FINANCIAL STABILITY REPORT

March 2010

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

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EXECUTIVE SUMMARY

During the second half of 2009, the world economy showed signs of recovery from the international financial crisis, reflected in lower level of risk aversion. However, fiscal pressures are mounting on developed economies due to increased government spending generated by the stimulus measures and could undermine the momentum in the global economy. In the case of Colombia, the indexes of consumer confidence and expectations for industry and commerce have recovered, but are still at levels below those registered prior to the financial crisis. The letter could result in a more optimistic scenario for increased intermediation activity in the financial system.

Financial system assets grew less during the second half of 2009; the annual increase went from 11.3% in June to 6.7% by the end of the year. This is largely the result of less growth in the total loan portfolio, which accounts for 64.4% of assets. Specifically, the different types of consumer and commercial lending posted negative annual real growth rates in December 2009: -0.4% and -1.6%, respectively. In contrast, the rate of growth in investments by credit institutions went from 23.8% in June 2009 to 28.4% six months later. Consequently, investments as a share of total assets rose 1.6 percentage points (pp) and came to 21.6% by December 2009.

Annual real growth in deposits declined from 14.5% in June 2009 to 5.8% by the end of the year. As for the different types of deposits, the annual real increase in CDs declined from 19.5% in June to -2.9% six months later. Current and savings accounts were up 6.2% and 10.1%, respectively, by the end of the year. This performance reflects a shift in deposits towards sight accounts, owing to lower interest rates and less inflation.

As for credit risk, the risky portfolio indicators for all types of loans other than commercial lending improved during the second half of 2009. Accordingly, the risky portfolio (non-A rated loans), as a percentage of the total portfolio, remained relatively stable and was 9.7% in December 2009. The same indicator for the commercial loan portfolio increased from 7.9% in June 2009 to 9.5% six months later; however, this is not a record high. Therefore, lending of this type must continue to be monitored closely. The non-performing portfolio as a

proportion of the gross loan portfolio declined for all types of lending, having gone from 5.3% in June 2009 to 4.6% by the end of the year.

Contrary to what occurred with credit risk, the increase in government bond holdings, particularly concerning the share of marketable securities, coupled with the added volatility in TES returns, has heightened exposure to market risk. Accordingly, it is important to keep a close eye on how this risk affects the performance of financial institutions. It also is important to bear in mind that the increase in government bond holdings lowered the exposure to liquidity risk.

Finally, in spite of the international financial crisis, there have been major changes in the profitability and capital adequacy indicators for the Colombian financial system. Interest income still accounts for the bulk of all financial income and, despite a lower spread, the return on assets remained relatively constant at 2.4% during the second half of 2009. This was due, in part, to the increase in earnings from investment valuation. The capital adequacy ratio increased 30 basis points (bp) to 14.9% by the end of last year.

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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(*) This report was prepared with the help of María Fernanda Ramírez and Erika Abreo, who are student interns in the Financial Stability Department. The assistance with data processing provided by Máryori Caviedes is much appreciated.

I. The Macroeconomic Environment

Although a number of Colombia's economic indicators performed better in 2009, many are still negative or less than what they were before the start of the international crisis. This being the case, the effects on the country's financial system will depend largely on the recovery of the Colombian economy and persistence of the positive momentum in the international environment.

A. BACKGROUND: THE INTERNATIONAL ENVIRONMENT

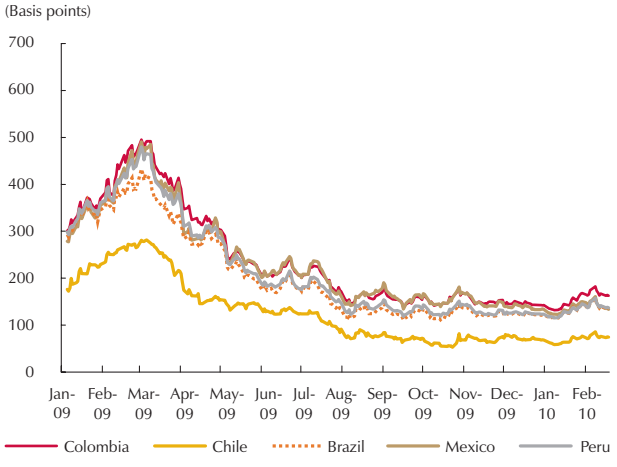
During the last few months, the world economy has shown signs of recovery in the wake of the financial crisis. Financial markets have been more dynamic, after posting all-time lows in 2008. Moreover, the past year was characterized by a decline in risk aversion, as reflected in a lower price for the credit default swaps (CDS)[1] of some Latin American countries since the beginning of the year and in the VIX [2] (Graphs 1 and 2).

The developed economies have a heavy tax burden due to the increase in public spending occasioned by the adoption of measures to address the international financial crisis. This could prevent added momentum in the economy and in lending to the private sector. Specifically, doubts about the fiscal performance of several European countries and the possible impact it could have on their

1 A credit default swap (CDS) is a specific kind of financial instrument that allows the risk on a bond to be transferred from one party to another. The bond holder pays a premium to the party offering the CDS, in exchange for which the latter responds for the nominal value should the issuer default. The value a CDS is directly related to the level of risk aversion among investors; in other words, the higher the likelihood of default, the higher the value of the CDS and vice versa.

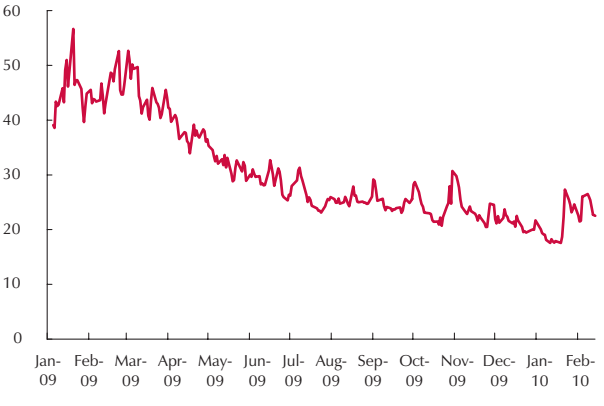
2 The VIX is an indicator of implied volatility in options on the S & P 500. An increase in the VIX means added uncertainty in the stock market, which is reflected in higher prices for options. Consequently, this index can be interpreted as another measure of risk aversion.

Graph 1
Five-year Credit Default Swaps (CDS) in Latin American Economies



Source: Bloomberg.

Graph 2
Market Volatility Index (VIX)



Source: Bloomberg.

markets were among the reasons for the increase in global risk aversion during January of this year.

The global outlook in terms of growth will be influenced by the effect of government debt in the economies that provided aid during the crisis and by how interest rates interest and developments in credit to the private sector will be affected. As noted in the last edition of the *Financial Stability Report*, the differences in economic growth between the emerging and developed economies remain still evident. While the growth forecast for the emerging economies is 2%, on average, in 2009 and 6% in 2010, developed countries are expected to grow at respective rates of -3.2% and 2.1% (Table 1).

With more optimistic estimates for global growth, and as long as the global demand continues to rise, raw material prices and the value of exports could continue to increase. Although this would mean better performance in Latin America, it bring inflationary pressure to bear the world over, which would preclude more economic growth, particularly in the developed countries, thereby affecting foreign trade and capital flows to emerging markets.

Despite better expectations in the productive sector of the developed economies, the financial sector is still plagued by a great degree of uncertainty. The effects of rising interest rates, higher capital requirements, pressure on the liquidity of financial intermediaries, and the slow recovery from losses incurred during the crisis continue to spell less growth for the financial sector and major challenges in terms of financial regulation.

B. GROWTH IN THE PRODUCTIVE SECTOR

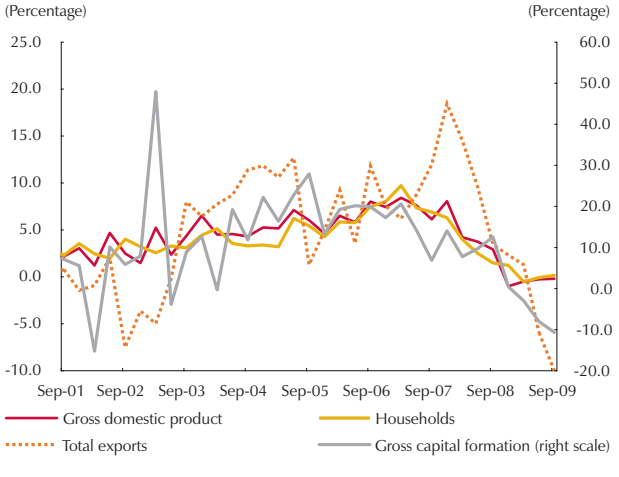
The Colombian economy continued to grow at negative rates during the second and third quarters of 2009, given the deterioration in export performance and gross capital formation, as well as less household consumption. The performance of these variables reflects the magnitude of the impact of the global crisis on Colombia's economy. Furthermore, although a number of indicators performed better in 2009, many are still negative or below what they were before the international crisis began.

Table 1
Economic Growth
(Annual percentage change)

	Actual		Current projections		Difference with respect to projections in September	
	2008	2009	2010	2011	2009	2010
World output	3.0	(0.8)	3.9	4.3	0.6	1.4
Advanced economies	0.5	(3.2)	2.1	2.4	0.6	1.5
United States	0.4	(2.5)	2.7	2.4	0.1	1.9
Euro Zone	0.6	(3.9)	1.0	1.6	0.9	1.3
Japan	(1.2)	(5.3)	1.7	2.2	0.7	0.0
United Kingdom	0.5	(4.8)	1.3	2.7	(0.6)	1.1
Canada	0.4	(2.6)	2.6	3.6	(0.3)	1.0
Other emerging markets and developing countries	6.1	2.1	6.0	6.3	0.6	1.3
America	4.2	(2.3)	3.7	3.8	0.3	1.4
Brazil	5.1	(0.4)	4.7	3.7	0.9	2.2
Mexico	1.3	(6.8)	4.0	4.7	0.5	1.0
Developing Asian countries	7.9	6.5	8.4	8.4	1.0	1.4
China	9.6	8.7	10.0	9.7	1.2	1.5
India	7.3	5.6	7.7	7.8	0.2	1.2
Colombia	**2.4**	**0.4**	**2.0**		**0.0**	**(0.5)**

Sources: International Monetary Fund (World Economic Outlook, January 2010), Banco de la República.

Graph 3
Growth in GDP and its Spending Components

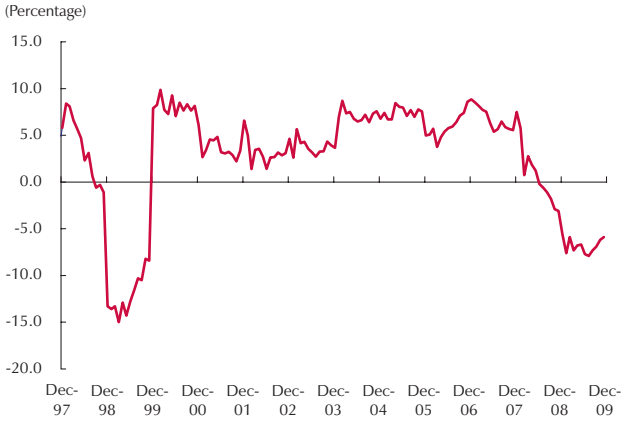


Source: DANE.

Graph 3 shows the slowdown in the pace of growth in GDP and its spending components. Between September 2008 and one year later, GDP growth went from 2.9% to -0.2%. During the same period, the increase in household consumption rose from 1.5% to 0.2%, while the increase in gross capital formation and exports went from 12.6% to -10.7% and from 3.4% to -10.0%, respectively.

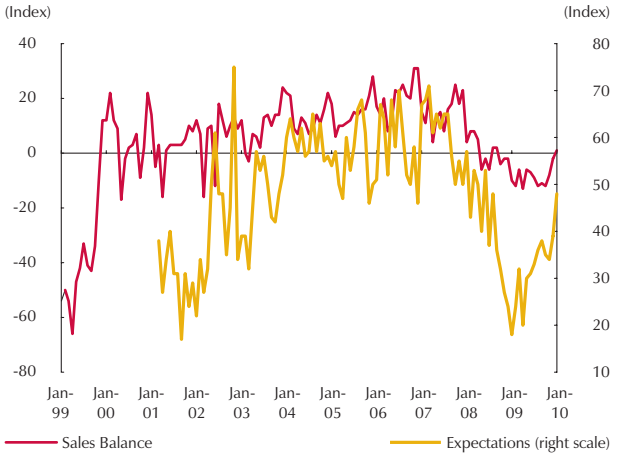
As for industry, the results of the Combined Industrial Opinion Survey (EOIC), conducted monthly by the Colombian Business Association (ANDI), show industrial production declined 5.9% in 2009 and sales, 3.3%. By June of last year, those reductions were on the order of 7% and 6%, respectively (Graph 4). When analyzed by sectors, it appears the manufacturers most affected are those producing glass, vehicles and rubber; the iron and steel sector was the only one to show positive growth (production 2.7% and sales 7.2%).

Graph 4
Year-to-date Rate of Growth in Industrial Production



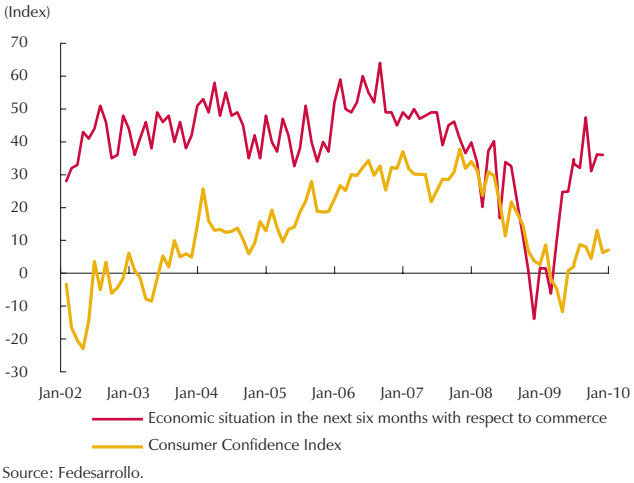
Source: EOIC (ANDI).

Graph 5
Sales and Expectations Six Months Out



Source: Fenalco.

Graph 6
Consumer Confidence Index and Expectations for the Economy in Six Months



Source: Fedesarrollo.

On the other hand, the situation in commerce is less unfavorable. The sales indicator calculated by the National Federation of Merchants (Fenalco) shows a recovery between January 2009 and the same month a year later, having gone from -10 to 1. Moreover, expectations of sales six months out increased during the same period, as illustrated in Graph 5.

The evolution of consumption shows an improvement since May 2009. Graph 6 contains the results of the indicator of consumer confidence and expectations for the economy in six months, based on the Consumer Opinion Survey (EOC) conducted by the Foundation for Higher Education and Development (Fedesarrollo). These indices show an upward trend as of early 2009, specifically from 2.7 and 1.5, respectively, in December 2008, to 6.3 and 36.0 a year later.

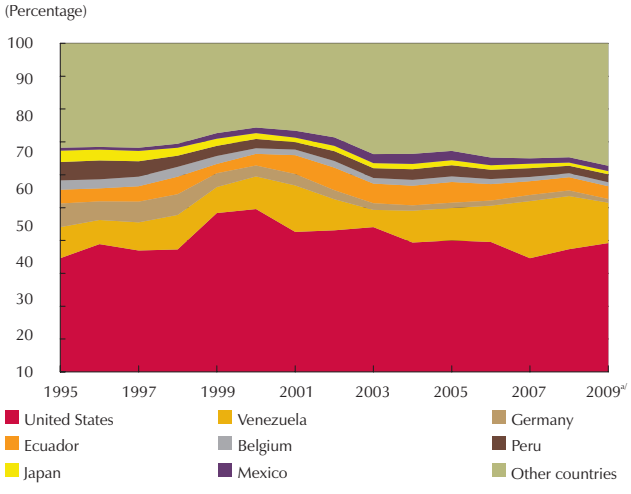
However, the trade balance during the same six-month period is a cause for concern, given the political situation with several neighboring countries. The restrictions adopted by Venezuela and devaluation of the *bolivar* pose problems for Colombian exporters, particularly for those who deal in non-traditional products. They have been forced to seek more trading partners. With the restrictions that were adopted recently, the share of exports to Venezuela dropped to 12.3% during 2009 compared to 16.2% a year earlier (Graph 7).

As shown in Graph 8, during the second half of last year the balance of payments current account deficit as a proportion of GDP decreased to less than half of what it was at the end of 2008, which was the highest on record since the crisis in the late nineties. By September 2009, the percentage was -2.3%, as opposed to -5.1% in December 2008. This decline means the economy is less sensitive to reductions in liquidity on international markets.

C. PROSPECTS FOR THE FINANCIAL SYSTEM

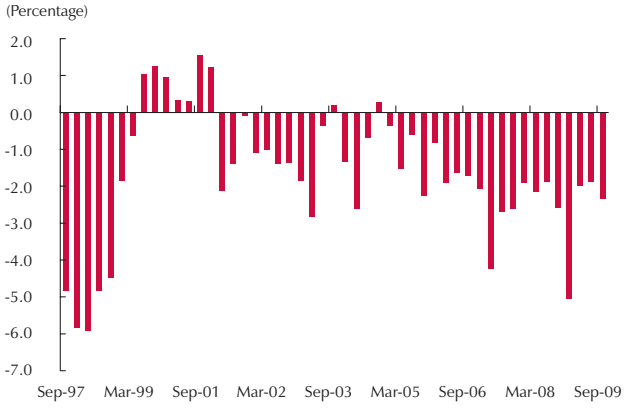
The outlook for the financial system during 2010 will depend on how financial institutions handle the various risks to which they are exposed. These, in

Graph 7
Share of Exports, by Country of Destination



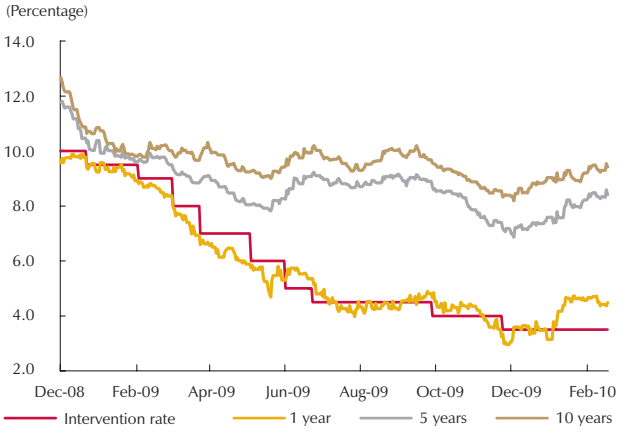
a/ Projected.
Source: DANE, calculations by Banco de la República.

Graph 8
Current Account/GDP



Source: DANE, calculations by Banco de la República.

Graph 9
Zero Coupon Rate in Pesos and the Intervention Rate



Source: Banco de la República and BVC; calculations by Banco de la República.

turn, are subject to the dynamics of risk aversion on international financial markets and to Colombia's economic performance.

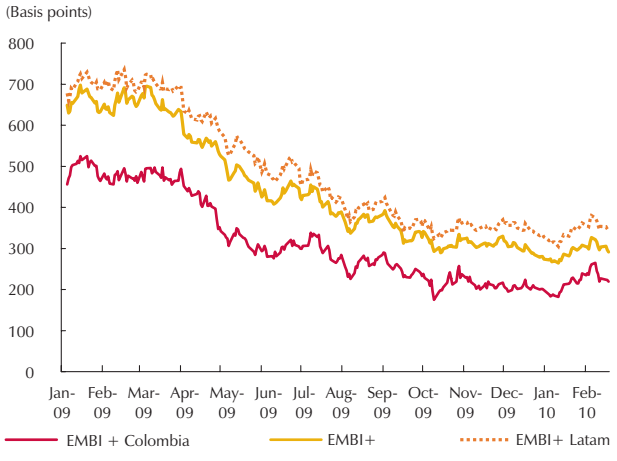
Market risk continued to grow during the second half of last year. Ever since Banco de la República began to cut its intervention rate, the yield curve for government bonds has followed a similar pattern (Graph 9). Financial institutions took advantage of the valuation this generated in TES and increased their exposure to these assets by COP$ 9.2 trillion (t) (20.1%). Moreover, the amount of securities negotiated in 2009 through the Electronic Trading System (SEN) and the Colombian Electronic Market (MEC) was much higher than in 2008. During September 2009, COP$ 354.4 t in government bonds were traded via SEN, while the monthly average in 2008 was COP$ 51.2 t. However, long-term rates began to rise in January 2010 as a result of several factors, including i) an end to expectations of future intervention rate cuts, ii) expectations of higher inflation associated with El Niño weather; iii) less demand for larger bond issues by the private sector and pension and severance funds, given changes in the resolution on severance pay and multi-funds; iv) uncertainty about the government's fiscal performance; and v) a small increase in global aversion risk. Market risk materialized as a result and the amount of trading declined. In December 2009, COP $ 120.1 t in government securities were traded through SEN.

Government bonds denominated in foreign currency behaved similarly, as reflected by the performance of EMBI +.[3] Graph 10 shows a decline in this index throughout 2009 and a rebound as of January 2010, due to the aforementioned increase in risk aversion. This same trend also is evident when analyzing the government debt in Latin America and other emerging countries.

The dollar devaluated by nearly 9% during 2009 with respect to the peso (Graph 11). When the

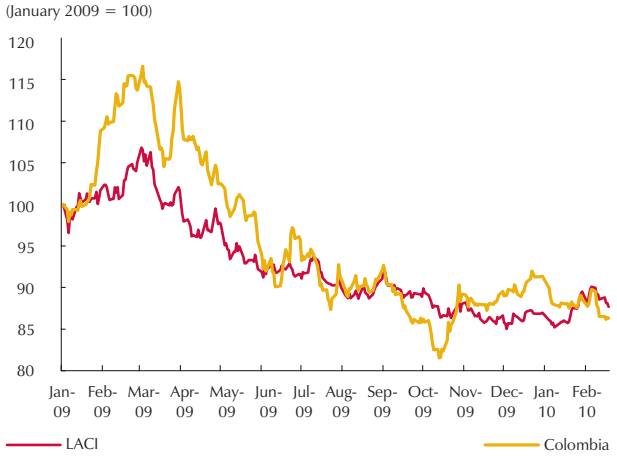
3 The Emerging Markets Bond Index Plus (EMBI +) is an indicator that measures the return on government bonds issued by emerging countries.

Graph 10
EMBI + Spread for Colombia, Latin America and Other Emerging Market Economies



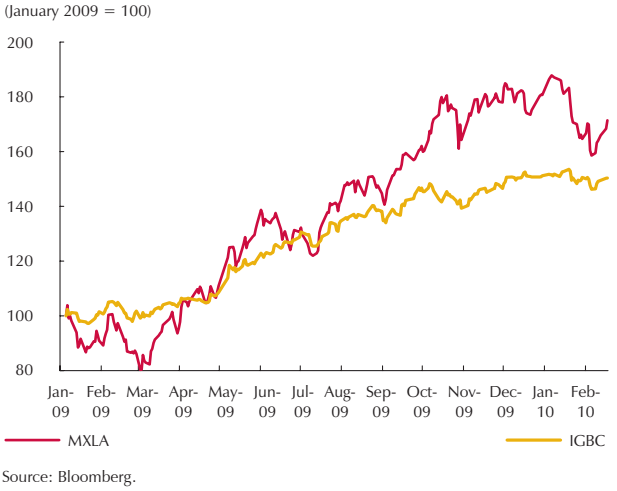
Source: Bloomberg.

Graph 11
Latin American Exchange Rates for the Dollar



Source: Bloomberg.

Graph 12
The Stock Market in Latin America



Source: Bloomberg.

performance of other Latin American currencies is analyzed using the LACI index,[4] one sees a similar pattern, which indicates other currencies have appreciated along with the Colombian peso.

Moreover, stock market performance in 2009 was outstanding (Graph 12), thanks to added growth in the global economy and the aforementioned drop in risk aversion during the year. The Colombian Stock Market Index (IGBC) posted a return of more than 50%, causing institutions such as pension management funds (PMF) to increase their exposure to the productive sector. During the same period, the stock markets in Peru and Brazil achieved returns of 99.7% and 82.7%, respectively. The Morgan Stanley Capital International Emerging Markets Latin America Index (MXLA), which measures equity market performance in Peru, Brazil, Mexico, Colombia and Chile, showed a return of 98.2% last year. In December 2009, the indexes representative of these stock markets reached levels above those observed in 2007.

Accordingly, the increase in commercial banking exposure to government securities during 2009 and the increase in productive sector investment by pension and severance fund managers (PFM) that same year gave these entities more market risk. There appears to be no reason for these investments to perform in 2010 as they did a year earlier, which means possible further materialization of that risk. Therefore, it will have to be monitored.

With respect to credit risk, the second half of 2009 saw less of an increase in the risky and non-performing portfolios for all types of lending. However, the risky portion of the total commercial loan portfolio did increase. If economic recovery becomes more pronounced, exposure to credit risk will continue to decline and portfolio growth will remain positive. However, high unemployment,

4 The Latin American Currency Index (LACI), developed by Bloomberg and JP Morgan, tracks the performance of the currencies of Argentina, Brazil, Chile, Colombia, Mexico and Peru against the dollar. The weights in the index are determined by the size of each country's exchange market and by their foreign trade flows.

which will begin to subside only when growth in the Colombian economy reaches higher levels, will continue to affect the increase in the portfolio. It is particularly important to monitor the performance of the commercial loan portfolio, as it grew less than the other portfolios and was the only one with an increase in credit risk. This is especially relevant, since the commercial loan portfolio accounts for the largest share of the total.

On the other hand, the financial markets in 2009 were characterized by a high degree of liquidity. The increase in TES holdings enabled credit institutions to register funding liquidity risk levels that represent no cause for added concern. Moreover, the amount of liquidity in the financial markets made it possible to place more corporate bonds. In a context of economic recovery, one could expect the market for these bonds to continue to gain liquidity, especially if other markets do not offer as favorable a return as they did in 2009. However, if the market risk assumed by financial institutions were to materialize, the liquidity of the system could be affected, particularly if government debt holdings decline.

With this scenario, the impact on the Colombian financial system will depend largely on economic recovery and the persistence of positive momentum in the international environment. In addition, the government's fiscal management could have consequences in terms of the appearance of market risk, which in turn could affect the liquidity of the financial system.

II. The Financial System

The financial system continued to show solid profit margins and capital adequacy ratios during the second half of 2009. The slowdown in the loan portfolio continued, particularly with respect to commercial lending. Loan portfolio quality and default indicators improved, thereby reducing credit risk and its materialization. The non-bank financial institutions maintained steady growth in their portfolio.

A. CREDIT INSTITUTIONS

Gross loan portfolio growth continued to slow during the second half of 2009, especially with respect to commercial lending, while the pace of growth in investment continued to rise, increasing as a share of the assets of credit institutions.

With respect to credit risk, the loan portfolio quality indicator remained relatively stable during the second half of 2009; however, it was not the same for all types of credit. The commercial loan portfolio deteriorated in terms of risk, while the other types of lending showed an improvement. Owing to a more than proportional decline in risky portfolio growth, compared to the rise in loan-loss provisioning, the coverage indicator increased. Also, there was a generalized decline in the non-performing portfolio.

1. General Balance Sheet Positions

a. Asset Accounts

In December 2009, annual real growth in the assets of credit institutions was 6.7% and came to COP$ 235.1 trillion (t) (Graph 13). However, despite added investment, the increase in total assets slowed during the second half of 2009.

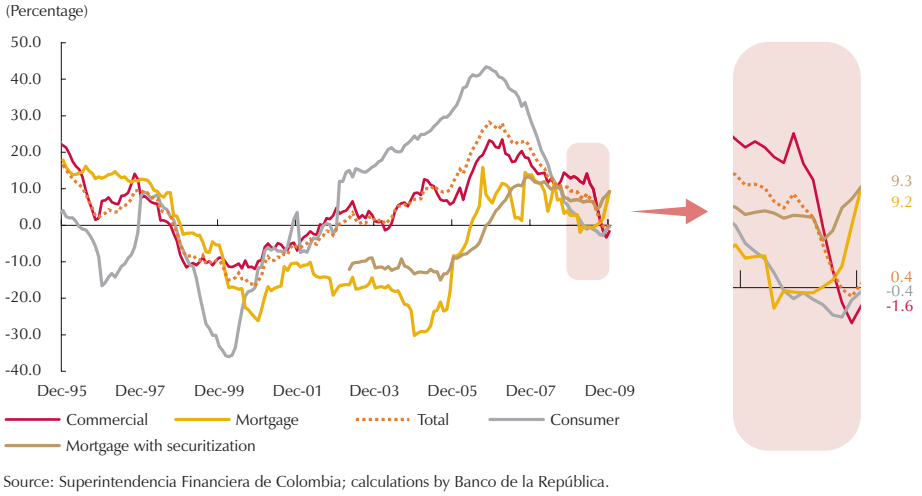
Graph 13
Credit Institution Assets

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

This was due to the slowdown in the loan portfolio, which accounted for 64.4% of assets in December the year before.

The momentum in the gross loan portfolio continued to decline during the second half of 2009, as has been the case since early 2008. In fact, it went from 7.3% in June 2009 to 0.4% in December of the same year (Graph 14). This behavior is explained primarily by the commercial loan portfolio,[5] which plunged from 11.3% annual real growth in June 2009 to -1.6% in December of the same year. The opposite was true of the mortgage loan portfolio, which experienced quite an increase in growth. By June 2009, mortgage lending had risen at an annual real rate of 0.5%; six months later, the increase came to 9.2%. The recovery in mortgage portfolio growth is due, in part, to government subsidies for interest rates on home loans granted by the government. On the other hand, in real terms, consumer lending continued to contract on an annual basis during the second half of 2009 (-0.4% in December the previous year).

Graph 14
Annual Real Growth in the Gross Loan Portfolio of Credit Institutions

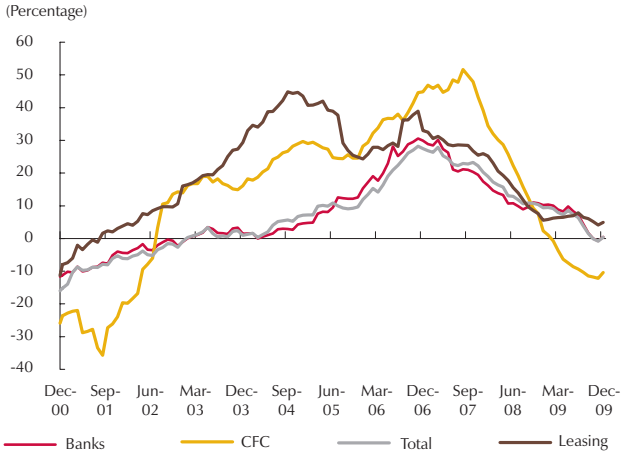


Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

When analyzing real portfolio growth, by type of intermediary, one sees the slowdown has been more pronounced for finance companies (CFC) compared to other institutions. At December 2008, the CFC portfolio was up at an annual real rate of 2.4%, as opposed to -10.4% a year later. The contraction was equally pronounced for commercial banks, having gone from 10.2% to

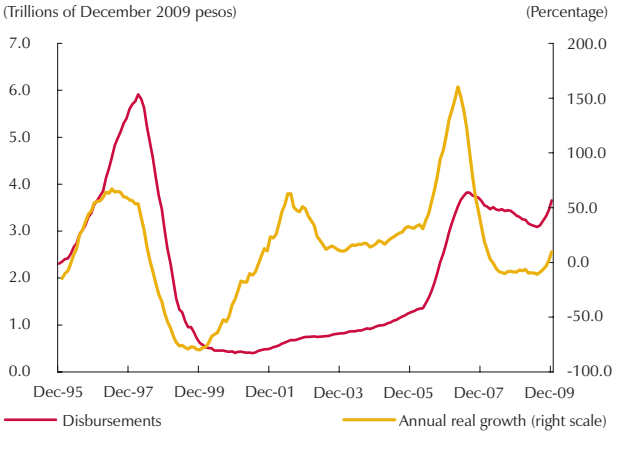
5 Commercial lending accounted for 55% of the entire loan portfolio at December 2009.

Graph 15
Annual Real Gross Portfolio Growth by Intermediary Groups



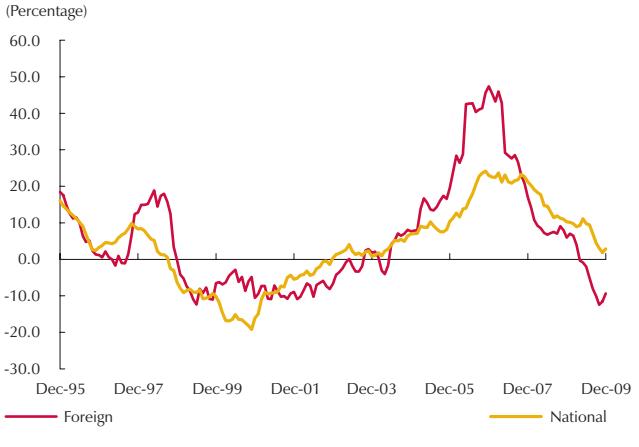
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 16
Monthly Disbursements for Home Purchase



Source: ICAV; calculations by Banco de la República.

Graph 17
Annual Real Portfolio Growth by Type of Capital



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

0.5% during the same period. However, the increase in their loan portfolio remains positive (Graph 15).

