periods. Nevertheless, it would be premature to confirm whether or not its development will be better than that of previous harvests or not. This could depend more on the follow up and monitoring of this type of loan portfolio than on changes in the Colombian economy.

In general terms and in the analysis of the transition matrices and the harvests, an improvement in credit risk is seen towards the end of 2010 with respect to what had been registered in the two immediately preceding years.

Graph 97
Analysis of the Loan Portfolio Quality by Harvests:
Micro-credit

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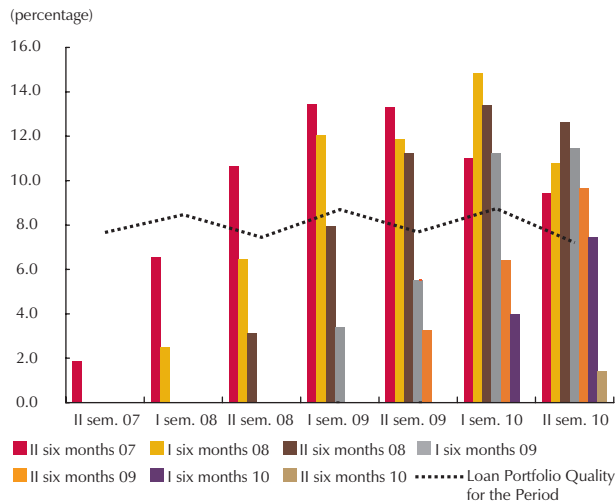
Source: Financial Superintendency of Colombia, Banco de la República calculations.

3) Credit Risk Combined with the 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, a database of debtors who have a micro loan and, at the same time, another type of loan (consumer, housing, and commercial) was constructed. As of December 2010, 22.4% (229,179) of the borrowers in the micro-credit portfolio also had transactions in the consumer one. At the same time, in terms of capital, these represented 55.8% of the total balance of the micro-credit portfolio. In other words, borrowers who have these two types of loans have, on average, debts that are larger than those that only have micro-credit.

The loan portfolio quality indicator (QI) of the debtors with these two types of loans was at 7.5% as of December 2010. This value is above the QI for the micro-credit portfolio as a whole (7.2%). In other words, borrowers with these two types of loans are riskier on average which could be due to the larger amount of debt that they are carrying (Graph 98).

In addition, the same combined analysis was done of the commercial loan portfolio and the housing portfolio. As of December 2010, 1.2% of the debtors in the micro-credit portfolio also had a housing loan while 4.6% also had a commercial loan. Likewise, the QI of the borrowers with a micro loan and housing loan was 7.7% while those with a micro loan and a commercial loan registered a QI of 7.3% in the same year. These levels of QI are also higher than the QI for the entire micro-credit portfolio (7.2%). This implies that these borrowers are, on average, riskier (Graph 98).

Graph 98
QI Comparison Between Samples and Total

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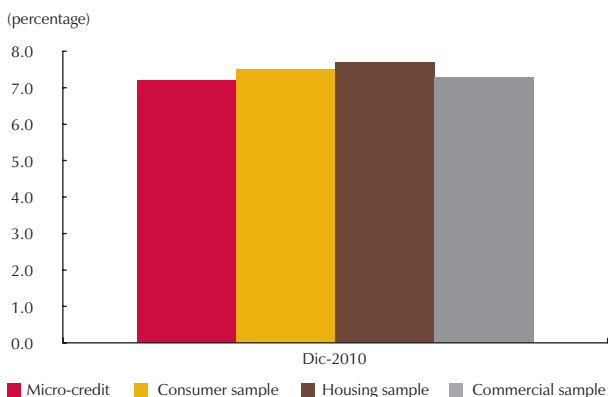
Source: Financial Superintendency, Banco de la República calculations.

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 risk associated with the inability of an institution to cover its 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 considered, exercises for measuring the liquidity risk associated with each of the

above-mentioned dimension are given in this section. Furthermore, stress exercises are included as well to analyze 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 interbanking 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.[62]

For a horizon of one week, the formula of the LRI corresponds to the sum of the liquid assets adjusted for market liquidity (AML) and the requirement of net liquidity (RNL) estimated for said range of time:

$$LRI = AML + RNL$$

where,

$$RNL = FNVC + FNVNC$$

FNVC is the net cash flow of contractual original from assets, liabilities and off-balance sheet positions within the next seven calendar days and $FNVNC_1$ is the estimated net cash flow of non-contractual origin for the next seven days from deposits and liabilities payable on demand. 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. It 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:[63]

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62   In the September edition of the Financial Stability Report, the SARL and the method for calculating the LRI implemented by the Financial Superintendency of Colombia are described.

63   The haircuts applied to securities correspond to the ones published monthly by the Department of Operations and Market Development in the Banco de la República.

$$ALM = cash + (bonds\ issued\ by\ the\ national\ government,$$
$$Banco\ de\ la\ República,\ Fogafin)\ x\ (1 - TES\ haircut) +$$
$$all\ other\ securities)\ x\ (1 - 1.2 * TES\ haircut) - (total\ required$$
$$daily\ average\ reserve)$$

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,

$$\widehat{LRI}_{it} = \frac{LRI_{it}}{TA_{it} - MLA_{it}}$$

Where *TA* are total assets and *MLA* are liquid assets adjusted to market liquidity risk.

Given that *LRI* is a liquidity gap calculated on the basis of 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 99 shows the evolution of the LRI for commercial banks from September 24, 2010 to January 28, 2011 based on the last week of the month. Although the agents' liquidity levels varied considerably, 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 stable performance in the last few months and in the last week of January, it reached a level that was similar to what had been seen in late September 2010 (11.6%). However, it must be noted that the indicator's last registered value was below what had been seen for the same week a year before (17.6%).

Graph 99
LRI/(TA-LA) Banks
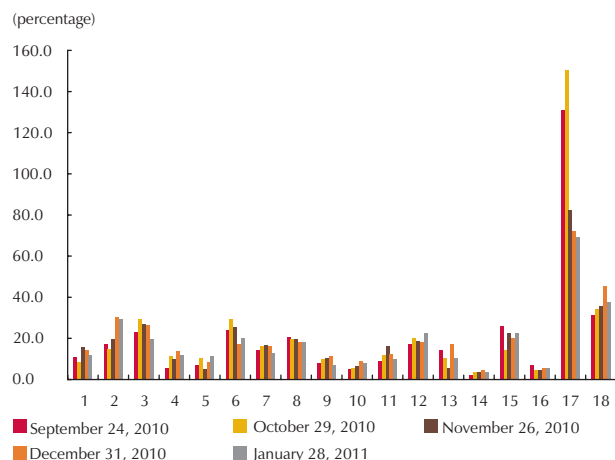
(percentage)

September 24, 2010	October 29, 2010	November 26, 2010
December 31, 2010	January 28, 2011	

Doing a more detailed analysis for the banks, the indicator shows a growth trend for the entities that have below average levels of liquidity as well as a declining trend for the institutions that have traditionally managed higher levels of liquidity. Thus, the variation in the indicator has decreased in recent months.

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:

$$\widehat{LRI}_{stressed} = \frac{LRI_{i,t} - x \, (checking \ and \ savings \ accounts)}{TA_{i,t} - MLA_{i,t}}$$

Using the latest data for $LRI_{i,t}$ (seven days), the stress test was calculated for the banks, assuming $x = 4\%$. As can be seen in Graph 100, 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.

Graph 100
Stress Test for LRI7/(TA-LA) January 28, 2011

(percentage)

LRI 7 days

Stressed LRI 7 days

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

Graph 101
Stress Test for LRI15/(TA-LA) January 28, 2011

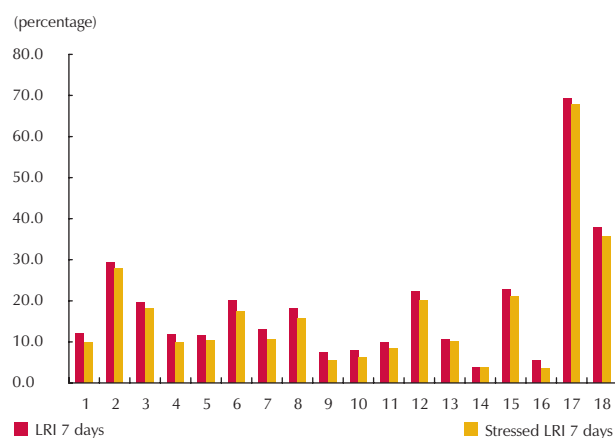(percentage)

LRI 15 days

Stressed LRI 15 days
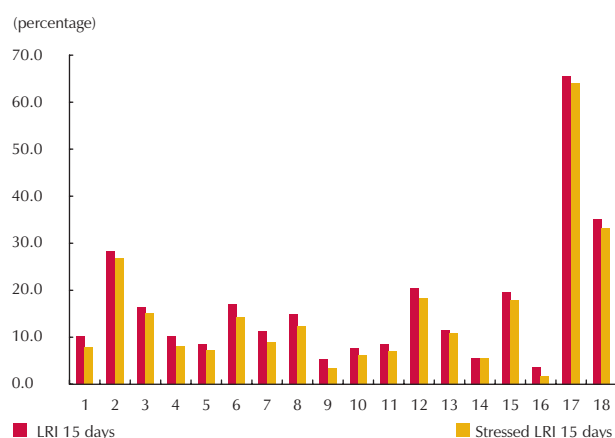
Source: Financial Superintendency of Colombia, Banco de la República calculations.

After that, the same stress test was done but this time with a liquidity gap after fifteen days. Again, the LRI indicator is seen to take positive values for all of the institutions after the shock. This indicates that none of them would find themselves in a situation of high liquidity risk (Graph 101).

The Bank of Sweden (Riksbank) has developed a stress test to measure the liquidity risk in which the structure of the financial institutions' business is considered. Unlike the stress test that is traditionally presented in the Financial Stability Report, the proposed exercise weights the shocks on deposits. It gives greater importance to the deposits from large companies in comparison to those that pertain to the small ones and to people. This makes the shock unequal and instead it depends on the type of creditor.

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.[64] The weights were estimated by taking into account the deposit structure of the banking entities as well as a uniform shock of 4% withdrawals. As a result, a different weight was used in this exercise for each entity based on the performance that each type of creditor represented in the deposits as a whole (shock differentiated by entity). The adjustment factors obtained give greater importance to the deposits from companies and less to those from private individuals. These differences are due to

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64   The method for calculating the VaR-L is found in Gonzalez and Osorio (2007). "El valor en riesgo ajustado por liquidez en Colombia," *Financial Stability Report*, Banco de la República, March.

A.   Banks with a Higher Proportion of
         Deposits from Households

(percentage)
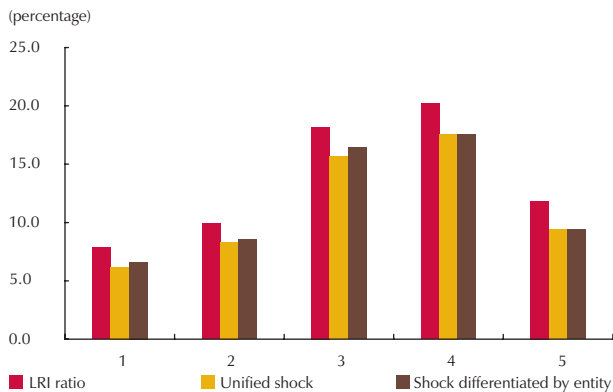
B.   Banks with a Uniform Distribution of
         Deposits by Type of Client

(percentage)
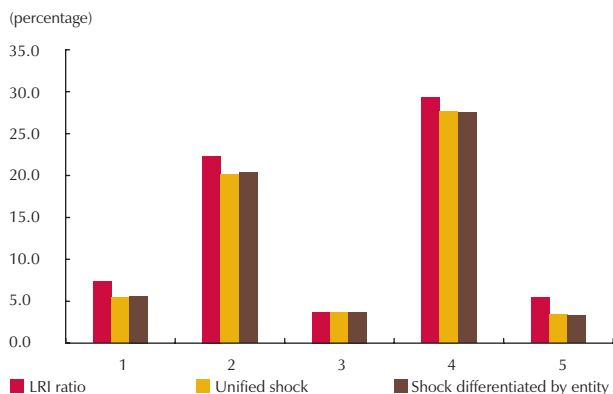
C.   Banks with a Greater Proportion of
         Deposits from Companies

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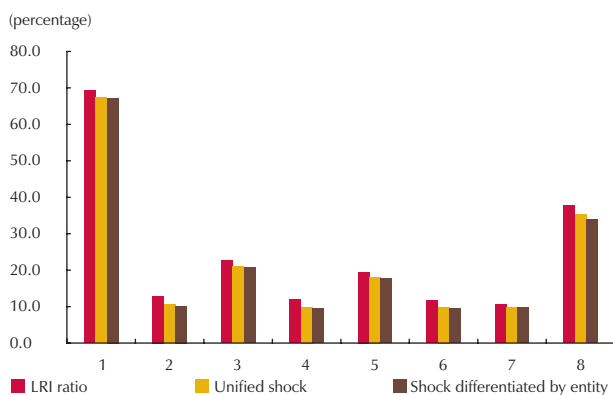
Sources: Financial Superintendency of Colombia, Banco de la República calculations.

the fact that the concentration of deposits per agent is higher is this case than it is in the case of individuals, whose deposits are generally isolated.

Graph 102 shows the adjusted LRI for a week and the results of the stress exercises described above for the different banks based on the proportion of the deposits 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 institution. 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 pertain to households are more resistant to the shock. Using the information that was available for the last week of January 2011, it should be emphasized that the institutions did not have liquidity problems even though the proposed shock was more severe for some.

2.   Liquidity-adjusted Value at Risk (VaR-L): A Market Liquidity Risk Indicator[65]

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.[66] 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 February 18, 2011 (Table 22).

The results show that the VaR for credit institutions as a whole should increase by 7.1% to incorporate market

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65   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.

66   The bas is a measurement of the distance between the points registered for the supply and for 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.

liquidity risk. This figure shows an increase in liquidity risk in comparison to what had been registered on August 20, 2010 (5.2%). The rise in this risk is the result of both a slight increase in the bid-ask spread (bas)[67] average for the system and the shift of the portfolio towards bands of debt securities that are less liquid.

When the VaR-L is analyzed by entity, the banks are found to be more dispersed in comparison to what was seen in August 2010 and there was a greater variability in exposure to market liquidity risk on the part of these institutions. In general, the indicator worsened for all of the entities except for one, which indicates a deterioration compared to what had been seen six months before. Nevertheless, the bas levels were at their historical minimum in mid-2010.

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 that the percentage of liquidity adjustment for the system went from 20.7% to 21.1% between August 20, 2010 and February 18, 2011. The current composition of the aggregate loan portfolio shows greater vulnerability in the system to an adverse liquidity shock. However, the percentage adjustment is lower for 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 bas (Table 22).

Table 22
Market Liquidity Risk (VaR-L)
Percentage of Correction

Entities	August 20, 2010		February 18, 2011	
	No volatility	Volatility scenario [a/]	No volatility	Volatility scenario [a/]
1	6.2	22.4	8.4	20.6
2	6.0	25.7	7.9	22.7
3	5.2	25.8	9.5	28.1
4	5.0	19.8	4.6	21.6
5	3.9	14.8	9.9	17.6
6	5.7	20.6	8.1	24.0
7	4.4	20.2	5.3	19.7
8	3.1	13.5	15.6	13.7
9	4.2	22.4	7.2	20.7
10	5.5	16.5	8.8	22.0
11	4.5	21.4	3.1	21.0
12	5.5	20.3	6.4	20.5
13	5.6	19.9	5.7	20.6
14	4.7	21.2	5.0	20.4
15	4.2	23.5	6.1	22.7
16	6.3	19.3	8.3	19.3
Total	5.2	20.7	7.1	21.1

a/ Based on volatility in the second quarter 2006.
Source: Banco de la República calculations.

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. The other is the Electronic Trading System (SEN in Spanish) which is managed by the Banco de la República.

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.

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67   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.