The pace of growth in the mortgage loan portfolio with securitization remained stable, with an annual real increase of 9.3% by December 2009. This was the result of a recovery in disbursements, which went from -9.7% growth in June 2009 to 9.7% in December of that year (Graph 16).

A look at the loan portfolio in terms of local and foreign institutions[6] shows the slowdown in annual real growth has been sharper for foreign institutions. In fact, their loan portfolio was down 2.0% by June 2009 and -9.3% six months later. As for the local institutions, their portfolio growth declined in second half of 2009 by 6.9 percentage points (pp) and was 2.9% at December of that year (Graph 17).

As for the different types of lending, the annual real decline in the commercial loan portfolio was more pronounced for foreign institutions than for national ones (-15.4 and -12.5 pp, in that order), amounting to -12.5% and 0.6%, respectively, at December 2009. During the second half of 2009, mortgage portfolio growth displayed far more momentum in national institutions, increasing from -1.3% in June to 9.4% in December 2009. For foreign entities, growth in this type of lending went from 1.9% to 8.7% during the same period (Graph 18).

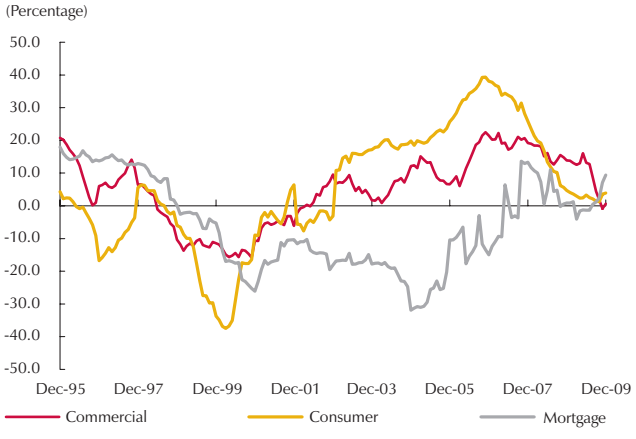
On the other hand, investments by credit institutions increased during the second half of 2009, from COP$ 45.5 t in June to COP$ 50.8 t in December. The annual real growth rate for these investments during that same period went from 23.8% to 28.4%. However, the momentum in investments witnessed up to the third quarter of last year declined during the fourth quarter (Graph 19).

The fact that investments grew more than the loan portfolio means their share of the total assets of credit institutions has increased. In June 2009,

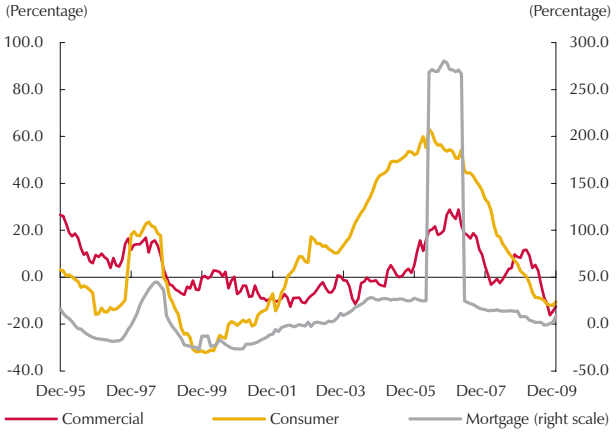
6 An entity is considered foreign if more than 50% of its capital comes from foreign entities.

Graph 18
Annual Real Loan Portfolio Growth by Type of Lending and Capital

A. National Institutions

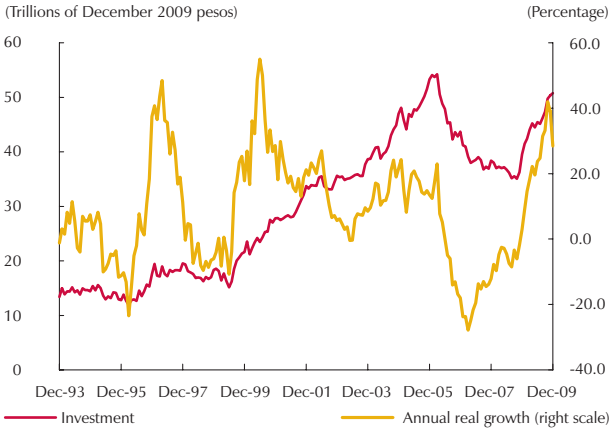


B. Foreign Institutions



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 19
Credit Institution Investments



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

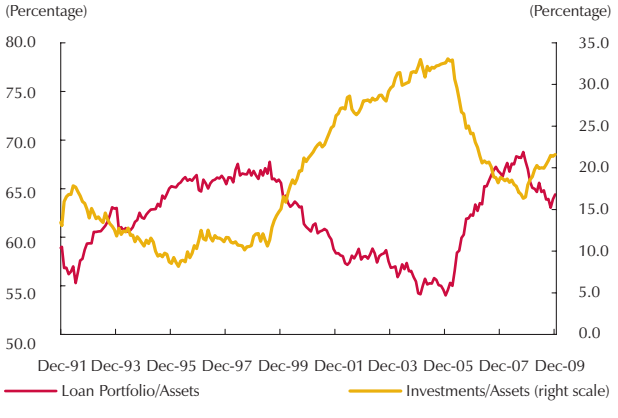
investments accounted for 20% of these assets; six months later, they represented 21.6% (Graph 20). It should be noted that there has been a substitution effect between the loan portfolio and investments throughout the period.

During the second half of 2009, the index of financial depth, measured as the ratio of the loan portfolio to GDP, declined from 33.1% in June 2009 to 32.5% in December of that year. This slight reduction is explained by the commercial loan portfolio; its indicator of financial depth went from 18.5% to 17.5% between June and December 2009. However, the indicator for consumer and mortgage lending increased by 14 and 15 basis points (bp), respectively, to 8.2% and 3.2%, in that order. However, these indicators still are at levels above those observed during the aftermath of the crisis in the late nineties, with the exception of the indicator for the mortgage loan portfolio (Graph 21).

b. Liability Accounts

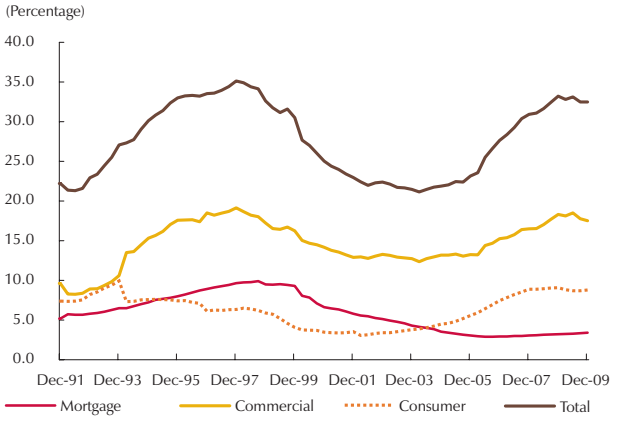
Contrary to the information provided in the September 2009 edition of this report, the real rate of growth in deposits with credit institutions declined during the second half of 2009, having gone from 14.5% in June to 5.8% in December of that year. Total deposits with the system came to COP$ 167.5 t by December 2009,

Graph 20
Investments and the Gross Loan Portfolio as a Share (%) of Total Assets of Credit Institutions



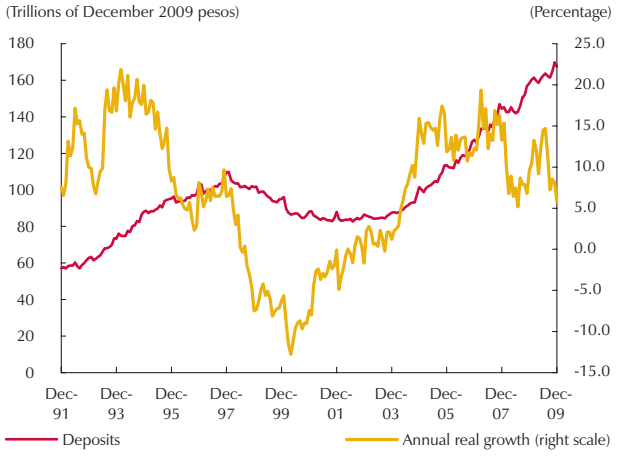
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 21
Financial Depth (Loan Portfolio / GDP)



Sources: Superintendencia Financiera de Colombia and DANE; calculations by Banco de la República

Graph 22
Deposits with Credit Institutions



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

which is COP$ 5 t more than the amount posted in June (Graph 22).

A look at the different types of deposits shows less growth in certificates of deposit (CD) and in the current account during the second half of 2009. In contrast, savings accounts increased as a substitute for CDs.

By December 2009, the annual real increase in current accounts was 6.2% (Graph 23). This represents a decline of 5.1 pp compared to the Graph recorded six months earlier. Certificates of deposit began the second half of the year with 16.2% growth, but experienced a decline in annual real growth at a rate of -2.9% in December. On the contrary, the increase in savings accounts was 7.7% by June 2009 and 10.1% in December of that year. The downturn in certificates of deposit is explained by several factors, namely: i) lower interest rates, which makes them less attractive than savings accounts; ii) the fact that financial intermediaries have not been subject to liquidity constraints, which means they are under no pressure to secure funding in the short term; iii) the elimination of interest on the reserve for CDs,[7] as of August 2009; and iv) the increase in corporate bond issuance.

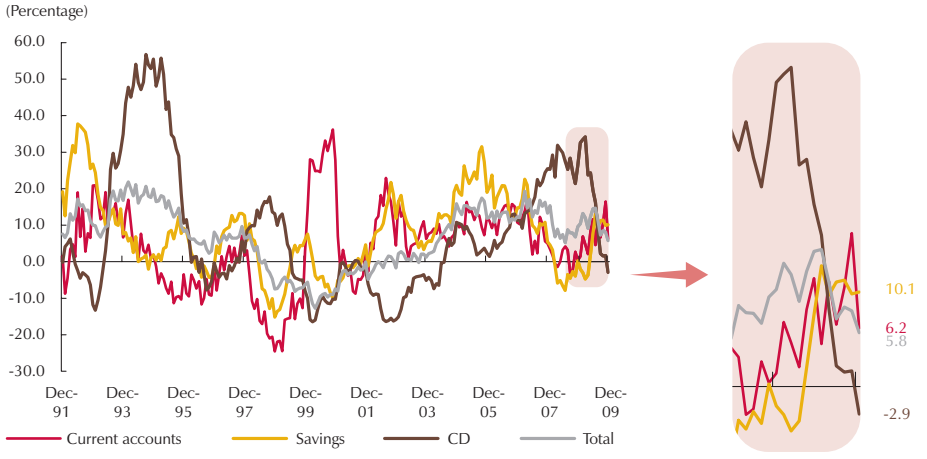
When analyzing the behavior of deposits by intermediary group, one finds the CF and CFC had the lowest growth levels (-8.8% in December 2009). Growth in deposits for commercial banks and leasing companies declined from 15.6% and 19.2% in June, 2009 to 6.1% and 6.8% in December 2009, respectively (Graph 24).

2. Credit Institution Exposure to Principal Debtors

Credit institution exposure at December 2009 came to COP$ 175.8 t, with 5.9% annual real growth compared to 8.5% the year before. The exposed amount, as a percentage of assets, was 74.8%, which is slightly less than the proportion observed during the last two years (Table 2).

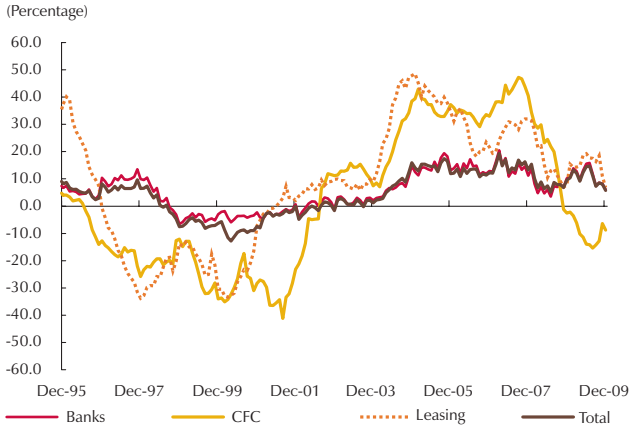
7 BDBR External Resolution 09 of July 2009 eliminated interest on the reserve for term certificates of deposit (CDT), effective as of the bi-weekly required reserve starting on August 5, 2009.

Graph 23
Annual Real Growth in Deposits with Credit Institutions, by Type of Deposit



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 24
Real Growth in Deposits, by Intermediary Group



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Contrary to what was noted in earlier reports, a look at the components of the aforementioned amount shows a rise in the share pertaining to the public sector, which went from 18.1% in December 2008 to 23.8% a year later (Graph 25). This increase is explained by loan portfolio growth (57.7%) and by government bonds (34.9%), which came to COP$ 8.5 trillion (t) and COP$ 33.3 t, respectively, at December 2009. As for borrowing by the private corporate sector, its share declined from 48.9% at end 2008 to 44.4% in December 2009, given the drop in the commercial loan portfolio, which posted -4.7% annual growth during 2009. The household share of the exposed amount declined throughout 2009, going from 33.0% to 31.9%, due to the performance of the consumer loan portfolio.

3. Loan Portfolio Quality and Loan-loss Provisioning

The loan portfolio quality indicator (QI), measured as the ratio between the gross portfolio and the risky portfolio,[8] was more or less constant during the second half of 2009 and came to 9.7% at the end of that year (Graph 26). This is explained by the contrast in the way this indicator evolved with respect to the different types of lending. On the one hand, the QI for the commercial loan portfolio increased during the second half of 2009, going from 7.9% in June to 9.5% in December, which reflects considerable deterioration in lending of this type. On the other hand, the consumer, micro-loan and mortgage loan

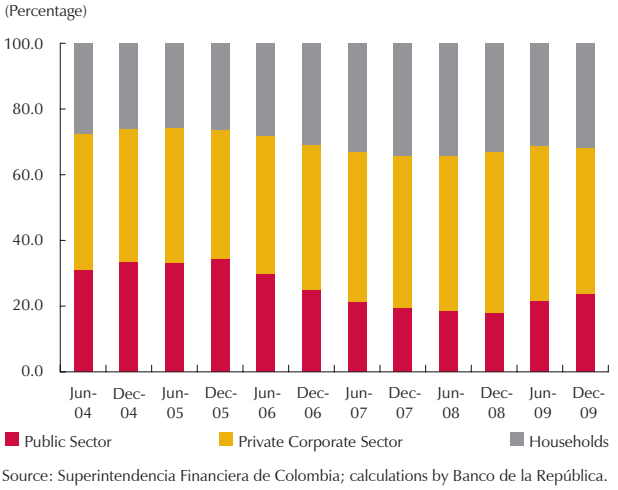
8 The risky portfolio is comprised of all non-A-rated loans.

Table 2
Credit Institution Exposure to their Major Debtors [a/]

Type	Dic-08		Dic-09		Percentage Annual Real Growth
	Trillions of -09 pesos	Share (%)	Trillions of -09 pesos	Share (%)	
Public Sector					
Loan Portfolio	5.4	3.2	8.5	4.8	57.7
Securities	24.7	14.9	33.3	18.9	34.9
Total	30.1	18.1	41.8	23.8	39.0
Private Corporate Sector					
Loan Portfolio	80.8	48.7	77.0	43.8	(4.7)
Securities	0.3	0.2	0.9	0.5	180.3
Total	81.1	48.9	78.0	44.4	(3.9)
Household Sector					
Loan Portfolio	51.4	30.9	52.2	29.7	1.5
Consumer	41.2	24.8	41.0	23.3	(0.4)
Mortgage	10.2	6.2	11.2	6.4	9.2
Securitizations	3.5	2.1	3.9	2.2	11.4
Total	54.9	33.0	56.1	31.9	2.1
Total Exposed Amount	166.1	100.0	175.8	100.0	5.9
Exposed Amount as a Share of Assets (%)	75.4		74.8		

a/ The accounts used to calculate credit institution exposure in the form of securities were adjusted for this report.
Sources: Superintendencia Financiera de Colombia and Banco de la República, calculations by Banco de la República.

Graph 25
Financial System Exposure, by Debtors



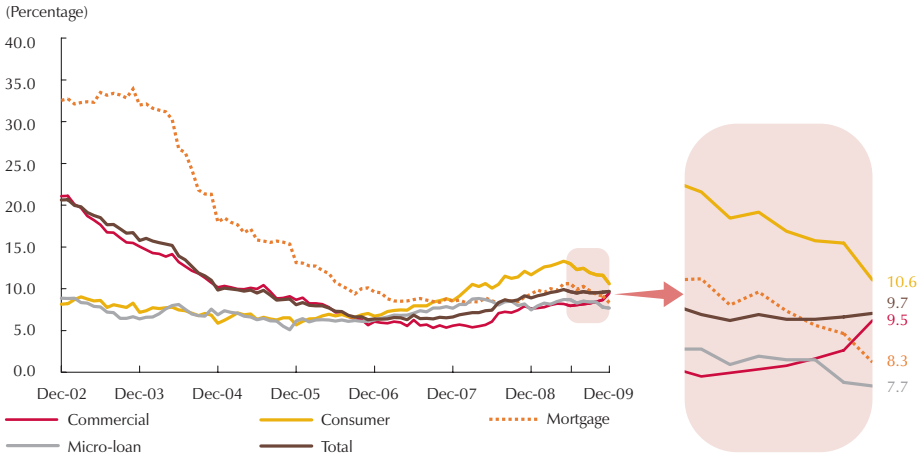
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

portfolios improved in terms of credit risk. Between June and December 2009, the QI went from 13.0% to 10.6% for consumer lending, from 8.7% to 7.7% for micro-loan, and from 10.6% to 8.3% for the mortgage loan portfolio (Graph 26).

A look at the QI by type of intermediary shows there continues to be more deterioration in the CFC portfolio compared to that of other institutions. However, during the second half of 2009, the QI for those institutions declined 20 bp to 17.2%. The QI indicator for commercial banks and leasing companies remained relatively stable during that same period, registering 9.3% and 9.0% in December 2009, respectively (Graph 27).

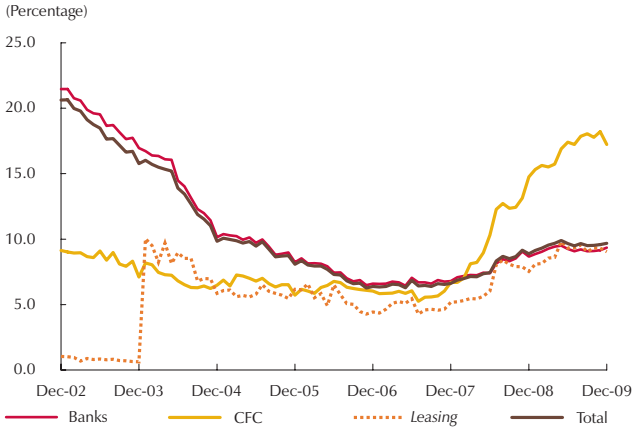
When considering this indicator based on the type of capital, one sees major differences (Graph 28).

Graph 26
Loan Portfolio Quality, by Type of Loan: Risky Portfolio / Gross Portfolio



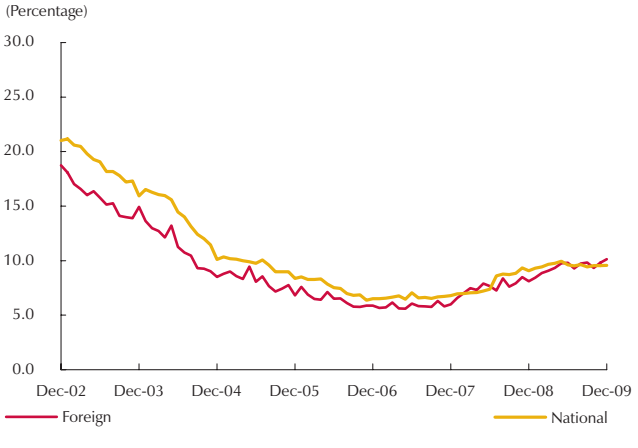
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 27
Portfolio Quality, by Intermediary Group



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 28
Loan Portfolio Quality, by Type of Capital



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The QI was 9.6% in December 2009 for national institutions and 10.1% for foreign ones.

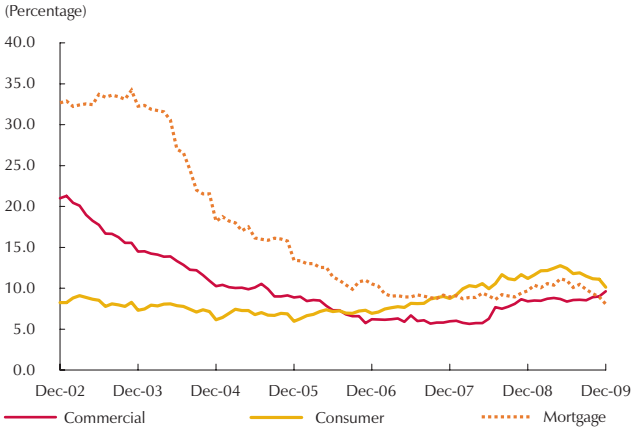
As to the various types of credit, the QI for the consumer and mortgage loan portfolios of foreign intermediaries (11.9% and 9.1%, respectively) is higher than the QI for national intermediaries (10.1% and 8.1%, in that order). This difference is explained primarily by the fact that foreign intermediaries have experienced more deterioration since June 2007. In contrast, with respect to the commercial loan portfolio, performance is better for foreign institutions; the QI for their commercial loan portfolio was down 1.0 pp at December 2009 (Graph 29).

In terms of credit risk, real growth in the total risky loan portfolio declined 30.1 pp during the second half of 2009. As illustrated in Graph 30, annual real growth was 9.3% by December 2009. As for the different types of lending, the risky commercial loan portfolio[9] posted 45.8% annual real growth at June 2009 and 22.4% six months later. The pace of deterioration in the risky consumer loan portfolio has become more moderate and the annual real increase in this portion of the consumer loan

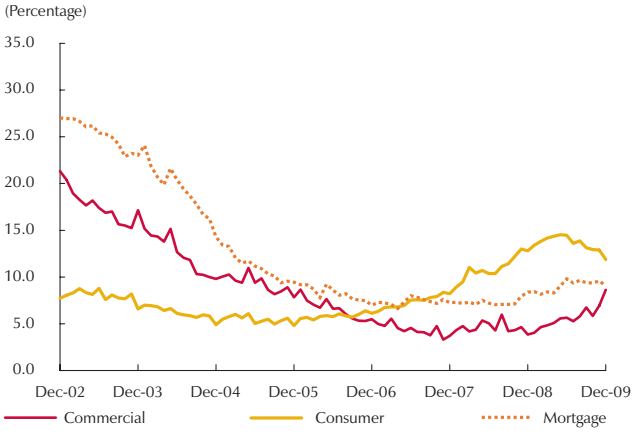
9 The risky commercial loan portfolio accounts for 53% of the total risky portfolio.

Graph 29
Loan Portfolio Quality, by Type of Intermediary

A. National Institutions



B. Foreign institutions



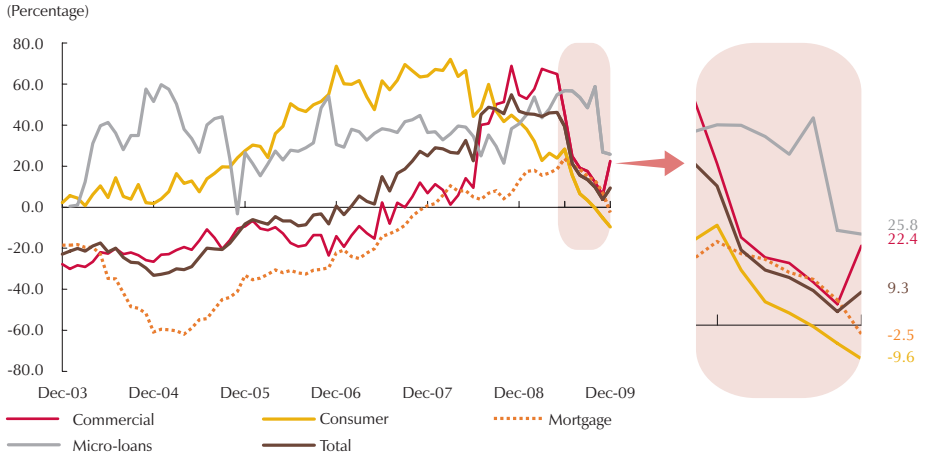
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

portfolio was -9.6% by the end of the second half of 2009, which is 25.2 pp lower than the figure reported in June of that year. On the other hand, growth in the risky mortgage loan portfolio dropped sharply from 23.7% in June 2009 to -2.5% in December of that year.

When analyzing the delinquency ratio (DR), measured as the ratio of the non-performing portfolio[10] to the total gross portfolio, one sees a general improvement for lending of all types. The DR was 4.6% in December 2009, which represents a decline of 70 bp compared to the indicator in June of that year (Graph 31). The mortgage loan portfolio had the highest DI among the different types of lending. However, during the second half of 2009, it dropped 2.7 pp to 9.9% in December 2009. The consumer and micro-loan portfolios showed 1.6 pp and 0.8 pp less default, respectively. In December 2009, the DR was 6.5% for the consumer loan portfolio and 5.7% for micro-loan. The DI for the commercial portfolio remained relatively stable throughout the second half 2009 and was 2.9% by the end of that year.

As with the QI, the DR for the CFC in December 2009 is higher than the DR for the system (6.9%). However, it declined by 1.1 pp during the second half of 2009. As for commercial banks, their DR

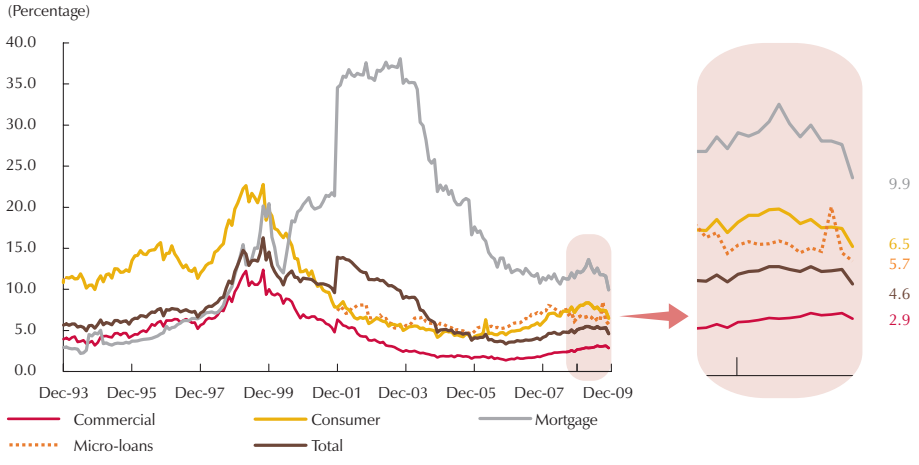
Graph 30
Annual Real Growth in the Risky Loan Portfolio



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

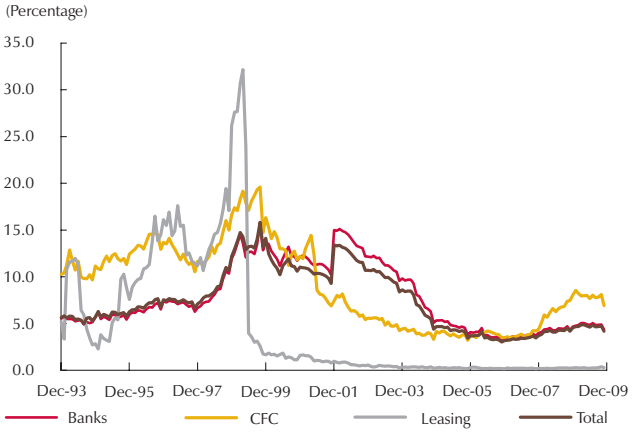
10 The non-performing portfolio is comprised of loans that are 30 days or more overdue.

Graph 31
Default Indicator: Non-performing Portfolio/Gross Loan Portfolio[a/]



a/ The estimate of the non-performing loans in the mortgage loan portfolio was modified. In previous reports, this account pertained solely to overdue installments. As of this edition, it is calculated as the sum of overdue installments and principal (as is done for all other forms of lending).
Source: Superintendencia Financiera de Colombia, calculations by Banco de la República.

Graph 32
Default Indicator, by Intermediary Group



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

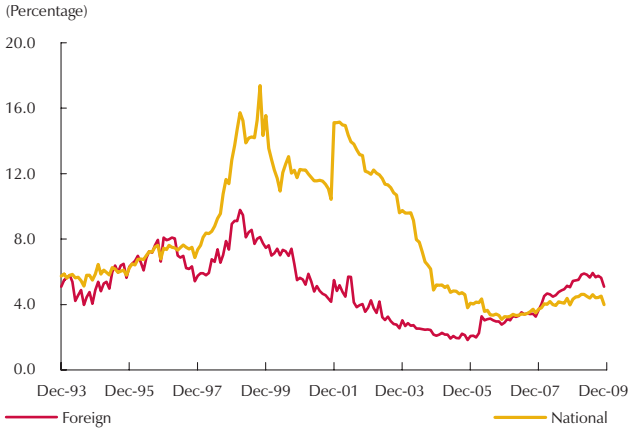
was 4.4% at December 2009, which is 50 bp less than the percentage registered six months earlier (Graph 32).

Moreover, when analyzing the difference in default between foreign and national institutions, one see the former have a level of default at December 2009 that is 90 bp higher than the latter. This is contrary to the trend observed since June 1997. This deterioration is related to the rapid growth in the loan portfolio of foreign intermediaries during the credit expansion phase (Graph 33). As shown in Graph 34, much of this performance is explained by further relative deterioration in the DR for consumer lending on the part of foreign institutions since March 2007.

The coverage indicator – measured as the ratio of loan-loss provisioning to the risky portfolio – increased for the total portfolio, having gone from 52.6% in June 2009 to 55.7% in December of that same year. This was due primarily to more of a decline in the growth of the risky portfolio (30.1 pp) with respect to the growth in loan-loss provisioning (18.7 pp) (Graph 35).

As for the different types of lending, the largest increase was for the consumer loan portfolio; its coverage indicator went from 59.6% in June 2009 to 71.0% in December of the same year. The microcredit and mortgage portfolios also posted respective increases of 4.3 pp and 2.3 pp in their coverage indicators. The opposite was true of the commercial loan portfolio; its coverage indicator declined from 52.7% in June 2009 to 51.1% by December of that year.

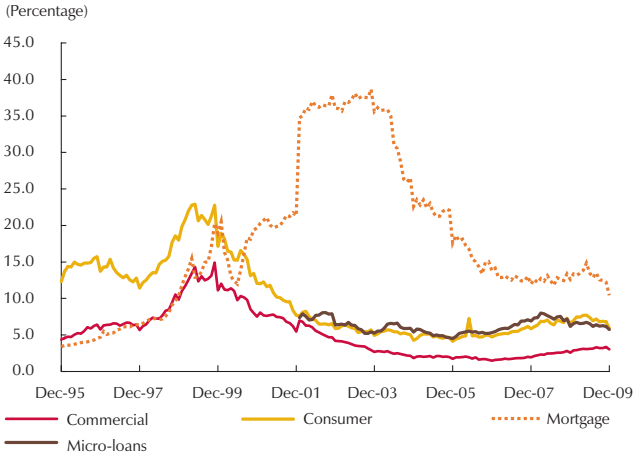
Graph 33
Default Indicator, by Type of Capital



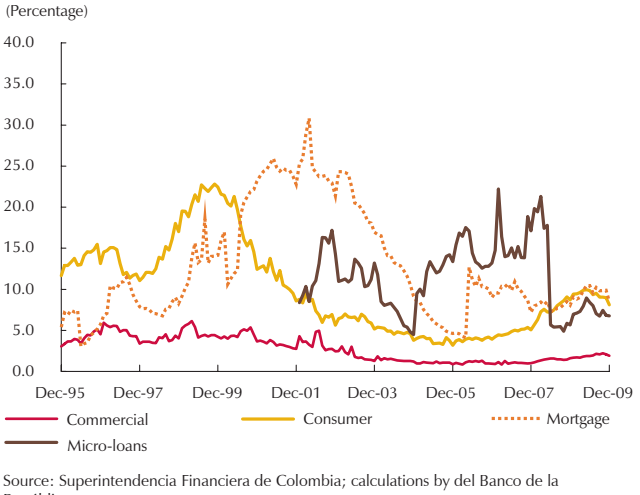
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 34
Default Indicator

A. National Institutions



B. Foreign Institutions



Source: Superintendencia Financiera de Colombia; calculations by del Banco de la República.

4. Earnings, Profitability and Capital Soundness

Profits rose at a annual real rate of 10.2% during the second half of 2009, reaching COP$ 5.5 t compared to COP$ 5.2 t six months earlier. This increase is explained, in part, by the valuation in TES resulting from lower interest rates.

Although profits rose, the return on assets (ROA) remained relatively stable and was 2.4% by December 2009, which is 3 bp higher than a year earlier (Graph 36). However, despite the slowdown in loan portfolio growth, profitability has remained at levels similar to those observed during the credit expansion period in past years.