Information on the repo transactions and simultaneous operations of the agents who participate in the SEN for each one of the dates analyzed is used to build the networks. In addition, the centrality indices described in Saade (2008) 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, according to 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 103 shows the structure observed in the SEN market for the Fridays between January 14 and February 18, 2011 but takes only the collateralized transactions between commercial banks into account. Three of the networks presented show an almost complete structure, which indicates that the majority of the agents who participated in the market traded with each other. This high connectivity in the network for those days suggests that the system has greater resistance to liquidity shocks since the risk can be spread out better in comparison to an incomplete market.

For January 28 and February 4 and 18 a high level of disconnection was observed in the network. Specifically, there was a persistence in the peripheral position of some agents which showed that they preferred to have few transactions with other loan entities on the market. Although the SEN market tends to be incomplete during the first few months of the year, the number of peripheral agents that appeared stood out. The stable net liquidity position the agents had is also notable.

In order to analyze the roles that the different institutions play in the current structure of the public debt securities market, the structure of this market in the MEC was also examined for February 18, 2011. On that date, the number of entities that participated in the market was 712. A sample was taken of the transactions carried out by the 30 institutions that had the highest representation on the market based the amount of their operations. That day, the transactions between the institutions in the sample came to COL$9.6 t, which was 72.5% of the total traded on the MEC (COL$13.2 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 75.2% of the possible transactions. This level is close to the connectivity in the SEN where the connection is usually higher than 80%.

In Graph 104 the structure of the market in government bonds managed by the MEC for February 18, 2011 is shown. The color of the links changes depending on the amount traded between each pair of 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

Graph 103
SEN Structure

A.   January 14, 2011

Net supply of liquidity

○ Between -288.3 b and -218.7 b
● Between -218.7 b and -149.2 b
● Between -149.2 b and -79.6 b
● Between -79.6 b and -10.1 b
● Between -10.1 b and 59.5 b
● Between 59.5 b and 129 b
● Between 129 b and 198.6 b
● Between 198.6 b and 268.1 b
● Between 268.1 b and 337.7 b
● Between 337.7 b and 407.2 b

Total Transactions

— Between 0 b and 4.9 b   — Between 19.8 b and 24.7 b   — Between 39.5 b and 44.5 b
— Between 4.9 b and 9.9 b   — Between 24.7 b and 29.7 b   — Between 44.5 b and 49.4 b
— Between 9.9 b and 14.8 b   — Between 29.7 b and 34.6 b
— Between 14.8 b and 19.8 b   — Between 34.6 b and 39.5 b
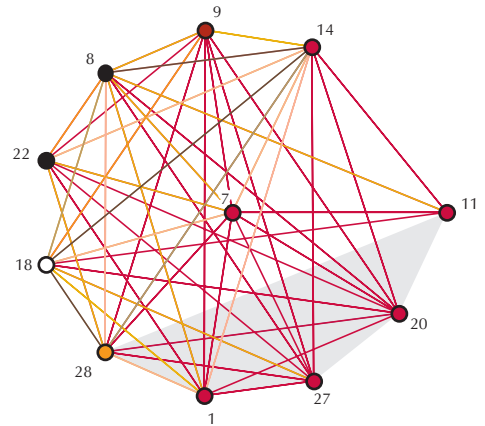
B.   January 21, 2011

Net supply of liquidity

● Between -189.0 b and -137.2 b
● Between -137.2 b and -84.6 b
● Between -84.6 b and -31.9 b
● Between -31.9 b and 20.8 b
● Between 20.8 b and 73.5 b
● Between 73.5 b and 126.2 b
● Between 126.2 b and 178.8 b
● Between 178.8 b and 231.5 b
● Between 231.5 b and 284.2 b
○ Between 284.2 b and 336.9 b

Total Transactions

— Between 0 b and 2.2 b   — Between 8.8 b and 11.1 b   — Between 17.7 b and 19.9 b
— Between 2.2 b and 4.4 b   — Between 11.1 b and 13.3 b   — Between 19.9 b and 22.1 b
— Between 4.4 b and 6.6 b   — Between 13.3 b and 15.5 b
— Between 6.6 b and 8.8 b   — Between 15.5 b and 17.7 b
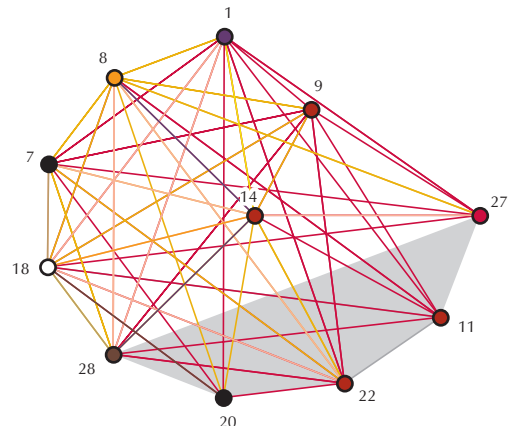
C.   January 28, 2011

Net supply of liquidity

○ Between -197.4 b and -147.5 b
● Between -147.5 b and -97.6 b
● Between -97.6 b and -47.8 b
● Between -47.8 b and 2.1 b
● Between 2.1 b and 51.9 b
● Between 51.9 b and 101.8 b
● Between 101.8 b and 151.6 b
● Between 151.6 b and 201.5 b
● Between 201.5 b and 251.4 b
● Between 251.4 b and 301.2 b

Total Transactions

— Between 0 b and 5.5 b   — Between 22 b and 27.5 b   — Between 44 b and 49.5 b
— Between 5.5 b and 11 b   — Between 27.5 b and 33 b   — Between 49.5 b and 55 b
— Between 11 b and 16.5 b   — Between 33 b and 38.5 b
— Between 16.5 b and 22 b   — Between 38.5 b and 44 b
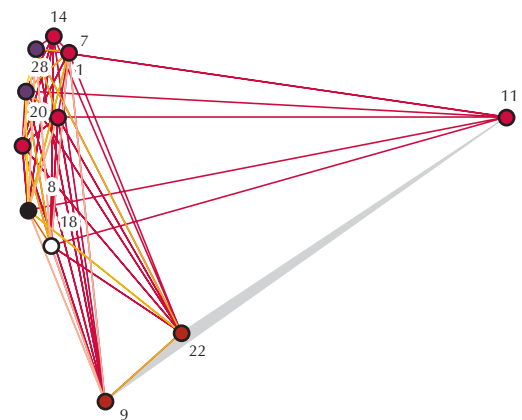
D. February 4, 2011

Net supply of liquidity

- ○ Between -224.4 b and -186 b
- ● Between -186 b and -147.7 b
- ● Between -147.7 b and -109.3 b
- ● Between -109.3 b and -71 b
- ● Between -71 b and -32.6 b
- ● Between -32.6 b and 5.7 b
- ● Between 5.7 b and 44.1 b
- ● Between 44.1 b and 82.4 b
- ● Between 82.4 b and 120.8 b
- ● Between 120.8 b and 159.1 b

Total Transactions

- —— Between 0 b and 5.7 b
- —— Between 5.7 b and 11.4 b
- —— Between 11.4 b and 17 b
- —— Between 17 b and 22.7 b
- —— Between 22.7 b and 28.4 b
- —— Between 28.4 b and 34.1 b
- —— Between 34.1 b and 39.7 b
- —— Between 39.7 b and 45.4 b
- —— Between 45.4 b and 51.1 b
- —— Between 51.1 b and 56.7 b
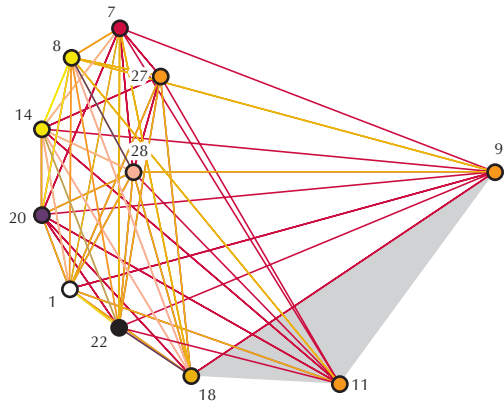
E. February 11, 2011

Net supply of liquidity

- ○ Between -268.2 b and -208.4 b
- ● Between -208.4 b and -148.7 b
- ● Between -148.7 b and -88.9 b
- ● Between -88.9 b and -29.2b
- ● Between -29.2 b and 30.6 b
- ● Between 30.6 b and 90.3 b
- ● Between 90.3 b and 150 b
- ● Between 150 b and 209.8 b
- ● Between 209.8 b and 269.5 b
- ● Between 269.5 b and 329.3 b

Total Transactions

- —— Between 0 b and 4.4 b
- —— Between 4.4 b and 8.8 b
- —— Between 8.8 b and 13.2 b
- —— Between 13.2 b and 17.6 b
- —— Between 17.6 b and 22 b
- —— Between 22 b and 26.4 b
- —— Between 26.4 b and 30.8 b
- —— Between 30.8 b and 35.2 b
- —— Between 35.2 b and 39.6 b
- —— Between 39.6 b and 44 b
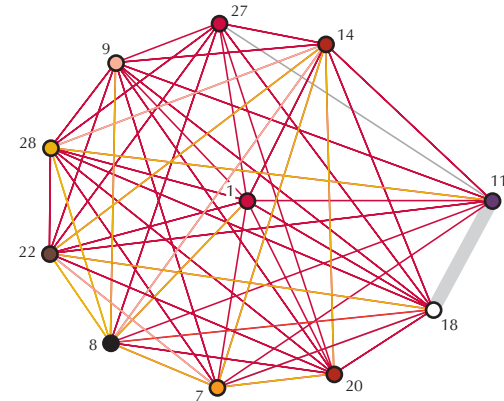
Source: Financial Superinten-
dency of Colombia, Banco de
la República calculations

F. February 18, 2011

Net supply of liquidity

- ○ Between -719.1 b and -659.3b
- ● Between -659.3 b and -599.6 b
- ● Between -599.6 b and -539.8 b
- ● Between -539.8 b and -480.1 b
- ● Between -480.1 b and -420.3 b
- ● Between -420.3 b and -360.6 b
- ● Between -360.6 b and -300.9 b
- ● Between -300.9 b and -241.1 b
- ● Between -241.1 b and -181.4 b
- ● Between -181.4 b and -121.6 b

Total Transactions

- —— Between 0 b and 4.4 b
- —— Between 4.4 b and 8.8 b
- —— Between 8.8 b and 13.2 b
- —— Between 13.2 b and 17.6 b
- —— Between 17.6 b and 22 b
- —— Between 22 b and 26.4 b
- —— Between 26.4 b and 30.8 b
- —— Between 30.8 b and 35.2 b
- —— Between 35.2 b and 39.6 b
- —— Between 39.6 b and 44 b
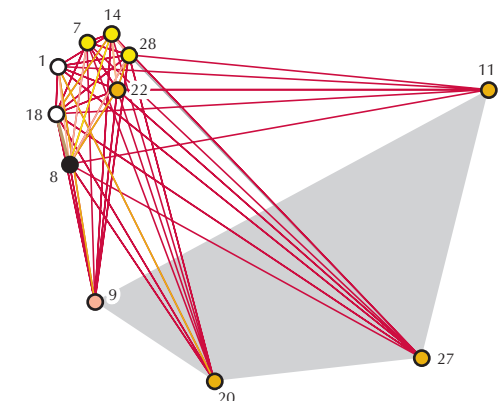
Source: Banco de la República.

Graph 104
MEC Structure February 18, 2011
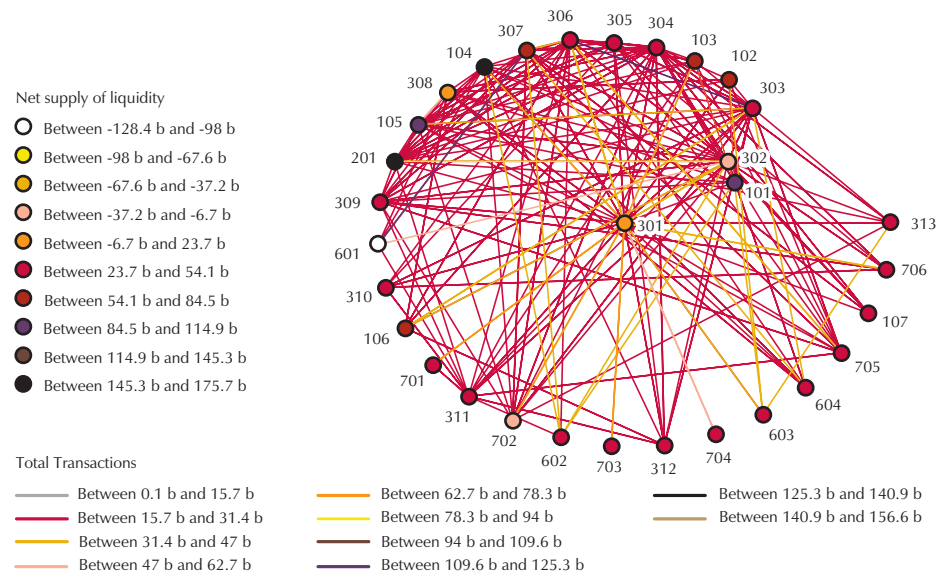
Net supply of liquidity

○ Between -128.4 b and -98 b
○ Between -98 b and -67.6 b
○ Between -67.6 b and -37.2 b
○ Between -37.2 b and -6.7 b
○ Between -6.7 b and 23.7 b
● Between 23.7 b and 54.1 b
● Between 54.1 b and 84.5 b
● Between 84.5 b and 114.9 b
● Between 114.9 b and 145.3 b
● Between 145.3 b and 175.7 b

Total Transactions

Between 0.1 b and 15.7 b	Between 62.7 b and 78.3 b	Between 125.3 b and 140.9 b
Between 15.7 b and 31.4 b	Between 78.3 b and 94 b	Between 140.9 b and 156.6 b
Between 31.4 b and 47 b	Between 94 b and 109.6 b	
Between 47 b and 62.7 b	Between 109.6 b and 125.3 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.

with a high degree of connectivity are 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 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 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 macroeconomic conditions that the financial intermediaries face
as well as their levels of profitability and soundness.

To do a combined analysis of the risks that the financial system is exposed to, the
Financial Stability Map (FSM) is introduced. The purpose of the map is to mea-
sure the stability of the financial system based on six aspects or dimensions. Three
are related to current risk conditions. Two are related to the macroeconomic en-
vironment and one, to the soundness and profitability of the system. The method
used ranks the vulnerability of the situation on a scale of one to nine with one be-
ing the lowest level of risk. Note that the model is designed to provide an indicator
of the current situation in the financial system.[68]

_____

68   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.

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[69] pursuant to the method suggested by the IMF[70] and by Bedford and Bloor (2009).[71] The indicators considered for each of the dimensions are shown in Table 23.

Table 23
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 2010 edition of the Financial Stability Report in the section on liquidity risk.
Source: Banco de la República.

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 system.[72] For each one of the indicators, the longest available time series was used. Therefore, there are some variables which have a very small dimension.

The comparative results of the FSM are presented in Graph 105. The brown line represents the median and is considered a normal level of risk. Caution must be taken in reading the graph 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 risks.

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69   In the selection of variables, the indicators were taken into account that showed an unchanging performance with respect to the risk that should be analyzed in each dimension. However, in some cases it is difficult to find indicators that have that characteristic.

70   International Monetary Fund (IMF), Global Financial Stability Report (2008), October.

71   Bedford, P, Bloor, C. (2009), "A Cobweb of Financial Stability in New Zealand," Discussion Paper Series, DP2009/11, Reserve Bank of New Zealand, November, 2009.

72   The difference in the periodic nature of each one of the dimensions does not lead to difficulties due to the fact that each one of them was built independently of the rest.