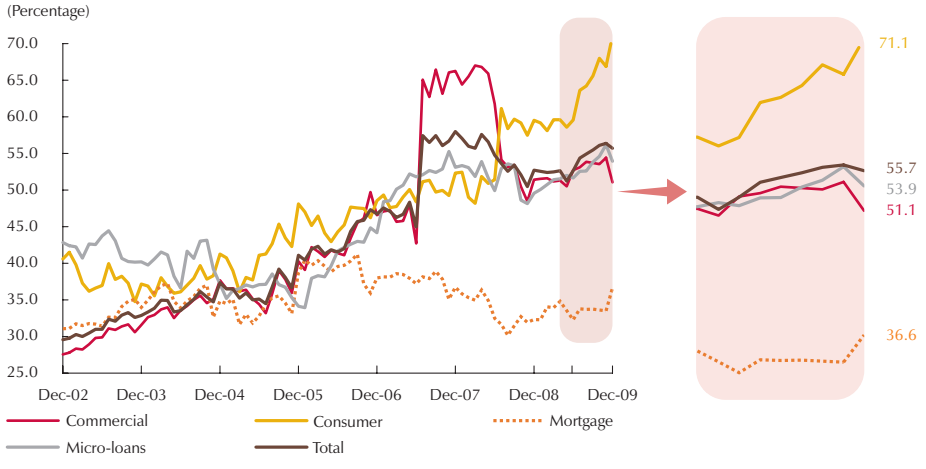
Moreover, the return for institutions with foreign capital remained stable throughout the past year at around 1.6%, which is 90 bp less than the average registered during the same period by intermediaries with domestic capital (2.5%).

When analyzing the make-up of financial income, one sees that interest income accounted for 62.1% in December 2009. This is 3.5 pp less compared to the proportion in June 2009; however, income from interest is still the largest component of this item (Graph 37). As for the income from commissions, its share increased by 1.2 pp during 2009 and was 9.9% in December of that year. This partially reverses the downward trend witnessed since September 2006. Income from investment valuation continued to rise and accounted for 11.2% by December 2009, which implies an increase of 1.1 percentage points compared to last June.

As to the soundness of the system, the capital adequacy ratio[11] is still above the average for the decade (13.5%) and exceeds the regulatory minimum of 9%; in fact, it was 14.9% in December 2009, which is 20 bp higher than was the case in June 2009 (Graph 38).

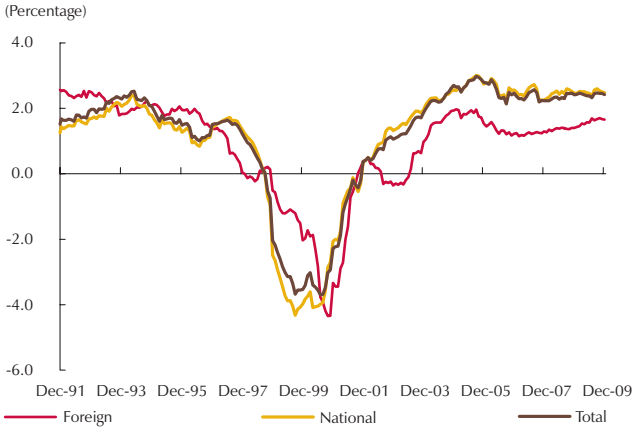
11 The capital adequacy indicator is the ratio of technical capital to risk-weighted assets, where technical capital is the sum of basic equity capital and additional equity capital combined (Article 4, Decree 2360/ 1993).

Graph 35
Coverage Indicator: Loan-loss Provisioning/Risky Portfolio



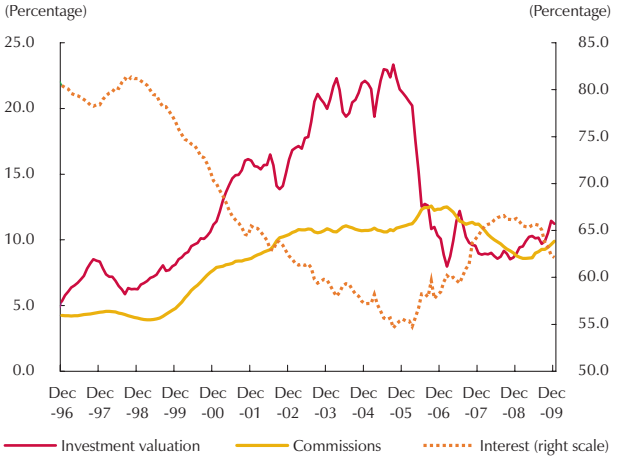
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 36
Return on Assets (ROA)



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 37
Financial Income Components



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

The increase in solvency levels translates into more support for the financial system's risky assets.

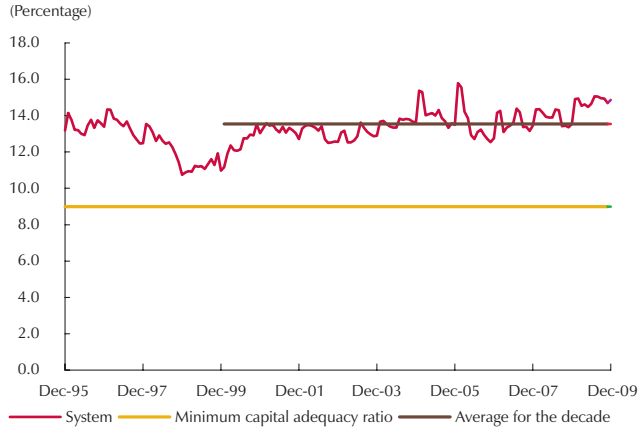
However, when analyzing the institutions with subsidiaries, is important to look at the consolidated capital adequacy ratio, which considers the extent of leveraging for both the parent company and its subsidiaries.[12] As shown in Graph 39, capital adequacy weighed by each institution's share of equity capital increased during the first half of 2009 from 11.9% to 12.5% in June of that year. As shown by the way this indicator has performed recently, when balance sheets are consolidated the institutions are not in as comfortable a position as when capital adequacy is considered individually. See Box 1 for a more detailed analysis of the capital adequacy of financial institutions.

5. Intermediation Spreads

During the second half of 2009, the Board of Directors of Banco de la República (BDBR)

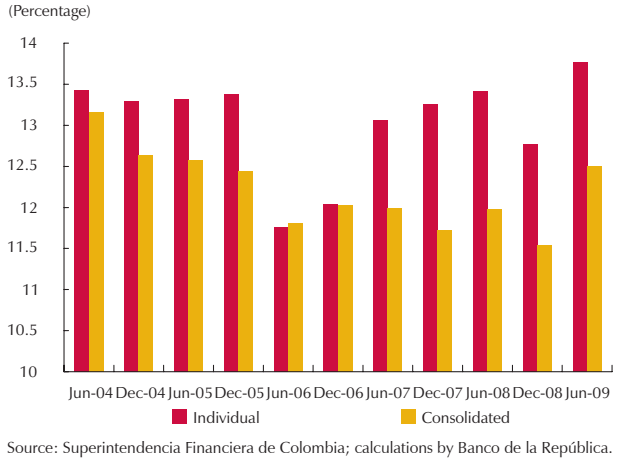
12 According to the regulations set by the Financial Superintendence, lenders that have subsidiaries and own more than 50% of those subsidiaries are required to present a consolidated capital adequacy ratio for the group. On the other hand, if the credit institution has less than a 50% interest, it must deduct the subsidiary's technical capital.

Graph 38
Capital Adequacy Ratio of Credit Institutions



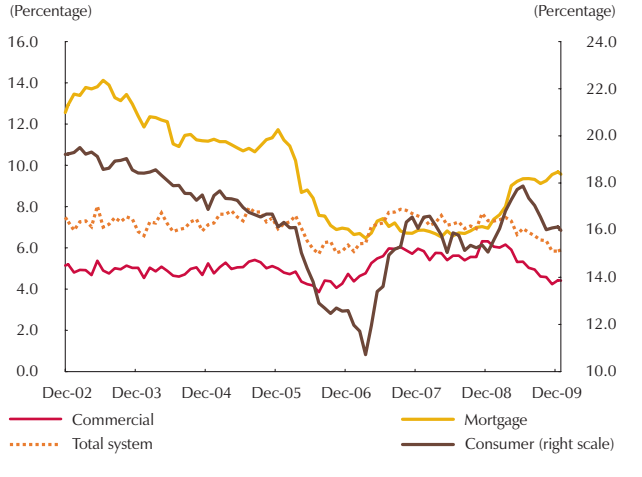
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 39
Weighted Capital Adequacy



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 40
Ex Ante Spread Using the Term Deposit Rate (CDT in Spanish)



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

continued to reduce interest rates as part of its monetary policy. This had an effect on lending and deposit rates in the financial system, which have fallen gradually. As illustrated in Graph 40, the ex ante spread[13] for the system as a whole continued to decline during the second half of 2009 and was 5.8% by December 2009, which amounts to a reduction of 1.1 percentage points compared to June of the same year (6.9%). This is explained largely by the reduction in the spread on commercial lending, which was 4.4% at the end 2009 as opposed to 5.3% six months earlier. The ex ante spread on consumer lending declined between June 2009 (17.9%) and December of that year (16.1%).

On the other hand, the ex post spread[14] declined during the second half of 2009 and was 8.2% in December, which is 40 bp lower than in June of that year (8.6%) (Graph 41). The reduction is explained by more of a drop in the lending rates implicit in the system, which went from 16.1% to 14.9% between June and December 2009, coupled with a less than proportionate decrease in the implied deposit

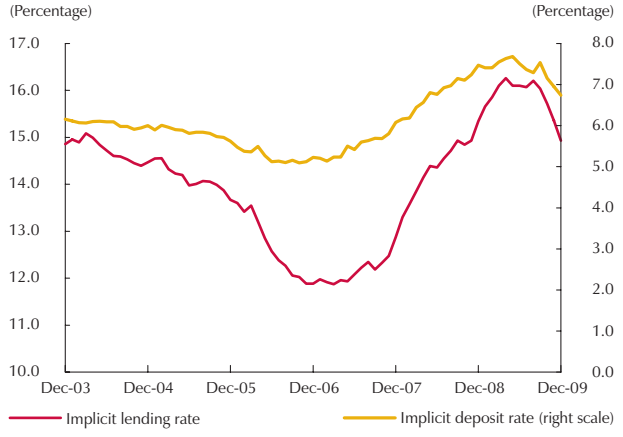
Graph 41
Ex Post Spread

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

13 The ex ante spread is the difference between the rates charged by intermediaries for different types of loans and the average rate on term deposits (CDT).

14 The ex post spread is calculated as the difference between the implicit lending and deposit rates. The first include earned interest, plus indexation as a percentage of the performing portfolio. The latter include outlays for interest, plus indexation as a percentage of liabilities with cost.

Graph 42
Implicit Interest Rates of Credit Institutions



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

rates (77 bp) during in the same period to 6.7% in December 2009 (Graph 42).

In short, the total loan portfolio continued to exhibit lower growth rates during the second half of 2009, especially for commercial lending. As to credit risk, the portfolio quality indicator improved for credit of all types, with the exception of commercial loans. The coverage levels increased for all types of lending, due to a more than proportional decline in the pace of growth in the risky portfolio compared to the increase in loan-loss provisioning. Moreover, the default indicators were better for all types of loans

The financial system showed solid profit margins and capital adequacy ratios, as was the case during the first half of 2009. Income from interest continues to account for the bulk of all financial income and, despite less of a spread, the return on assets remained relatively constant throughout the second half of 2009, partly because of the increase in income from gains in the value of investments.

Given the forecasts for added economic growth during the current year, more momentum in the loan portfolio is expected. Coupled with rising expectations for inflation and interest rates, this could prompt credit institutions to shift their portfolio away from investments and towards lending.

B. NON-BANK FINANCIAL INSTITUTIONS

An analysis of non-bank financial institutions (NBFIs) is crucial for the purpose of this report, given their possible impact on financial stability. NBFI are economic agents and, through portfolio management, they serve as savings and investment vehicles for households and the general public. They are also linked to other financial agents, either as counterparts in their market transactions or because they belong to a particular financial group. Consequently, NBFI can serve as systemic agents in certain contingencies. The NBFI analyzed in this section are pension and severance fund managers (PFM), life insurance and general insurance companies (LIC and GIC), mutual fund managers, brokerage firms (BF) and investment management companies (IMC).

To examine the role of the NBFI portfolio in the financial system, Table 3 shows the value of investments for each type of institution within the sector. As illustrated, the investment portfolio of financial institutions rose 16.9% and was COP$ 332.7 t by the end of December. This performance, which is consistent with the trend witnessed the year before, was prompted largely

by an increase of COP$32.45 t in the NBFI investment portfolio, which is equivalent to an annual variation of 33.1%. The change in the portfolio of credit institutions also contributed to the increase in the value of investments by financial institutions, but less so. Financial institutions added COP$ 15.5 t to their investment portfolio, which is equal to 8.3% growth.

The build-up in the NBFI investment portfolio is the result of growth in the portfolio of mandatory pension funds, which came to COP$ 21.5 t in 2009 (36.9%) due to favorable results with respect to the return witnessed during this period. Mutual funds also contributed to the increase in the value of the NBFI investment portfolio, but to a lesser degree. Mutual fund managers added COP $ 4.2 t to the value of their portfolio, which came to COP$ 13.9 t by the end of the year, thanks to positive momentum with respect to the stock market and government debt (Table 3).

It is important to point out that the high concentration of PFM-managed resources in local securities, mainly government bonds, makes them sensitive to changes in local market conditions market. Therefore, the valuation in TES and stocks observed throughout most of 2009 significantly increased the value of the PFM portfolio.

Table 3
Investment Portfolio: Financial Institutions

	2007		2008		2009	
	Trillion of pesos	Percentage of GDP	Trillion of pesos	Percentage of GDP	Trillion of pesos	Percentage of GDP (proj)
Credit Institutions						
Investments	35.0	8.1	8.1	8.1	50.8	10.2
Loan Portfolio	125.1	29.0	30.9	30.9	151.3	30.3
Total Credit Institutions	160.1	37.1	39.0	39.0	202.1	40.5
Non-Bank Financial Institutions						
Mandatory Pensions	51.1	11.8	12.2	12.2	79.9	16.0
Voluntary Pensions	7.1	1.6	1.6	1.6	9.5	1.9
Severance Pay	3.8	0.9	0.8	0.8	4.9	1.0
General Insurance	3.6	0.8	0.8	0.8	4.6	0.9
Life Insurance	6.9	1.6	2.5	2.5	14.3	2.9
Mutual Funds	6.1	1.4	2.0	2.0	13.9	2.8
Brokerage Firms and Investment Management Companies	3.3	0.8	0.5	0.5	3.4	0.7
Total Non-Bank Financial Institutions	82.0	19.0	20.5	20.5	130.6	26.2
Total	242.1	56.1	59.5	59.5	332.6	66.7

(Proj) Projected as of December 2009.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

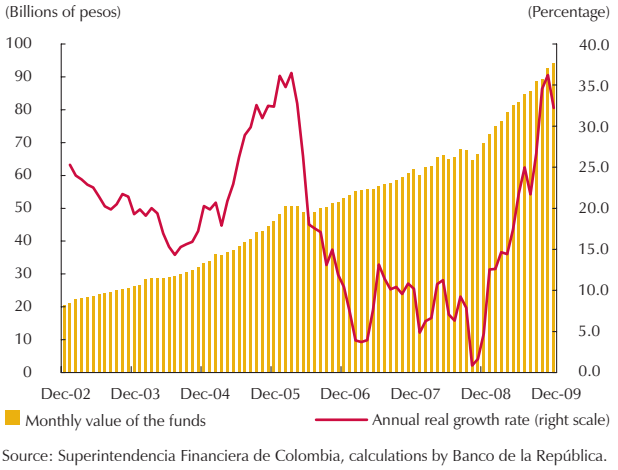
1. Pension and Severance Fund Managers (PFM)

The performance of the portfolio of PFM-managed funds was determined, for the most part, by the recovery in local financial markets. In fact, because PFM-managed funds are concentrated mostly in those markets, the value of the portfolio and the return on investment increased significantly. Moreover, the second half of 2009 was characterized by a shift in the composition of the PFM-managed portfolio, mostly away from government bonds and into equities.

a. Portfolio Value and Return

Continuing with the upward trend and sharp valuation experienced during the first half of the year, the value of the portfolio of PFM-managed funds increased significantly in the second half of 2009. Accordingly, by December, total resources came to COP $ 94.2 t. This is COP$ 12.0 t higher than the figure on record six months earlier and COP$ 24.4 t higher compared to twelve months before (Graph 43). The six-month increase, in particular, was equal to 32.2% annual real growth, largely due to the valuation in local financial markets.

Graph 43
Pension Funds: Value and Real Growth



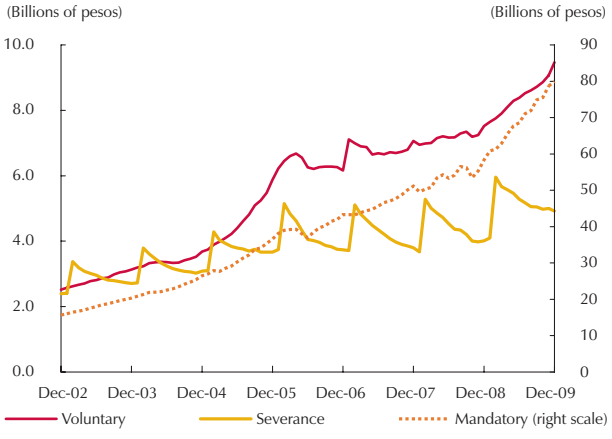
Source: Superintendencia Financiera de Colombia, calculations by Banco de la República.

The momentum in the total investment portfolio reflects the trend in each of its components. During this period, the mandatory pension funds (MPF) and the voluntary pension funds (VPF) and severance funds (SF) significantly increased the value of their portfolios, posting 34.2%, 23.5% and 20.2% annual real growth, respectively (Graph 44).

Specifically, the MPF investment portfolio increased COP$ 11.3 t in value during the second half of 2009, reaching COP$ 79.9 t by the end of the year. This change in value was related directly to the difference between income (COP$ 17.1 t) and outlays (COP$ 5.8 t); the former included COP$ 7.5 t in collections and COP$ 9.6 t in valuation.

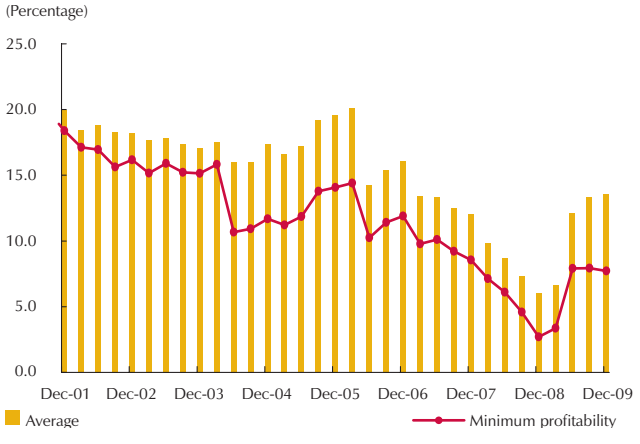
The value of VPF increased by COP$ 1.1 t during the second half of 2009 and was COP$ 9.5 t by the end of the year. The SF investment portfolio declined by COP$ 0.3 t during the same period to COP$4.9 t. However, it should be noted that the annual increase in the value of these funds was COP$ 0.9 t, despite the aforementioned reduction during the second half of 2009. This contraction was a direct consequence of the stationary performance of these funds, which is characterized by capitalization during the first half of the year and disbursements during the second.

Graph 44
Pension Funds: Portfolio Value



Source: Superintendencia Financiera de Colombia, calculations by Banco de la República.

Graph 45
Three-year Average Return on MPF and Minimum Profitability



Source: Superintendencia Financiera de Colombia, calculations by Banco de la República.

It is important to point out that most of the income for these funds was due to a significant valuation in their investments during 2009, thanks to a sustained increase in their profitability (Graph 45). Consequently, this off-set part of the downward trend in profitability observed in the previous three years.

In the case of MPF, average three-year profitability was 13.6% by the end of the year, which is 1.4 pp higher than in June 2009 and 7.5 pp compared to December 2008. However, minimum profit declined 18 bp during the second half of the year and was 7.7% in December. Average biannual SF profitability ended 2009 at 12.9%, thanks to half-yearly and annual increments of 2.5 pp and 7.8 pp, respectively (Graph 46). The return on SF rose 1.6 pp during last six months of 2009, ending the year at 7.4%. It should be noted that none of these funds failed to earn the minimum profit during this period.

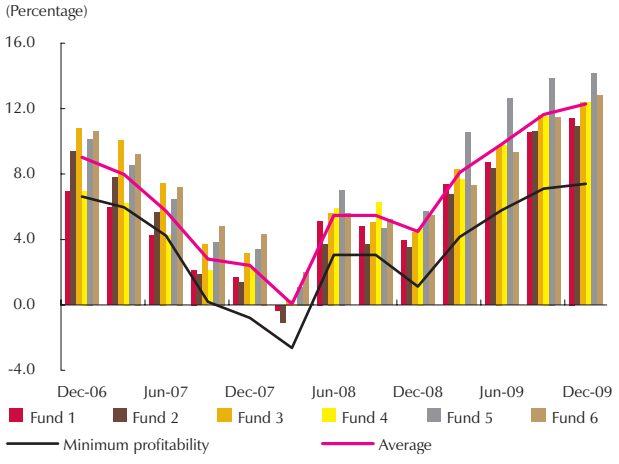
It is important to remember that pensions collected by those affiliated with the individual savings plan depend specifically on the value of the savings amassed during the pensioner's working life. These resources include what the pensioner has contributed to his or her individual savings account and, in large part, the return earned on those resources when invested by the MPF. Although profitability last year represents a positive outcome for the value of savings complied by those who contribute to the individual savings plan with solidarity, this comes on the heels of several years of a clear downward trend.

b. Portfolio Components by Issuer, Term and Currency

In light of existing regulations and the supply of securities available for investment, PFM-managed funds are still heavily concentrated in government debt instruments. However, during the second six months of 2009, investments initiated during the first half of the year were substituted to an extent that reduced the share of government bonds and financial securities,[15] and increased

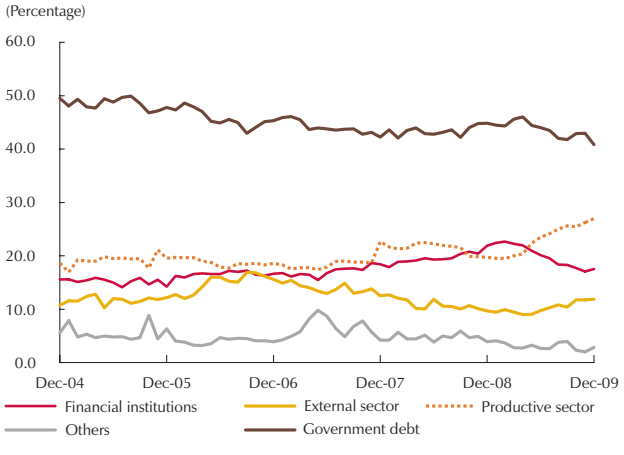
15 Bonds, CDs and shares with high stock market liquidity.

Graph 46
Bi-annual Profitability of Severance Funds and Minimum Profitability



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 47
Pension Fund Portfolio Components, by Issuer



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

the share of securities issued by the productive sector[16] and the external sector[17] (Graph 47).

Consequently, by the end of 2009, the portion of government bonds and financial sector securities came to 40.8% and 17.5% of the total value of the portfolio. Respectively, this is 3.2 pp and 2.6 pp less than six months before. The share of funds invested in instruments issued by the productive sector and the external sector increased by 3.5 pp and 2.1 pp and was 27.0% and 11.9%, respectively, in December. This shift in composition substantially increases the share of investments in the productive sector. This process was motivated primarily by the sharp valuation of instruments traded on the stock market during the second half of 2009, as mentioned in the previous section of this report.

Moreover, the substitution of a portion of government bonds for equity securities could be explained, in part, by the fact that the multi-fund system took effect during the second half of 2010. It allows affiliates to invest their savings in portfolios with different degrees of risk, in both the accumulation and withdrawal stages. Therefore, the PFM apparently have developed a portfolio adjustment process to anticipate the investment structure that will be defined eventually through regulations.

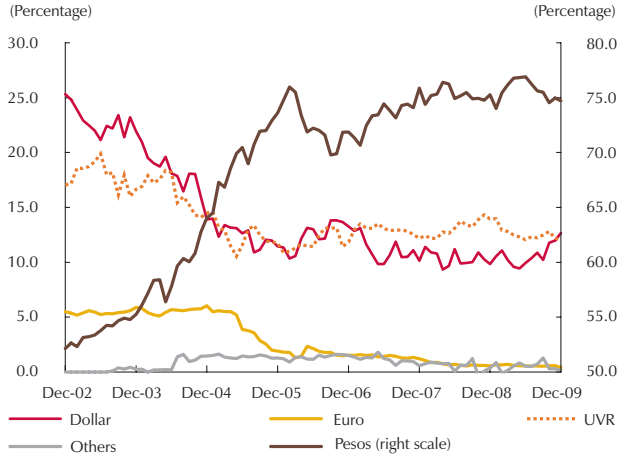
The increased share of securities issued by the external sector also is reflected by the shift in denomination registered during the second half of 2009 (Graph 48). During that period, the share of peso-denominated securities declined 2.2 pp; this reduction was offset by an increase, of the same proportion, in the share of investments denominated in dollars. As a result, the portfolio retained the high concentration in pesos witnesses during the last two years, which came to 74.7% at the end of 2009.

Despite the added proportion of resources in dollars, the share of the value of the uncovered portion of the MPF-managed portfolio denominated in foreign currency, registered levels in December of last year similar to those

16 Mostly bonds and stocks with high stock market liquidity.

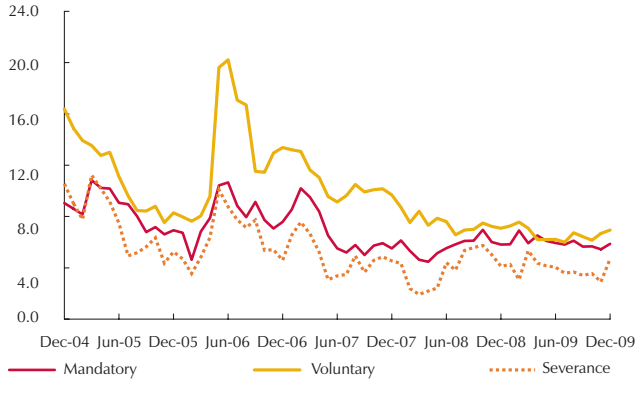
17 Mainly structured products issued by foreign banks.

Graph 48
Pension Fund Portfolio Composition, by Currency



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 49
Percentage of Uncovered Portfolio Value Denominated in Foreign Currency



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

observed six months earlier (5.9%). However, this effect can be observed in the dynamics of the VPF and the SF, which increased their uncovered positions denominated in foreign currency by 73 bp and 67 bp, respectively, raising their exposure to 6.9% and 4.7% of the value of the portfolio. It is important to emphasize that this is well below the limit for the uncovered position in foreign currency, which is 30% (Graph 49). Accordingly, there seems to be a high preference for peso-denominated instruments and a tendency to maintain a conservative policy on investments and portfolio management in dollars.

The restructuring of the PFM-managed portfolio, which initiated the year before with respect to terms or maturity, continued during the second half of 2009 (Graph 50). This involved replacing medium-term instruments (maturing in one to ten years) with short and longer term investments (maturing in less than one year and more than ten). Similarly, the portion of securities maturing in less than a year grew steadily between August and December 2009, ultimately placing the percentage of these investments at 46.7%.

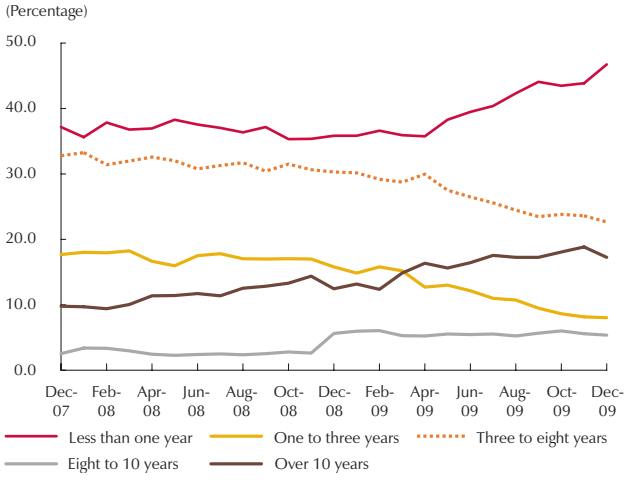
Banco de la República's benchmark rate cut mainly passes through to the short end of the yield curve, causing it to shift downward. As a result, the benefits from the valuation of securities in this portion of the curve appear almost directly. Moreover, securities with longer maturities and, consequently, those of longest duration, are the most price sensitive to changes in interest rates. Therefore, the shift in composition described earlier could be explained by the gradual reductions in Banco de la República's intervention rate throughout the second half of 2009, when investors were motivated to buy securities located at the ends of the yield curve.

The nature of the pension and severance fund business suggests that concentration of the portfolio in long-term assets obeys the fact that the liabilities of these funds are similarly long term. However, the fairly large share of the portfolio represented by assets maturing in less than one year could be due to the limited supply of investment securities in the local market.

2. Life Insurance and General Insurance

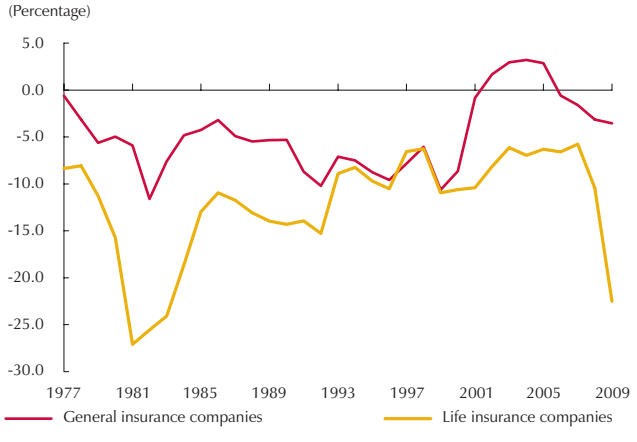
The investment portfolio of general insurance (GIC) and life insurance companies (LIC) during the second half of 2009 continued the upward trend

Graph 50
Pension Fund Components, by Term



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 51
Technical Profit Margin



Source: Fasecolda.

registered since 2002. Accordingly, by December, they were valued at COP$ 4.6 t and COP$ 14.4 t, respectively. These amounts represent semi-annual increases of COP$ 0.4 t and COP$ 0.7 t, respectively.

With respect to the operation of these companies, one sees the technical profit margin, defined as the ratio technical profits to issued premiums,[18] posted a marginal correction in the downward trend experienced during the last two years by the general insurance companies. This indicator was -1.9%, having increased 1.2 pp last year.

The downturn in the LIC technical profit margin continued and reached -18.4%, dropping 8.5 pp during 2009 (Graph 51). As for the GIC, the upward correction in their growth is explained by the added momentum in issued premiums compared to technical profits. The recent performance of the technical margin for LIC is the direct result of an increase in claims during 2009 (COP$ 0.7 b).

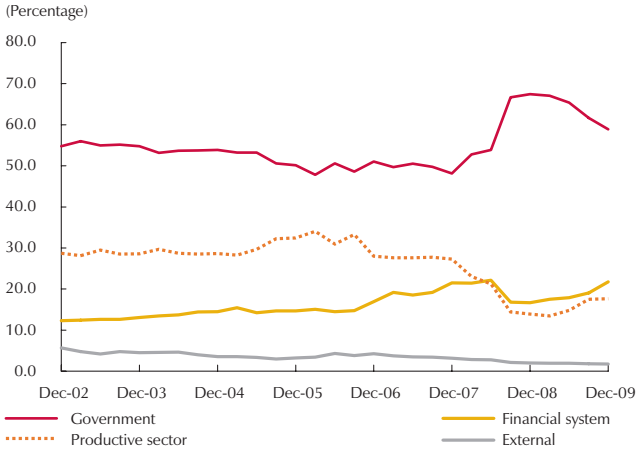
The technical profit is an operational profit for insurance companies. As such, it is an indicator of surplus or deficit in the operation of the business. A technical margin near zero signals efficiency in the system. Therefore, a negative technical margin is indicative of a scenario where the extent of risk posed by customers is underestimated. In this context, inadequate actuarial calculations forecast less value for potential claims payable relative to issued premiums. In contrast, a positive technical margin may suggest the existence of a problem concerning lack of competition among insurance companies. It reveals a situation that could be considered one of market power in which the premiums charged are higher than those suggested by the risk associated with the clients.

The fact that the technical margin for both GIC and LIC is negative suggests there is a high tendency within the system to underestimate the risk posed by the customers of these companies. Moreover, the GIC have a far better margin than the LIC, which have the lowest margin in the last three decades.

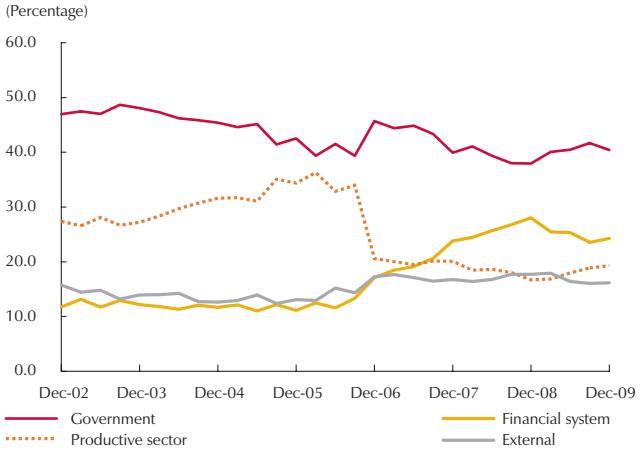
18 Technical profit is the operating profit earned by insurance companies. It includes insurance and reinsurance income, minus outlays for those same items, commissions and general expenses. Accordingly, the technical margin establishes the proportional surplus or deficit insurance companies have with respect to their business. A margin near zero is a sign of competitive and efficient insurance systems.