Domestic macroeconomic environment

Profitability and capital adequacy

Exposure to foreign sector

Market risk

Credit risk

Liquidity risk

● 0   ● 1   ● 2   ● 3   ○ 4   ● 5   ● 6   ● 7   ● 8   ● 9
——— Median   ——— Dic-09   ——— Jun-10   ——— Dic-10
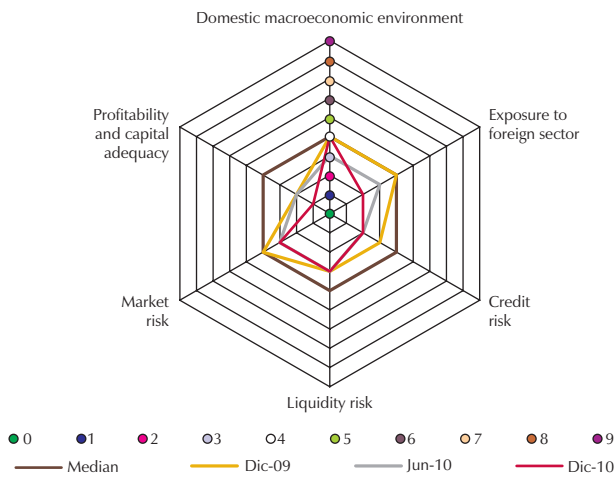
Sources: Financial Superintendency of Colombia, DANE, and Bloomberg, Banco de la República calculations.

At the end of 2010, there was a level of vulnerability in the domestic macroeconomic environment that was similar to what had been registered a year earlier. While the conditions of economic growth and fiscal deficit are similar, there was a reduction in the unemployment rate in 2010, which was accompanied by a rise in the inflation rate. That trend remained at a stable level in this category. Exposure to the foreign sector, in turn, continued declining as a result of a better perception of the country risk (EMBI) in combination with a higher level of foreign investment. Greater importance was placed on the performance of these two factors than on the deterioration seen in the current account balance for the same period.

With respect to the risks to the system, the FSM shows that the market risk witnessed a reduction compared to the levels registered in 2009 and was at a level of 3 at the end of the second half of 2010. This result could be due to the reduction in market volatility and of the fact that the percentage of negotiable securities did not show a lot of variation. The liquidity risk, in turn, remains at a stable level that is below the median as a result of the large holdings of TES on the part of the intermediaries. Likewise, credit risk continued to register reductions in 2010. This trend was essentially due to the decline in the default indicator and to the lower rate of growth for the non-performing portfolio.

In the case of the profitability and capital adequacy of the financial system, note that in 2010, this was at its lowest level of vulnerability as a result of the rise in the capital adequacy ratio, the return on equity, and the stability in the intermediation spread.

In conclusion, there were declines in the levels of credit, market, and liquidity risk that the intermediaries face with credit risk being the one that has shown the largest drop. Furthermore, for this Financial Stability Report, the exposure to the foreign sector continues to show improving conditions as the result of a more favorable perception of the country risk and more foreign investment. The local macroeconomic environment, in turn, looks vulnerable in both prices and government expenditures due to the effects of the winter flooding. As a result of this, the macroeconomic environment is at a level of vulnerability that is similar to what was seen a year ago. Nevertheless, if the better expectations for growth this year become stronger, it can be expected that the level of vulnerability will decline in this category.

The floating exchange rate regime prevalent in Colombia since about the end of 1999 allows the price of foreign currencies, especially the US dollar, to fluctuate freely and be determined by the market. This is a challenge for Colombian companies that are exposed to the foreign exchange risk due to the nature of either their capital or operations. This could materialize to the degree that the value of their assets or liabilities (income or expenditures) in pesos denominated in foreign currency are affected by unexpected variations in the exchange rate.

The purpose of this box is to analyze the use of exchange rate derivative instruments by the companies in Colombia. The information provided corresponds to that of the module on foreign exchange risk[1] applied by Banco de la República and Fedesarrollo in January 2011.

Derivative Instruments as a Method of Exchange Rate Hedging

The information presented in this section corresponds to the results of the module for foreign exchange risk in which industrial companies were surveyed. Unlike the survey given in July 2010, the January 2011 survey was focused on companies that had any of their accounts (assets, liabilities, income or expenditures) denominated in foreign currency. These selection criteria produced a bias towards large companies (Table B8.1). However, it ensured that the analysis would be done only on those companies that were exposed to fluctuations in the exchange rate.

The results of the survey indicate that a low percentage of companies hedge their exchange rate risk with derivatives. Graph B8.1 shows that only 21% of the surveyed companies stated that they had used them, which is consistent with the results presented in the Financial Stability Report for September 2010. This suggests that the derivatives for the exchange rate have not been incorporated into the corporate policies of this sector, which could be due to a low exposure to exchange rate risk or a lack of knowledge about these instruments, among other reasons.

Table B8.1
Distribution of the Sample by Size and Sector
(percentage)

	Share
Size of the surveyed companies	
Large	59.2
Medium	34.0
Small	6.8
Total	**100**
Economic sector	
Manufacturing of furniture	11.7
Manufacturing of food products	10.7
Manufacturing of chemical substances and products	8.7
Manufacturing of apparel	7.8
Manufacturing of metallic products	6.8
Manufacturing of rubber and plastic products	5.8
Manufacturing of automotive vehicles	5.8
Other	42.7
Total	**100.0**

Sources: Banco de la República and Fedesarrollo (module for exchange rate risk).

Graph B8.1
Use of Exchange Rate Derivatives

82%
21%

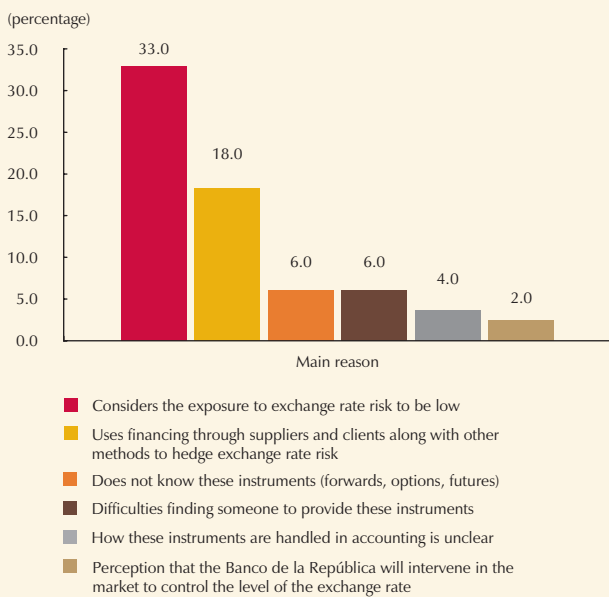■ Yes   ■ No
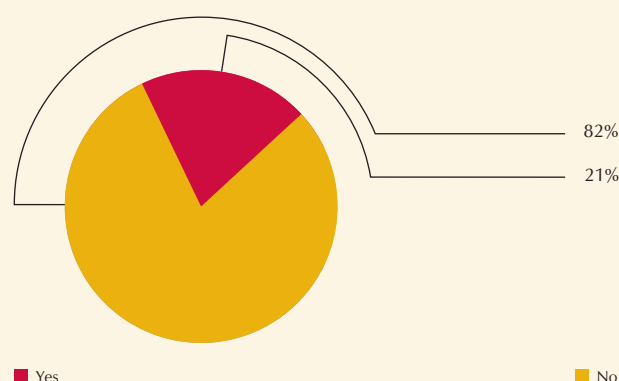
Sources: Banco de la República and Fedesarrollo (module for exchange rate risk).

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1   We would like to express our appreciation for Herman Kamil's work preparing the questionnaire used in the module for exchange rate risk.

a. Companies That Do Not Use Derivatives for Exchange Rate Risk

The businessmen were asked about their main reason for not using this kind of instrument in order to confirm this hypothesis. Graph B8.2 shows that the most important argument chosen by 33% of those surveyed was that the exchange rate exposure is low. Following it in order of importance are the use of financing with suppliers and clients (18%) and the difficulties they faced finding someone who could carry out this kind of operation (6%).

Graph B8.2
Main Reason for not Using Derivatives for Exchange Rate Risk

(percentage)

Main reason

■ Considers the exposure to exchange rate risk to be low
■ Uses financing through suppliers and clients along with other methods to hedge exchange rate risk
■ Does not know these instruments (forwards, options, futures)
■ Difficulties finding someone to provide these instruments
■ How these instruments are handled in accounting is unclear
■ Perception that the Banco de la República will intervene in the market to control the level of the exchange rate

Note: The options "other" and unanswered questions are excluded.
Sources: Banco de la República and Fedesarrollo (module for exchange rate risk)

Also, 28% of the surveyed companies answered that other factors controled their decision. Other answers associated with the use of cash for transactions, the policies of the parent company and the desire to stay with natural hedging, etc. are included in this group.

In order to determine if in fact the firms that said they did not use derivatives have a limited exposure to exchange rate risk, they were asked about the percentage of income and expenditures they had denominated in dollars. By comparing these percentages with those for the companies that do use derivatives, we see that the exposure is lower for the companies that do not use them.

Graph B8.3, panel A shows that both types of companies are concentrated in the lowest percentiles with respect to their income in dollars. In other words, most of the companies surveyed have less than 25% of their total income denominated

in dollars. Doing a breakdown between companies that use derivatives and those that do not use them, 60% of the former and 76% of the latter stated that less than 25% of their total income was denominated in dollars.

When the distribution by expenditures in dollars is analyzed (panel B), a larger difference between the firms that use derivatives and the ones that do not use them is evident. On one hand, the latter are still concentrated in the lowest percentiles with 78% of these companies having expenditures below 25%. If this datum is compared with the data for the companies that do use derivatives, it is evident that the latter are distributed in higher percentiles with 24% of them in the 26%-50% expenditure range and 14% in ranges above 50%.

In conclusion, the results suggest that although the companies that do not use derivatives are indeed exposed to fluctuations in the exchange rate, the exposure appears to be relatively low.

Graph B8.3
Distribution by Range of Income and Expenditures in Dollars

A. Income

(percentage)

■ Do use derivatives   ■ Do not use derivatives

B. Expenditures

(percentage)
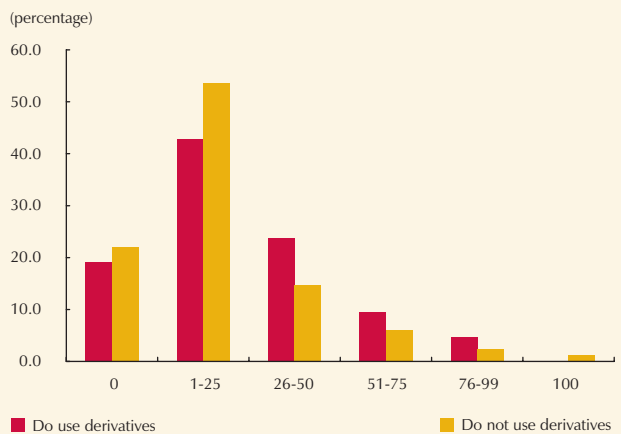
■ Do use derivatives   ■ Do not use derivatives
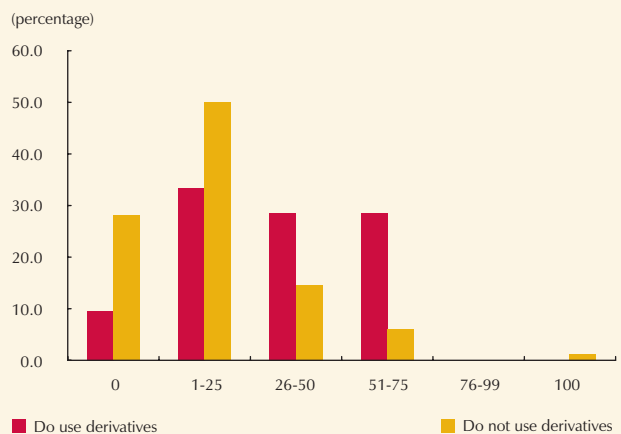
Sources: Banco de la República and Fedesarrollo (module for exchange rate risk).

b.   Companies that Used Derivatives for Exchange Rate Risk

An analysis by size and sector shows that the large companies use derivatives for exchange rate risk (29.5%) more than the medium size companies do (8.6%). At this time, no small firm has confirmed the use of derivatives in the most recent three-month period. This outcome is consistent with what has been found for countries such as the United States and Germany and has been associated with the fixed costs of maintaining a hedging program that discourage small companies from using these instruments in spite of their potential benefits (Bodnar and Gebhardt, 1999).

By economic sector, the highest percentage for use of derivatives corresponds to the textile manufacturing sector. In this sector, 40% of the companies use derivatives to hedge for exchange rate risk. In contrast, the sectors of manufacturing paper products and automotive vehicles show the lowest hedging rates with 25% and 16.7% respectively (Graph B8.4).

In addition, when the companies were asked about the type of contract they used, the forward contract was found to be the most important instrument: 67% of the companies used forward contracts for purchases and 38% used them for sales. In order of importance, this instrument is followed by options (19%), futures (14%) and swaps (5%). The above could be associated with a preference for simpler instruments and the desire of the companies to choose derivatives that fit their needs (Graph B8.5).

Another important aspect in this study is the goal the companies are pursuing when they use derivatives as a hedging mechanism (Graph B8.6). The survey suggests that the main goals were to minimize the variations in cash flow and cover the balance sheet accounts and 47.6% of the companies used it for these goals. This correlates with the predictions in the literature about use of derivatives (Mian, 1996; Ross, 1996). Here the fact that the companies' priorities must be associated with the reduction of volatility in their cash flow is established given that this makes it possible to have sufficient internal funds for the investment programs and helps to mitigate the problems caused by irregularities in information. However, a reduction in the variations of both the accounting profits and the market value of the company are objectives that are less typical.

In conclusion, most of the companies that used derivatives for exchange rate risk are large ones and were motivated by their desire to reduce the volatility in their cash flow and cover their balance sheet accounts. The instrument that the companies used the most was forwards and the domestic financial institutions were the largest providers of these. When the companies were asked who they did the transaction with, 90.5% answered that they only went through domestic financial institutions (exchange market interme-

Graph B8.4
Use of Derivatives

A.   Size
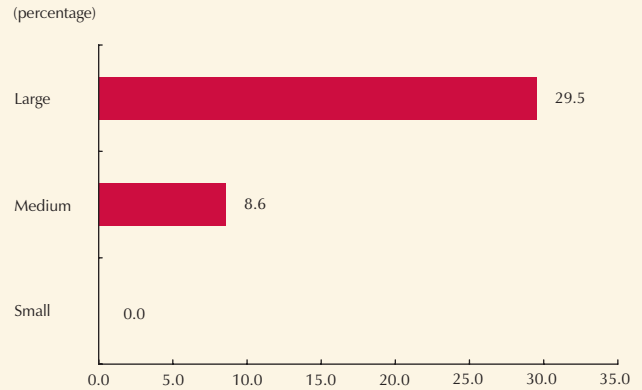
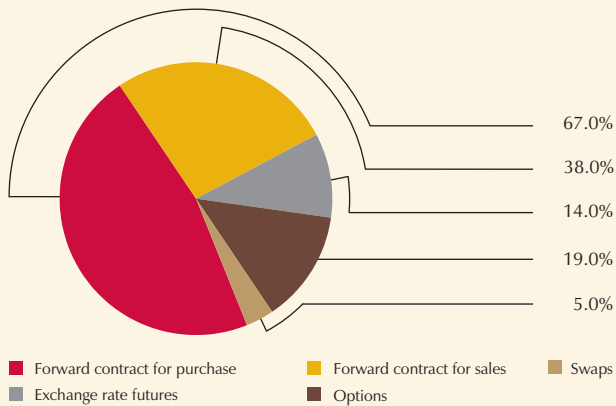(percentage)

B.   Economic sector

(percentage)

Sources: Banco de la República and Fedesarrollo (module for exchange rate risk).

diaries) and 9.5% contracted with both a national and a foreign financial institution.[2]

Finally, the results of the January 2011 survey on exchange risk show that the use of derivative instruments to handle the exchange rate risk is not the usual practice in the industrial sector. This can be explained by the low degree of exposure the companies have. However, this does not mean that the companies will not experience losses due to unexpected changes in the exchange rate.
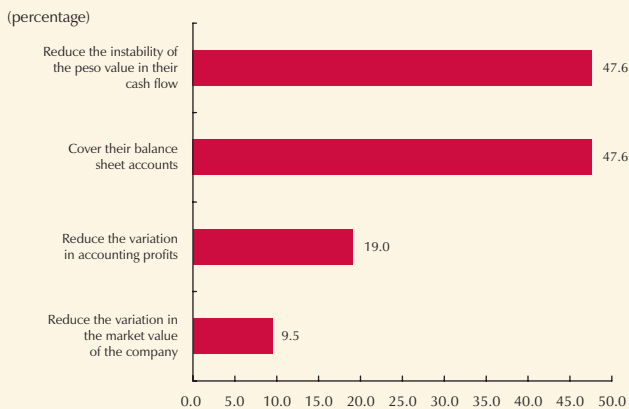
2   The survey asked which institution had rendered the service and multiple answers were possible.