Graph 52
Investment Portfolio , by Issuer

A. Life Insurance Companies

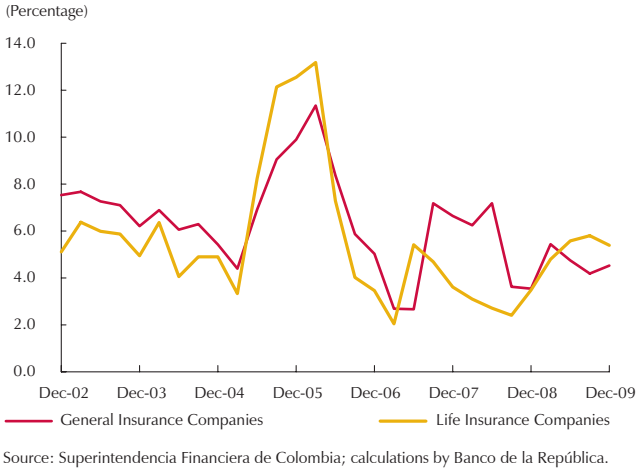


B. General Insurance Companies



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 53
ROA for Life and General Insurance Companies



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The investment portfolio of insurance companies remains concentrated largely in debt instruments issued by the government. In the case of the LIC, although the share of these instruments dropped by 6.5 pp during the second half of 2009, it was 58.9% at year's end. As for the GIC, government bonds accounted for 40.4% of the total value of the portfolio at December, which means their relative share remained stable between July and December of 2009 (Graph 52).

This marginal reduction in the LIC concentration in public debt was consistent with the increased share of securities issued by the financial system and the productive sector. As a result, the proportion of resources invested in those sectors rose 3.9 pp and 2.8 pp, respectively, and accounted for 21.8% and 17.7% of the total portfolio. By the end of the year, the make-up of the CSG portfolio was similar to what it had been at the end of the first six months, with important positions maintained in financial and productive sector instruments and those of the external sector. Specifically, by December 2009, these types of investments accounted for 24.2%, 19.3% and 16.2%, respectively (Graph 52, Panel B).

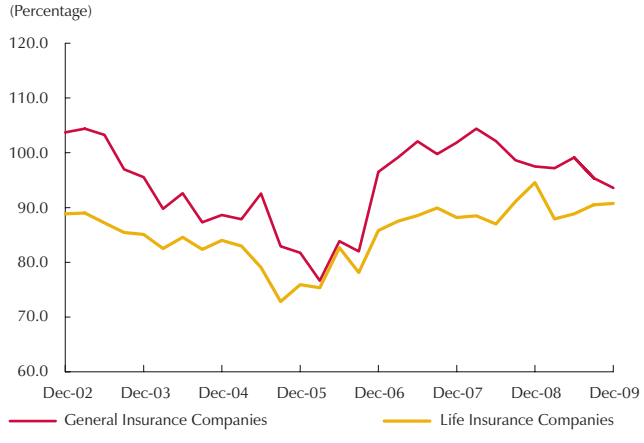
The high concentration in government bonds allowed important valuation gains, owing to higher prices, mainly for TES during the past year. The increase in the return on investments reflects this positive outcome and was 14.0% and 12.3% for LIC and GIC, respectively, by December. Although these levels equal half-year changes of 0.7 pp and -2.9 pp, the annual variation in profitability comes to 5.3 pp and 0.3 pp for each of these sectors, in that order.

The return on insurance company assets during the second half 2009 remained at levels similar to those witnessed during the first six months of the year (Graph 53). ROA for LIC declined to 5.4% between June and December. This represents a reduction of 19 bp and was due to fewer profits and the increase in assets registered at the end of year. The downward trend in ROA for GIC during the first three quarters of the year was offset partly during the fourth quarter. As a result, ROA was 4.5% by December,

which is 22 bp less than it was six months earlier. This was due to more of an increase in assets than in profits.

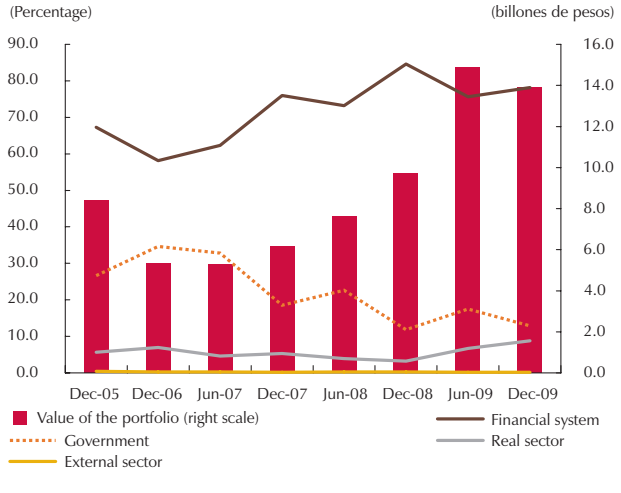
Likewise, the levels of coverage for the sector, estimated as technical reserves over investments, are good. At December 2009, this indicator was 90.7% for LIC and 93.6% for GIC, following respective half-year variations of -5.6 pp 1.9 pp (Graph 54).

Graph 54
Coverage Indicator for Life and General Insurance Companies



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 55
Mutual Funds: Value and Components , by Issuer



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

3. Mutual Funds[19]

An analysis of mutual funds refers to the changes in the value of equity funds, mutual investment funds, ordinary mutual funds and special mutual funds. At December 2009, mutual fund companies reported an investment portfolio of COP$ 13.9 t. Despite a COP$ 0.9 t reduction during the second half of 2009 (-6.6%), this amounts to an increase of COP$ 4.2 t (43.0%) for the year as a whole.

On the one hand, the significant expansion during the first half of 2009 (COP$ 5.1 t) was the result of a sizeable increase in CD and government bond holdings, in addition to bonds issued by companies in the productive and financial sectors (Graph 55). On the other hand, the decline during the second half of last year was mainly a reduction in investments in government bonds (COP$ 815 b) and financial sector securities (COP$ 385 b).

With this shift in composition, financial assets accounted for 78.8% of the mutual fund portfolio by December 2009 (Graph 55) and were mostly in the form of CDs. Also worth noting is the increase in real sector securities as a share of total resources. In 2009, mutual funds increased their holdings of these investments by COP$ 904 b; as a result, their share of the total value of the portfolio came to 8.8% (COP $ 1.2 t).

Although the first half of 2009 witnessed a partial correction in the downward trend registered since December 2008, a year later the profitability of these

19 As of June 2007, any mechanism or vehicle designed to receive deposits or to manage money for a group of persons for the purpose of obtaining common economic returns is known as a mutual fund (Decree 2175 issued by the Ministry of Finance and Public Credit).

funds was less than what it was six months before. As shown in Graph 56, ROA was 3.9% at December 2009, which is 3.7 pp and 0.8 pp less compared to what it was the end of 2008 and at June 2009, respectively.

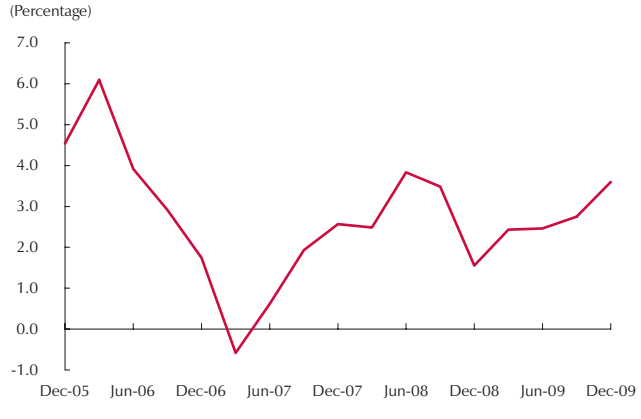
4. Brokerage Firms and Investment Management Companies

The value of the investment portfolio of brokerage firms and investment management companies fell 27.0% during the second half of 2009, following an increase of 79.9% during the first half of that year. Accordingly, it stood at COP$ 3.4 t by the end of 2009, which is COP$ 0.8 t more than at December 2008. This performance is in keeping with the added momentum and valuation witnessed in fixed and equity income[20] during 2009.

Graph 56
ROA for Mutual Funds

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 57
ROA: BF and IMC



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The ROA for these institutions during the second half of 2009 maintained the upward trend observed since the start of the year and was 3.6% by December. This is equal to respective half-yearly and annual increases of 1.1 pp and 2.1 pp. In addition to the decline in assets, as a direct effect of fewer investments, this trend during the last six months corresponds to an increase in profits of 11.5% to COP$ 141 b at year's end (Graph 57).

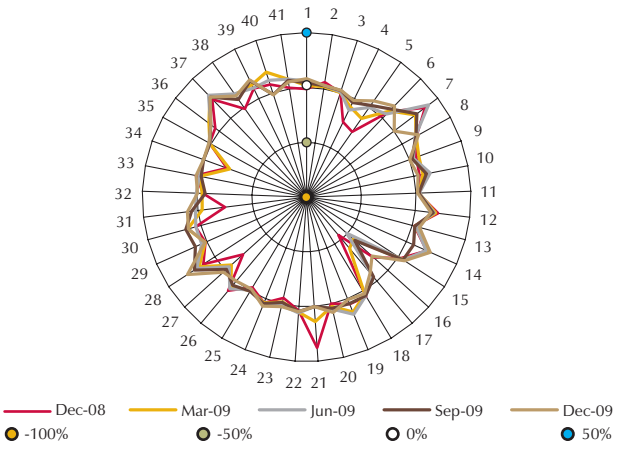
The general trend in the ROA follows the individual performance of most institutions in this sector. A look at the specific performance of each institution shows a trend in which the ROA improved during the second half of the year. This momentum is illustrated in Graph 58, which considers 41 institutions whose returns increase in value proportional to the distance from the center of the circle. In fact, 56% of the institutions reported higher profitability in December 2009 compared to June.

As noted in the last edition of this report, institutions with a significantly negative ROA do not have an excessive amount of leverage, although it is still high. In fact, their investment/equity ratio is below the average for the sector, which was 3.7 % at December 2009 (as opposed to 5.8% in June).

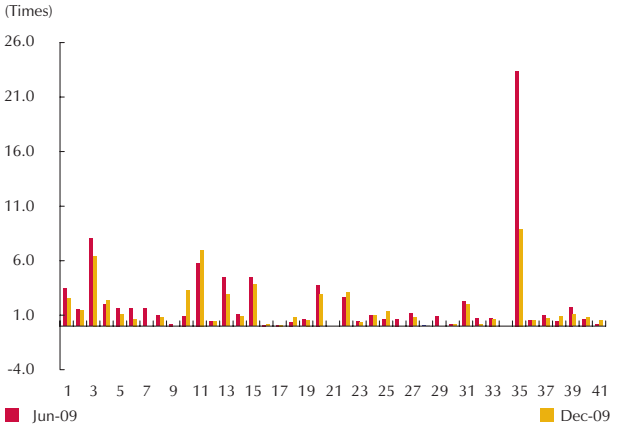
20 The Colombian Stock Market Index (IGBC) increased 30.7% during the first half of 2009 and 17.4% during the second half.

Graph 58

A. ROA for Brokerage Firms and Investment Funds



B. Investments / Equity of Brokerage Firms and Investment Funds



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

When analyzing the performance of NBFI, it is possible to conclude that 2009 was a year of positive results. In general, the different sectors increased the value of their investment portfolio, thanks to high local market valuation and high concentration in this market. The added momentum in the markets and the valuation in government bonds and stocks, among others, resulted in a situation where the NBFI investment portfolio grew more than the economy; consequently, its share of GDP rose as well. The MPF and the mutual funds accounted for the most growth. However, the recent, sharp devaluation in the local government bond market during the early months of 2010 is an important warning sign, since high exposure to local investments makes portfolios even more sensitive to changes in local financial markets.

Box 1
COMMENTS ON THE DEFINITION OF CAPITAL ADEQUACY

Several ideas are presented in this section concerning the capital adequacy of financial institutions in terms of their soundness to properly withstand critical events, given the recent international financial crisis.

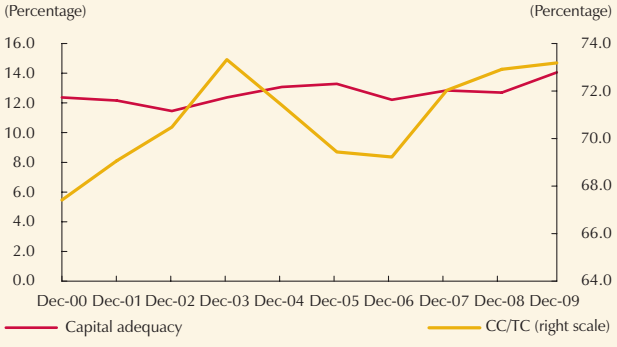
The provisions financial institutions include on their income statements are intended to absorb expected losses, which are a normal component of the financial intermediation business. The role of equity, on the other hand, is to offset an institution's unexpected losses, which are not too likely to occur. This raises the question as to how large that equity should be, in what type of accounts it should be constituted, and how it should relate to the risks banks assume.

In the late eighties, the Basel Committee put forth a series of recommendations in that regard (known as Basel I)[1], which were endorsed by most supervisory bodies in the world. Essentially, Basel I states that Technical Capital (TC) is twofold. In other words, it includes Core Capital (CC), which is made up of paid-in capital and disclosed reserves (the legal reserve in the Colombian case), and supplementary or Additional Capital (AC), which includes undisclosed reserves, valuations, general provisions, hybrid capital and debt instruments (e.g. mandatorily convertible securities) and subordinated debt (payment of which is subject to the payment of external liabilities in the event of liquidation). Additional or supplementary capital may not exceed core capital, and technical capital may be no less than 8% (9% in the case of Colombia), of risk-weighted assets.[2] Basel II was issued in 2004 and is structured around three pillars: minimum capital requirements based on the risks banks face, oversight and information disclosure to encourage market discipline.

In Colombia, the capital adequacy ratio adheres to the provisions in Basel I. By December 2009, it was 14%, with core capital accounting for 73% of technical capital. Graph B1.1 illustrates how these two ratios have evolved since 2000.

One sees that, as banks emerge from the crisis of the late nineties, CC is gaining as a share of TC, in an environment of weak growth in the portfolio, and carries the most

Graph B1.1
Capital Adequacy and Core Capital / Technical Capital for Banks



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

weight in terms of risky assets. In 2006, the peak in portfolio growth coincided with the low point in the share of CC /TC, which is the same as the high point for AC /TC.

The fact that periods of financial stress coincide with an increase in the share of AC/TC seems to indicate that institutions manage their AC as a resource to meet the capital adequacy ratio. This would reflect vulnerabilities in the definition of AC.

As to the main components of CC in December 2009, we see that paid-in capital and the legal reserve account for 92% of CC. The importance of the other components is shown in Graph B1.2, where the largest share pertains to subordinated debt, with 13.1% of TC, followed by valuation of investments with 6.9%.

The main change in this composition with respect to the previous year is rooted in the increased importance pertaining to valuation of investments, which went from 4.5% to 6.9%.

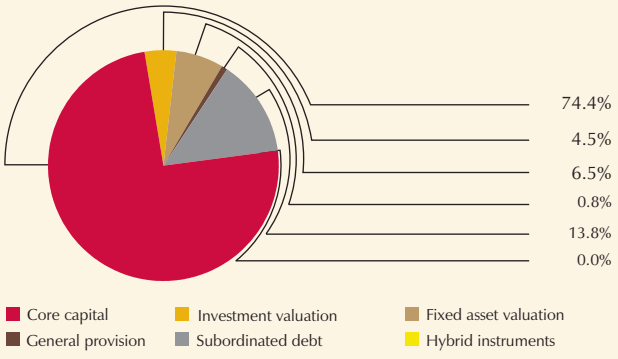
Moreover, Basel definition of the capital adequacy ratio has been questioned in the wake of the international crisis in 2007, since the capital of financial institutions was insufficient to properly absorb the losses incurred by them institutions. This exposed the problem of quality and quantity with respect to adequate capital. Accordingly, it was proposed that the components and the weights of technical capital be redefined and the required amount of capital be increased for those with more capacity to absorb losses.

1 Basel Committee on Banking Supervision (1988), "International Convergence of Capital Measurement and Capital Standards "

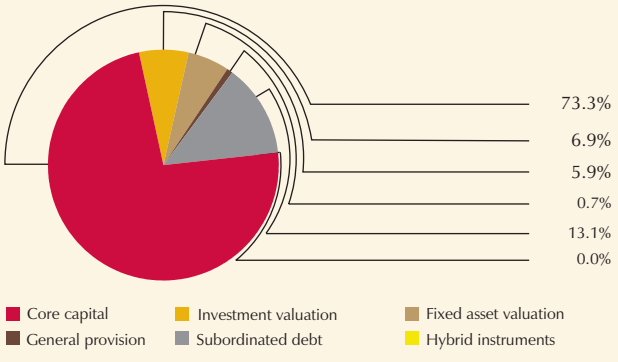
2 Bank assets are classified into five risk categories that range from 0%, such as cash and central government debt, to 100%, such as ordinary lending.

Graph B1.2

A. Components of Technical Capital: December 2008



B. Components of Technical Capital: December 2009



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The procyclicality of Basel II has been criticized as well, because the capital requirement is based on the risks an institution takes, which increase during times of financial stress. Ideally, regulations should take the edge off economic cycles rather than deepen them.

Capital requirements, provisioning requirements and mark-to-market[3] or fair value accounting are the main regulatory sources that accentuate recessionary cycles. The following are several proposals to mitigate regulatory procyclicality.

In the case of capital requirements, different formulas are being discussed, one being to increase capital requirements in good times and reduce them in bad times, without lowering current regulatory levels and even increasing them. Another complementary mechanism is to increase capital requirements for institutions that exceed long-term growth, as a way to discourage the excessive growth that is particular to boom periods.

As for procyclicality in provisions, countercyclical mechanisms are being discussed internally, such as the Spanish model in which a savings provision is amassed during boom times and used in bad times. Financial institutions in Colombia are required to constitute countercyclical savings, but their limited size, as we have reiterated in various documents, would suffice only to mitigate half a year in a recession similar to the one we saw in the late nineties. When the savings are depleted, the regulation becomes highly procyclical, as institutions must provision with more stringent parameters (those of transition matrix B) compared to those that guided provisioning during good times (matrix A).[4] Another countercyclical measure adopted in 2008 calls for a reserve to be constituted with earnings to deal with potential losses during three years thereafter, given the anticipated economic standstill. Measures such as this one reinforce the soundness of the financial system; accordingly, it should be a formal regulation as opposed to a discretionary measure.

As for marking to market or revaluating investments to reflect their current market value, it has been suggested that excessive price increases not be considered "fair market price". This would help to prevent excessive valuation from increasing profits, thereby cushioning the losses that occur when performance is reversed.

Undoubtedly, one of the results of the Basel II revision will be to increase the capital requirement for financial institutions. Higher regulatory capital requirements clearly mean a sounder banking system. However, they also imply higher intermediation spreads to compensate for less leverage. This poses a choice between: i) a slight increase in the long-term sustainability of the GDP growth rate per capita, which comes from lower intermediation spreads, and ii) a reduction in the likelihood of sharp economic volatility, which undermines well-being given its impact on household income and employment.[5]

Colombia cannot ignore this international debate, and it will be necessary to review the quality and quantity of local capital adequacy requirements, as well as the mitigation of regulatory procyclicality, inasmuch as the effect of added capital requirements on intermediation spreads is something that cannot be ignored.

3 See The Bank of Korea Financial Stability Report, April 2009.

4 Transition matrices A and B are probabilities that the rating of a loan will improve or decline.

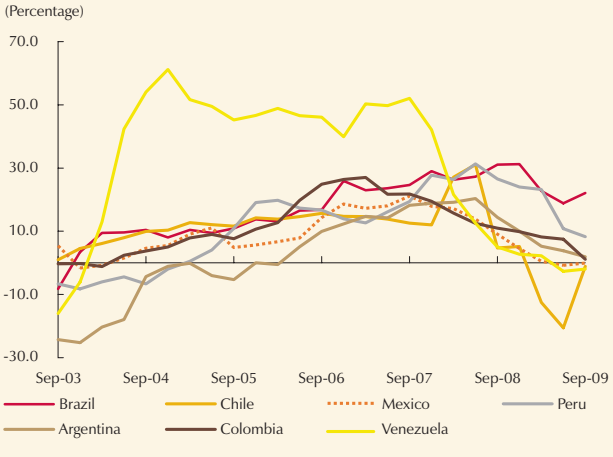
5 See Financial Services Authority, "The Turner Review: A Regulatory Response to the Global Banking Crisis," March 2009.

Box 2
INTERNATIONAL INDICATORS

Latin America's financial systems have yet to recover from the effects of the crisis. This is evidenced by the low levels of real growth in the gross loan portfolio and the fact that countries are more exposed to market risk. The key financial indicators for several Latin American countries are analyzed in this section to assess the performance of variables such as profitability, efficiency and risk.

Between September 2008 and the same month in 2009, real gross loan portfolio growth declined for all the countries analyzed. Peru and Argentina posted the largest reductions, which went from 26.5% to 8.3% and from 14.4% to 1.9%, respectively. However, Venezuela and Chile are the countries with the highest negative growth rates (-6.4% and -1.1%, in that order). It is important to point out that all the countries registered portfolio growth under 2%, with the exception of Brazil (22.0%) and Peru (8.3%) (Graph B2.1).

Graph B2.1
Real Gross Portfolio Growth



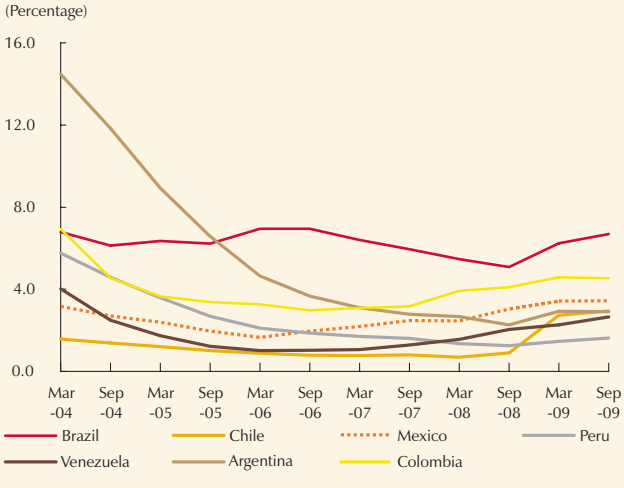
Sources: The central banks and banking authorities in each country; calculations by Banco de la República.

The default indicator[1] deteriorated for all the countries in question during the same period. Chile posted the largest variation, having gone from 0.9% to 2.9%, while Brazil and Colombia continue to have the highest default indicators (6.7% and 4.5% respectively) (Graph B2.2).

The efficiency indicator, measured as the ratio of administrative and labor costs (ALC) to assets shows an improvement for most countries between September 2008 and the same month on 2009, with the exception of Peru and Argentina. Chile still has the most efficient financial system, with administrative costs equal to 1.5% of assets, while Argentina and Colombia are the least efficient countries in the sample, with respective ratios of 5.7% and 4.8% (Graph R2.3).

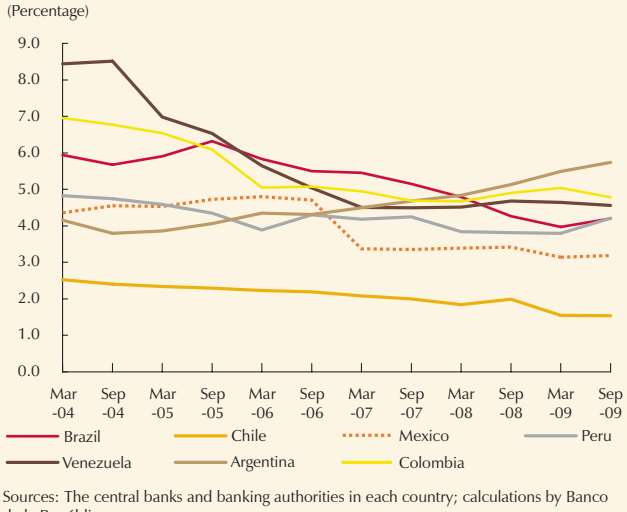
The loan portfolio coverage indicators for Peru and Argentina declined during the aforementioned period, increasing the exposure of those countries to credit risk.

Graph B2.2
Default Indicator: Non-performing Portfolio/ Gross Portfolio



Sources: The central banks and banking authorities in each country; calculations by Banco de la República.

Graph B2.3
Efficiency: ALC / Assets

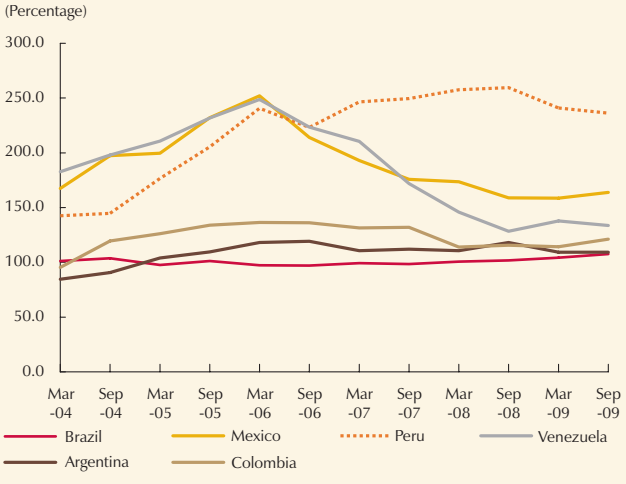


Sources: The central banks and banking authorities in each country; calculations by Banco de la República.

1 The indicators are not comparable among countries, since the measuring methods differ.

Although the variation in Peru was the largest (23.2 pp), it is still the country with the best coverage indicator among the economies analyzed (236.3%). Brazil and Argentina had the lowest coverage indicators in the sample: 107.6% and 109%, respectively (Graph R2.4).

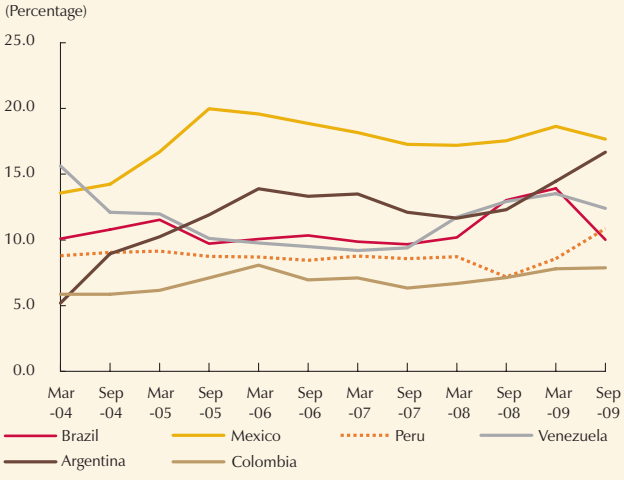
Graph B2.4
Coverage: Provisions / Non-performing Loans



Sources: The central banks and banking authorities in each country; calculations by Banco de la República.

The ex post spreads are shown in Graph B2.5. For September 2009, Mexico and Argentina are the countries with the highest intermediation spreads (17.7% and 16.7%, in that order). Colombia had the lowest rate (7.9%).

Graph B2.5
Ex post Intermediation Spread



Sources: The central banks and banking authorities in each country; calculations by Banco de la República.

In short, the situation of the financial systems in the Latin American countries is diverse. On the one hand, Peru had one of the highest rates of real portfolio growth, low default levels and high coverage for the non-performing portfolio. On the other hand, the real portfolio growth rates in Argentina and Colombia deteriorated, as did their efficiency and coverage indicators. Although Chile has the lowest rate of real portfolio growth, it has the most efficient financial system.

BOX 3
AN ANALYSIS OF CONCENTRATION AND COMPETITION

The level of concentration and the competitiveness of financial intermediaries are analyzed in this section. The first measurement of concentration uses the market share of the five largest intermediaries in the loan and deposit markets, supplemented with the Herfindahl-Hirschman Index (HHI),[2] which makes it possible to quantify the level of concentration in each of those markets. Because high levels of concentration do not imply that a market is not competitive, several additional methods are used to determine the extent to which financial intermediaries in the loan and deposit markets are competitive.

1. Concentration

The share of the loan market pertaining to the five largest intermediaries (RC5) remained stable throughout 2009 (Graph B3.1, Panel A, and Table B3.1). In terms of the portfolio as a whole, there were no major changes in the extent of participation, with a decline of 1.6 pp in the second half of 2009. As to the different types of lending, the RC5 showed increases in the mortgage and micro-loan portfolios, while consumer and commercial lending declined.

The HHI indicators registered a drop in concentration levels during the second half of 2009 for the total portfolio and for the different types of lending, with the exception of mortgages and micro-loans (Graph B3.1, Panel B). However, despite the reduction in the HHI for the total portfolio, it remains close to that of a moderately concentrated market. The most significant change was in the micro-loan index, which went from 2,960 points (p) in June 2009 to 3,037 p in December of that year. It should be noted that this portfolio is still the most concentrated of all types of lending.

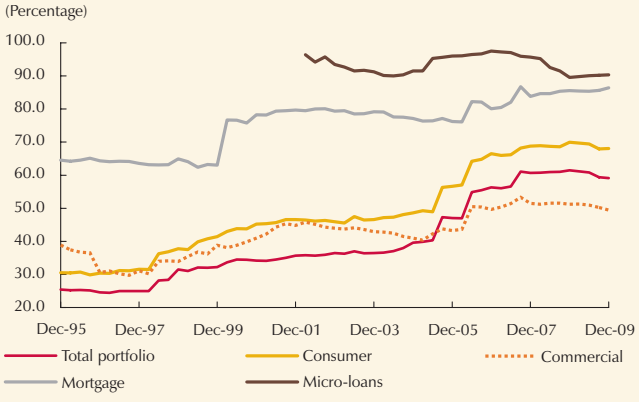
The share of the deposit market pertaining to the five largest intermediaries increased slightly during the second half 2009, with the exception of the term deposit segment (Graph B3.2, Panel A and Table B3.2). During that period, these intermediaries expanded their share of total deposits by 55 basis points (from 57.7% in June to 58.1% in December 2009.) When deposits are analyzed by type, one sees an increase in the indicators for both current and savings accounts, which went from 73.1% in June to 74.8% in December 2009 and from 64.0% to 66.3% during the same period, respectively. On the other hand, term deposits (TD) were down by 3.1 pp.

The pattern of the change in the HHI during the last six months of 2009 is similar to that of RC5 deposits. The HHI for total deposits increased 15 p during this period, having gone from 869 to 883, which is indicative of a market with a low level of concentration.

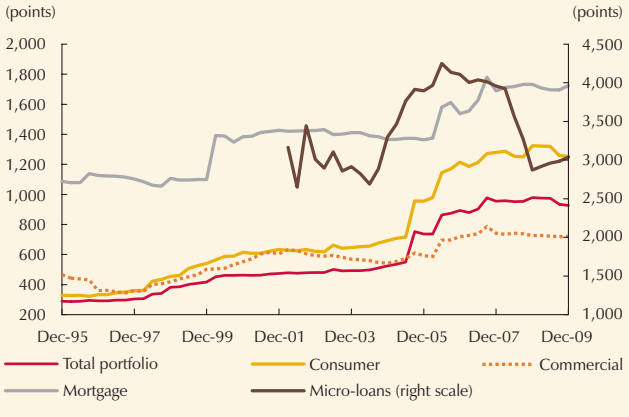
In short, the change in the loan and deposit market indicators during the second half of 2009 shows relative stability with respect to concentration of the financial

Graph B3.1

A. Portfolio Share of the Five Largest Institutions



B. Loan Portfolio HHI



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

1 For more information on the methods used, see "Concentration an Competition Measurements" in "Financial Stability Issues" *Financial Stability Report*, Banco de la República, March, 2008.

2 The HHI measures the market concentration level. The indicator is in the 0 ≤IHH ≤10,000 range. A number below 1,000 indicates low concentration, a number between 1,000 and 1,800 is considered indicative of average or moderate concentration, and an index above 1,800 signals a highly concentrated market.