Graph B8.5
Derivative Instrument Used

67.0%
38.0%
14.0%
19.0%
5.0%

■ Forward contract for purchase ■ Forward contract for sales ■ Swaps
■ Exchange rate futures ■ Options

Note: multiple answers were accepted.
Sources: Banco de la República and Fedesarrollo (module for exchange rate risk).

Graph B8.6
Goal Pursued by Using Derivatives for Exchange Rate Risk

(percentage)

Reduce the instability of the peso value in their cash flow — 47.6
Cover their balance sheet accounts — 47.6
Reduce the variation in accounting profits — 19.0
Reduce the variation in the market value of the company — 9.5

0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0

Sources: Banco de la República and Fedesarrollo (module for exchange rate risk).

References

Bodnar, G. M. & Gebhardt, G. (1999). "Derivatives Usage in Risk Management by US and German Non-Financial Firms: A Comparative Survey", *Journal of International Financial Management & Accounting*, vol. 10, pp. 153-187.

Mian, S. (1996). "Evidence on Corporate Hedging Policy", *Journal of Financial and Quantitative Analysis*, vol. 31, pp. 419-439.

Papaioannou, M. (2006) "Exchange Rate Risk Measurement and Management: Issues and Approaches for Firms", *South-Eastern Europe Journal of Economics*, vol. 2, pp. 129-146.

Ross, M. (1996). "Corporate Hedging: What, Why and How?", Working Paper, University of California, Berkeley.

Box 9
CONCENTRATION RISK BY ECONOMIC SECTOR

The objective of this box is to analyze the concentration in the commercial loan portfolio by economic sector because high levels of concentration raise the vulnerability of the financial system in the event of shocks to the ability of debtors to pay their debts. The Herfindal-Hirschman index (HHI)[1] is used to determine if the loan portfolio has become more or less concentrated. The period analyzed goes from December 1998 to December 2010.

The results suggest that both the level of concentration has decreased and sectors such as mining and transportation have increased their share in the commercial portfolio in the last few years. This is consistent with the performance of those sectors at the end of the period under study.

In addition, the analysis by type of intermediary indicates that the special official institutions (SOI)[2] are the most concentrated whereas the banks and the financing companies show lower levels of concentration.

Loans to the Non-financial Corporate Sector

The risk of concentration could be derived from significant exposures to a limited number of economic sectors, a limited number of debtors, and to the correlation of the performance between some debtors or sectors. This box focuses on the first of these components by using the HHI as measurement of concentration. This assumes that in a diversified portfolio[3] the lender is exposed evenly to each sector. The larger the HHI, the larger the concentration will be.

In Colombia, the portfolio of loans to companies from the non-financial corporate sector represents close to 46.8% of the total of the financial system assets that are exposed as of December 2010. The study of the structure of the portfolio by sectors is especially important because sectors with

different cycles can face diverse factors of risk that are not necessarily associated with system risk.

In particular, the sample used in this study corresponds to 70% of the total commercial loan portfolio and consists of both private and public non-financial companies. Graph B9.1 shows the distribution of the loan portfolio by sector at four points in time and makes it evident that although some sectors maintain a relatively constant share, others have increased their share in the last few years. As of December 1998, the largest sectors were industry (29.7%), public utilities (19.6%) and other public entities (15.8%),[4] which, taken together, represented close to 65% of the loan portfolio as a whole. Four years later, the level of concentration for these entities had risen slightly (66.7%) at the same time that the share of the commercial sector went up. This performance is a partial consequence of the crisis in late 1999 when the credit risk materialized and compelled the financial entities to concentrate on sectors with lower levels of risk or with better customers.

However, as the economy continued to recover and some sectors experienced better performance, the financial entities reduced the concentration of their loan portfolios and pursued other markets such as commerce and the transportation and communication sector. This caused the drop in the share for the three sectors mentioned above. This trend continued and industry (26.2%), commerce (21.9%), and transportation and communications (12.2%) became the main sectors as of December 2010.

The construction of concentration indices for the total loan portfolio by sector and the classification by type of entity were included in order to complement the previous analysis. As shown by Graph B9.2, the HHI for the total loan portfolio registered high levels between March 1999 and September 2004 with figures that were above 1,800. Nevertheless, the concentration declined after that date and went to moderate levels, especially since the second half of 2009. These results are consistent with the aforementioned dynamics of the economy.

When the indicators are built by type of financial entity, one sees that the performance of the total HHI is mainly a result of the changes in the indicator for the commercial banks[5] (Graph B9.3). It is noteworthy that these entities are the ones

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1   The HHI measures the level of concentration in the market. This indicator fluctuates within a range between 0 and 10,000. In this range, a figure lower than 1,000 is considered low concentration, between 1,000 and 1,800 corresponds to a medium or moderate concentration, and an index above 1,800 represents a high concentration.
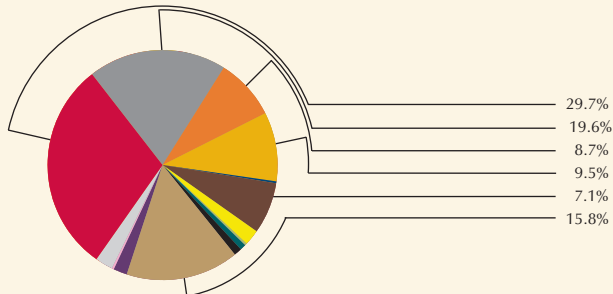
2   Bancoldex, Finagro, etc.

3   In the literature that deals with risk of concentration, when the term 'diversification' is used it refers to lack of concentration. Therefore, it should not be confused with the concept of minimum-variance portfolio that is discussed in the literature on corporate finances.

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4   Under the heading "other public entities" territorial entities such as districts and departments, etc. are included.
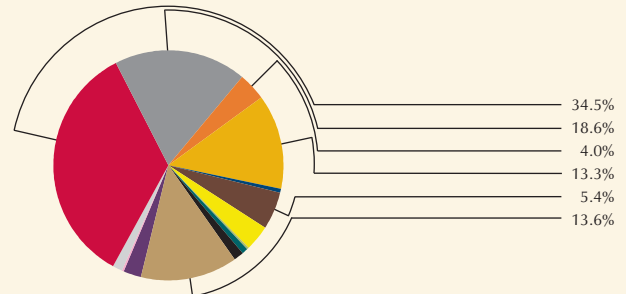
5   For the first years of the analysis, the savings and loan banks (SLB) were considered commercial banks.

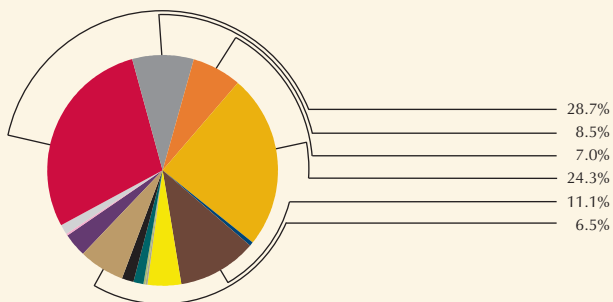Share of the Commercial Loan Portfolio by Economic Sector
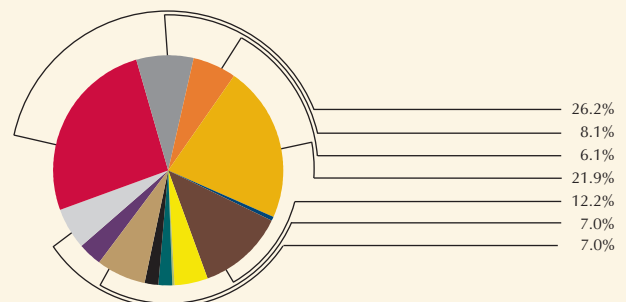(percentage)

A.   December 1998

29.7%
19.6%
8.7%
9.5%
7.1%
15.8%

B.   December 2002

34.5%
18.6%
4.0%
13.3%
5.4%
13.6%

C.   December 2006

28.7%
8.5%
7.0%
24.3%
11.1%
6.5%

D.   December 2010

26.2%
8.1%
6.1%
21.9%
12.2%
7.0%
7.0%

- ■ Agriculture
- ■ Public utilities
- ■ Transportation and communications
- ■ Social and health services
- ■ Fishing
- ■ Construction
- ■ Real estate activity
- ■ Other social service activities
- ■ Mining
- ■ Commerce
- ■ Public administration
- ■ Households
- ■ Industry
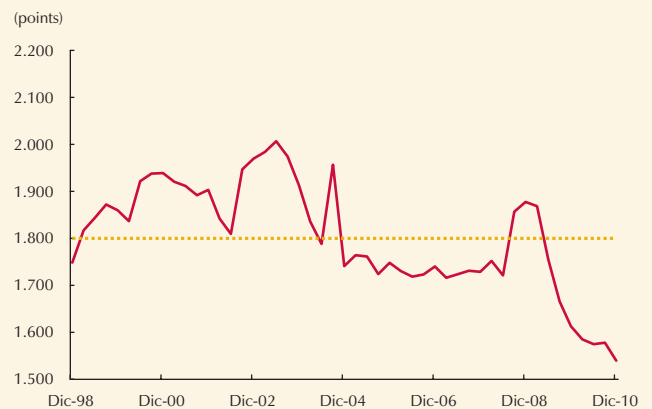- ■ Hotels
- ■ Education
- ■ 'Other' public

Sources: Financial and Corporate Affairs Superintendencies, Banco de la República
calculations.

with the lowest concentration in the loan portfolio whereas
the SOIs had the highest level in the indicator for the entire
period analyzed. This could be explained by the public char-
acter of these entities which serve as investment channels for
development plans sponsored by the government. In fact,
when the indicator for these entities is segregated by sector
the results show that public utilities and "other public enti-
ties" contributed the largest shares in the indicator.

In addition, panel A shows that the concentration held by
financing companies increased in the last quarter of 2010,
which could be related to the loan portfolio sales they made
to commercial banks. When the indicator is broken down,
the result shows that the financing companies concentrated
their loan portfolios in the industrial and commercial sectors
and also that their exposure to the real estate business rose
in the fourth quarter of 2010.

Panel B presents the HHI for FCs and others. This shows
that the indicator is higher and more stable for the FCs than
for the banks and financing companies. The series includes
up to the year 2006 due to the changes that took place in

Graph B9.2
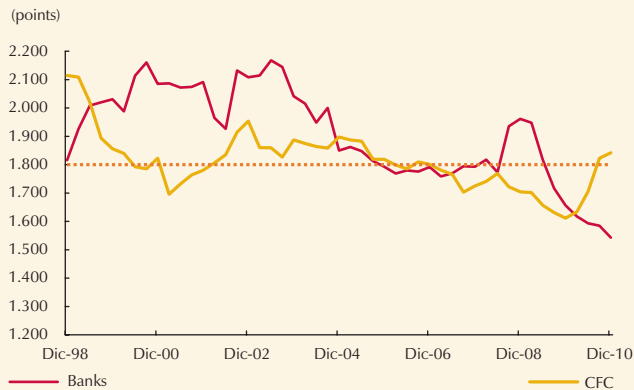HHI for the Commercial Loan Portfolio

(points)

Sources: Financial and Corporate Affairs Superintendencies, Banco de la República
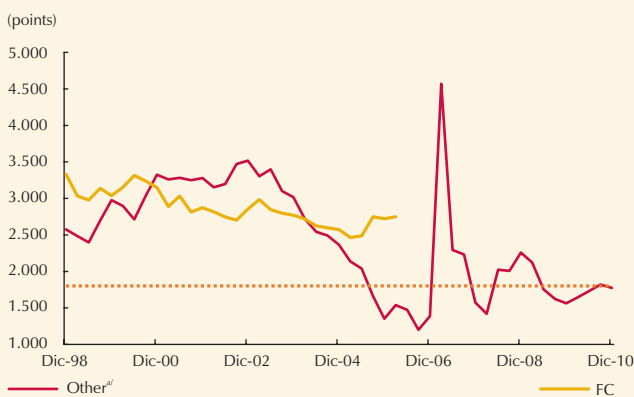calculations. biario).

the business position of these entities. It is evident that the
most volatile indicator is that of the HHI for "others" due to
the structure of the entities included in that category.

A.

(points)

Graph B9.3
HHI by Financial Entities
A.

B.

(points)

a/ Other includes the following: trust companies, financial cooperatives, savings funds, insurance companies and global custodians.
Sources: Financial and Corporate Affairs Superintendencies, Banco de la República calculations.

When the analysis of concentration is contrasted with the changes in the QI by sector (Graph B9.4), it can be seen that the sectors with the highest shares in the commercial loan portfolio are those that generally show the lowest QI. Particularly, when the QI rises in a generalized fashion during periods of crisis, the HHI also grows. This suggests that the financial entities swiftly adjust the composition of their loan portfolios in the event of adverse shocks that could affect the risk profile of their debtors and, as a consequence, concentrate on the least risky[6] (Graph B9.5).

In conclusion, a decrease in the HHI for the commercial loan portfolio implies that the structure of the loan portfolio is more balanced in the case of the financial sector. This performance has taken place at the same time as a downward trend for the QI, which is evidence that the financial entities swiftly rearrange their loan portfolios. In spite of these results, it is important to remember that the interdependency of the
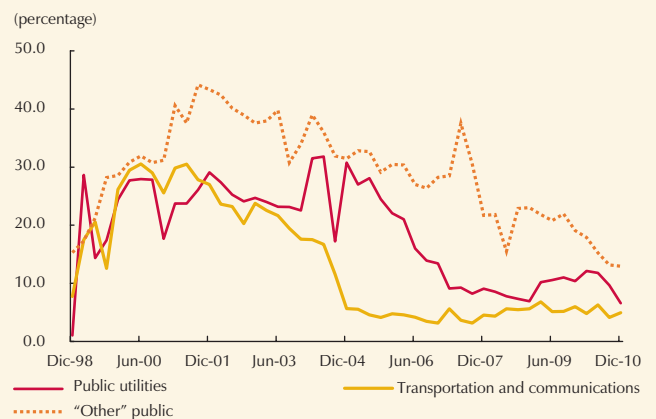
economic sectors is not included in the analysis. Otherwise, the information regarding the degree of vulnerability in the system would become more complete.

Graph B9.4
Quality Indicator for the Commercial Loan Portfolio by Economic Sector

A.
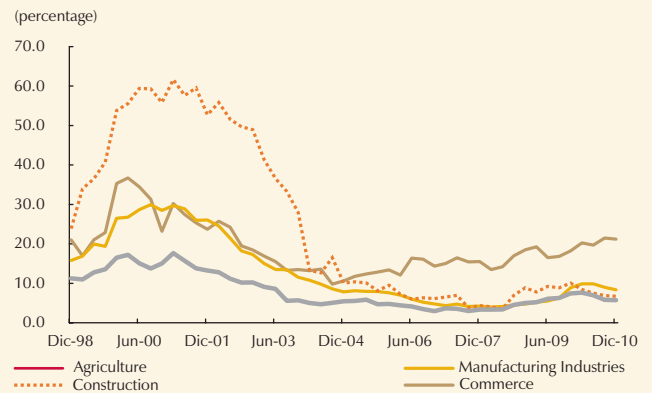
(percentage)

B.