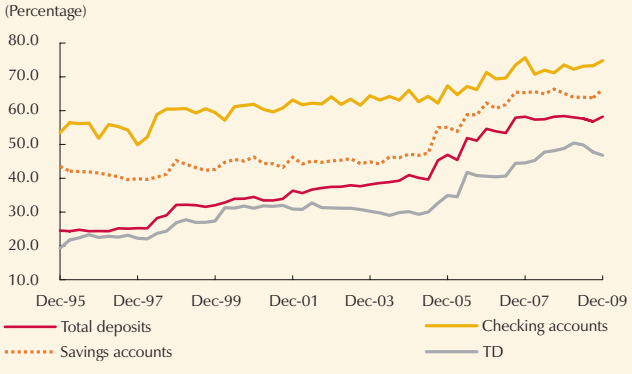
Table B3.1
Loan Portfolio Concentration Indicators as of December 2009

	Total Portfolio	Consumer	Commercial	Mortgage	Micro-loans
Share (%)					
Two Largest	32.43	42.91	24.60	47.30	67.14
Five Largest	59.15	68.07	49.47	86.39	90.33
HHI	927	1,252	720	1,725	3,037

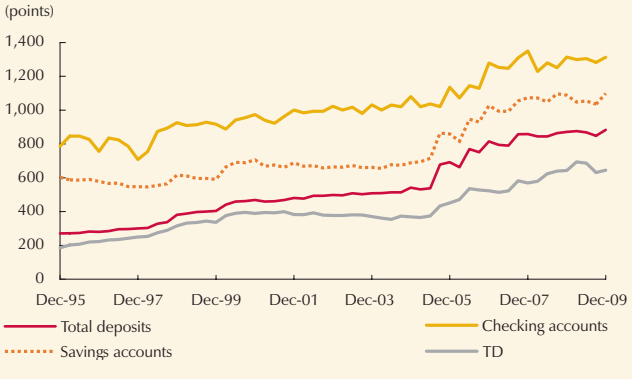
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph B3.2

A. Five Largest Institutions' Share of Deposits



B. HHI for Deposits



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

system. The behavior of the CD concentration indicators is worth noting.

2. Competition

Regarding market structure, the results of the competition models showed no significant variations with respect to those noted in the last edition of the *Financial Stability Report*. The outcome of these exercises is presented below.

Table B3.2
Deposit Concentration Indicators as of December 2009

	Total Deposits	Checking Accounts	Savings Accounts	CD
Share (%)				
Two Largest	31.60	40.52	34.63	25.79
Five Largest	58.21	74.79	66.29	46.79
HHI	883	1,313	1,099	645

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The first method is the one introduced by Panzar and Rosse, which allows us to analyze how a firm's income responds to changes in factor prices. The response is measured by means of an *H* statistic, the value of which identifies the structure characterizing each market.

The statistics indicate that the intensity of competition varies between one type of lending and another. However, the structure of these markets is characteristically one of free-entry monopolistic competition (Table B3.3). The results for the different types of lending indicate that competition is greatest in the mortgage loan market, while the commercial loan portfolio tends to reflect a monopolistic balance.

A more recent method used to measure the extent of competition is the one introduced by Boone (2008).[3] It assumes the most efficient intermediaries (those with lower marginal costs) have more benefits or market share than their less efficient counterparts. In other words, the latter are penalized (in terms of benefits and market share) insofar as there is more competition in the market. This occurs when the more efficient firms increase their supply of credit by taking advantage of their lower marginal costs. The Boone Indicator (BI) is obtained with the following equation:

$$\ln \pi_{s_i} = \beta_0 + \beta_1 \ln \frac{c_i}{\sum_{j=1}^{n} c_j}$$

3 Boone, J. (2008). "A New Way to Measure Competition," *The Economic Journal*, pp. 1245-1261.

Table B3.3
H Statistics, by Portfolio Type

Portfolio	H
Total	0.3478
Consumer	0.2683
Commercial	0.4227
Mortgage	0.4856

Note: Imbalanced panel estimation. The exercise was done for the financial system as a whole, excluding leasing companies, using quarterly data from March 1995 to December 2009.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

where π_i is the share in the market benefits for the *i*-th firm, c_i are the marginal costs of the *i*-th firm and β_1 is the Boone Indicator. The *i*-th firm's share of the benefits increases as its marginal costs decline. By the same token, a higher level of competition increases the market share of the most efficient firm. In this sense, high levels of competition are related to negative BI values. According to the results of the exercise, the extent of competition among banks is low; leasing is the most competitive sector (Table B3.4).

Table B3.4
Boone Indicator (BI)

Type of Institution	BI
Banks	0.1824
CFC	0.0016
Leasing Companies	-0.0103

Note: Estimated with the maximum likelihood method, using data at June 2009.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The statistical analysis of *H* and BI is supplemented with a method designed to determine the relationship between market power (Lerner Index), financial system concentration and credit risk. The results show that concentration and risk relate positively to market power (Table B3.5). This suggests that the higher the level of concentration, the more power intermediaries have to control the market and the more possibilities they have to pass on the cost of the business to consumers through higher costs for financial services.

Conjectural analysis is another way to identify market structure by studying the reaction of financial intermediaries in the loan and deposit markets. In the model, conjectural parameter γ indicates how a firm reacts to changes in the terms on which its rivals compete, which shows the structure of competition in a given market.

Table B3.5
Relationship between Market Power, Concentration and Risk Dependent Variable: Lerner Index

	Financial System
HHI	0.1507***
	(0.0192)
Loan Portfolio Quality	0.1084***
	(0.0145)

HHI ***
Loan portfolio quality
Note: Estimated with imbalanced grouped square minimums. The exercise was done for the entire financial system, excluding leasing companies, between May 2002 and December 2009.
*** Indicates statistical significance at 1%.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The results for the loan portfolio suggest this market is characterized by a monopolistic competitive structure[4] where competition is below Nash equilibrium[5] (Table B3.6). This result corroborates what was found using the Panzar and Rosse method. As for deposits, the results suggest the structure governing the market is more competitive than one of Nash equilibrium.[6] Possibly, this is because deposits are the main source of funding for financial intermediaries, which is why competition for deposits is so high.

In conclusion, there were no major changes in the extent of competition during the last half of 2009. The loan market still is dominated by a monopolistic competitive structure with respect to all types of lending. The deposit market is characterized by a highly competitive structure, which could be an indication of considerable rivalry for different types of deposits.

Table B3.6
Conjectural Parameters for the Loan Portfolio and Deposits

γ of the loan portfolio	9.31E+04 a/
	(4.55E+03)
γ of deposits	-2.7479 a/
	(0.4343)

a/ Indicates statistical significance at 1%.
Note: The reduced forms are estimated with the full information maximum likelihood method. The exercise was done for the financial system as a whole, except leasing companies, using quarterly data from March 1995 to December 2009.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

4 Conjectural parameter γ is above zero.

5 Nash equilibrium is a situation where the agents are price takers, but the economic benefits may be above zero.

6 Conjectural parameter γ is below zero.

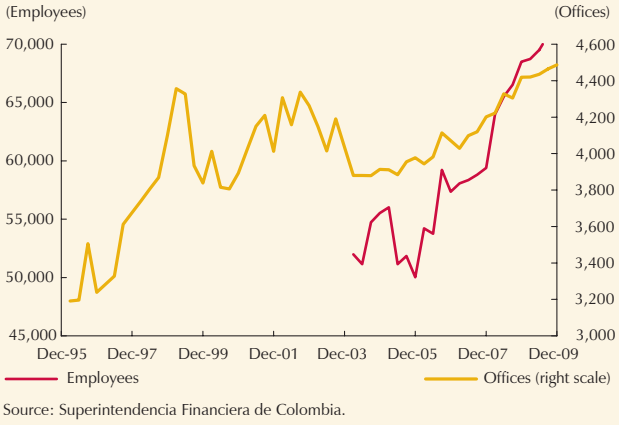
Box 4
AN ANALYSIS OF BANCARIZATION IN COLOMBIA

Financial depth in Colombia, measured as the ratio of the loan portfolio to GDP, deteriorated with the crisis in the late nineties, when it dropped to levels below 20.0%. However, this indicator has improved in recent years and was 30.4% of GDP by December 2009.

The added momentum in economic activity could be attributed to two reasons: i) agents who had been granted loans within the system acquired larger amounts or, ii) there are new users with access to credit. If the latter is the reason, it means bancarization has increased, namely because the number of users with access to the financial system - in this case, access to loans - is higher.

One way to measure access to financial services is by the number of offices and employees in the system. A look at these variables for Colombia shows the respective indicators have increased rapidly. Graph B4.1 illustrates the upward trend in these variables since 2004. With respect to offices, annual growth following crisis in the nineties averaged 1.5%, for a total of 4487 offices by December 2009. The number of bank employees has increased even more, at an average annual rate of 6.6%, with 71,051 employees by the end of the period.

Graph B4.1
Bank Employees and Number of Offices



Source: Superintendencia Financiera de Colombia.

However, this trend is not consistent throughout Colombia. Some provinces or "departments" still have low levels of bancarization. The following is an analysis of several different indicators that attempt to measure the financial activity in each of the country's departments, taking into account portfolio amounts, deposits, number of offices, employees in the system and the population, among other factors.

1. Level of Bancarization in the Departments

A look at the number of offices by department shows major dissimilarities. While some only have one branch, others have more than 1,000 offices. However, when weighted by population, the difference is less significant. Graph R4.2 illustrates the number of inhabitants per branch for each of the country's departments and the national total. The higher this indicator is, the lower the level of bancarization in the respective department.

Out of the 33 departments taken into consideration,[1] the national total in December 2006 was 10,662.1 inhabitants per office, and 23 departments had a higher number. However, the national average during the same month in 2009 was lower and equal to 10,024 inhabitants per branch, although 20 departments surpassed that figure.[2]

Access to credit was analyzed by means of an index constructed as the ratio of the net loan portfolio[3] to the number of inhabitants. In this case, the higher the indicator, the higher the level of bancarization in the department. As illustrated in Graph B4.3, the difference between these two variables is greater than the difference in the indicator for the number of offices. In December 2009, each inhabitant in Vaupés had COP$ 96,569.3 in loans, on average, as opposed to COP$ 7,166,402.7 for each inhabitant of Bogotá.

The differences among the departments are related to the economic activity in each department. A comparison between share of the total loan portfolio and share of departmental GDP shows a correlation coefficient of nearly 90% for the series, since the departments with more economic activity are those with more loans.

Moreover, when constructing a similar indicator linked to total deposits in the banking system, we found the correlation is less and the departments with low levels of lending are not necessarily those with fewer deposits. Although Vaupés and Guainía showed lower levels with respect to this indicator, they were closer to the national

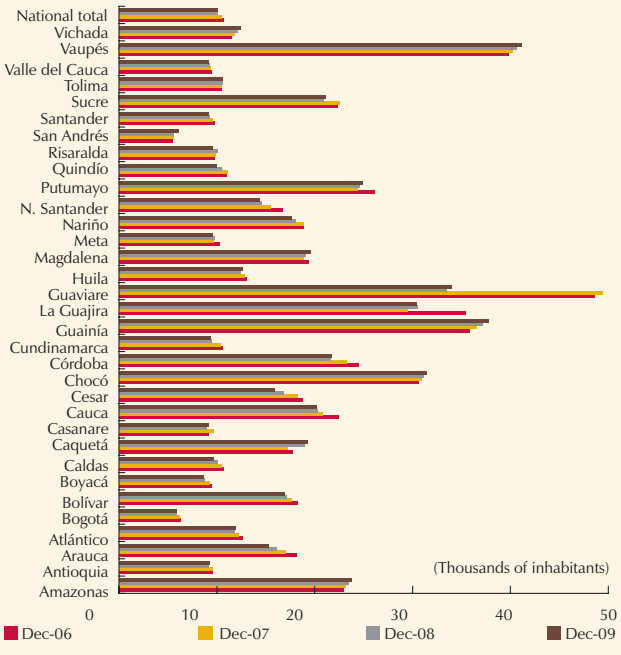
1 Bogotá and Cundinamarca were considered separately.

2 According to the Financial Stability Bulletin of Argentina for the first half of 2008, the average indicator for Latin America is 8,000 inhabitants per office.

3 Due to problems with the availability of information, the total net portfolio was taken into account as opposed to the net portfolio of the private sector.

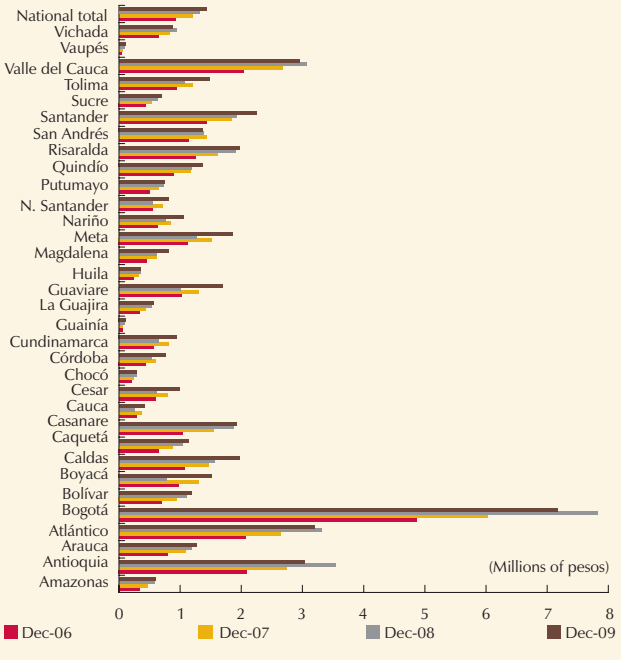
average with respect to total checking accounts, savings accounts and term deposits. (Graph B4.4).

Graph B4.2
Inhabitants per Office



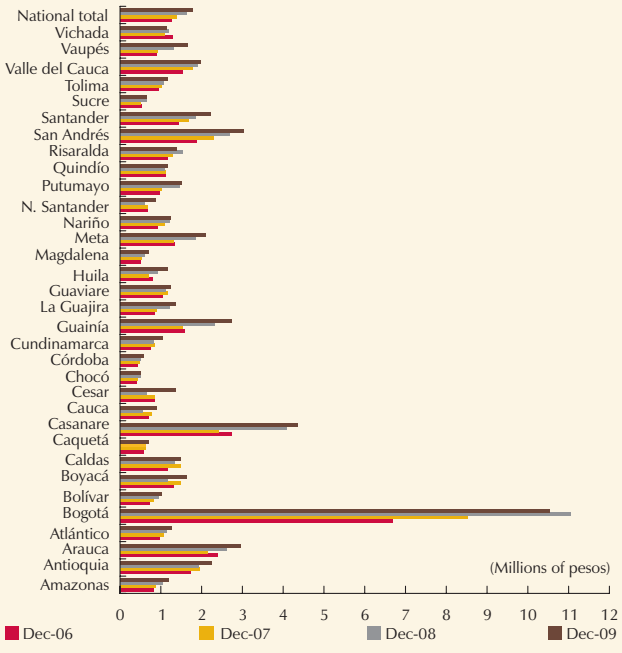
Sources: Superintendencia Financiera de Colombia and DANE, calculations by Banco de la República.

Graph B4.3
Net Loan Portfolio Per capita



Sources: Superintendencia Financiera de Colombia and DANE, calculations by Banco de la República.

Graph B4.4
Deposits Per Capita



Sources: Superintendencia Financiera de Colombia and DANE, calculations by Banco de la República.

2. Concentration by Regions and Financial Institutions

Loan and deposits were considered when analyzing the financial performance of each institution, so as to determine how many departments they operate in.[4] If institutions operate in a single department, they are considered local; if they operate in less than half, they are regional. Otherwise, they are considered national.

During the period in question, most banks had operations in more than half the country's departments and received 92.9% of the deposits, on average. The remaining institutions operated at a regional level. However, the number of offices and the balance of operations are concentrated in the Andean departments. An indicator of the number of branches per 1,000 inhabitants was constructed for this analysis (Map B4.1).

Because government-owned banks always have had a strong presence in all the departments, if we consider the number of offices per thousand inhabitants in December 2009, the indicator is 69.2% lower, on average, and some departments are down by more than 200%. However, a look at the extent of bancarization without these entities shows an average drop of 21.3% in the loan portfolio per

4 For loan transactions and deposits, those made through non-bank correspondents were included.

Map B4.1
Thousands of Inhabitants per Office

Less than 10,000 inhabitants per office
Between 10,000 and 20,000 inhabitants per office
Between 20,000 and 30,000 inhabitants per office
Between 30,000 and 40,000 inhabitants per office
More than 40,000 inhabitants per office

Sources: Superintendencia Financiera de Colombia and DANE, calculations by Banco de la República.

capita and 17.8% for deposits . The less than proportional decline in the first indicator compared to the second is explained by the recent change for non-bank correspondants, which are allowed to conduct financial transactions without being required to have a branch.[5]

Although the level of bancarization has improved in recent years, access to loans remains concentrated in several departments; this refers to offices as well as portfolio balances and deposits. Therefore, it is important that new strategies and products be developed to increase the number of agents who are part the financial system, especially in regions with low levels of bancarization.

5 According to the Asociación Bancaria y de Entidades Financieras de Colombia (Colombian Association of Banks and Financial Institutions), there were 5500 non-bank correspondents by December 2010.

III. CURRENT SITUATION AND THE OUTLOOK FOR BORROWERS FROM FINANCIAL SYSTEM

In 2009, there was a decline in total corporate debt and a restructuring of liabilities towards longer-term debt and local borrowing. Bonds and commercial paper increased as a share of total liabilities. The indicators of borrowing capacity: interest coverage ratio and profitability, have improved in the last few months. At the same time, the mortgage loan portfolio as a share of total household debt increased. This situation has been accompanied by a decline in the household financial burden and an increase in the price of mortgage loan collateral.

A. PRIVATE CORPORATE SECTOR

The situation in the private corporate sector is analyzed in this section based on accounting information reported to the Financial Superintendence of Colombia (FCS) by bond-issuing companies in the real sector.[21] At December 2009, these firms accounted for 8.1% of the commercial loan portfolio. Most are large companies,[22] with an average of COP$1.2 t in assets.

21 A homogeneous sample was constructed with the companies that collectively have information for the years 2006, 2007, 2008 and 2009. In December 2009, the assets of this sample represented 73% of the total assets of businesses in the real sector that report to the FCS. Unlike earlier reports, the figures represent only the homogeneous sample.

22 According to Law 590/ 1990, companies can be classified as follows, depending on the extent of their assets: i) small: total assets valued at 501 to 5001 times the minimum monthly legal wage (LMMW), ii) medium: total assets valued at 5001 to 30,000 times LMMW, and iv) large: total assets valued at more than 30,000 times LMMW.

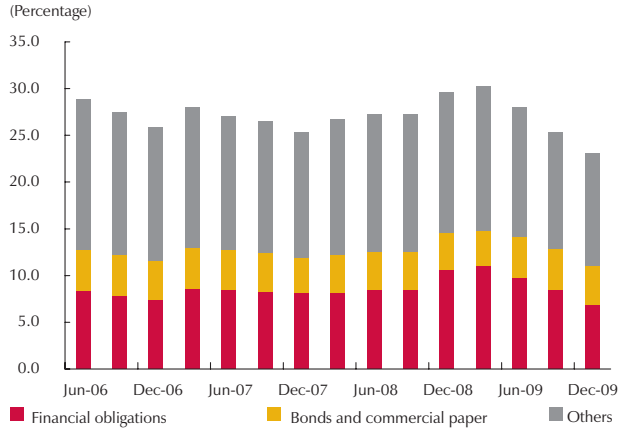
The analysis in this section was done for the companies as a whole and by groups, based on a classification between producers of tradable goods and non-tradables.[23] The indicators that were considered describe the debt taken on by firms and their borrowing capacity or ability to pay. They include indicators of debt, profitability and liquidity, which have been identified as determinants of the financial frailty of Colombian companies.[24]

1. Indebtedness

A company's degree of leveraging measures the proportion of total assets that have been financed with debt or the resources of third parties (creditors). As this proportion increases, so does the amount of funds that will have to be committed to pay debt service.

One of the indicators used to measure the degree of leveraging is the ratio of liabilities to assets, which also is known as the debt ratio. Graph 59 shows the changes in that indicator, differentiated by type of debt: financial obligations (debt contracted with lending institutions), bonds and other liabilities.

Graph 59
Debt Ratio (Liabilities/Assets)



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

As illustrated, the indicator declined in 2009 and was 23% during the final quarter of the year. In other words, the companies in the sample financed 23% of their assets by borrowing. This is the lowest proportion on record since March 2006 and is explained by the 6.6% reduction in total liabilities, including the negative change in the balance of financial obligations (Table 4).

a. Funding Mechanisms[25]

Graph 59 shows that financial liabilities, as a share of total liabilities, declined in 2009, while the share of bonds increased. This restructuring is due not only to the decline in outstanding financial obligations, but also to the increase in bond placement.

---

23 Companies producing tradable goods are those involved in agriculture, cattle-raising, hunting, fishing, mining, quarrying and industrial manufacturing. Those producing non-tradables pertain to the other sectors.

24 Oscar Martinez (2003). "Determining the Frailty of Colombian Companies," Borradores de Economía, No. 259, Banco de la República.

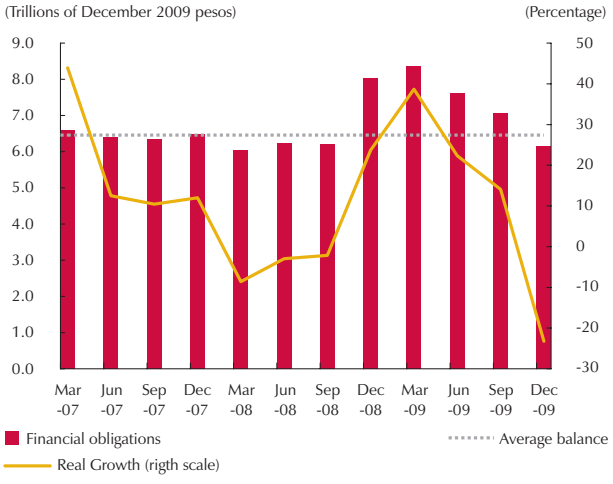
25 Only sources of funding originating with liabilities are considered in this section; those obtained from stocks are not.

Table 4
General Balance: Private Productive Sector

	Trillions of December 2009 Pesos			Growth Rate (%)		Share (%)	
	2007	2008	2009	2008	2009	2008	2009
Assets							
Current Assets	**12.1**	**12.6**	**10.4**	**3.9**	**(17.7)**	**16.7**	**11.5**
Available Funds	0.8	0.8	0.8	2.1	7.5	1.0	0.9
Investments	1.9	1.7	1.3	(10.0)	(26.7)	2.3	1.4
Debtors	5.7	6.1	5.1	7.4	(16.5)	8.1	5.6
Inventories	3.6	3.7	3.0	4.6	(19.5)	4.9	3.3
Others	0.2	0.3	0.1	32.6	(61.9)	0.4	0.1
Long Term Assets	**68.0**	**63.0**	**80.2**	**(7.3)**	**27.2**	**83.3**	**88.6**
Investments	25.3	25.5	32.7	0.7	28.4	33.7	36.2
Debtors	1.8	2.0	1.9	10.4	(1.1)	2.6	2.1
Property, Plant and Equipment	13.5	13.4	12.9	(1.0)	(3.4)	17.7	14.3
Intangibles	4.6	4.0	4.1	(12.4)	1.6	5.3	4.5
Deferred	1.2	1.3	1.4	8.1	8.1	1.7	1.5
Other Assets	0.0	0.0	0.0	26.5	(4.7)	0.1	0.0
Valuations	21.6	16.9	27.0	(22.0)	60.0	22.3	29.8
Total Liabilities	80.2	75.7	90.5	(5.6)	19.6	100.0	100.0
Liabilities							
Current Liabilities	**12.7**	**13.2**	**11.6**	**3.4**	**(12.0)**	**58.9**	**55.4**
Financial liabilities	3.6	3.5	2.2	(2.4)	(39.0)	15.8	10.3
Suppliers	2.9	3.0	2.8	5.3	(7.9)	13.6	13.4
Accounts payable	3.1	3.2	3.0	4.7	(5.9)	14.3	14.4
Commercial paper	0.5	0.5	0.7	1.8	38.1	2.3	3.3
Others	2.7	2.9	2.9	8.1	1.0	13.0	14.0
Long Term Liabilities	**7.6**	**9.2**	**9.3**	**21.6**	**1.3**	**41.1**	**44.6**
Financial liabilities	2.9	4.5	4.0	56.5	(10.9)	20.1	19.1
Suppliers	0.0	0.0	0.0	(29.6)	(38.1)	0.1	0.1
Accounts payable	0.5	0.6	0.7	19.0	10.0	2.9	3.4
Bonds	2.6	2.5	3.1	(4.7)	27.8	11.0	15.0
Other liabilities	1.5	1.6	1.4	2.6	(8.7)	7.1	6.9
Total Liabilities	**20.3**	**22.4**	**20.9**	**10.2**	**(6.6)**	**100.0**	**100.0**
Total Equity	**59.8**	**53.3**	**69.5**	**(11.0)**	**30.6**	**100.0**	**100.0**
Equity – Capital stock	1.7	2.0	1.8	13.8	(10.1)	3.7	2.6
Surplus Capital	19.9	17.7	23.2	(11.3)	31.3	33.1	33.3
Reserves	7.0	7.8	8.4	10.7	8.5	14.6	12.1
Equity revaluation	9.4	8.6	8.3	(8.5)	(3.8)	16.2	11.9
Dividends	0.0	0.0	0.0	(7.1)	(2.1)	0.0	0.0
Profit from the accounting period	2.7	3.0	3.9	14.5	29.2	5.7	5.7
Profits from previous accounting periods	(2.5)	(2.7)	(3.1)	6.2	15.1	(5.0)	(4.4)
Valuation surplus	21.6	16.9	27.0	(22.0)	60.0	31.7	38.8

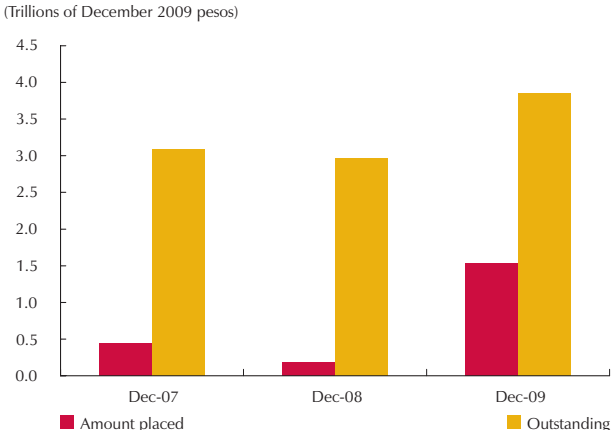
Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 60
Debt Contracted with Lending Institutions



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 61
Bonds and Commercial Paper: Placed and Outstanding



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

A look at the changes in financial obligations during 2008 shows the companies in the sample significantly increased their borrowing during the final quarter of that year. However, the opposite has been true since June 2009, when the real increase in those obligations began to slow (Graph 60). By December 2009, outstanding financial obligations were down 23% compared to the balance one year earlier, having fallen below the average observed from 2006 to 2009. This is consistent with what was observed in the aggregate for the commercial loan portfolio (see Chapter II.).

Bonds and commercial paper as a share of total liabilities increased from 14% to 18% between December 2008 and December 2009 (Table 4). This was due not only to fewer financial obligations, but also to a 29% increase outstanding bonds (Graph 61).

As for new issuance, the amount of bonds issued in 2009 is 8.5 times what was reported in 2008.[26] These issues were floated by four companies,[27] primarily in the tradable goods sector. Seventy percent of these issues mature in over five years, which means they are mostly long-term. The majority (60%) were contracted at a variable rate, referenced to the CPI.

b. Debt Maturity

The composition of financial obligations and of bonds and commercial paper according to maturity shows the share of long-term debt increased during the period under consideration.

On the one hand, the share of financial obligations maturing in over a year rose 9 pp to 65% of total liabilities (Table 5). This increase is explained by a reduction of 39% in outstanding bonds maturing in less than a year, which is higher than the decline observed in long-term financial obligations.

26 Only issues floated by the companies in the sample are taken into account. They represent 23% of all non-financial corporate sector placements that pertain to the productive sector. On the other hand, total issuance by the non-financial corporate sector came to COP 6.5 t, which is 3.4 times the amount in 2008.

27 A total of nine companies in the private productive sector floated bond issues in 2009.

Composition by bond maturity has been relatively stable. Since December 2007, bonds have been concentrated at maturities over a year, which account for 81% of all bonds outstanding, on average. As illustrated in the previous subsection, 70% of the bonds placed in 2009 were for more than five years and were issued largely by companies in the tradable sector. In fact, this group posted an increase of COP$ 700 b in the bond balance (Table 5).

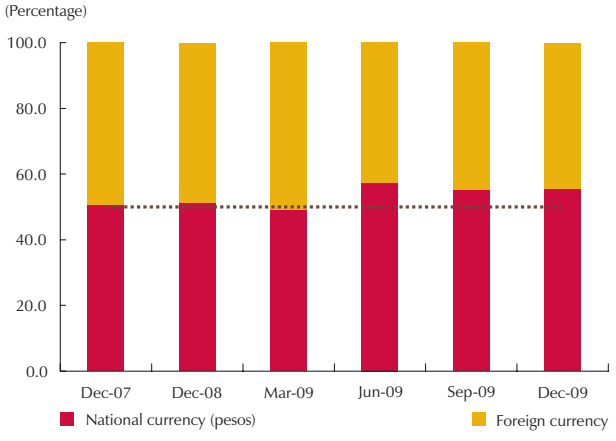
Table 5
Composition, by Debt Maturity

	Trillions of December 2009 pesos					
	Dec-07	Dec-08	Mar-09	Jun-09	Sep-09	Dec-09
Total						
Financial obligations	6.5	8.0	8.4	7.6	7.1	6.2
Short term (%)	56	44	40	39	33	35
Long term (%)	44	56	60	61	67	65
Bonds and commercial paper	3.1	3.0	2.9	3.5	3.6	3.8
Short term (%)	16	17	26	19	19	18
Long term (%)	84	83	74	81	81	82
Negotiable						
Financial obligations	2.2	3.6	3.8	3.3	3.2	2.7
Short term (%)	52	55	49	45	41	44
Long term (%)	48	45	51	55	59	56
Bonds and commercial paper	1.3	1.2	1.2	1.8	1.9	1.9
Short term (%)	22	25	25	16	15	15
Long term (%)	78	75	75	84	85	85
Non-negotiable						
Financial obligations	4.3	4.4	4.5	4.4	3.9	3.4
Short term (%)	58	35	33	34	27	28
Long term (%)	42	65	67	66	73	72
Bonds and commercial paper	1.8	1.8	1.7	1.7	1.7	1.9
Short term (%)	12	12	28	22	24	21
Long term (%)	88	88	72	78	76	79

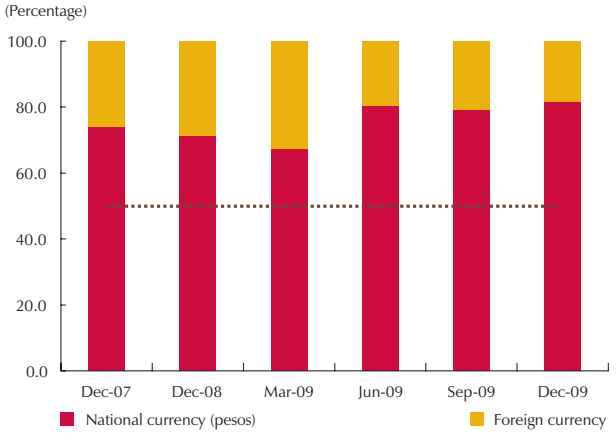
Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 62

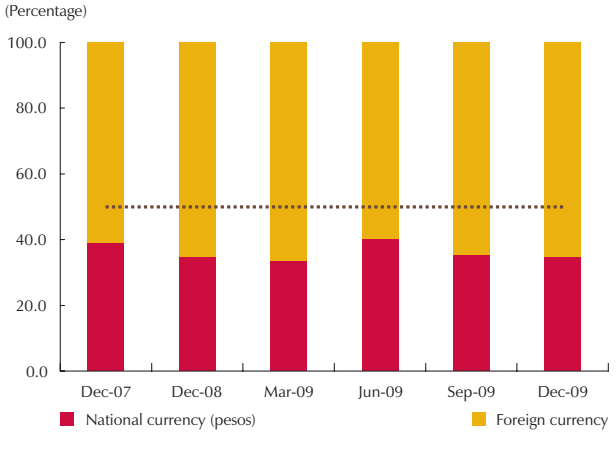
A. Composition of Financial Obligations, by Type of Currency



B. Composition of Financial Obligations, by Type of Currency. Companies in the Tradable Sector



C. Composition of Financial Obligations, by Type of Currency. Companies in the Non-tradable Sector



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

c. Debt Denomination: National versus Foreign Currency[28]

The share of financial obligations denominated in foreign currency declined during 2009, mainly because of less borrowing from foreign lenders by companies in the tradable sector. Their debt in foreign currency fell 53% in annual real terms between 2008 and 2009, which reduced their share by 11 pp (Graph 62, Panel B).

The decline in the share of debt denominated in foreign currency is not as evident for companies in the non-tradable sector. This is because both local and the foreign borrowing fell 20%, which is why the ratio remains stable.

The reduction in borrowing from foreign lenders could be associated with tighter loan requirements applied largely by commercial banks in the United States.[29] Therefore, many firms may have had to resort to local funding.

2. Creditworthiness

The indicators used to analyze the creditworthiness of companies include profitability, liquidity and the interest coverage ratio.

a. Profitability

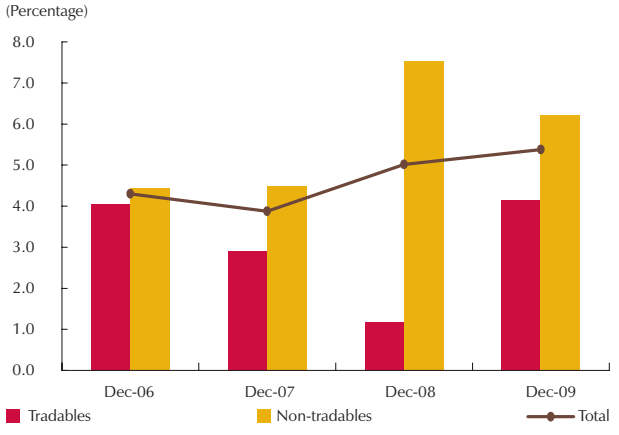
The return on assets (ROA)[30] increased from 5.0% to 5.4% between December 2008 and the same month in 2009 (Graph 63). The profitability of firms producing non-tradables declined from 7.5% to 4.2% during the period in question, while the

28 This sub-section takes into account the make-up of financial obligations in national currency (pesos) and foreign currency. The available figures do not allow for reference to bonds.

29 In the survey done by the Fed's Credit Office in September 2009, 805 of the banks surveyed claimed to have stricter requirements and standards for granting loans.

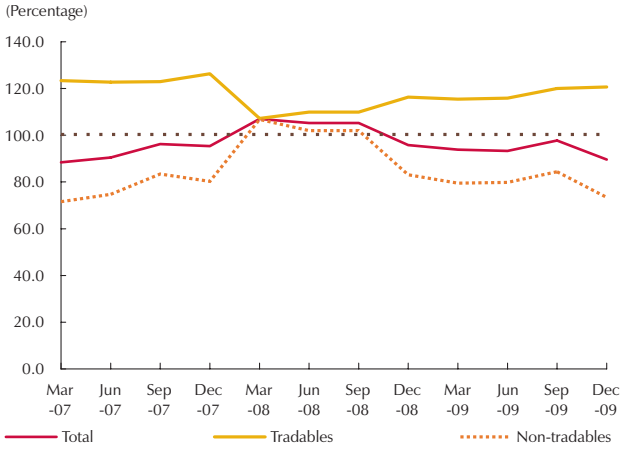
30 Defined as profit on assets total before taxes.

Graph 63
ROA (Profit before Taxes/Assets)



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 64
Current Liquidity (Current Assets/Current Liabilities)



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

profitability of companies producing tradable goods rose 3.0 pp, having gone from 1.2% to 4.2% during that lapse of time.

b. Liquidity

The liquidity indicator, measured as the ratio of assets to current liabilities, went from 95.8% in December 2008 to 89.6% a year later. This reduction is explained by a decline in the balance of inventory and in accounts receivable (debtors): 19.5% and 16.5%, respectively (Table 4).

During the aforementioned period, the liquidity indicator for the companies producing tradables maintained the momentum exhibited since early 2008. As a result, it continues to exceed the liquidity indicator for the companies producing non-tradables. The indicator for the former increased 4.3 pp to 120.7% by December 2009, while the latter saw their liquidity decline by 9.8 pp, primarily because of a 18 pp drop in their accounts receivable (debtors) and a annual real increase of 95% in outstanding commercial paper (Graph 64).

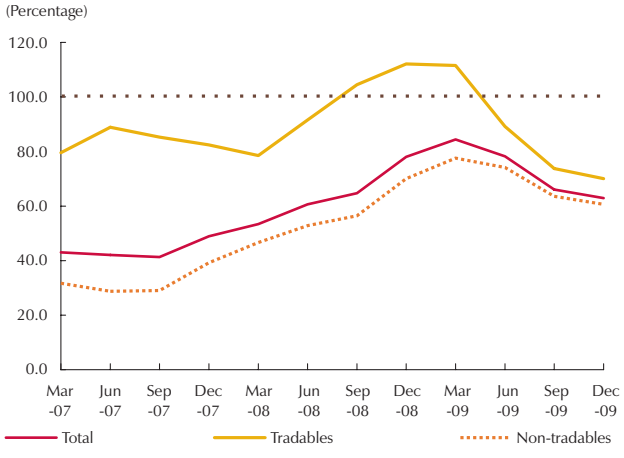
c. Interest Coverage Ratio

This indicator gauges a company's ability to cover the finance charges arising from a debt. It is measured by the ratio of interest to earnings before interest and taxes (operating income). Ratios above 100% indicate the cost of interest would consume all of the company's operating profit. In other words, operation of the firm does not leave enough profit to cover the interest charged on its debt.

A look at how this indicator has changed shows it improved in 2009, having declined for companies in the tradable and non-tradable sectors to an average of 63%. This may be due to the correction in the 2008 levels; as shown in (Graph 65), they were above 100% for tradable-sector firms.

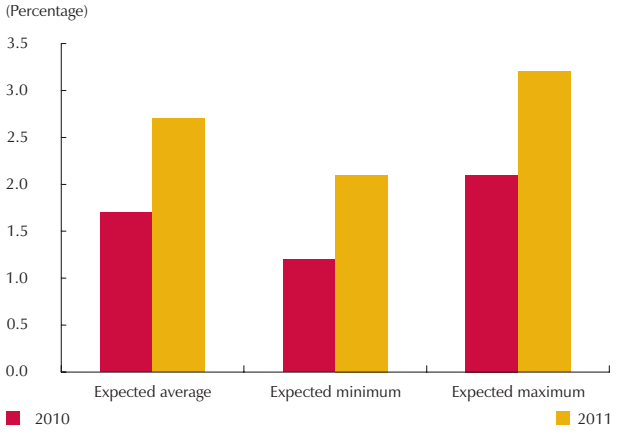
In conclusion, total corporate borrowing declined in 2009 and liabilities shifted towards longer-term debt and local currency. Bonds and commercial paper increased significantly as a share of total liabilities and became an important means of funding for these firms.

Graph 65
Ability to Pay Interest (Interest / Profit before Interest and Taxes)



Note: Third-order moving average.
Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 66
Anticipated GDP growth



Source: Banco de la República.

Graph 67
Company Economic Expectations

Source: Fedesarrollo (Business Opinion Survey- December 2009).

As to creditworthiness or ability to pay, companies saw their level of liquidity decline. However, the interest rate coverage ratio improved, as did profitability. It is important to point out that the analysis was done for companies that are larger, on average, and account for 8.1% of the loan commercial portfolio.[31]

3. Business Expectations

According to Banco de la República's expectation survey conducted in January 2010, the expectation is for 1.2% to 2.1% economic growth this year, which is far lower than it was a year earlier (3.3% to 4.2%) (Graph 66). Finance and industry are the most optimistic sectors with respect to economic performance, while the most pessimistic are transport, communications and labor unions. As for 2011, business people expect between 2.1% and 3.2% economic growth.

In the December 2009 edition of the Fedesarrollo business opinion survey (EOE in Spanish), the replies from companies to questions about the economic situation in the next six months tally on the optimistic side. Graph 67 shows an upward trend since the end of the third quarter of 2008, which indicates the number of business people with positive expectations has increased compared to the pessimists.

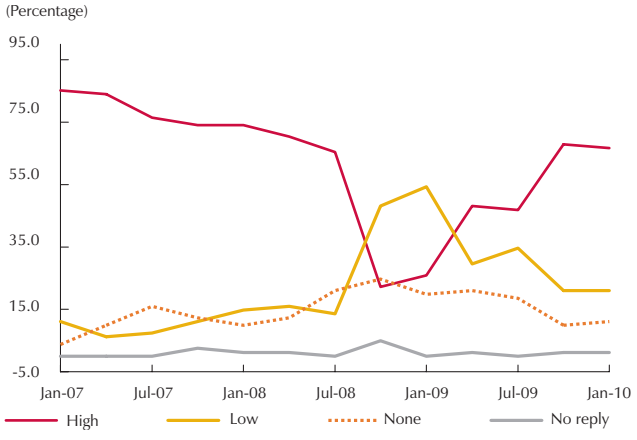
According to the December 2009 edition of the combined industrial opinion survey (EIOC in Spanish) conducted by the Colombian Business Association (ANDI), use of installed capacity at year's end was 75.6%, which is quite similar to the level posted a year earlier (75.0%). Low demand, the exchange rate and higher raw material costs are some of the obstacles companies face.

Going back to Banco de la República's survey, the proportion of those questioned who believe liquidity

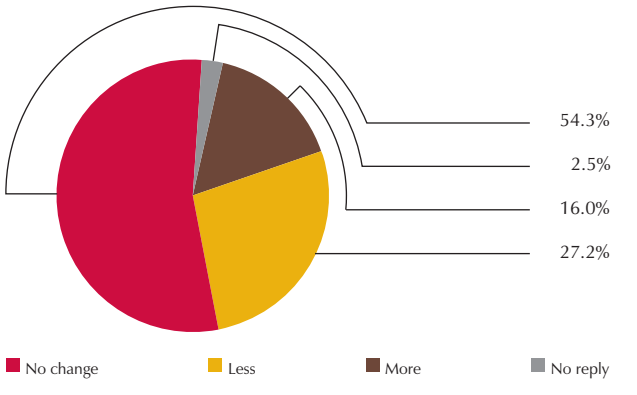
31 An aggregate analysis will be done in a later edition of this report (September), once financial information is available from the companies that report to the Superintendencia de Sociedades (Fierms Superintendence)

Graph 68
Mortgage and Consumer Loan Portfolio/GDP

A. Current Perception of Liquidity in the Economy



B. Developments in Liquidity during the Next Six Months



Source: Banco de la República.

levels are high recouped 40.8 pp compared to the survey in January 2009 and was 66.7% (Graph 68, Panel A). The group of business people who believe liquidity is low accounted for 21%, having declined 33.3 pp compared to the results a year earlier.

In terms of expectations for liquidity in the next six months, the balance of the replies suggest it will remain unchanged (54.3%) (Graph 68, panel B). The financial sector is the one with the highest proportion of those surveyed who believe liquidity is high (71.9%), while those with the lowest levels are industry (58.8%) and mining (56.6%).

Finally, the average perception that credit is readily available tended to increase during in 2009 and was 60.5% in January 2010, which is 40.7 pp more than the year before (Graph 69, Panel A).The proportion of business people who believe credit is not readily available declined sharply from 58.0% in January 2009 to 25.9% a year later. Similarly, in January 2010, those surveyed who did not perceive credit as readily available accounted for 12.3%, which is by 7.5 pp less than the year before.

As to the availability of credit in the next six months, 64% of those surveyed believe there will be no change in availability during that period, while 18% expect the supply to increase (Graph 69, Panel B).

B. HOUSEHOLDS

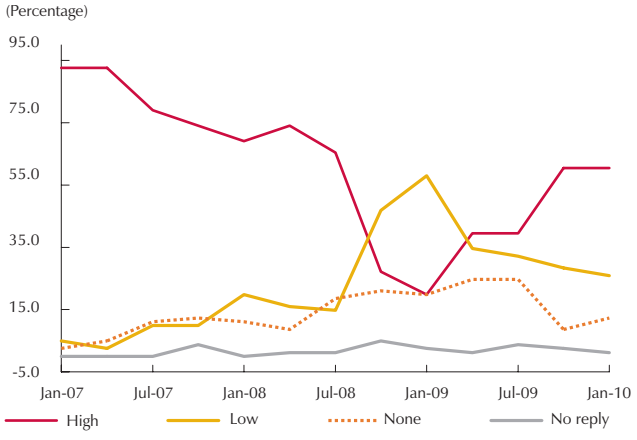
A look at the household financial situation is fundamental to understanding developments in the stability of Colombia's financial system. The behavior of consumer and mortgage lending is analyzed in this section, taking into account how it relates to changes in home prices and the household financial burden. The indexes of household expectations, economic confidence and household economic conditions are examined, as is household perception of home and durable goods purchases.

1. Household Debt

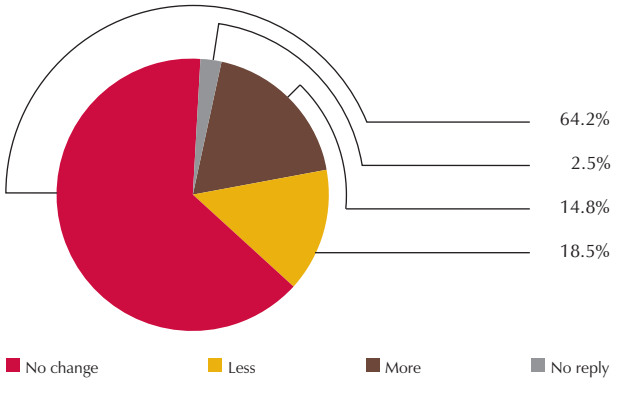
The household debt level, defined as all mortgage and consumer loans from the financial sector as a percentage of GDP, shows some recovery and has stabilized at levels near 11.4%. This growth is related to the increase in

Graph 69

A. Current Perception of the Availability of Credit in the Economy



B. Developments in the Availability of Credit during the Next Six Months



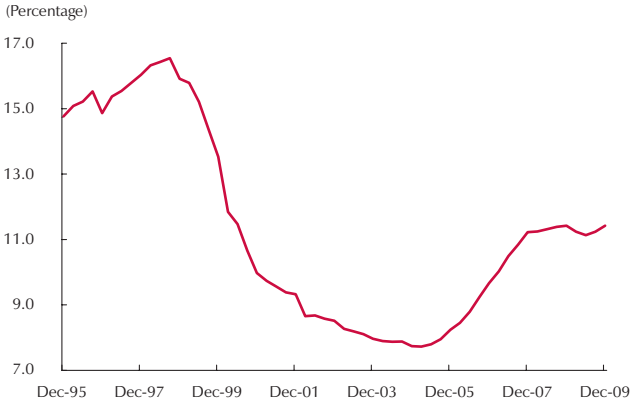
Source: Banco de la República.

mortgage lending as a result of government subsidies for housing and the drop in nominal interest rates on loans of this type (Graph 70). The debt is at a level well below the historic high of 16.5% posed in the third quarter of 1998. The new data suggest a reversal of the downward trend observed in this indicator midway through 2009. In fact, annual real growth in the combined portfolio (mortgage and consumer lending) was 2.2% by December 2009, rebounding from the negative growth (-0.2%) witnessed in September of that year (Graph 71).

2. Components of Household Debt

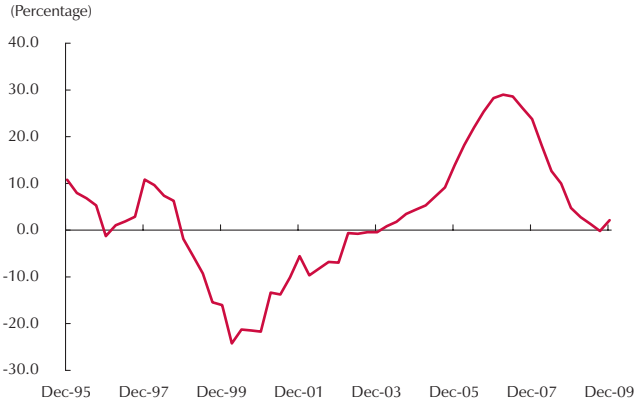
The components of household debt should be analyzed separately to identify the different levels of exposure posed by each type of credit. Consumer lending as a share of total household debt shows a slight downward trend, mainly because of the slowdown in consumer loans and the growth in mortgage lending (Graph 72). The change in the trend of this share, which increased rapidly during the period from December 1999 to June 2007, became more pronounced in the last half of 2009. The decline in consumer lending as a portion of total household debt indicates less exposure to credit risk for the financial system, inasmuch as mortgage lending usually offers financial institutions more collateral than consumer loans.

Graph 70
Mortgage and Consumer Loan Portfolio /GDP



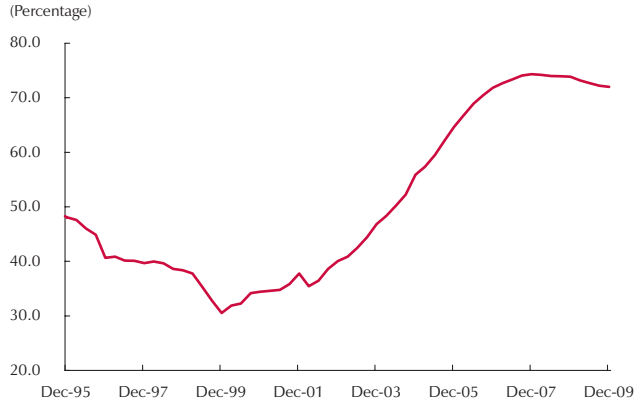
Sources: DANE and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 71
Annual Real Growth in Household Indebtedness



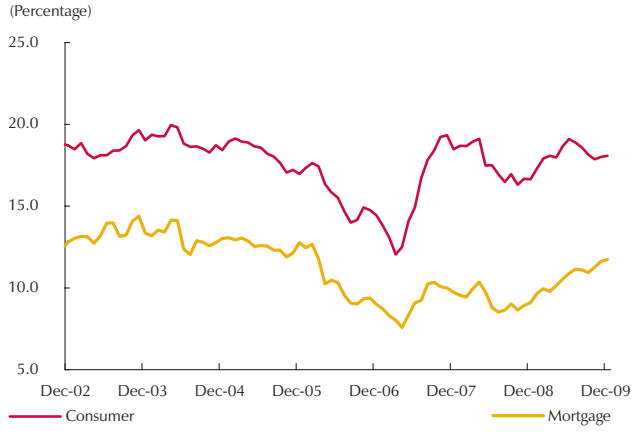
Sources: DANE and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 72
Consumer Lending as a Share of Total Household Debt



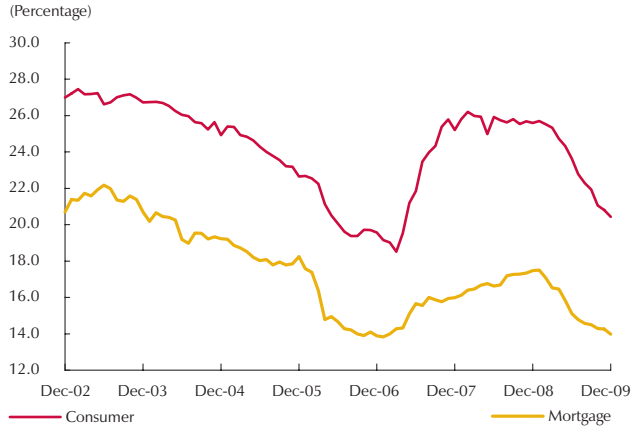
Sources: DANE and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 73
Real Lending Rates



Sources: DANE and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 74
Nominal Lending Rates



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

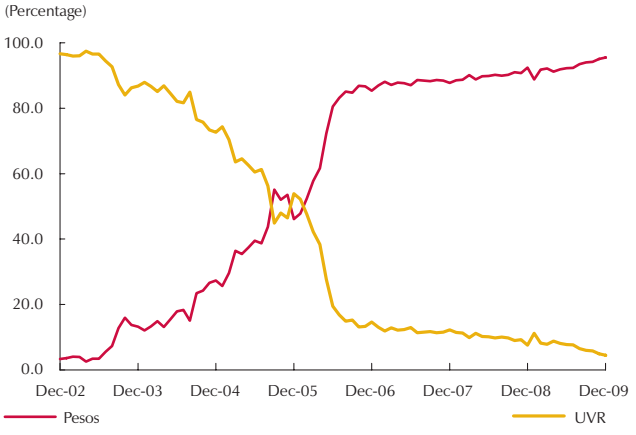
In the past, real and nominal interest rates on consumer loans have been higher than those on mortgage lending. This is because consumer loans entail more administrative and monitoring costs and imply more exposure to credit risk. Real lending rates continue to rise, associated with the low level of inflation observed in 2009, and reached 18.1% in the case of consumer loans and 11.7% for mortgage lending (Graph 73). Nominal lending rates continue to decline. This trend replicates the changes in other nominal interest rates and is consistent with the interest rate cuts that have been part of Banco de la República's monetary policy since December 2008 (Graph 74).

a. Mortgage Loan Portfolio

Most mortgage loan disbursements during 2009 were denominated in pesos. By December 2009, 95.3% were contracted in pesos at a fixed rate and only the remaining 4.7% were denominated in UVR (Graph 75). This contrasts with the situation in 2002 and 2003, when UVR-denominated loans accounted for nearly 97% of all disbursements. This shift in composition reflects increased household confidence in the stability of the currency's purchasing power, inasmuch as households prefer to borrow in pesos and at a rate fixed. However, this means more exposure to interest-rate risk for lenders, as the rates on loans remain fixed, while those on deposits may change.

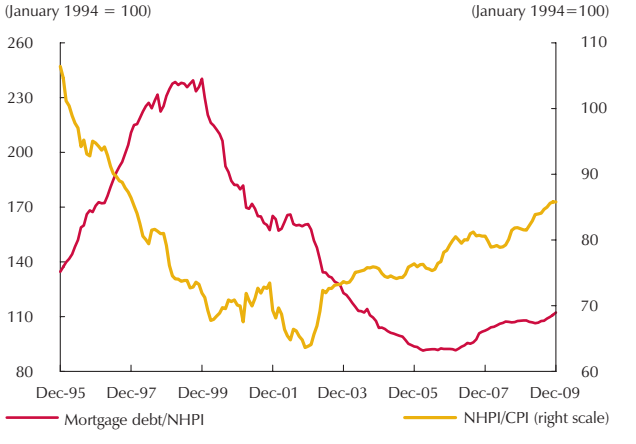
On the other hand, the ratio of the mortgage debt growth rate to the new home price index (NHPI) rose slightly during the final quarter and was 112.2 by December 2009 (Graph 76). This small increase is the result of a more than proportionate rise mortgage lending compared to the increase in new home prices observed during the last six months. However, this indicator is still at comparatively low levels with respect to the historic high of 240 in December 1999. Accordingly, the current situation does not seem to offer incentives for households to stop paying their debts.

Graph 75
Composition of Mortgage Loan Disbursements



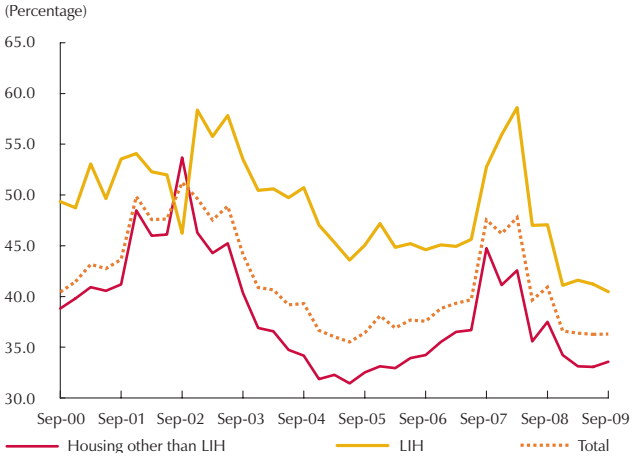
Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 76
Ratio of the Mortgage Debt Growth Rate to the NHPI and NHPI/CPI Ratio



Sources: DANE, DNP and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 77
Loan to Value



Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The upward trend in the NHPI/ CPI ratio continues, indicating a favorable situation for the financial system. As of 2003, the increase in this index shows an improvement in household wealth and a build-up in the value of mortgage collateral, all of which reduces a component of credit risk for financial institutions; namely, loss through default.

Loan to value, calculated as the ratio of mortgage debt to mortgage collateral value, dipped slightly during the second half of 2009, given the decline in loan to value for LIH loans (Graph 77). In September of this year, the indicators were close to 34% for non-LIH housing and 41% for LIH, which is far less than in 2007 and 2008. The drop in this indicator since mid-2008 is due mainly to the sharp increase in the value of collateral compared to a more moderate rise in the mortgage debt. This indicates the exposure of financial lenders to credit risk with mortgage loans is relatively low.

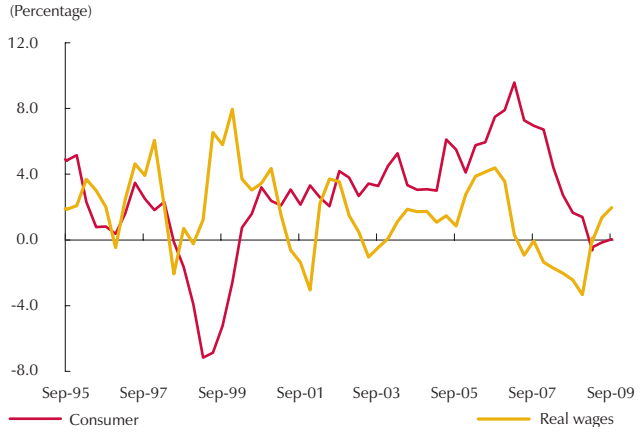
b. Consumer Loan Portfolio

Real growth in consumer lending has been negative since April 2009. There was a slight rebound to -0.4% in December of that year, reversing the downward trend witnessed since March 2007. Hand in hand with the performance of this portfolio, the real growth in household consumption recovered somewhat during September 2009, contrary to what was observed since March 2007, when it hit a record high of 9.6% (Graph 78). The increase in real wages as a result of the recent drop in inflation is important to note, as it suggests an improvement in household creditworthiness.

On the other hand, real growth in non-performing consumer loans and mortgages[32] was negative, with respective declines of 10.0% and 4.8% for December 2009 (Graph 79). This reduction in the non-performing portfolio confirms the hypothesis

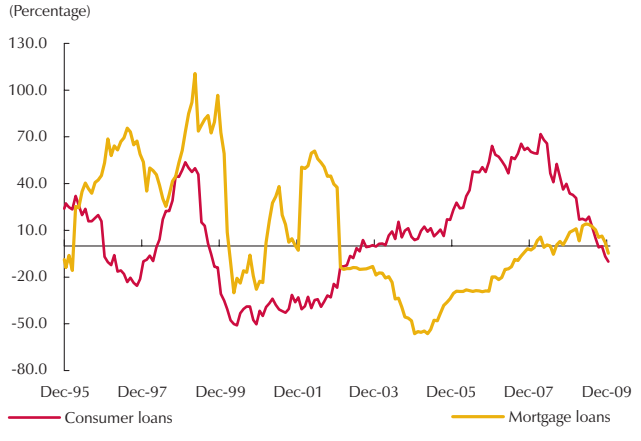
32 The definition of a non-performing loan portfolio changed in December 2001. Since then, it includes overdue installments as well as contributions to overdue principal. This explains the jump in the annual growth series during 2002.

Graph 78
Annual Real Growth in Wages and Household Consumption



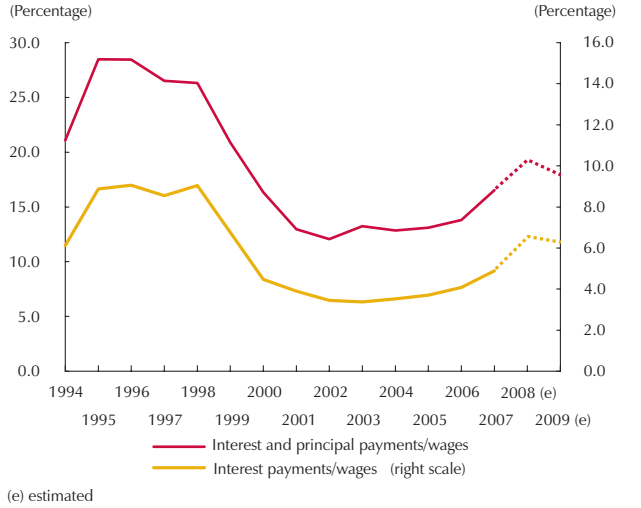
Source: DANE; calculations by Banco de la República.

Graph 79
Annual Real Growth in the Non-performing Loan Portfolio



Source: DANE; Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 80
Household Financial Burden



(e) estimated
Sources: Superintendencia Financiera de Colombia and DANE; calculations by Banco de la República.

concerning a more favorable situation for the financial system in terms of household debt payment.

3. Household Financial Burden

The household financial burden declined during the past year,[33] ending the upward trend witnessed in previous years and reaching 17.9% by December 2009 (Graph 80), which probably enabled households to dedicate more of their income to consumption or savings. The indicator behaves similarly when payment against loans and monetary indexing are excluded from the numerator, leaving only interest payment. It is important to note that payments against principal are nearly triple interest payments.

Indeed, as mentioned in the last edition of the *Financial Stability Report,* one of the repercussions of debt relief for households was a decline in the ratio of the non-performing portfolio to the gross portfolio, even though employment levels did not improve.

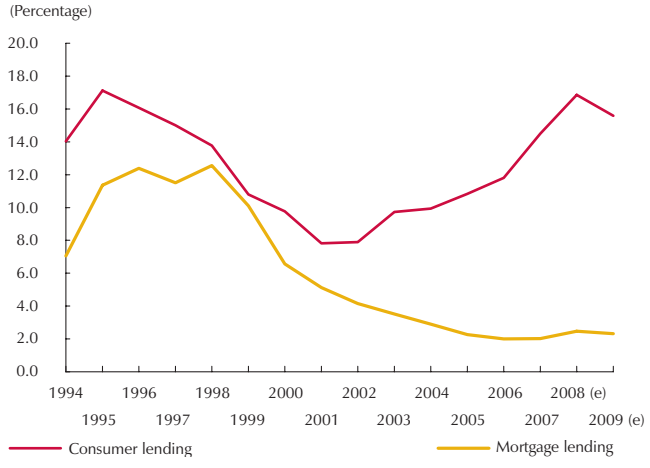
On the other hand, how the financial burden behaves is determined by the consumer loan portfolio (Graph 81). In effect, the sharp upward trend in consumer lending that began in 2006 appears to have tapered off during 2009. However, it is important to point out that this level is similar to the one observed in the period prior to the last financial crisis (1998 and 1999).

Another indicator of the household financial burden is constructed as follows:

Financial Burden = Real Component of Interest Paid/Wages

33 This indicator has changed slightly compared to what was estimated up until June 2009. It is defined as interest payment (with indexation) and payment against principal associated with the consumer and mortgage loan portfolios, divided by employee wages. The 2000 base series was used to determine the increase in remuneration paid to employees, as reported by DANE; 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.

Graph 81
Household Financial Burden (Including Debt Repayment)



(e) estimated
Sources: DANE; Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 82
Household Financial Burden: Real Component of Interest/ Wages

(e) estimated
Sources: DANE; Superintendencia Financiera de Colombia; calculations by Banco de la República.

In this case, the numerator solely reflects spending on interest, but only with respect to its real component. It does not include the inflationary component of interest, which is not considered an expense but an installment on the principal, since it compensates for the loss in the value of the nominal amount outstanding over time. This installment lowers the debt in real terms, leaving household wealth unaltered. Payment against principal is not included for the same reason. Accordingly, this indicator measures the portion of household financial cost that reduces household wealth.

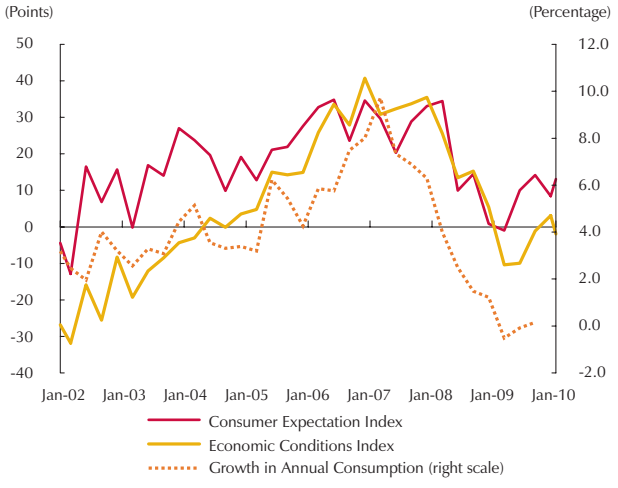
With this indicator one sees a somewhat different trend compared to the other indexes mentioned earlier. Although the increase accentuated in 2009 (Graph 82), its level was less than in 1998-1999. This is because inflation dropped 5.7 pp last year, thereby increasing the real component of paid interest. This is a reflection of the fact that when inflation declines, lending rates are slow to react (partly because most loans are contracted at a fixed rate), so real rates rise. Another explanation in the same direction deals with the make-up of household borrowing, which has shifted during the present decade from mortgage lending to consumer borrowing and from UVR-denominated mortgages to loans denominated in pesos. The result is increasingly less interest paid in UVR and more interest paid in pesos (nominal rates). Therefore, the numerator of this indicator of expenditure on interest increased compared to when household borrowing was comprised largely of mortgage lending.

From the standpoint of banks and CFCs, the December 2009 edition of the *Report on the Credit Situation in Colombia* (RSCC in Spanish) indicates the creditworthiness of existing clients is still the biggest hurdle to a larger volume of lending for the private sector, even though this constraint was slightly less for banks compared to last quarter. In short, creditworthiness continues to be perceived as weak.

4. Prospects

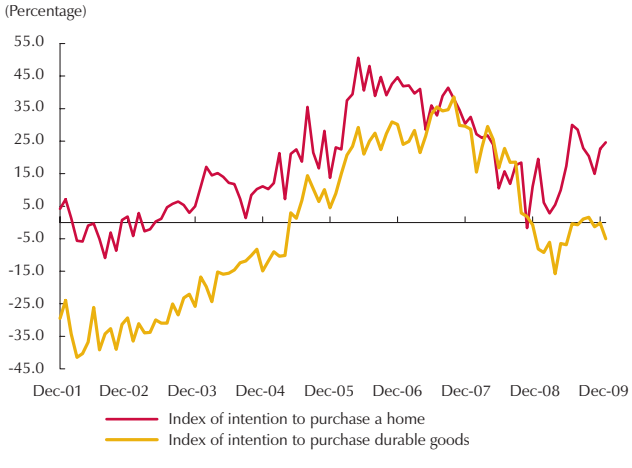
Last year's improvement in the expectations of households concerning their economic situation and that of the country appear to signal a halt in the downturn that began in early 2008. The Fedesarrollo Consumer Expectation

Graph 83
Growth in Household Consumption and Indexes of Consumer Expectations and Economic Conditions



Sources: Fedesarrollo and DANE; calculations by Banco de la República.