(percentage)

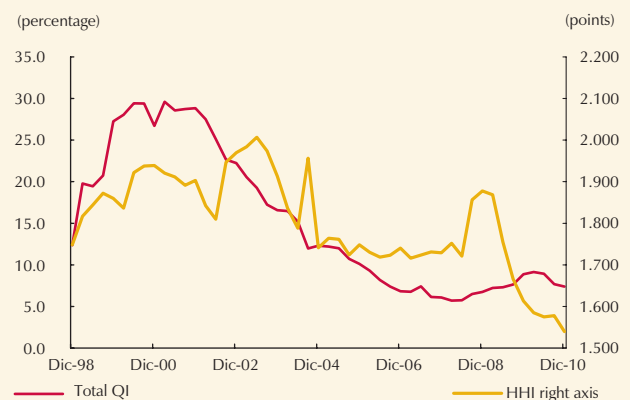Sources: Financial and Corporate Affairs Superintendencies, Banco de la República calculations.

Graph B9.5
HHI and QI

(percentage)   (points)

Sources: Financial and Corporate Affairs Superintendencies, Banco de la República calculations.

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6   The correlation between these two series was 68%.

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

The SFI classifies the management of credit establishments into four zones: the *I* (with an SFI between 1.5 and 2.0) and the II (an SFI between 1.0 and 1.49) include the best qualified entities because their profitability levels are considered outstanding and acceptable respectively. Their core indicators are consistent with a sound financial position in their respective zones. Zone III (an SFI between 0.5 and 0.99) is considered a risky one because it includes those entities whose core indicators reveal financial weakness even though they have a slightly positive, real profitability. Finally, zone IV (an SFI between 0.0 and 0.49) is considered a deterioration zone because it encompasses those financial intermediaries with poor core indicators and a real, negative profitability that has begun to weaken their equity. In this last case, the institutions are unsustainable in the medium term unless they are financially supported by their shareholders or by an external entity (Table B10.1).

1. Changes in the Financial Situation by Groups of Financial Intermediaries[2]

Graph B10.1 shows the changes in the financial situation for each one of the four groups of credit establishments. Since the beginning of the period analyzed (December 2006) no group of credit establishments has been in the warning areas (zones III and IV) with the exception of the CFC group which was in zone III (risk) for most of the period. However, the financial situation of the entities in this group improved and moved them into the acceptable zone (an SFI of 1.0) in June 2010. They have shown a favorable performance ever since.

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1   For more information about the model, see F. Pineda, and H. Piñeros (2009) "El IFU como mecanismo de alerta temprana: una nueva versión," in Financial Stability Issues, Financial Stability Report, March.

2   The banks are included (both commercial banks and those specializing in mortgage loans [BECH in Spanish]), the financing companies (CFC) as well as the companies specializing in leasing and the financial cooperatives. The financial corporations are not included because they are focused on investment banking and do not handle loan operations.

Table B10.1
Classification by Zones

Zone	SFI value	State
I	1.5 to 2.0	Outstanding
II	1.0 to 1.49	Acceptable
III	0.5 to 0.99	Risky
IV	0.0 to 0.49	Deterioration Deterioro

Source: Banco de la República.

Graph B10.1
Financial Entities (SFI changes, 2007-2010)
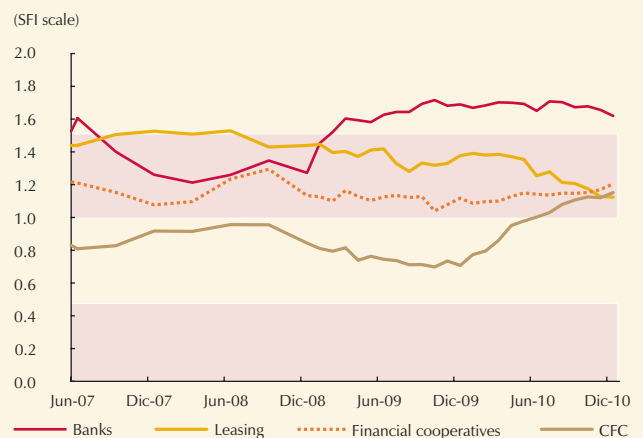
Source: Financial Superintendency of Colombia, Banco de la República calculations.

As was mentioned in the previous Financial Stability Report, the persistent upward trend of the rating for the group of banks in the last few months as well as their subsequent sustainability at around 1.60 reflects a satisfactory financial performance and a sound position for these entities compared to the other groups of financial intermediaries in 2010.

The financial cooperatives have also shown improvements in their financial situation since the second half of the year as they reached an SFI of 1.20 in December.

In contrast, the ranking for the leasing companies has gone down since June. This result could be the result of the merging process these companies went through with their associated banks in 2010.[3] Thus, the SFI for this group of intermediaries closed the year at 1.12.

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3   Five leasing companies were absorbed in 2010 and another five still remained in the financial market as of December 2010.
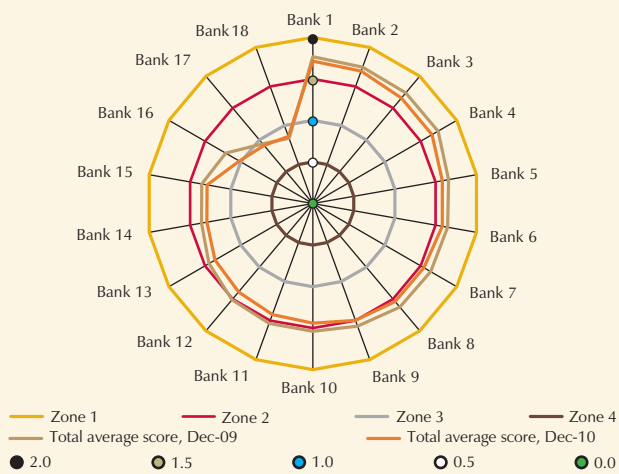
2. Ranking Financial Entities within Each Group

Graph B10.2 (panels A, B, C and D) shows the hierarchical order by group for each financial entity based on the results of the evaluation done by the SFI in terms of intermediation management. It should be emphasized that there was no financial entity in the deterioration zone (zone IV) as of December 2010.
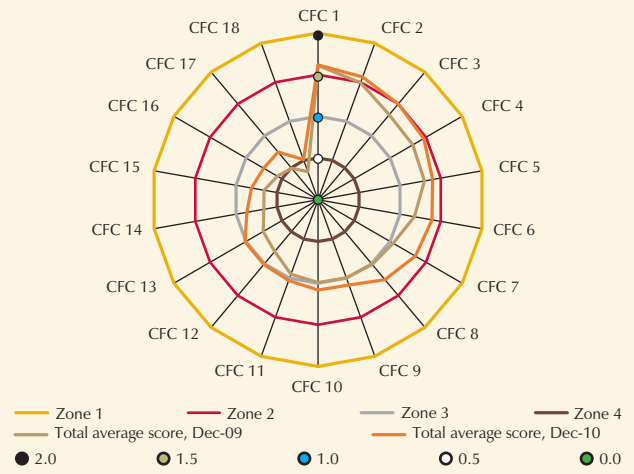
Finally, the fact that the performance of the Colombian economy in 2010 was consistent with the lower proportion of credit establishments in the warning zones should be highlighted. In 2009, 31.5% of the financial intermediaries had been in those zones, but one year later that percentage was reduced to 20.4%.

Graph B10.2
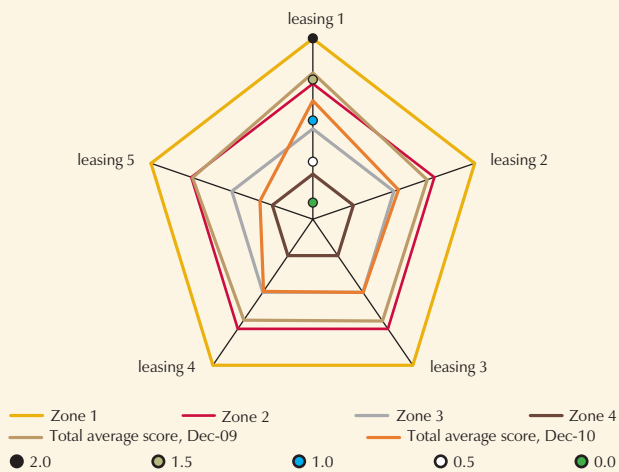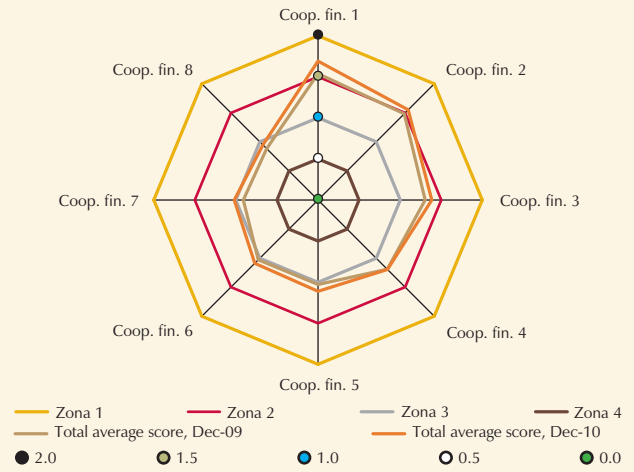Classification as of December 2010

A. Banking system

— Zone 1	— Zone 2	— Zone 3	— Zone 4
— Total average score, Dec-09		— Total average score, Dec-10	
● 2.0	◐ 1.5	● 1.0	○ 0.5	● 0.0

B. CFC

— Zone 1	— Zone 2	— Zone 3	— Zone 4
— Total average score, Dec-09		— Total average score, Dec-10	
● 2.0	◐ 1.5	● 1.0	○ 0.5	● 0.0

C. Leasing

— Zone 1	— Zone 2	— Zone 3	— Zone 4
— Total average score, Dec-09		— Total average score, Dec-10	
● 2.0	◐ 1.5	● 1.0	○ 0.5	● 0.0

D. Financial cooperatives (Fin. coop.)

— Zona 1	— Zona 2	— Zona 3	— Zona 4
— Total average score, Dec-09		— Total average score, Dec-10	
● 2.0	◐ 1.5	● 1.0	○ 0.5	● 0.0

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

Box 11
BENCHMARK INDICATOR FOR COMPANIES

In this box a vulnerability indicator for Colombian companies is presented and an analysis is done of its relationship to the risk ratings for the companies' loans. Doing an analysis of the firms is relevant since, to the degree in which these represent a significant share of the credit institutions' portfolio as a whole, their vulnerability is a risk for the financial system.

Based on the accounting information of the businesses that were in the financial system database on debtors in 2010 and that reported accounting information to the Superintendency of Corporate Affairs, a benchmark indicator for firms (BIF) was built that measures the strength or weakness of the companies compared to others in the same area.[1]

1. Method

Following the results of previous studies[2] four indicators were designed to be built on the basis of the companies' accounting information and to evaluate the performance of these companies with respect to liquidity, activity, leveraging and profitability.

As a liquidity indicator of a firm, the ratio between the available funds and assets was analyzed. With respect to efficiency, the ratio selling general and administrative costs to sales. Likewise, to measure the level of leveraging, the ratio between the financial obligations and assets was taken and finally, profitability was calculated as the earnings before taxes/the total assets of the firm. Based on these measurements, the indicators of liquidity and profitability deteriorated when their values decreased while the indicators of activity and leveraging deteriorated when the values rose.

Following the method used to construct the single financial indicator (SFI),[3] the four indicators were standardized so that they would be compatible. However, the logistic function

that is used should be modified given that some indicators cannot take negative values.

Given that the indicators for activity and leveraging are always positive and deteriorate when the value of the indicator rises, the following version of the logistic function was used:

$$I_i(x) = \frac{2}{1 + \frac{x}{x_c}(ke)^{\frac{x-x_c}{|x_c|}}} \text{ , con } i = f, a.$$

Where I_f is the standardized indicator for efficiency and I_a is the standardized indicator for leveraging. x_c is equal to the mean of each sector plus one standard deviation and, k is a parameter that determines the concavity of the function and is defined in such a way that it satisfies $I_f(x_d) = 0.5$ where x_d is equal to the mean of the sector that is being analyzed plus two standard deviations.

Since the liquidity indicator does not take negative values either but improves when it rises, the following equation is used:

$$I_l(x) = \frac{2}{1 + \frac{x_c}{x}(ke)^{\frac{x_c-x}{|x_c|}}}$$

In this case, x_c is equal to the mean of the sector minus one standard deviation, k is calculated the same way and x_d is the mean minus two standard deviations.

Last of all, given that profitability is not delimited, the original version of the logistic function is used:

$$I_r(x) = \frac{2}{1 + (ke)^{\frac{x_c-x}{|x_c|}}}$$

This has an infinite range and the values of x_c and x_d are calculated the same way as in the previous case.

The indicators show the behavior of the firms in comparison to others in the same sector in each one of the categories. If this is between 1.5 and 2.0, the company is considered to be within the area of best performance. If this is between 1.0 and 1.5, the company is showing an acceptable result since its indicator does not deviate from the average by more than one standard deviation. The businesses that have an indicator between 0.5 and 1.0 are separated from the mean for the sector by between one and two standard deviations. Therefore, they are considered to be low per-

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1   A total of 17,842 firms were studied in all of the branches of the CIIU classification. The information from four sectors: agriculture and fishing where 786 companies were analyzed; mining with 220; manufacturing, 3,341; and finally, commerce, 5,127.

2   O. Martinez (2003). "Determinantes de fragilidad en las empresas colombianas," en Borradores de Economia, num. 259, Banco de la Republica.

3   Pineda, F. y Piñeros, H., "El IFU como mecanismo de alerta temprana: una nueva versión," Financial Stability Issues, *Financial Stability Report*, March 2009.

forming ones. Finally, the firms with an indicator that is less than 0.5 are the ones that have the worst result compared to others in their sector.

The BIF is calculated as a simple average of the activity, leveraging, profitability and liquidity indicators. As a consequence, it is an indicator that takes values that are between 0 and 2 and establishes a way to classify the companies in the four areas described.

When interpreting the results of the BIF, it is necessary to remember that it is an intrasectoral indicator. As a result, it only shows the performance of the companies in comparison to the rest of the firms in the sector. Because of this, when a sector is going through difficulties, it is possible for the companies that are at risk to be classified as having the best levels. Likewise, when a sector is experiencing a bonanza, some firms could have the worst ratings even with good performance. This warning should be kept in mind when analyzing the relationship between the BIF and companies' credit ratings.

2.   BIF Results by Sectors

The results of the BIF for the four most representative sectors in terms of their share of the commercial loan portfolio (manufacturing and commercial sectors) and of their relevance for economic development (mining and agricultural sectors) are analyzed in this section.

After the BIF is calculated by sectors, the relationship between this indicator and the credit rating of the companies will be studied.[4] Based on the survey about the lending situation for March 2011, the criteria that are the most important to the credit institutions when they are studying their clients are their financial viability, their leveraging and other financial indicators. It is also important to study their credit rating history. Based on the above, it is expected to find a relationship between the BIF and the companies' credit ratings in spite of the fact that this is not the only determining information for rating a loan.[5]

When the results of the BIF for the mining sector were analyzed, it was found that in terms of efficiency and leveraging,

the companies are concentrated in the best category. With respect to liquidity, they are more dispersed while their profitability performance is concentrated in the middle categories (Graph B11.1, panel A). When these results are added into the BIF, we see that more than 56% of the companies in this sector are classified in the area of acceptable performance. The fact that 18% of the companies for this sector are classified in the best levels and only one firm classifies into the area of the worst results stands out (Graph B11.1, panel B).

When the relationship that exists between BIF and the credit rating of these companies was studied, all of the companies that had a high BIF were found to have good credit ratings.[6] In spite of that, there is a significant group of companies with a low BIF and A and B credit ratings. This could be due to the bonanza that this sector has been experiencing recently, which would mean that firms that are performing well are being classified into the low BIF categories. In contrast, there are companies that share the same BIF level but have different credit ratings. This could be due to reasons other than accounting criteria which could explain the ratings (such as the credit history) (Graph R11.2).

With respect to the commercial sector BIF, the majority of the companies have the highest rating in the activity and leveraging indicators. Just as in the case of the mining sector, there are firms that place in the two most extreme categories of the liquidity indicator. And with respect to profitability, a significant concentration was found at the lower levels (Graph B11.3, panel A). After averaging out these indicators, 50% of the commercial firms were found to have a BIF that was between 1.0 and 1.5 and only 8.6% of the companies are at the highest level (Graph B11.3, panel B).