Graph 84
Home and Durable Goods Purchase Perception Index [a/]



a/ Percentage of households who believe the time is right to purchase a home or durable goods, minus the percentage who do not.
Source: Fedesarrollo; calculations by Banco de la República.

Index (IEC in Spanish)[34] showed positive values between March and December 2009 (Graph 83). A similar trend was observed in the indicator of economic conditions (ICE)[35] and with respect to the growth in consumption, which also has been positive since early 2009. However, that trend does not appear to have consolidated entirely, since the former registered no increase during the fourth quarter of 2009 and the latter declined in January 2010.

On the other hand, the behavior of the home and durable goods purchase perception indicators, which appear to signal an end to the downward trend witnessed since 2007 (Graph 84), was not as evident in the second half of last year. In the case of intention to purchase a home, the indicator declined again between July and November 2009, but recovered in December 2009 and January 2010. The indicator of intention to purchase durables had been declining slightly since October 2009.

Finally, based on the December 2009 edition of the RSCC, one sees the percentage of banks that plan to raise their requirements for allocating new consumer loans has been on the decline since the third quarter of last year. This appears to indicate that lack of confidence on the part of banks and CFCs with respect to the creditworthiness of consumer borrowers has begun to subside compared to what it was in December 2008.

In conclusion, although most of the indicators improved during the first six months of 2009, this progress was not as evident by the second half of that year. However, according to the RSCC, there are signs that credit risk aversion is beginning to wane in a context where loan portfolio quality has begun to improve.

34 Constructed on the basis of the following questions: Do you believe your household economic situation will be better, worse or remain the same during the next 12 months? Do you believe we will be better off or worse economically in the next twelve months? Do you believe economic conditions in Colombia will be better or worse in a year compared to the situation at present?

35 Constructed on the basis of the following questions: Is your household better or worse off economically than it was a year ago? Do you believe the time is right to purchase major items, such as furniture or domestic appliances?

C. THE NON-FINANCIAL PUBLIC SECTOR (NFPS)

The analysis presented in this section is based on the Financial Plan published by the Ministerio de Hacienda y Crédito Público (Ministry of Finance and Public Credit). Broadly speaking, the preliminary figures for 2009 and the fiscal projections for 2010 are set in a scenario where there is still uncertainty about the effects of the financial crisis.

The figures at the close 2009 show the balance for the NFPS was negative, with a deficit equal to 2.7% of GDP, which is higher than expected. According to the 2009 Financial Plan,[36] the estimated deficit was equal to 2.3%. This lower deficit in the nonfinancial public sector was due mainly to the central government (CG) deficit, which was 4.1% of GDP, and to less of a surplus in the decentralized sector (DS), which came to 1.4%. In the 2010, the deficit is expected to grow to 3.8%, primarily due to more of a CG deficit and less of a DS surplus (Table 6).

Table 6
Fiscal Balance: Non-financial Public Sector

Balance by Period	Billions of Pesos		Percentage of GDP	
	2009	2010 a/	2009	2010 a/
1. Non-financial public sector	(13.514)	(19.510)	(2.7)	(3.8)
1.1 Central government	(20.473)	(23.59)	(4.1)	(4.5)
1.2 Decentralized sector	6.958	4.075	1.4	0.8

a/ These Graphs are from the revision done in January 2010.
Source: Ministerio de Hacienda y Crédito Público (Confis).

The increase in the CG deficit last year was caused largely by the drop in government revenue rather than by increased expenditure. Although the country's fiscal policy was countercyclical, the increase in government spending stayed abreast of the growth in output, keeping spending/GDP ratio constant. Accordingly, the balance is explained by the decline in expected revenue for the nation, due to the effect of the economic slowdown.

The NFPS debt level is explained largely by the CG debt level. A look at how the debt behaved last year shows a nominal annual increase of 13.5% in the total CG debt, while internal and external debt was up 15.6% and 9.3%, respectively. Moreover, as a share of the total, internal and external debt has been quite stable since mid-2005, when internal debt continued to constitute the largest share, with 67.8% (at December 2009), while the external component accounted for the remaining 32.2% (Table 7).

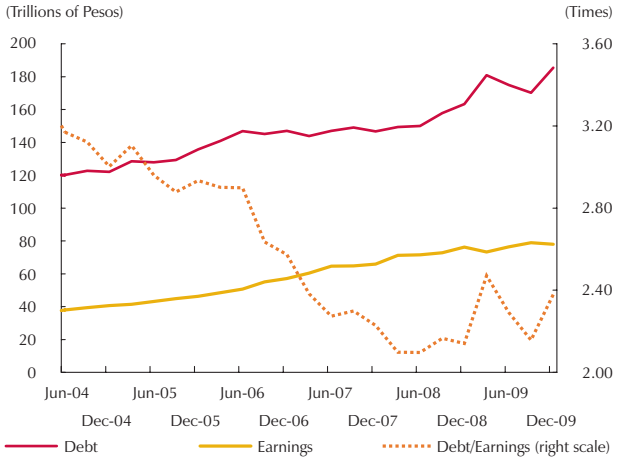
36 The *"Plan Financiero Revisado para 2009"*, August 21, 2009, Fiscal Policy Council (CONFIS).

Table 7
CG Gross Debt

	Internal	External	Total	Internal	External	Internal	External	Total
	(Billions of pesos)			(participación porcentual)		(crecimiento porcentual anual nominal)		
Mar-04	65,169	55,060	120,229	54.2	45.8			
Jun-04	64,038	56,159	120,197	53.3	46.7			
Sep-04	67,592	55,143	122,735	55.1	44.9			
Dec-04	68,632	53,355	121,987	56.3	43.7			
Mar-05	75,209	53,257	128,466	58.5	41.5	15.4	(3.3)	6.9
Jun-05	80,211	47,632	127,843	62.7	37.3	25.3	(15.2)	6.4
Sep-05	82,265	46,923	129,188	63.7	36.3	21.7	(14.9)	5.3
Dec-05	88,060	47,626	135,686	64.9	35.1	28.3	(10.7)	11.2
Mar-06	94,792	46,007	140,799	67.3	32.7	26.0	(13.6)	9.6
Jun-06	95,349	51,506	146,855	64.9	35.1	18.9	8.1	14.9
Sep-06	92,603	52,474	145,077	63.8	36.2	12.6	11.8	12.3
Dec-06	94,399	52,613	147,012	64.2	35.8	7.2	10.5	8.3
Mar-07	94,335	49,513	143,848	65.6	34.4	(0.5)	7.6	2.2
Jun-07	100,815	46,104	146,918	68.6	31.4	5.7	(10.5)	0.0
Sep-07	101,882	47,164	149,046	68.4	31.6	10.0	(10.1)	2.7
Dec-07	99,062	47,653	146,715	67.5	32.5	4.9	(9.4)	(0.2)
Mar-08	105,247	44,062	149,309	70.5	29.5	11.6	(11.0)	3.8
Jun-08	106,183	43,819	150,002	70.8	29.2	5.3	(5.0)	2.1
Sep-08	106,592	51,169	157,761	67.6	32.4	4.6	8.5	5.8
Dec-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
Dec-09	125,640	59,694	185,334	67.8	32.2	15.6	9.3	13.5

Sources: Ministerio de Hacienda y Crédito Público and Banco de la República.

Graph 85
CG Creditworthiness



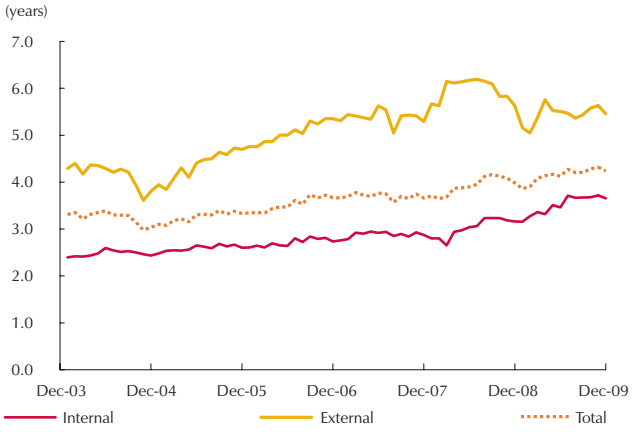
Sources: Ministerio de Hacienda y Crédito Público and Banco de la República.

1. Creditworthiness and Momentum in the Debt

As Graph 85 illustrates, the CG creditworthiness indicator (debt/income ratio) rallied against the drop witnessed during the first half of the year. This performance is consistent with the increased borrowing observed in 2009 compared to growth in revenue. By December, the debt was COP$185.3 t, having increased 13.5% with respect to December 2008, while growth in revenue during the same period came to 2.1%.

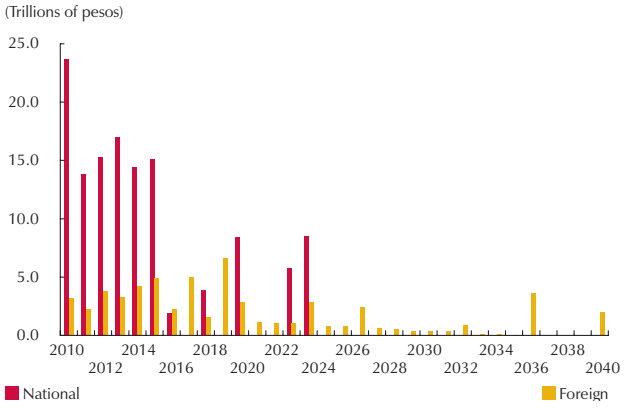
An analysis of the duration of the total CG debt shows it continued to increase during 2009 and was 4.2 years by December 2009 (Graph 86). A look at duration by type of debt shows a similar situation.

Graph 86
Duración deuda del GNC



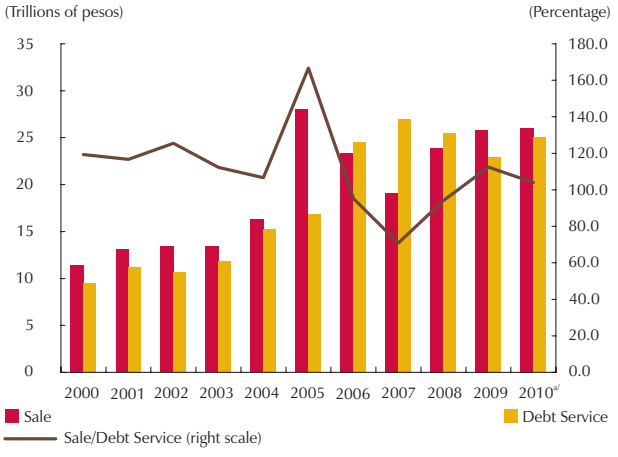
Sources: Ministerio de Hacienda y Crédito Público and Banco de la República.

Graph 87
Bond Profile in Pesos



Sources: Ministerio de Hacienda y Crédito Público and Banco de la República.

Graph 88
Domestic Debt Roll-over (TES)



a/ Projected Graphs.
Sources: Ministerio de Hacienda y Crédito Público and Banco de la República.

Internal and external debt duration at December was 3.7 and 5.5 years, respectively, compared to 3.2 and 5.2 years, respectively, in January 2009. These changes could be explained by the government's preference for long-term borrowing, which reduces the risk of refinancing and means less vulnerability to adverse movement in interest rates, considering most of the debt is at a fixed rate (90.9% of the debt at December 2009).

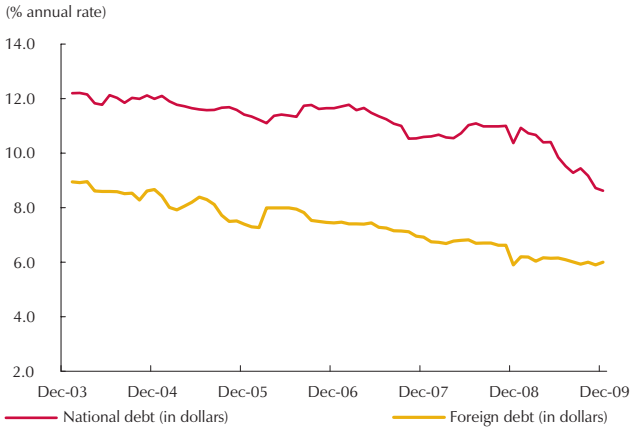
With respect to the maturity profile for debt contracted in pesos, internal and external debt maturity is concentrated within the next five years (Graph 87). It is important to point out that a shortening of these debt profiles can imply the need for major refinancing in the years thereafter, exposing the borrower to more funding pressure and higher costs. Therefore, it is desirable for the government to exchange the short-term debt for longer maturities.

Pursuant to the 2010 Plan Financiero,[37] the government will float a domestic bond issue in the hope of selling COP$26 t in long-term TES during 2010 (5.0% of GDP). This target includes COP$6.5 t in agreed operations (1.3% of GDP), COP$13 t in bonds to be auctioned on the local market (2.5% of GDP) and COP$6.5 t in forced operations (1.3% of GDP. In this respect, refinancing the domestic debt in 2010 will be less than what it was in 2009. The estimated bond sale in 2010 assumes nearly 100% refinancing (Graph 88), which will depend on how TES-UVR yield and indexing behave.

Finally, when analyzing the changes in the average coupon rate for the CG debt, one sees that annual rates have declined sharply since the start of last year for both the domestic and foreign debt. The coupon rate at December 2009 was 8,6% on the domestic debt and 6.0% on the foreign debt. Less risk aversion, coupled with added confidence in the government's ability to sustain the debt - given a credible fiscal stance – has facilitated the government's access

37 "Actualización Plan Financiero 2010", February 2010, CONFIS.

Graph 89
CG Debt Coupon



Source: Ministerio de Hacienda y Crédito Público.

to markets, thereby guaranteeing financing at low interest rates (Graph 89).

2. Outlook

As for 2010, the NFPS balance is expected to deteriorate compared to the year before, with the deficit increasing from 2.7% to 3.8% of GDP (COP$19.5 t). This is explained by several factors: i) the adverse performance of oil prices in 2009, which will have a major impact on CG revenue; ii) a poorer balance sheet for the Oil Price Stabilization Fund (FEPC in Spanish), because it has assumed payment of a subsidy that was once paid through the CG (0.3% of GDP) and iii) added budget performance anticipated in the regions, which means more of a drain on the National Royalties Fund (FNR in Spanish) for regional projects.

In the specific case of the CG, the increase in the deficit is expected to equal 0.4% of GDP, which means it would expand from COP$20.4 t (4.1% of GDP) to COP$23.5 t (4.5% of GDP PIB). This is due to the impact of the economic slowdown and to less revenue, including income from the petroleum industry,[38] which means a sizeable reduction in the revenue forecast for 2010. Expenditure as a share of GDP is expected to remain constant, since it is growing at the same pace as the economy.

In 2010, the government will cover the obligations stemming from financial system restructuring in the amount of COP$499 b (0.1% of GDP) and a projected deficit of COP$23.5 t (4.5% of GDP). This brings the deficit to be financed to COP$24t (4.6% of GDP). Moreover, if the CG is faced with a situation where it needs more funding than has been announced already (COP$26 t in TES to be placed on the market, Table 8), this could limit space for lending to the private sector, which needs to fund its own growth. Therefore, since resources in the economy are limited, the government would have to compete with the corporate sector when it floats bonds on the market.

Finally, the net CG debt indicator is expected to increase to 38% of GDP between 2009 and 2010. An increase in the announced deficit could raise the debt to amounts over 40% of GDP, which would have a negative impact, not only on the exchange rate and interest rates, but primarily on the sustainability of the debt and the credibility of the country's fiscal policy.

38 The unexpected decline in oil prices in September 2008 affected corporate balance sheets that year and necessitated modifying the forecasts for international prices. This, in turn, affected projected profits for 2009, which would be transferred in 2010. It also meant fewer dividends and less income tax revenue.

Table 8
National Debt Placed in 2010

TES Placed	2010 Target		Placed[a/]		For placement	
	Billions of Pesos	(Percentage)	Billions of Pesos	(Percentage)	Billions of Pesos	(Percentage)
Auction	13,033	50.1	389	3.0	12,644	97.0
Agreed	6,500	25.0	174	2.7	6,326	97.3
Forced	6,500	25.0	1,460	22.5	5.04	77.5
Awarded	0.00	0.0	0	0.0	0	0.0
Total	**26,033**	**100.0**	**2,023**	**7.7**	**24**	**92.2**

a/ These graphs are from the revision January 2010.
Source: Ministerio de Hacienda y Crédito Público (Confis).

Box 5
ASSET PRICE OVERVALUATION

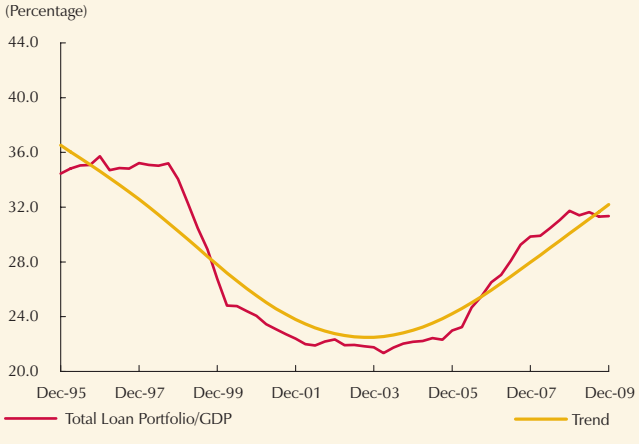
A financial accelerator is a major source of potential economic and financial instability. It is a mechanism whereby economic growth and a change in asset prices can affect decisions on private investment and borrowing in the economy. The possible negative effects associated with a financial accelerator occur when imbalances and high volatility exist simultaneously in asset and credit prices cycles. It is important to examine and determine whether or not asset price increases are permanent and if they are being fed by a surplus supply of credit resulting from an increase in the consumption pattern and the need for additional financing.[1] Therefore, the variables that affect the way debtors behave and their expectations must be monitored, so the consequences this could have on their ability to pay, particularly during an economic slowdown, can be analyzed. The following article offers a description of asset price cycles in light of their trends in both the mortgage and securities markets,[2] along with an analysis of the development of credit in light of financial depth.[3]

1. The Loan Market

The supply of financing and how it has evolved with respect to its trend is examined in this section, using a Hodrick and Prescott filter applied to consumer and mortgage lending, to respective disbursements and to the total loan portfolio.[4] A descriptive analysis is done to compare the actual level of the series to its particular trend. These deviations in the variables provide information that can be used to detect possible periods of excessive growth.

The total loan portfolio, as a percentage of GDP, was below its trend during the second half of 2009. This was contrary to the situation witnessed during the first quarter of that year (Graph B5.1) and is largely the result of stabilization in the total loan portfolio relative to GDP and the growing momentum in its trend during the most recent semester. The behavior of the series shows the positive phase of the latest cycle lasted as long as the one between December 1996 and September 1999. However, the scope of the cycles prior to the crisis at the end of the nineties was three times greater. This suggests that loan portfolio growth relative to GDP was not excessive in the positive phase of the current cycle, when compared to what happened prior to the crisis.

Graph B5.1
Total Loan Portfolio/GDP and Trend



Source: DANE and Superintendencia Financiera de Colombia; calculations by Banco de la República.

The consumer loan portfolio as a percentage of GDP shows the negative difference between current figures and their trend continues to grow (Graph B5.2). It is important to point out that, contrary to what happened in the case of the total loan portfolio, the duration of the positive phase of the cycle was longer in recent years compared to what it was between June 1997 and June 1999. However, the scope of the cycle was quite similar in both cases. Nevertheless, the gap with respect to this indicator has been negative since the first quarter of 2009, partly because of the slowdown in consumer lending.

The mortgage loan portfolio relative to GDP shows just the opposite, as its gap continues to widen (Graph B5.3). Yet, that gap is less than what was reported during the third quarter of 1998, when it was almost three times larger.

The current increase in the gap is associated with reactivation of the mortgage loan portfolio, coupled with the drop in output. The trend in the series shows a flattening associated with the change in the way the series has behaved since the first quarter of 2007 (Graph R5.4).

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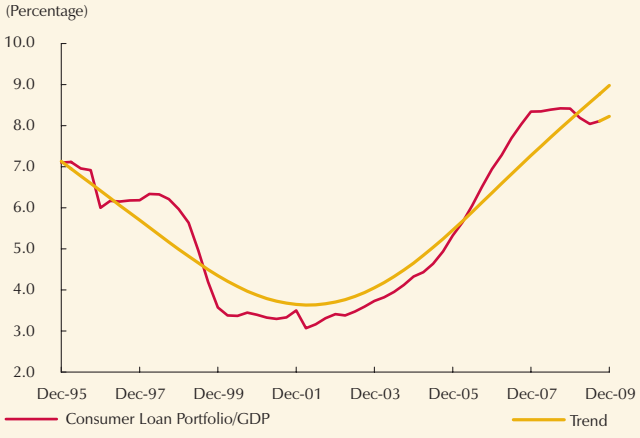
1 For further details on how asset and credit price imbalances and volatility are generated, see the September 2007 edition of the *Financial Stability Report*.

2 An analysis of the price of government securities (TES) is not included, as they account for only a small share of total household and corporate wealth. The opposite is true of housing and stocks.

3 Financial depth is the ratio of credit to nominal GDP.

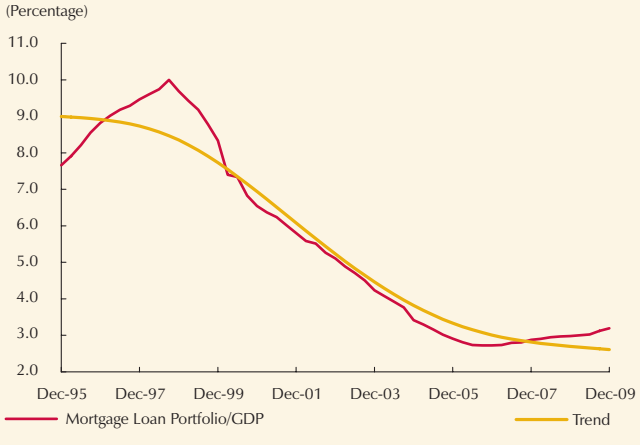
4 The series for the total loan portfolio and the consumer loan portfolio as a percentage of GDP from December 1994 to December 2008 were used. GDP at December was projected on the assumption that real quarterly growth would come to 1.15%.

Graph B5.2
Consumer Loan Portfolio/GDP and Trend



Source: DANE and Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph B5.3
Mortgage Loan Portfolio/GDP and Trend



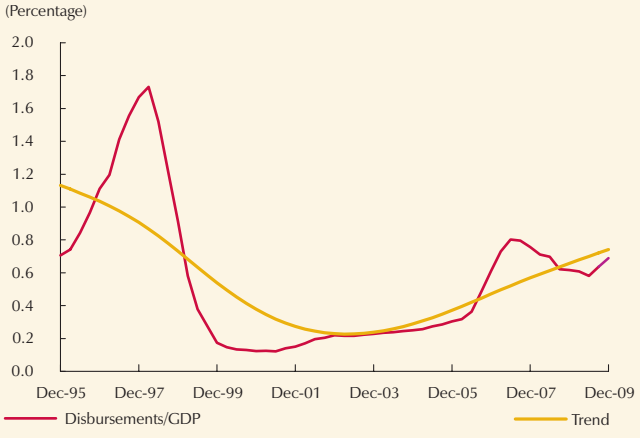
Source: DANE and Superintendencia Financiera de Colombia; calculations by Banco de la República.

Mortgage loan disbursements relative to GDP indicate a convergence towards their trend, largely due to growth in the mortgage loan portfolio and the revival in the housing market during the second half of 2009. The positive phase, which ended in June 2008, was less extensive than the one preceding the crisis at the end of the nineties. This indicates less growth in the mortgage loan portfolio during the latest economic boom, compared to what happened prior to the crisis in the nineties.

2. The Housing Market

Two separate indexes were used to verify the possible existence of overvaluation in the mortgage market. One is the new home price index (NHPI) compiled by the Departamento Nacional de Planeación (National Department of Planning) (DNP in Spanish). The other is the used home price index (UHPI) compiled by Banco de la República. Each of these indicators is related to Banco de la República's rental index (RI).[5] The ratio of the NHPI to the rental index (RI) and the ratio of the UHPI to the RI compare the price of an asset (new or used) to that of the fundamental that determines said price (in this case rentals). Moreover, a Hodrick and Prescott filter is applied to both price series to evaluate deviations with respect to their trend.

Figure B5.4
Mortgage Loan Disbursements/GDP and Trend



Source: DANE and Superintendencia Financiera de Colombia; calculations by Banco de la República.

The NHPI/RI ratio stabilized at 11.3% during the last six months, which exceeds the average for the series (Figure B5.5). This stability appears to cut short the upward momentum displayed by this indicator since March 2008. The NHPI/RO ratio is currently at levels well below those on record between 1994 and 1995, when the indicator was more than 25% above its historic average.

If we compare the NHPI/RI ratio to its long-term trend, we see the gap for December 2009 is negative (Figure B5.6). This indicator has fluctuated around this trend, with no sharp deviations from its medium-term behavior. Despite the slowdown in the economy, the trend in the NHPI/RI ratio is still positive. It shows that home prices are rising in accordance with rental prices and, consequently, there may be a positive effect on household wealth and creditworthiness.

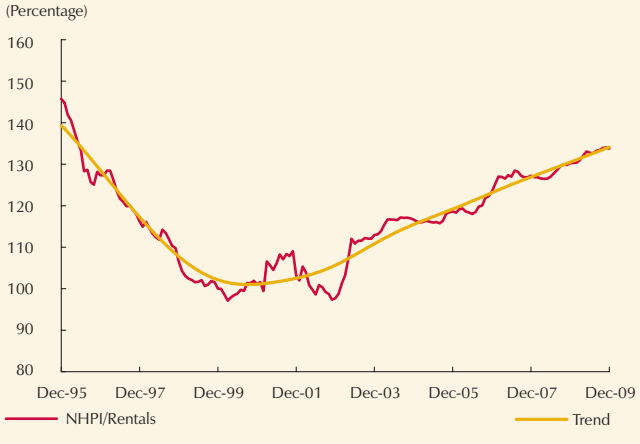
Both these methods should be regarded as complementary, inasmuch as the first identifies periods when home prices are high, such as those on record between 1994 and 1995, while the second takes considers that the trend

5 The NHPI for December 2009 was projected with the growth rate for the last four quarters. The rental index is the housing component of the CPI.

Graph R5.5
NHPI to Rentals
(1994 - Dec, 2009 Average = 100)

Sources: DNP and DANE; calculations by Banco de la República.

Graph R5.6
NHPI to Rentals and Trend
(1994 - Dec,2009 Average = 100)

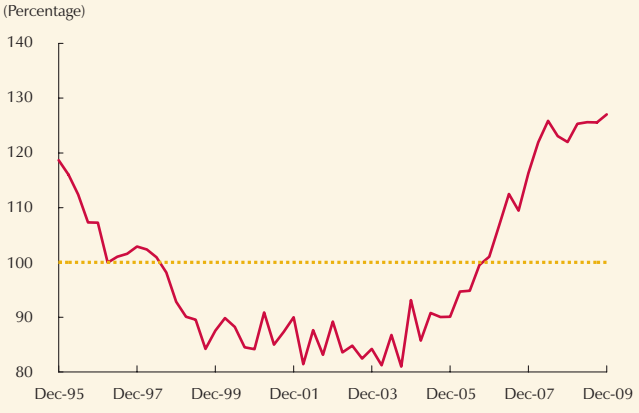


Sources: DNP and DANE; calculations by Banco de la República.

in the series can vary in time, which has proven to be useful in identifying slowdown periods in the mortgage loan sector.

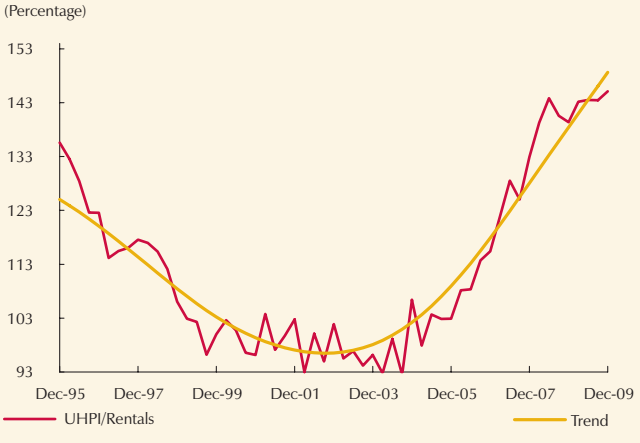
The UHPI/FI ratio has reached an all-time high, reflecting the accelerated growth in used home prices compared to the rental index. The fourth quarter of 2009 saw a difference of 27.0% with respect to the average for the period in question. This appears to be due to a slowdown in the pace of growth in the rental index, while the increase in the used home price index has remained constant (Figure B5.7). The warning about the importance of monitoring used home prices to prevent these assets from becoming excessively overvalued in the economy could pose difficulties in the face of changes in the macroeconomic environment or variations in agent expectations. However, considering the trend in the series, the gap is negative, which shows there has been less of an increase in the indicator compared to its average performance (Graph B5.8).

Graph R5.7
UHPI to Rentals
(1994 - Dec, 2009 Average = 100)



Sources: DANE; calculations by Banco de la República.

Graph R5.8
UHPI to Rentals and Trends
(1994 - Dec, 2009 Average = 100)



Sources: DANE; calculations by Banco de la República.

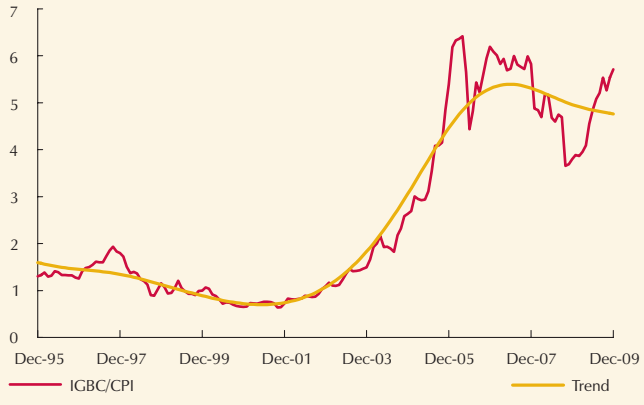
3. The Stock Market

The Colombian Stock Exchange Index (IGBC in Spanish) is weighed by the consumer price index (CPI), and deviations from its trend are analyzed to evaluate the existence of overvaluation in the stock market.

Broadly speaking, the results of the exercise show high volatility in recent years and, more specifically, a growing deviation of the IGBC from its trend, which came to more than 20% by December 2009. The latter suggests a possible overvaluation of stocks, on average (Figure B5.9). In effect, the sustained recovery in the IGBC as of late 2008 is associated, on the one hand, with more consumer confidence, given better expectations and economic conditions and, on the other, with less uncertainty and risk aversion, thanks to the stabilization of local and international financial markets. (See pp. 13).

Graph R5.9
IGBC to CPI and Trend

(December, 1999 = 100)



Source: Bolsa de Valores de Colombia; calculations by Banco de la República.

4. Conclusions

The results show an overvaluation in used and new home prices associated with the upward trend in both these ratios. Government incentives and the increase in household confidence have stimulated the housing market of late, causing a rise in its relative prices. This increase may be risky for the financial system, in the event of dramatic changes in household expectations. However, the positive effect on the wealth of borrowers can make them more creditworthy and can reduce the credit risk component associated with loss through default. Accordingly, it is extremely important to monitor the situation in the real estate market to identify potential imbalances.

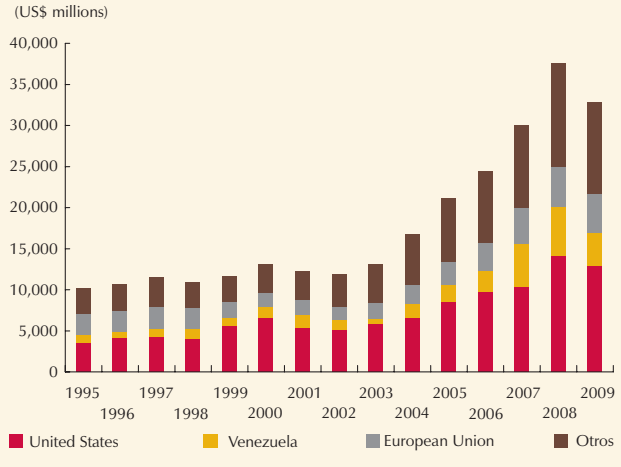
The stock market, represented by the IGBC, has performed positively since the end of 2008 as a result of less uncertainty in local and international financial markets and optimistic economic prospects.

A look at the loan market reveals the slowdown in the total loan portfolio as a portion of GDP during the last six months. This also was true of the inventory of consumer loans. In the case of the mortgage loan portfolio, the gap was positive and wider, reflecting the recovery in this type of lending since the end of 2009. The momentum in mortgage loan disbursements show a convergence towards their positive trend, which also indicates mortgage lending could continue to increase.

Box 6
VULNERABILITY OF THE COLOMBIAN FINANCIAL SYSTEM TO FLUCTUATIONS IN THE INCOME OF COMPANIES EXPORTING TO VENEZUELA

The upward trend in total exports observed since early 2003 was reversed in 2009, with a decline of 12.7% compared to the year before. This can be explained by several factors, namely (i) the slowdown in the world economy, which caused demand to slide, and (ii) the restrictions on trade with Venezuela, which resulted in many trade agreements being cancelled (Graph B6.1).