When the relationship between this indicator and the credit rating of the companies in this sector was analyzed, statistical evidence that there was a negative correlation was found.[7] In spite of this, there are two situations that draw one's attention. The first is that firms were found that had the same BIF level and, in spite of that, their credit ratings differ. This is particularly obvious in companies with a low BIF. The second one is the fact that some were found with high BIFs and unsatisfactory credit ratings, a result which is worth highlighting. At the same time, there are companies with a low BIF and A and B credit ratings. This could be because the accounting information is not sufficient to explain the rating or there may be problems evaluating and monitoring the risk (Graph B11.4).

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4   For companies with more than one loan, their ratings were averaged out where an A rated loan was made comparable with 1 and an E rated one was made comparable with 5. When a firm's credit rating is referred to, it will mean the average of the ratings for all of their loans.
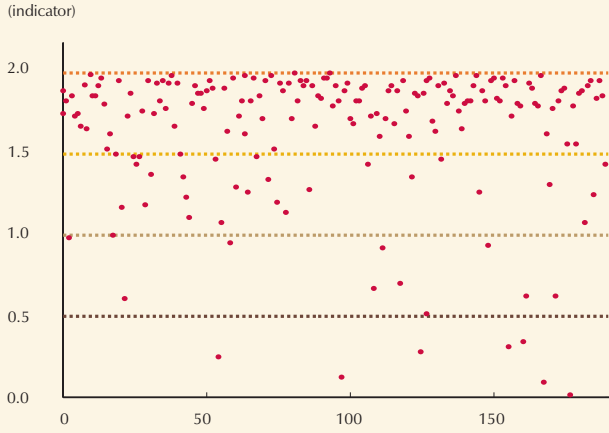
5   For this analysis, the information on the current loans as of December 2010 was used and this was compared to the firms' accounting information from 2009. This is consistent with the evaluations that the banks do.

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6   When a Spearman correlation analysis was done, statistical evidence was found that the data was correlated to a coefficient of -0.2 which is significant at 5%.
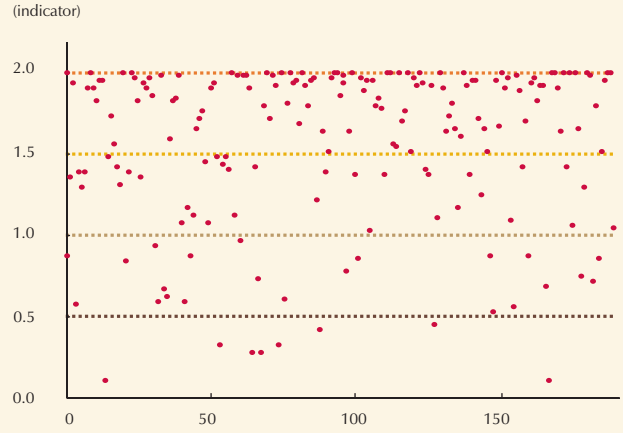
7   The Spearman correlation coefficient is -0.2 which is significant at 5%.
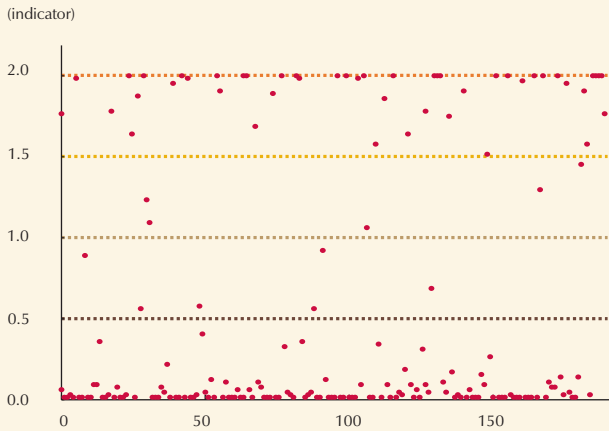
Performance Indicators and BIF of the Mining Sector

A.1   Activity

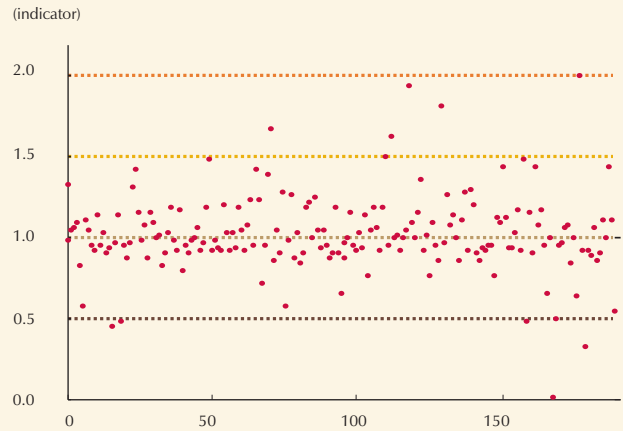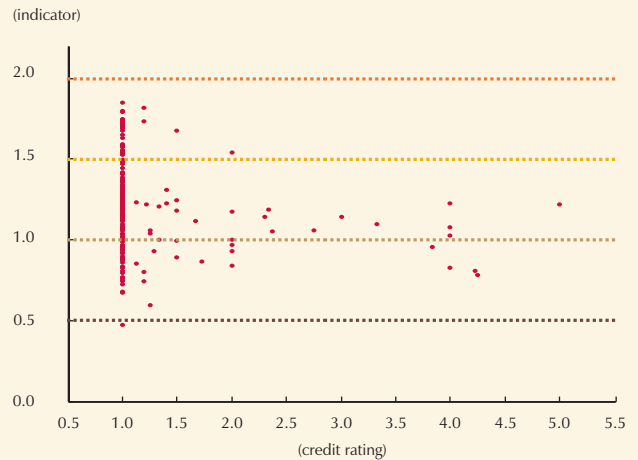(indicator)

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   Mining Sector BIF

(indicator)

(companies)

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

Graph B11.2
BIF and Credit Rating for Mining Sector Companies

(indicator)

(credit rating)
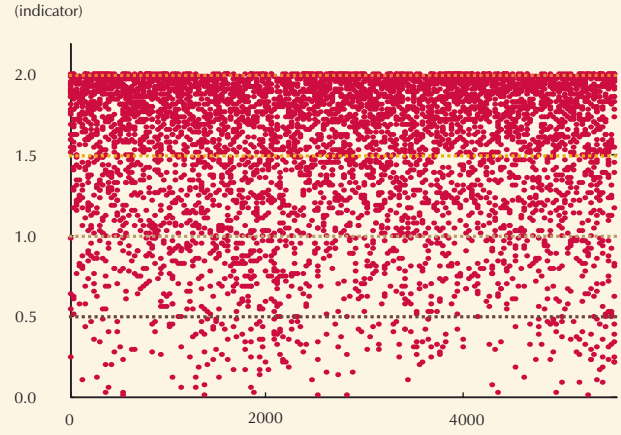
Source: Financial Superintendency of Corporate Affairs, Financial Superintendency of Colombia, Banco de la República calculations.
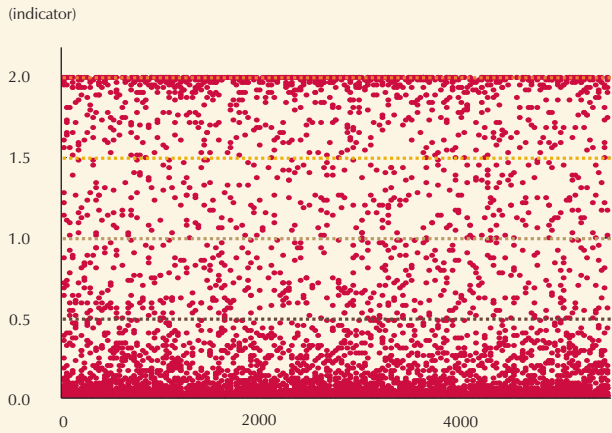
Performance Indicator and PIF for the Commercial Sector

A.1   Activity

(indicator)
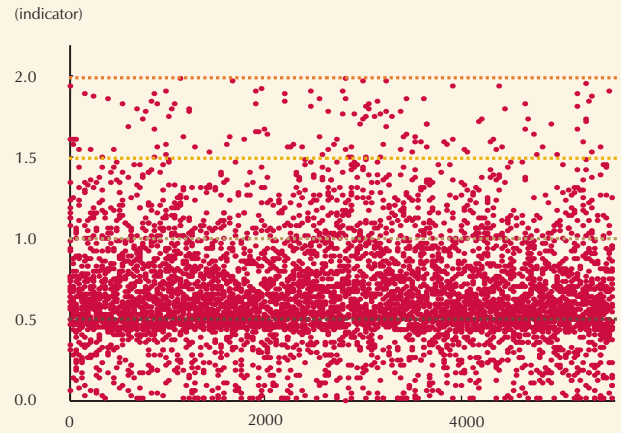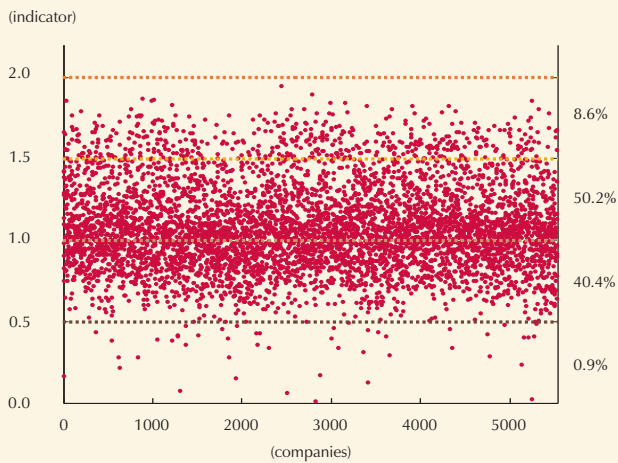

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   Commercial Sector BIF

(indicator)

8.6%

50.2%

40.4%

0.9%
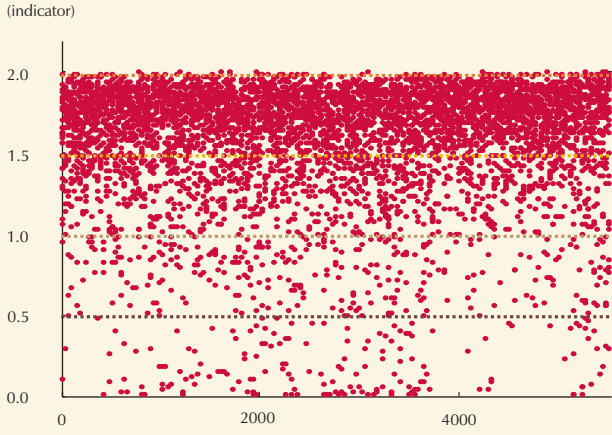
(companies)

Graph B11.4
BIF and Credit Rating for Commercial Sector Companies

(indicator)

(credit rating)

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

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

Likewise in the commercial sector, when the BIF for the manufacturing sector was analyzed, the majority of the companies were found to have good ratings with respect to activity and leveraging. However, in terms of profitability, the majority of them are at lower levels. Like the previous cases, there was a lot of dispersion between the companies with respect to liquidity (Graph B11.5, panel A). When the BIF was built for this sector, the highest proportion of the firms (47%) was found to have an acceptable performance by zone (Graph B11.5, panel B).

A negative correlation is found again when the BIF is compared to the credit rating of the companies.[8] Just as in the previous sectors that analyzed, companies with a high BIF also have a good credit rating in the majority of the cases. In spite of this, there are companies in the manufacturing sector, which have different credit ratings although they share the same BIF. This occurs more often than not in the cases where companies have a low BIF (Graph B11.6).

Finally, when calculating the BIF and its components for the agricultural and fishing sector, the companies were found to have good performance with respect to activity and leveraging. In spite of this, regarding profitability, the majority of them are classified in the lowest section (Graph B11.7, panel A). When these results are averaged out in the BIF, we see that 43.4% of the firms in the sector have a BIF that is between 0.5 and 1.0. In other words, they are classified in the low performance section while only 7% of them have a better classification. (Graph B11.7, panel B).

With respect to the relationship between the credit ratings and the BIF for these companies, there is also a negative and significant correlation between the indicators.[9] Just as in the other sectors, the agricultural one presents high levels of BIF related to good credit ratings while the firms that have low BIF levels have different kinds of ratings. Again, the fact that companies whose BIFs are the same have different credit ratings draws attention (Graph B11.8).

As a first conclusion, the performance of all of the sectors with regards to leveraging and activity is notably concentrated in the section of the best results. In spite of this, all of the sectors that were analyzed, with the exception of mining, showed profitabilities grouped in the lowest levels of performance. With respect to the liquidity indicator there was extensive dispersion for the firms in all of the sectors.
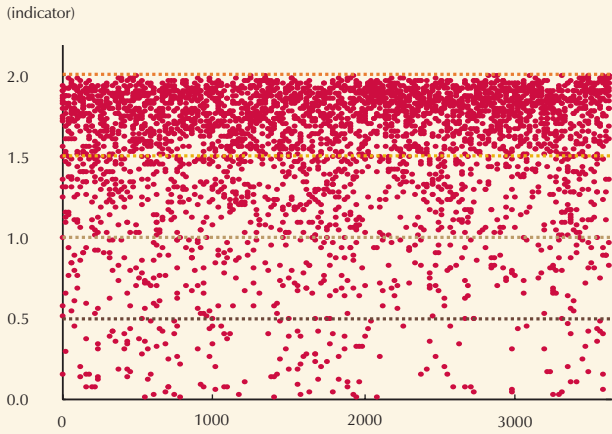
On the other hand, the results confirmed that the BIF and credit ratings for the companies in each sector deteriorated in the same direction. This relationship is stronger for companies with better performances. Nevertheless, there are two situations that draw our attention. The first is when there are coexisting companies that have low, equal BIFs but different credit ratings and, second, when there are firms with high BIF levels and low credit ratings alongside companies with low BIFs and good credit ratings. The two situations mentioned above are a warning that accounting information is probably not sufficient to explain a credit rating or points to problems in the evaluation and monitoring of risk on the part of the credit rating entities.

8   The Spearman corre The Spearman correlation coefficient between these indicators was -0.3 and statistically significant at 5%.
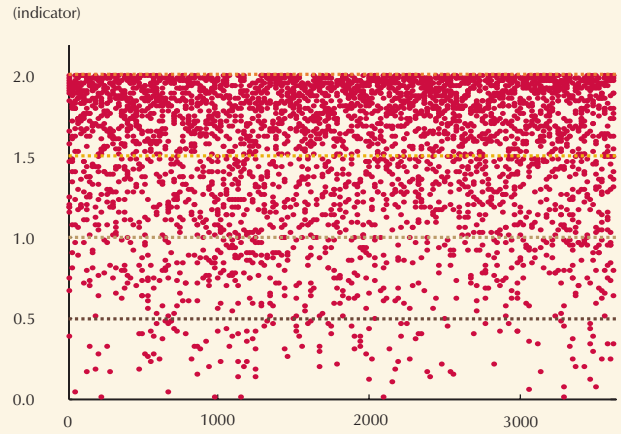
9   The Spearman correlation coefficient between these indicators was -0.3.

Graph B11.5
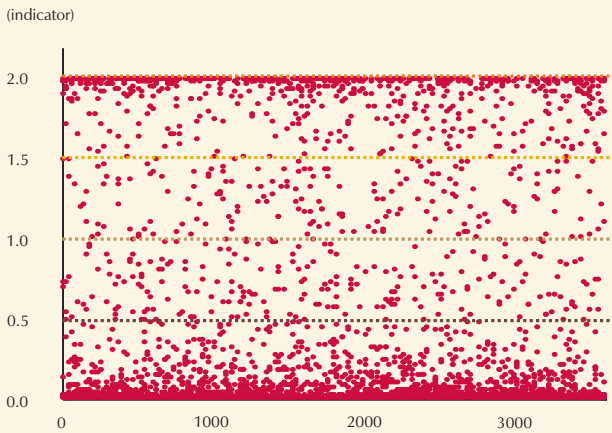Performance Indicators and BIF for the Manufacturing Sector
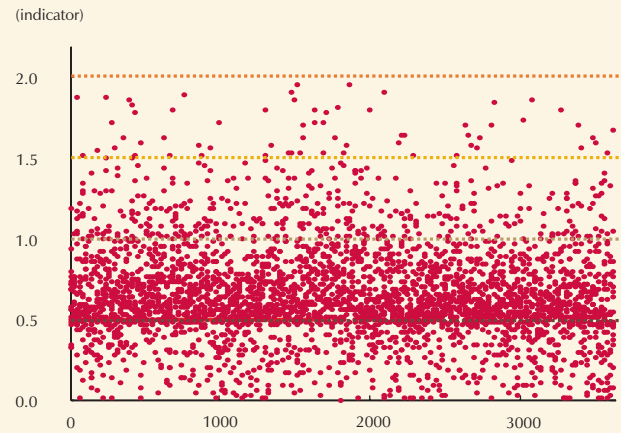
A.1   Activity

(indicator)

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   Manufacturing Sector BIF

(indicator)

9.9%

47.0%

41.9%

1.1%
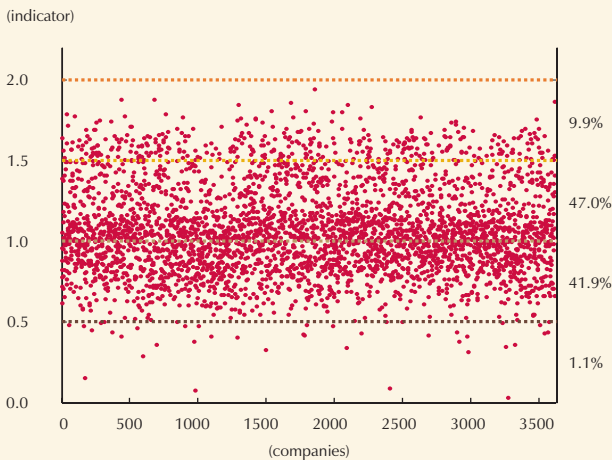
(companies)

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

Graph B11.6
BIF and Credit Rating of Companies in
the Manufacturing Sector

(indicator)

(credit rating)

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

Performance Indicators and BIF for
the Agricultural and Fishing Sector

A.1   Activity
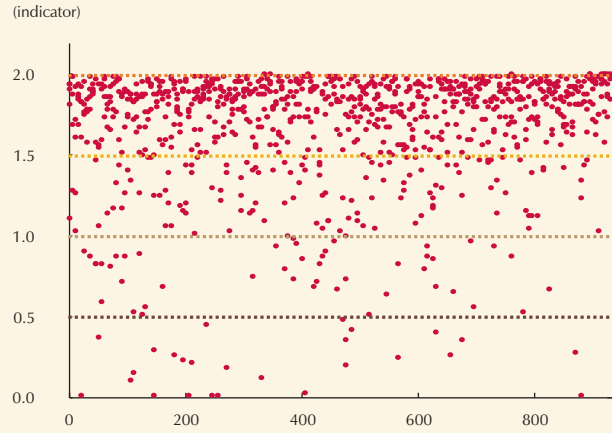
(indicator)

A.2   Leveraging

(indicator)

A.3   Liquidity

(indicator)

A.4   Profitability

(indicator)

B.   Agricultural and Fishing Sector BIF

(indicator)

(companies)

Sources: Financial Superintendency of Corporate Affairs, Banco de la República calcula-
tions República.
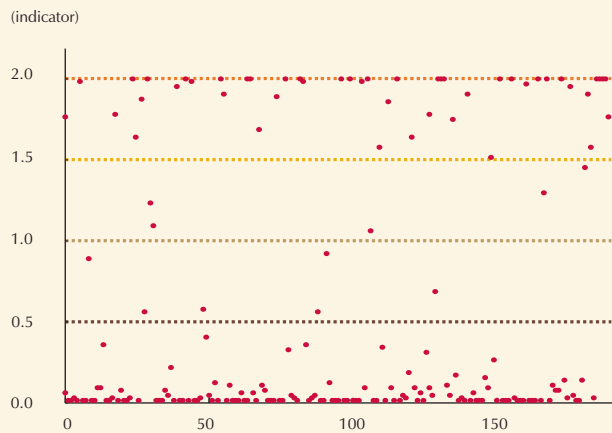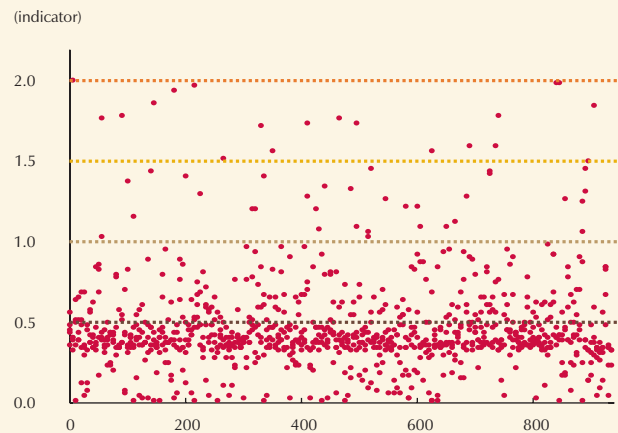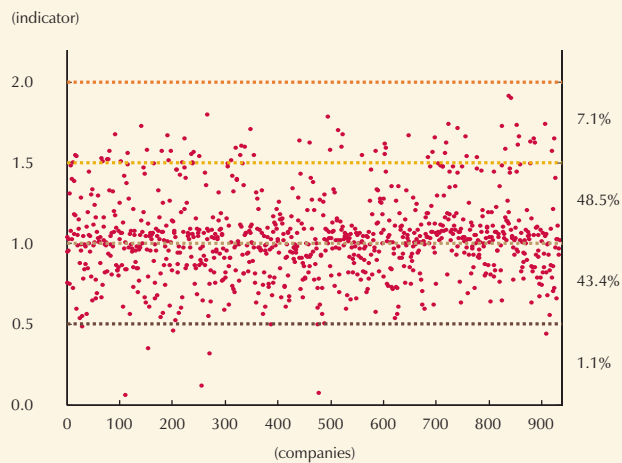
Graph B11.8
BIF and Credit Rating of Companies
in the Agricultural and Fishing Sector

(indicator)

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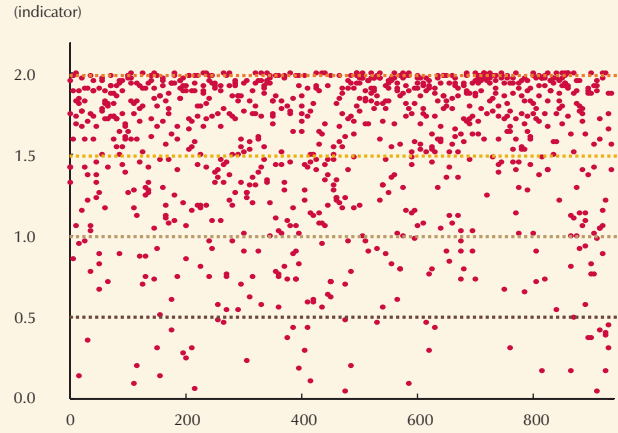
Sources: Financial Superintendency of Corporate Affairs, Financial Superintendency of
Colombia, Banco de la República calculations.

Box 12
FINANCIAL STABILITY INDEX FOR COLOMBIA

This box shows an update of the financial stability index for Colombia (FSI). This indicator, which is done monthly, features the considerations that were developed in Aspachs *et al* (2006)[1] with respect to profitability and the probability of default and constitutes a continuing and quantifiable measurement that can determine the stress level of the Colombian financial system over time.[2]

For the construction of the indicator, a combination of ratios of capital, profitability, credit liquidity and risk for the different financial intermediaries were used. The variables chosen for the index are: return on assets (ROA), return on equity (ROE), ratio of overdue loan portfolio to total loan portfolio (OP), ratio non-performing loan portfolio to total loan portfolio (NP), intermediation spread (IS), ratio of liquid liabilities to liquid assets (LL) ratio of inter-bank funds to liquid assets (IF) and the uncovered liabilities ratio (ULR).

These variables are weighted by means of different methods suggested by the literature such as variance equality,[3] main components[4] and models for counting methods: *zero inflated poisson regressions* and *zero-inflated binomial negative*.[5] As it is seen in Table B12.1, the methodologies used result in a higher weight for the variables associated with profitability and credit risk.

The information generated by the FSI allows for a simple interpretation given that each variable included in its construction has been standardized. Thus, the stress level of the current period can be compared to the historical one in terms of deviations from the mean. The index values that

Table B12.1
Weights of Variables in the Index by Methodology

	VEA	CP	ZINB
ROA	12.5	19.8	7.65
ROE	12.5	19.7	11.75
CV	12.5	17.7	15.69
CI	12.5	19.3	6.17
MI	12.5	13.6	23.03
PL	12.5	2.9	11.95
FI	12.5	0.8	12.03
RPNC	12.5	6.2	11.73

Source: Banco de la Republica calculations.

are above zero indicate situations of greater financial stress in comparison to the historical average while the negative values indicate periods of greater stability. Likewise, growth of the index within a specific period of time can also provide useful information about changes in the stress level over time.

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

Graph B12.1 shows the changes in the index of financial stability for the financial system between December 1996 and the same month in 2010. The recent performance of the indicator reflects the increase in the financial stress level in connection with the international crisis that took place in the second half of 2007, as well as the transition towards a period of higher stability in the months following June 2009. The decline in the level of the indicator has become more evident in the last few months and based on the analysis of index components, it could be attributed to an improvement in terms of the credit risk of the entities.

Graph B12.2 shows three indicators that correspond to the different types of entities that are analyzed.[6] When the indices built for the CB and the CFC are examined, it can be seen that during the last quarter of the year, these entities saw a significant improvement thus demonstrating the higher levels that they have reached in terms of financial stability. One of the indicators calculated for the COOP shows a slight deterioration during the same period, which can be attributed

1   O. Aspachs, C.A.E. Goodhart, M. Segoviano, D.P. Tsomocos, L. Zicchino, (2006) "Searching for a Metric for Financial Stability," Special Paper Series, # 167, LSE Financial Markets Group.

2   For further information, see D. Estrada and M. Morales (2009), "Indice de estabilidad financiera para Colombia," Financial Stability Issues of the Banco de la República, Financial Stability Report, March.

3   Better known as variance equal approach. In this technique, the variables are standardized in order to express them in the same unit and then aggregate them by using identical weights.

4   The main idea behind this methodology is to build an index based on the weight of the selected variables in such a way that the combination would fully explain the combined variance of the variables.

5   This approach uses econometric estimates to model the relationship between the variables that indicate stress and the dependent variable. In this case, it is defined as the number of stressed banks per period. The estimated coefficients are the basis for calculating the weights.

6   The methodologies used are those of the variance equality and main components. The data counting models are not used in this case.
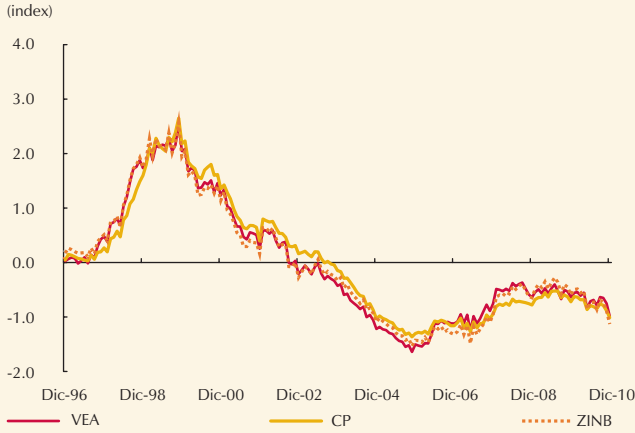
(index)

to the performance of its liquidity risk. However, the indicator is remaining at stable levels.

As was mentioned above, the index succeeds in determining the current stress level in the system, both as a whole and separately, which makes it possible to generate a diagnosis of the financial stability in Colombia. The results of this update show that the degree of stress in the system and for the different types of entities that it is made up of is low and has presented a slight decline in the last few months.

Graph B12.2
Financial Stress Index by Type of Entity

A.   CB Index
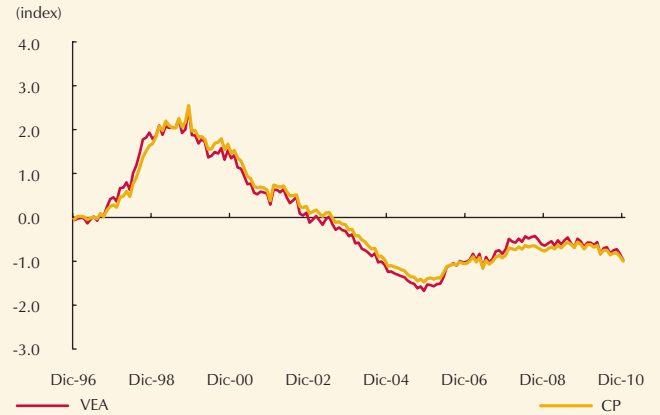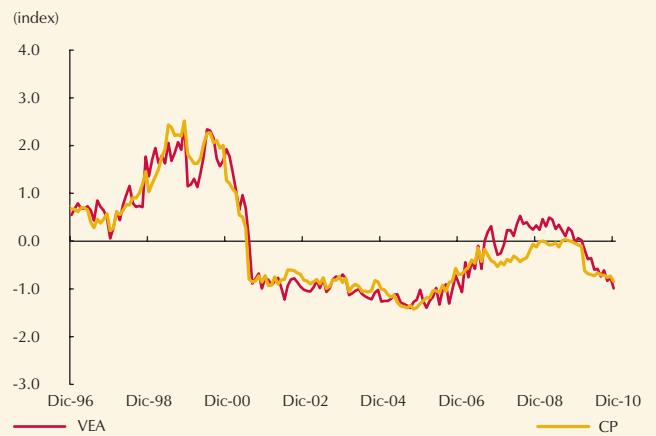
(index)

B.   CFC Index

(index)

C.   COOP Index

(index)

The objective of this box is to do a general comparative analysis between the micro-credit and the consumer loan portfolios. On one hand, there is a summary of the current regulations regarding credit risk for these two loan portfolios and their respective differences. On the other hand, the probability of default is estimated by finding reasons that support the need for a specific risk system for micro-credit. This is due to the fact that said probability is a fundamental factor in establishing the requirements for loan-loss provisioning and capital.

The continuous and meticulous follow-up on credit risk on the part of financial intermediaries is a primary concern for the supervision and regulatory entities in the financial system. In this regard, it must be acknowledged that there are differences between consumer loans and loans granted to small business owners, in spite of the fact that they have similar features.

1. Credit Risk Regulations

Before the Credit Risk Management System (SARC in Spanish) was established for the consumer loan portfolio, the way risk was rated for both this loan portfolio and that of micro-credit was very similar because they both depended on the period of time the loan is in default rather than on the debtor's risk profile[1] (Table B13.1). Once these risk ratings were established, the loan-loss provisioning percentages for each loan portfolio remained identical.[2]

Furthermore, the micro-credit portfolio can become non-performing faster than the consumer loan portfolio due to the fact that interest income from the first one can no longer be entered on the profit and loss statement within a very short period of time (past due 30 days or more). At the same time, the interest from the consumer loan portfolio cannot be entered on the books after being past due 60 days or more.

Table B13.1
Risk Rating based on Days in Default

	Micro-credit	Consumer
A	Up to 1 month	Up to 1 month
B	More than 1 month and up to 2 months	More than 1 month and up to 2 months
C	More than 2 months and up to 3 months	More than 2 months and up to 3 months
D	More than 3 months and up to 4 months	More than 3 months and up to 6 months
E	More than 4 months	More than 6 months

Source: Financial Superintendency of Colombia.

Finally, according to the Financial Superintendency of Colombia (FSC), the probability of default as shown by internal models are determined the same way for both consumer and micro-credit loan portfolios. which can be used for the approved models by the supervising body as shown in Table B13.2.

Table B13.2
Default Probability
(percentage)

Risk categories	Default probability (percentage)
AA	0 a 3
A	> 3 a 5
BB	> 5 a 28
B	> 28 a 40
CC	> 40 a 53
C	> 53 a 70
D	> 70 a 82
E	> 82 a 100

Source: Financial Superintendency of Colombia.

---

1   If the financial entity does not have internal models, it must resort to what is stipulated in External Circular 29/2007 of the Financial Superintendency.

2   Once the consumer SARC was incorporated, the risk ratings no longer depended only on the time a payment is overdue but also incorporated characteristics of the debtor's risk profile. To achieve this, some benchmark models based on Z-score methodology and logistics probability models are proposed. In addition, the levels of loan-loss provisioning are different from those of the former system, and consequently, from those of micro-credit.

2. Conceptual Differences between Consumer Credit and Micro-credit

Although there are certain similarities between consumer loans and micro-credit loans, it is important to establish the differences between them so that the way they are structured and monitored is appropriate. The differences are related to the origin of the debtor's funds, how the loan will be used, the collateral and maturities, etc.

In general, we find that the users of consumer loan usually have formal and verifiable income (employees and independent contractors that have a credit history and organized accounting records of their businesses). In contrast, micro entrepreneurs have a volatile income, their accounting (if they have it) is rudimentary, and therefore, the data on their businesses is unreliable. Keeping this in mind, while the amount for consumer loans is calculated based on the debtor's salary, in the case of micro-credits it must be estimated on the basis of their business outlook.

Regarding the use of the loan, while consumer loans are oriented towards acquiring goods and services that are intended to satisfy specific consumer needs, those of micro-credit are loans for an investment that is intended to improve or enlarge the borrower's business. Therefore, the risk considerations should be different for the two cases.

Finally, although the collateral that is used as a guarantee for both kinds of loans tends to not be suitable anyway,[3] the non-traditional collateral used for micro-loans does not achieve its objective of bringing down the cost of losses resulting from default (LRD). This is due to the fact that if there is a default on payment, the liquidation of that collateral would not cover the value of the loan. However, for a micro-credit user, the personal value that collateral has translates into a lower probability of default.

The above-mentioned characteristics make the credit risk for the two kinds of loan portfolios different. Consequently, these characteristics have to be analyzed in order to be able to develop workable regulations that will allow for the establishment of loan-loss provisioning and capital that fits those circumstances. Nevertheless, in order to incorporate them in a regulatory framework, it is necessary to differentiate between the loans in which micro-credit technology is used and those in which is not. The former usually includes specific information about the debtor which cannot be gathered by means of traditional risk models.

3.   Estimate of Default Probability

The methodology presented in Gonzalez et al. (2010) was used in order to compare the credit risk for both consumer and micro-credit loan portfolios. This was done by drawing on information from all the micro-credit loans while, in the case of the consumer loan portfolio, information was drawn only from categories that were not credit cards or car loans.[4]

The information used for the estimate was provided by the Financial Superintendency of Colombia form 341. The period of the analysis is the period between 2006 and 2009. In the case of the consumer loan portfolio, due to the large number of records there are (Table B13.3) fifty random samples were taken during each period and the distribution of loss probability was calculated for each sample. Then, the percentiles were averaged to obtain a single probability distribution for this loan portfolio. The simulation results for both kinds of loan portfolios are presented in Graph B13.1.

Table B13.3
Number of Loans used to Calculate the Loss Probability Distribution as Percentage of the Loan Portfolio

Year	Micro-credi	Consumer	
		Complete base	Average size of the sample
2006	279.525	2.769.695	420.100
2007	400.884	3.723.242	561.350
2008	449.634	3.495.940	667.756
2009	642.042	3.851.568	564.224

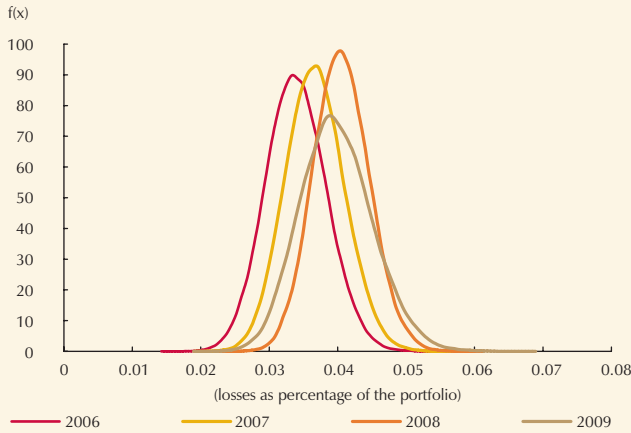Sources: Financial Superintendency of Colombia, Banco de la República calculations.

As shown in Graph B13.1, panels A and B, the distributions of loss probability as a percentage of the loan portfolio are different for these two types. On one hand, the losses in the micro-credit portfolio have a low degree of dispersion and are concentrated on the mean. This is due to the fact that these two types of loans are very similar with respect to the amount granted since the debt levels incurred by the debtor are limited by regulation to a low level.[5] In contrast, the consumer loan portfolio presents a loss distribution with higher variance than the micro-credit, and therefore, its shape is flatter due to the variability in the amounts granted for this type of loan. Likewise, the distribution of loss probability is different for each type of loan. While the loss distribution in micro-credit adjusts to the normal curve, in the consumer loan portfolio, the distribution is biased to the left and shows

3   It is important to emphasize that some micro-credits have guarantees from the National Guarantee Fund or the Farming Guarantee Fund.

4   These loans were excluded from the database inasmuch as the first has a different methodology that does not allow us to establish

either the installments or the total amount. The loans for vehicles, in turn, also have more extensive installments than the average for consumer loans as well as suitable collateral (i.e. pledging the vehicles themselves for which the loan is granted).

5   Act 590/2000 and Decree 919/2008 define micro-credit as that in which the total indebtedness by the borrower does not exceed 120 times the current legal monthly minimum wage (SMMLV in Spanish). Also, the small companies that the micro-loan is for have as many as ten workers and total assets under 500 SMMLV (Act 590/2000 and Act 905/2004). These restrictions make the micro-credit amounts more uniform because they are relatively low and also bring their concentration lower than that for the other kinds of loan portfolio.

A.   Micro-credit Loan Portfolio


B.   Consumer Loan Portfolio
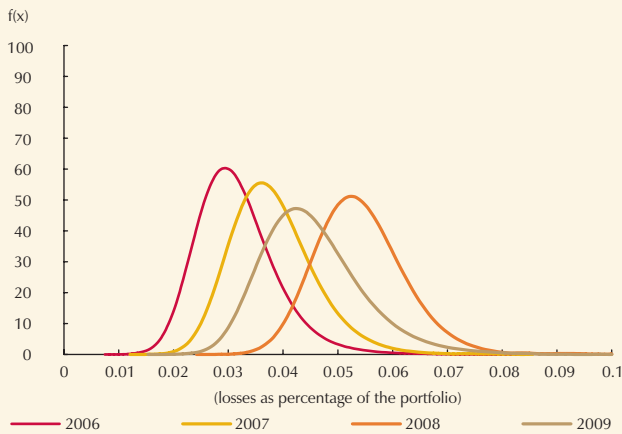
Source: Financial Superintendency of Colombia, Banco de la República calculations.

wide tails. This gives it the probability of larger extreme losses in comparison to the micro-credit loan portfolio.

Graph B13.2 shows the loss distribution as percentage of the loan portfolio for both consumer and micro-credit port-folios in December 2009. As can be seen, the expected loss is larger for the consumer loan portfolio (4.6%) than for the micro-credit portfolio (4%). In addition, the maximum loss that could take place at a significance level of 1% (VaR) is also larger for the consumer loan portfolio (7.7%) given the wider tail seen in its distribution with respect to that for micro-credit (5.3%). The above suggests that a loan for the small business sector needs less loan-loss provisioning

Graph B13.2
Loss Distribution as Percentage of Credit
Loan Portfolio, 2009
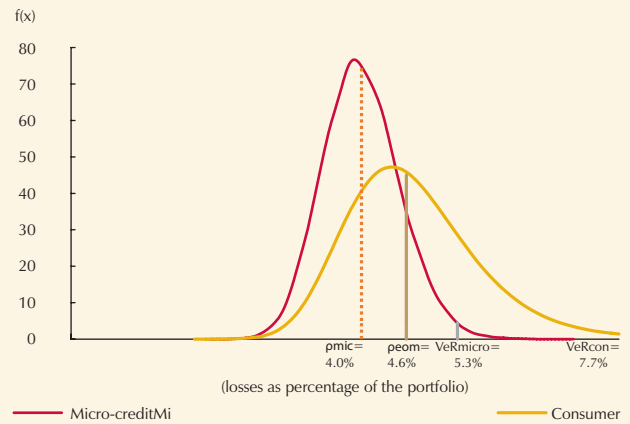
Source: Financial Superintendency of Colombia, Banco de la República calculations.

than what is demanded for a consumer loan and, at the same time, it could require less regulatory capital to cover unexpected losses.

Table B13.4 shows the expected and unexpected loss for both the consumer and micro-credit loan portfolios, in which the first measurement is used to calculate loan-loss provisioning and the second, for the level of capital required. In general, the aforementioned is confirmed with respect to the amounts for loan-loss provisioning and regulatory capital based on type of credit. On average, the level of loan-loss provisioning for micro-credit is 3.6% while for consumer loans, it is 4.3%. The level of capital, in turn, for each peso granted is 1.3% for the former and 2.5% for the latter. In the first year that was analyzed (2006), the results were contrary to what occurred in the rest of the years studied since the expected loss as a percentage of portfolio value was slightly

Table B13.4
Expected and Unexpected Loss (ne) as
Percentage of the Value of the Portfolio

Year	Micro-credit		Consumer	
	ρ	ρne	ρ	ρne
2006	3,4	1,1	3,2	2,2
2007	3,7	1,0	3,8	2,2
2008	4,1	1,0	5,4	2,4
2009	4,0	1,3	4,6	3,1
Average	3,6	1,3	4,3	2,5

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

higher for the micro-credit than for the consumer loan portfolio (3.4% vs. 3.2%). However, it is probable that advances in the introduction of micro-credit technology, which translates into a higher level of monitoring, could have caused this tendency to change with respect to the abovementioned results.

To summarize, different performances are seen in the distribution of losses as a percentage of the portfolio for both the micro-credit and the consumer loan portfolios. Thus, the results suggest different percentages of loan-loss provisioning for the two types of loan portfolio and show that the level of capital for the consumer loan portfolio is higher than the one for micro-credit. Given the differences in the characteristics and nature of these types of loans, it is important to establish different plans for loan-loss provisioning and risk management for each kind. Therefore, it is important to build a risk management system for the micro-credit portfolio that can be adapted to the specific characteristics of this type of loan.

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Felaban & WWB (2005). "Bancarización para la mayoría: microfinanzas rentables y responsables".

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FINANCIAL CONDITIONS INDEX: EARLY AND LEADING INDICATOR FOR COLOMBIA?

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This paper is an attempt at constructing a simple and effective macroprudential tool for policymakers. By integrating the joint occurrences of the main financial markets in Colombia into a single Financial Conditions Index (FCI), we hope to synthesize the information embedded in them regarding possible future economic outcomes. To do this, we use monthly data on 21 variables for the period comprised between July, 1991 - June, 2010 and apply PCA on their correlation matrix. On the one hand, we evaluate the predictive capacity of the FCI in forecasting GDP growth at different time horizons and find that it performs better as a leading indicator of real activity than other individual financial variables and an autoregressive model of GDP growth. Additionally, we are interested in testing the FCI's long-term capability to correctly anticipate periods of distress in the economy. Our FCI seems to represent a useful instrument for both financial stability and macroprudential purposes.

ÍNDICE DE CONDICIONES FINANCIERAS: ¿INDICADOR LÍDER Y DE ALERTA TEMPRANA PARA COLOMBIA?

Este trabajo es un intento por construir una herramienta macroprudencial efectiva para los hacedores de política. El objetivo es sintetizar la información contenida en los principales mercados financieros en Colombia en un único indicador de condiciones financieras (FCI, por su sigla en inglés), mediante la combinación del desempeño conjunto de variables representativas de estos mercados. Para esto, utilizamos datos mensuales de 21 variables durante el período julio de 1991 a junio de 2010 y aplicamos un análisis de componentes principales (PCA, por su sigla en inglés) a su matriz de correlaciones. Por un lado, evaluamos el poder predictivo del FCI para pronosticar el crecimiento del PIB a diferentes horizontes de tiempo y encontramos que tiene un mejor desempeño como indicador líder de la actividad real en comparación a otras variables financieras y a un modelo autorregresivo. Adicionalmente, se evalúa la capacidad de largo plazo del FCI para anticipar correctamente períodos de estrés en la economía. Este índice parece constituir un instrumento útil tanto para propósitos macroprudenciales como de estabilidad financiera.

FINANCIAL BURDEN ESTIMATION: AN ARTIFICIAL NEURAL NETWORK APPROACH

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Debt indicators contribute to individual credit limits assessment as well as an instrument to monitor the system's credit dynamics and sustainability. As far as the financial information obtained on a micro level basis, is not available at the macro level in Colombia, we develop an income-inference methodology for credit holders in Colombia, relying upon the relationships between individual financial expenditure and income. The methodology considers cluster analysis and Artificial Neural Network (ANN) based multiple regression models for every cluster. The resulting estimates, allow for the construction of micro-founded aggregate indicators, useful for the design and implementation of financial stabilization mechanisms. Results suggest about 10% of population facing excess debt burden.

ESTIMACIÓN DE LA CARGA FINANCIERA EN COLOMBIA

Los indicadores de endeudamiento permiten evaluar la posición crediticia de cada individuo. En el nivel agregado contribuyen al seguimiento de la dinámica y sostenibilidad del crédito en el sistema. A pesar de su importancia, en Colombia la información financiera que se obtiene en el nivel micro no se encuentra disponible para la construcción de indicadores en el nivel macro. Por esta razón se propone un método de inferencia de la renta de los individuos a partir de su relación con el gasto financiero, que permite medir la carga financiera para la totalidad de titulares de crédito en el país. La metodología parte de la conformación de segmentos para estimar, en cada uno de ellos, regresiones múltiples basadas en redes neuronales artificiales (RNA). La agregación de indicadores microfundamentados puede contribuir al diseño e implementación de mecanismos de estabilización financiera. Los resultados sugieren exceso probable de endeudamiento para un 10% de la población.

EFFECTS INTEREST RATE PAPS ON FINANCIAL DEEPENING

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In this document we explore the relationship between financial depth (credit to private sector and GDP ratio) and the existence of a ceiling in interest rates in Latin American countries between 1980 and 2008. First, we present the characteristics and evolution of related regulation and then we estimate a panel data regression in order to evaluate the effect of an interest rate ceiling on the level of financial depth. Moreover we use an application of Stiglitz and Weiss classic model (1981) in order to identify possible effects of variations of this limit over aggregate credit. Main results indicate that the presence of a restrictive limit on interest rates is associated with a lower level of financial depth in Latin America over this period.

DEFECTOS DE LOS LÍMITES A LAS TASAS DE INTERÉS SOBRE LA PROFUNDIZACIÓN FINANCIERA

Este documento explora la relación entre la existencia de un límite superior a las tasas de interés y la profundización financiera (medido como el crédito al sector privado como porcentaje del PIB) en América Latina entre 1980 y 2008. Inicialmente se hace una exposición de las características y evolución de dicha regulación en América Latina y a continuación se analiza esta relación para varios países de la región por medio de una estimación con datos panel. Adicionalmente, mediante una aplicación del modelo clásico de Stiglitz y Weiss, (1981) se explora el efecto negativo que puede tener la existencia de dicho límite sobre el nivel de crédito en la economía y los posibles efectos que podría generar el aumento o eliminación de dicho límite. Los resultados indican que la presencia de un límite restrictivo a las tasas de interés está asociada con un menor nivel de profundización financiera en América Latina para el período considerado.