Graph B6.1
Total Colombian Exports



Source: DANE; calculations by Banco de la República.

In Colombia, around 51,5% of all exports go to two countries: the United States (39.2%) and Venezuela (12.3%). The rest are distributed among approximately 197 countries, particularly the European Union, which accounted for 14.3% at December 2009.

Because there is little diversification in export destinations, fluctuations in the amount exported to Colombian's major trading partners have an important impact on our economy. Accordingly, given the situation in recent months, an exercise is provided in this section to measure the vulnerability of the Colombian financial system to a decline earnings for companies that export to Venezuela.

After the crisis experienced by Venezuela in 2003, exports to that country grew steadily from US$696.0 m in 2003 to US$6,091.6 m in 2008. However, the problems mentioned earlier occasioned a reduction in the amount of exports, which came to US$4,049 m at December 2009. Consequently, the share of exports to Venezuela plunged to 12.3% of total exports that same month. Moreover, the share of the number of companies exporting to Venezuela declined to 27.0% by December 2009 (Table B6.1).

Yet, despite this drop, exports to Venezuela continue to represent an important share of all Colombian exports. Given the current situation, it is important to analyze the direct effect a break in trade relations between the two countries could have on the performance of credit institutions.

1. Borrowing from Colombia's Financial System

The commercial loan portfolio data reported to the Financial Superintendence in December 2009 were used to determine the extent to which companies that export to Venezuela are indebted to the financial system. The results show that 2,058 of the 3,040 companies that exported to Venezuela during 2009 owe money to institutions in the Colombian financial system.

Most of the credit institutions that lend to companies exporting to Venezuela are banks (90.7%), and the loan portfolio of the companies in the sample accounts for 16.1% of the entire commercial loan portfolio.

Table B6.2 shows the number of loans and the amount of the commercial loan portfolio granted to companies that export to Venezuela, for each institution. In the case of commercial banks, although the number of loans to companies exporting to Venezuela accounts for only 1.3% of total lending, the amount represents 16.1%. For the CFCs, the share of the portfolio pertaining to companies that export to Venezuela, according to the number of loans and the amount, is 2.4% and 8.7% respectively. This suggests the average amount per loan made to these companies is high.

To analyze the level of risk for each institution, Table B6.3 shows the loan portfolio quality indicator (QI) for commercial banks and CFCs as a whole. For most institutions, the QI of the portfolio extended to companies that export to Venezuela is better than the QI of their entire commercial loan portfolio. The case of the CFCs is similar. Accordingly, this suggests that, on average, the companies that export to Venezuela are less risky.

Table B6.1
Companies Exporting to Venezuela: Number and Amount

Year	Total		Venezuela		Venezuela's Share	
	Amount (US billions)	No. of Companies	Amount (US billions)	No. of Companies	Amount (Percentage)	No. of Companies (Percentage)
1995	10.2	15,484	1.0	3,424	9.5	22.1
1996	10.7	14,130	0.8	2,977	7.3	21.1
1997	11.6	14,238	1.0	3,188	8.6	22.4
1998	10.9	10,663	1.1	3,338	10.5	31.3
1999	11.6	6,967	0.9	2,260	7.9	32.4
2000	13.2	7,780	1.3	2,499	9.9	32.1
2001	12.3	9,006	1.7	3,068	14.1	34.1
2002	12.0	9,172	1.1	2,616	9.4	28.5
2003	13.1	10,283	0.7	1,901	5.3	18.5
2004	16.7	11,451	1.6	2,270	9.7	19.8
2005	21.2	12,703	2.1	2,667	9.9	21.0
2006	24.4	12,319	2.7	2,765	11.1	22.4
2007	30.0	12,280	5.2	3,358	17.4	27.3
2008	37.6	12,309	6.1	3,708	16.2	30.1
2009	32.9	12,703	4.0	3,433	12.3	27.0

Source: DANE; calculations by Banco de la República.

Table B6.2
Share by Amount and Number of Loans Granted to Companies Exporting to Venezuela

Institution	Exporters' Portfolio		Total Commercial Loan Portfolio		Share	
	No. of Loans	Amount (US$ billions)	No. of Loans	Amount (US$ billions)	No. of Loans (percentage)	Amount (Percentage)
1	1,618	3,110	103,641	19,769	1.6	15.7
2	1,131	2,496	104,696	14,638	1.1	17.1
3	539	1,635	52,148	9,392	1.0	17.4
4	813	963	37,569	6,073	2.2	15.8
5	393	959	20,875	5,904	1.9	16.3
6	476	594	6,719	3,710	7.1	16.0
7	303	669	4,346	2,531	7.0	26.4
8	272	445	7,356	3,110	3.7	14.3
9	31	220	66,882	3,702	0.0	5.9
10	237	415	9,954	2,623	2.4	15.8
11	154	324	7,756	1,678	2.0	19.3
12	219	255	2,932	1,902	7.5	13.4
13	170	215	931	805	18.3	26.7
14	59	129	538	515	11.0	25.1
15	99	120	61,185	1,569	0.2	7.7
16	4	35	17	133	23.5	26.1
17	9	1	584	52	1.5	1.7
Total Banks	**6,528**	**12,585**	**488,979**	**78,110**	**1.3**	**16.1**
Total CFC	**2,171**	**1,273**	**91,721**	**14,693**	**2.4**	**8.7**

Note: Numbers at December 2009.
Sources: DANE and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

Table B6.3
Risky Portfolio of Companies Exporting to Venezuela vs. the Total

Institution	Exporters' Portfolio		Total Commercial Loan Portfolio	
	Risky portfolio (COP$ billions)	QI (Percentage)	Risky portfolio (COP$ billions)	QI (Percentage)
1	135.9	4.4	1496.2	7.6
2	310.1	12.4	1543.1	10.5
3	36.8	2.3	637.1	6.8
4	77.3	8.0	543.9	9.0
5	26.9	2.8	471.3	8.0
6	16.5	2.8	207.4	5.6
7	9.2	1.4	72.3	2.9
8	73.5	16.5	330.0	10.6
9	3.7	1.7	681.0	18.4
10	12.7	3.1	325.9	12.4
11	3.8	1.2	88.7	5.3
12	23.0	9.0	347.0	18.2
13	22.2	10.4	44.2	5.5
14	1.3	1.0	31.0	6.0
15	1.0	0.9	229.9	14.7
16	0.0	0.0	9.8	7.4
17	0.0	0.0	3.1	5.9
Total Banks	**754.1**	**6.0**	**7062.5**	**9.0**
Total CFC	**79.8**	**6.3**	**1782.2**	**12.1**

Note: Numbers at December 2009
Source: DANE and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

2. Stress Test

The stress test described below was done to analyze how a break in trade relations with Venezuela might affect institutions in the financial system.

1. A complete halt in Colombia's trade relations with Venezuela was considered.

2. It is assumed the companies in the sample would experience a reduction in sales equivalent to the amount currently being exported to Venezuela.

3. It is assumed the companies would default on their loans, in an amount proportional to the reduction in income, and would not use their capital to meet their financial obligations.

4. Default on the part of these companies translates into a larger non-performing portfolio. This, in turn, results in more provisions and less financial income. Therefore, lending institutions would see fewer profits and their capital adequacy ratio would decline.

The results, with the scenario in question, suggest the default indicator would increase 42 bp for banks and 27 bp for CFCs. The capital adequacy ratio would decline from 14.1% to 13.6% for banks and from 16.0% to 15.7% for CFCs. Lost profits for the commercial banks as a whole would come to COP$731.7b, which is equivalent to 12.2% of their total profits at December 2009. This drop in profits would result in 40 bp less profitability. As for the CFCs, the losses would amount to COP$23.0 b. (Table B6.4).

It is important to point out that the exercise measures only the direct effect of a decline in income for companies that export to Venezuela. In other words, it does not consider the indirect effects, such as higher unemployment and fewer benefits for companies because of lower prices due to the surplus supply that would be generated on the local market. These effects would cause the commercial loan portfolio to deteriorate and other types of lending as well.

Table B6.4
Stress Test Results

Institution	Default Indicator (Percentage)	Stressed Default Indicator (Percentage)	Capital Adequacy Ratio	Stressed Capital Adequacy Ratio	ROA (Percentage)	Stressed ROA (Percentage)
1	3.7	4.2	17.3	16.8	3.2	2.7
2	2.9	3.4	12.8	12.3	3.6	3.2
3	4.3	4.8	12.4	12.0	2.2	1.7
4	3.9	4.6	11.1	10.4	3.5	3.0
5	6.1	6.3	12.4	12.2	2.6	2.4
6	2.9	3.5	15.4	14.7	2.6	2.0
7	3.1	3.7	14.0	13.4	1.6	1.0
8	7.2	7.5	11.5	11.1	2.4	2.1
9	4.8	4.8	14.5	14.5	4.4	4.4
10	3.3	3.6	12.7	12.4	4.0	3.7
11	5.5	5.8	12.6	12.2	2.7	2.4
12	1.6	2.0	11.5	11.0	1.8	1.6
13	6.1	6.4	16.8	16.6	4.9	4.7
14	7.0	7.5	13.9	13.4	(3.0)	(3.5)
15	9.8	9.9	14.9	14.7	0.8	0.8
16	0.0	0.2	27.9	27.8	3.5	3.4
17	2.4	2.5	38.1	38.1	(10.6)	(10.6)
Total Banks	**4.4**	**4.8**	**14.1**	**13.6**	**3.0**	**2.6**
Total CFC	**8.1**	**8.4**	**16.0**	**15.7**	**0.7**	**0.4**

Note: Numbers at December 2009
Source: DANE and the Superintendencia Financiera de Colombia; calculations by Banco de la República.

IV. Potential Risks

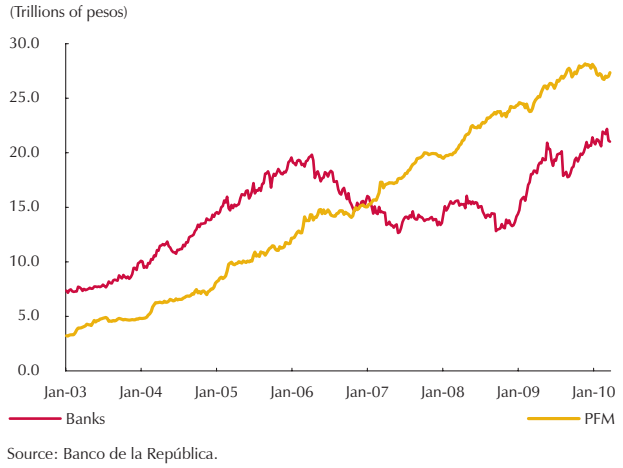
The consumer, mortgage and micro-loan portfolios improved in terms of credit risk during the second half of 2009, as reflected in the transition matrices and harvest analysis. The commercial loan portfolio performed just the opposite. Moreover, the increase in government bond holdings and, particularly, in the share of tradable securities has increased, causing more exposure to market risk and, in turn, a decline in liquidity risk.

A. MARKET RISK

1. Financial System Exposure to Government Bonds

Commercial banks have increased their holdings of peso and UVR-denominated TES since August 2008. In fact, the balance was COP$21,0 t on February 19, 2010, which is more than the figure registered in 2006 (Graph 90). On the other hand, the balance of TES holdings reported by the PFM has been on the rise since 2003. Nevertheless, a downturn started in October 2009 and, by the third week of February 2010, the balance was COP$27.3 t, which is COP$813.7 b less than in October.

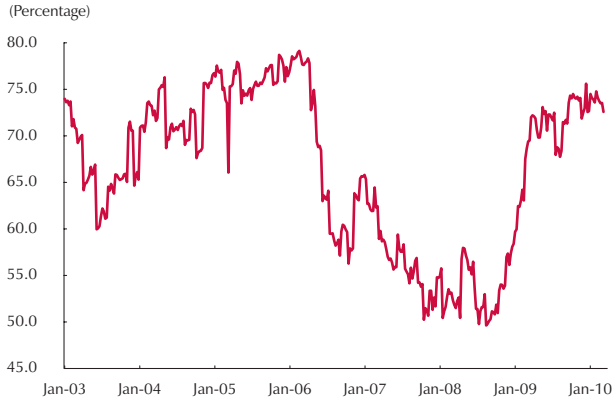
Graph 90
Outstanding Pesos and UVR-denominated TES Held by Commercial Banks and PFM



Source: Banco de la República.

While that sum represents the amount of exposure for the PFM, in the case of commercial banks, one must consider their investment in government bonds, which are subject to changes in market price. As illustrated in Graph 91, the increase in outstanding TES held by these institutions since late 2008 has been accompanied by a rise in the exposed percentage. At February 2010, 72,6% (COP$15.2 t) pertained to investments subject to

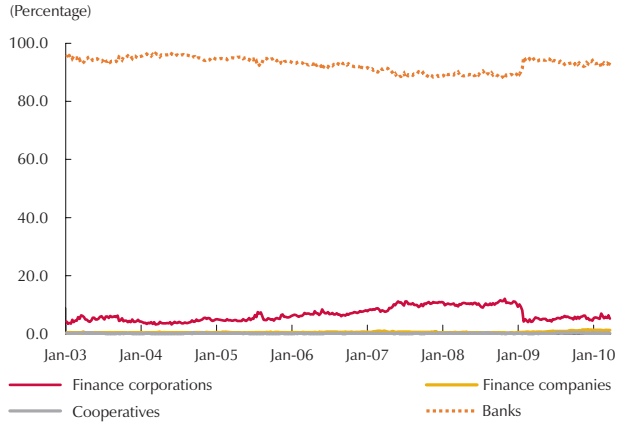
Graph 91
Share of the TES Investment Portfolio Comprised of Tradable and Callable TES Held by Commercial Banks



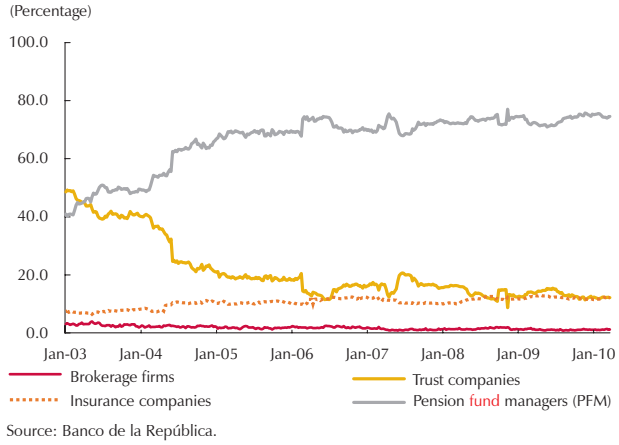
Source: Banco de la República.

Graph 92

A. Share of Outstanding Peso and UVR-denominated TES in the Portfolio of Credit Institutions



B. Share of Outstanding Peso and UVR-denominated TES in the Portfolio of the Non-bank Financial System



Source: Banco de la República.

market valuation.[39] This share is close to the record high (79.1% in February 2006), which implies considerable market risk exposure.

The institutions most representative of the financial system in the government bond market are commercial banks and PFM. The share of the portfolio pertaining to commercial banks compared to that of credit institutions was 93.4% in February 2010. Furthermore, this percentage has averaged 92.8% since 2003 (Graph 92, Panel A). Although the TES portfolio of FC, CFC and financial cooperatives has increased respectively by 50.0%, 138.5% and 441.3% since February 2009, their individual share within credit institutions as a whole does not account for more than 10%.

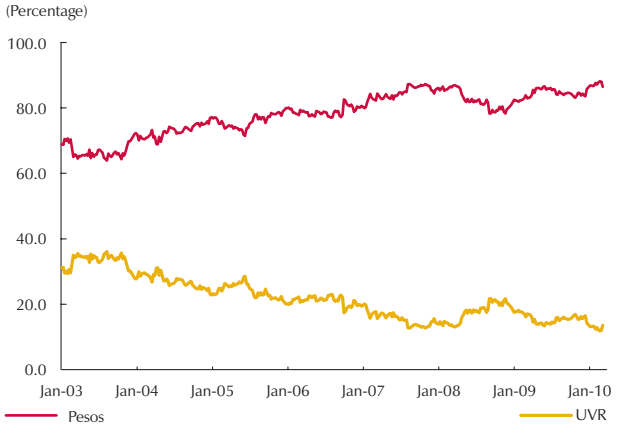
As for non-bank financial institutions (NBFI), the PFM share of the government bond portfolio has grown since 2003 (Graph 92,Panel B) and, by February of this year, it accounted for 74.5% of the total portfolio pertaining to NBFI, while life insurance and trust companies accounted for 12,2% each (COP$4,5 t). Compared to that of credit institutions, the NBFI portfolio experienced less of an increase than last year (8.3%) and came to COP$36.7 t in February 2010.

In the commercial bank portfolio, 86.4% of the investments in government bonds are peso-denominated TES. As illustrated in Graph 93, Panel

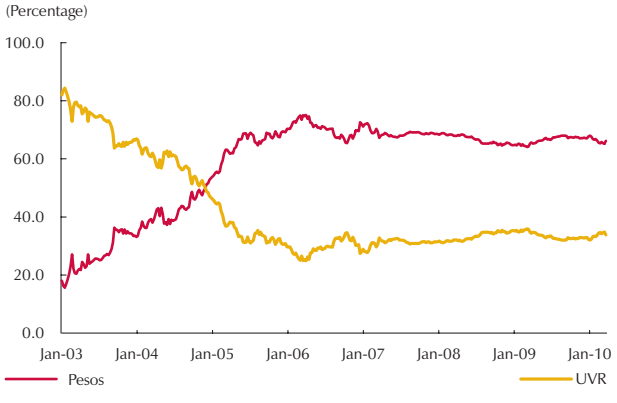
39 Investments can be classified as tradable, available for sale or at maturity. The first are securities acquired to obtain a profit in the short term, based on fluctuations in their price. They are entered on the books initially at their purchase price and revaluated daily to reflect their current market value; the resulting adjustment is entered in the profit and loss account. The second are securities the holder is entitled legally to maintain for a period of no less than one year, or Central Bank bonds with low or minimal marketability. Despite this restriction, their condition as saleable does not change; in other words, they are investments that can be sold at any time. Entered on the books initially at their purchase price , they are adjusted daily, in the same way as investments at maturity. However, the variations in market price are incorporated into the adjustment, which is entered in the capital or proprietor accounts. Investments at maturity are securities the holder is entitled legally to hold to maturity or redemption. They are entered on the books initially at their purchase price and revalued daily in an exponential way based on the internal rate of return calculated at the time of purchase. The adjustment is recorded in the profit and loss accounts.

Graph 93

A. Composition of Commercial Bank Investments in Peso and UVR-denominated TES, by Currency



B. Composition of PFM Investment in Peso and UVR-denominated TES, by Maturity



Source: Banco de la República.

A, the proportion in UVR-denominated TES has declined since 2003. This drop is the result of a 19.7% increase in peso-denominated investments during the past year, coupled with a 9.0% reduction in UVR-denominated investments during the same period. As for the PFM, their investments in peso-denominated government bonds account for 66.2% of the total, which is 1.0 pp more than in 2009. This is explained by an increase of 13.1% in the balance of peso-denominated TES held by PFM, which is higher than the 8.2% registered for UVR-denominated securities (Graph 93, Panel B).

look at the composition of the commercial bank portfolio in TES, based on maturity shows these investments have been concentrated in short and medium-term maturities since 2003 (Graph 94, Panel A). Bonds maturing in more than eight years have accounted for 6.3% of the total, on average. The medium-term investments in TES are up by 52.7% since February 2009, and the latest figure indicates they make up 53.3% of the total. Most PFM investments in government bonds have been at two to eight years. However, since April 2009, the balance of long-term bonds has exceeded that of medium-term maturities and represented 58.4% of the total by February 2010 (Graph 94, Panel B), given an increase of 68.2% in investments of this type compared to the year before.

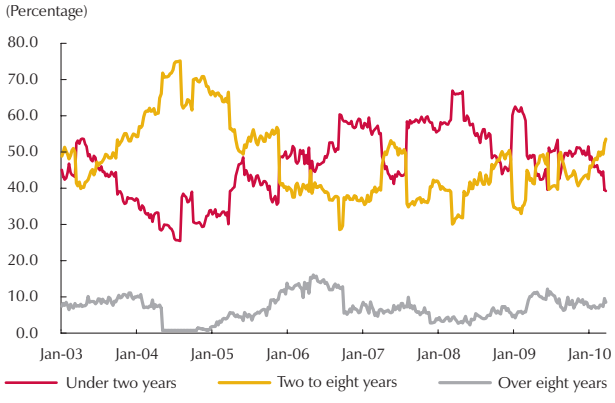
The make-up of commercial bank and PFM investments in government bonds reflects the dynamics of their duration. The average duration of the commercial bank portfolio has been 2.4 years since 2003, as it was in February 2010, while the average duration of the PFM portfolio during the same period is 4.4 years. However, it is important to point out the increase in the duration in the PFM portfolio between May 2005 and December 2009, a time when the trend seems to have reversed. At February 2010, the portfolio of these institutions had an interest rate sensitivity equal to that of a five-year zero-coupon bond. (Graph 95).

2. Sensitivity to TES Rate Increases

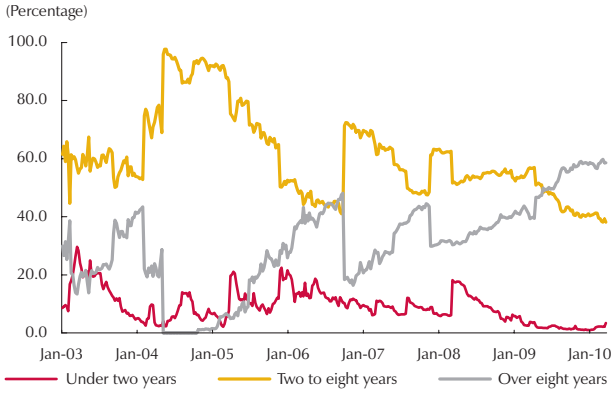
In previous editions of the *Financial Stability Report,* portfolio value losses were calculated with a 200 bp increase in all maturities along the zero-coupon yield curve for peso and UVR-denominated TES. This is the shock suggested by the Basel Committee on Banking Supervision for countries other than the

Graph 94

A. Composition of Commercial Bank Investments in Peso and UVR-denominated TES, by Maturity

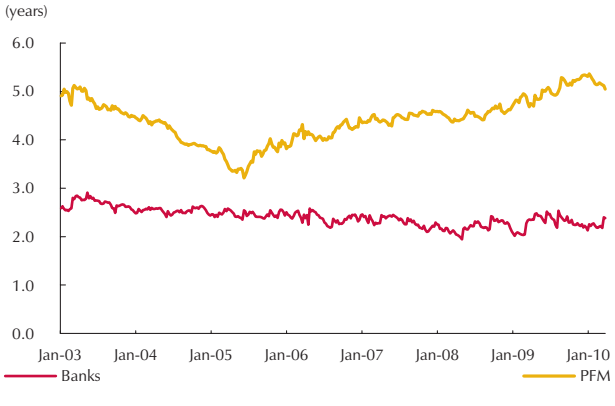


B. Composition of PFM Investments in Peso and UVR-denominated TES, by Maturity



Source: Banco de la República.

Graph 95
Duration of the TES Portfolio of Commercial Banks and PFM



Source: Banco de la República.

G-10. However, this edition of the report considers three additional scenarios with bond interest-rate increases, based on the assumption that financial institutions will shift the make-up of their portfolio in the event of a possible increase in those rates, so as to limit their losses; namely, by reducing the duration of the portfolio and the share of tradable securities, which means less exposure to market risk. A forceful reaction by these institutions is taken into account in this respect.

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

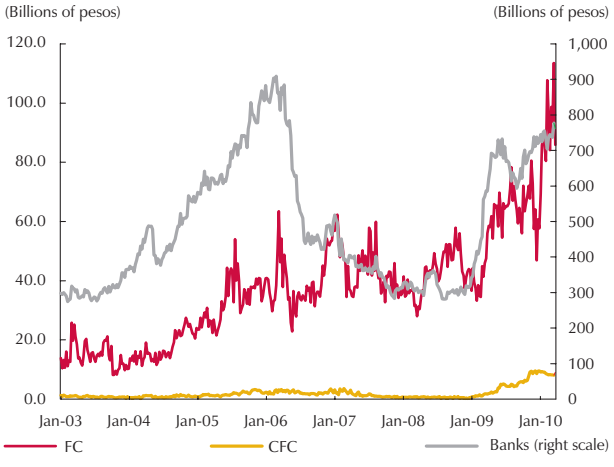
The losses financial institutions would incur with a parallel shock of 200 bp in the TES curve are shown in Graph 96. Importantly, the effect of the shock does not accumulate over time, but pertains to possible devaluation if a shock were to occur at each point in time. Panel A shows the potential losses for credit institution in response to the shock. As one can see, given the increase in TES holdings during the past year, coupled with the higher share of tradable securities, the losses with a possible shock of have increased for every sector. They came to COP$856.4 b on t February 19, 2010, which is COP$220.2 b more than the losses financial institutions would have incurred if the shock had come a year earlier.

When analyzing the effects by type of credit institution, one sees commercial banks would incur the largest losses with a change in interest rates on government bonds, since they have a larger exposed balance of TES. In February 2010, their losses would come to COP$761.6 b, which is an increase of 29.7% compared to the losses they would have incurred a year earlier. By the same date, the FC, would have lost COP$85,9 b, which is 80.6% more that the loss a year earlier. This reflects a considerable increase in market risk exposure for credit institutions.

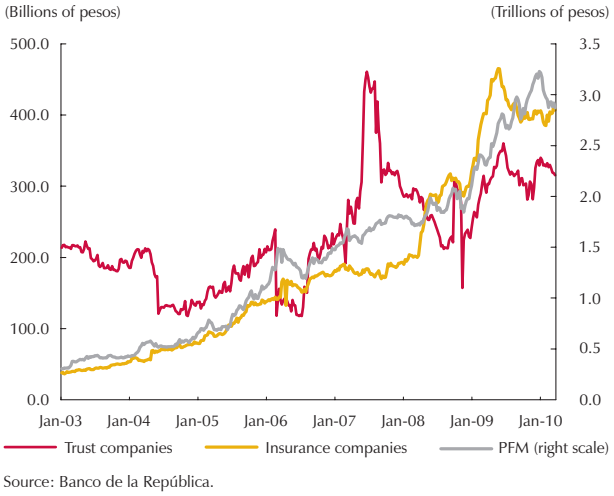
Panel B shows the NBFI losses from the interest rate shock. By February 2010, the losses with this exercise would come to COP$3.6 t for all NBFI, which is COP$596.3 b more than would have been the case a year earlier. As for the different types of

Graph 96

A. Credit Institution Valuation Losses with a 200 bp Increase



B. NBFI Valuation Losses with a 200 bp Increase



Source: Banco de la República.

institutions, pension funds are the most exposed to the TES interest rate shock. At February of this year, the losses for the accounting period would come to COP$2.9 t, which is 20.0% more than would have been the case one year earlier. In the same scenario, trust companies and insurance companies would lose COP$315.6 b and COP$407.1 b respectively. These possible market value losses are slightly higher than they would have been a year earlier. Hence, NBFI market risk exposure increased, particularly for the pension funds.

When analyzing the losses from the exercise, as a percentage of profits for lending institutions, one sees an increase during the past year. In fact, by February 2010, they would account for 15.6% of those profits, which is 3.2 pp more than in February 2009. With respect to the different types of institutions, banks would lose the most in relation to profits (17.4% or 4 pp more than would have been the case in February 2009). The devaluation loss for FC at February 2010 would come to 11.8% of their profits, which is 2.5 pp less than a year earlier. Therefore, in terms of profits, one sees more market risk exposure for banks and less for FC (Graph 97, Panel A).

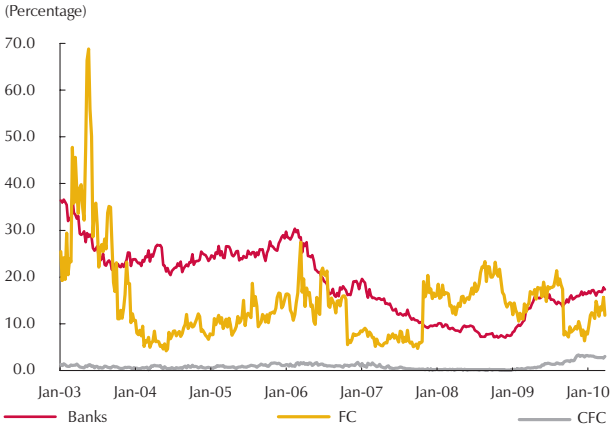
A look at losses in relation to the total value of the NBFI portfolio shows the PFM are the institutions most exposed to the TES interest rate shock. At February 2010, these institutions would lose 3.0% of the value of their portfolio, while trust and insurance companies would lose 2.1% (Graph 97, Panel B).

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

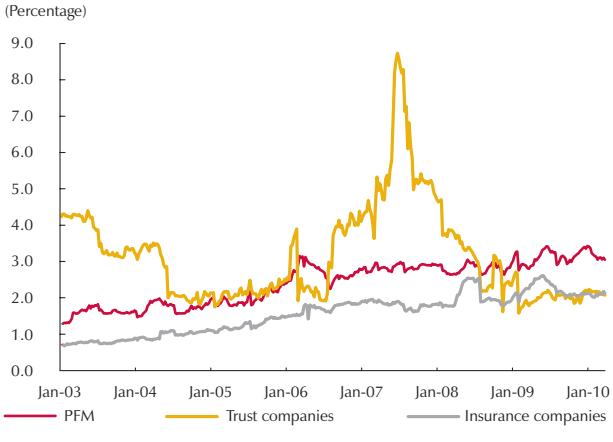
Different scenarios with changes in interest rates on government bonds that correspond to 99, 80 and 60 percentile of the annual increases witnessed in the zero-coupon yield curve in pesos since 2003 are considered in this exercise. The assumption in each of the scenarios is that institutions in the financial system will modify the composition of their portfolios when anticipating an increase in interest rates, so as to minimize the impact on their profits and on the value of the portfolio. Therefore, given an increase in interest rates on government bonds, institutions are expected reduce the duration of their portfolios and the share of tradable securities. The scenarios in question are presented in Table 9.

Graph 97

A. Valuation Losses with a 200 bp Increase, as a Percentage of Annualized Profits for Credit Institutions[a/]



B. Valuation Losses with a 200 bp Increase, as a Percentage of Portfolio Value for NBFI[a/]



a/ Annualized profits and the value of the portfolios at December 2009 were used for the 2010 calculations.
Source: Banco de la República.

The changes in duration and in the share of tradable securities between 2006 and 2007 were considered for the extreme scenario. This was the period during the past decade when government bonds lost the most market value. The medium and moderate scenarios were calculated by means of the econometric estimates.[40] The government bond portfolios at February 19, 2010 were used for this exercise.

The results of the exercise are shown in Table 10. In the event of an increase of 300 bp in the rate on TES, banks and FC would lose 17.4% and 18.0% of their annualized earnings at December 2009, in that order, while CFC and cooperatives would lose only 4.0% and 4.4% of their respective profits, given their low balance of TES.

As for NBFI, pension funds are the institutions that would suffer the largest losses in each of the scenarios. In the most extreme scenario, they would lose around COP$4.6 t, which represents 4.8% of the portfolio at December. In the same scenario, the insurance and trust companies would lose 3.5% and 3.3% of the value of their portfolios, respectively, while brokerage firms would lose only 1.0% of their portfolio, because their government bond holdings are not large.

In short, the institutions in the financial system have increased their exposure to market risk, mainly because of the growth in government bond holdings witnessed during 2009. Pension fund managers and commercial banks are still the major players in this market and, therefore, have the most exposure to future changes in interest rates.

It is important to bear in mind that the two exercises are different in terms of their definition, which means the results are not necessarily comparable. While the first considers change in all maturities along the zero-coupon yield curve for TES, the second summarizes the shock with a change in the rate on a zero-coupon bond with maturity equal to the average maturity of the securities

40 A regression between the change in duration and the change in the one-year rate on the zero coupon yield curve for peso-denominated TES was estimated for each type of NBFI. In addition, for each type of lender, another regression was estimated between the change in the share of tradable securities and the same independent variable of the aforementioned regression.

Table 9

A. Scenarios Used for the Stress Test Applied to Credit Institutions

	Scenario 1 [a/]				Scenario 2: Medium[b/]				Scenario 3: Moderate[c/]			
Type of Institution	**CB**	**FC**	**CFC**	**Coop**	**CB**	**FC**	**CFC**	**Coop**	**CB**	**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 the share of tradable securities (%)	(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. Scenarios Used for the Stress Test Applied to NBFI

	Scenario 1: Extreme [a/]		Scenario 2: Medium [b/]		Scenario 3: Moderate [c/]	
Type of Institution	**PFM**	**Others**	**PFM**	**Others**	**PFM**	**Others**
Change in duration (years)	(0.3)	0.0	(0.1)	0.0	(0.1)	0.0

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

Table 10

A. Results of the Stress Test Applied to Credit Institutions

Name	Duration (years)	Total Balance (COP$t)	Neg. Sec (%)	Exposed Balance (COP$t)	Market Price (COP$t)	Annualized Profits (COP$t)	Scenario 1		Scenario 2		Scenario 3	
							(COP$b)	(%)[a/]	(COP$b)	(%)[a/]	(COP$b)	(%)[a/]
Bancos comerciales	2.38	21.03	0.73	15.26	15.30	4.40	(767)	(17.4)	(708)	(16.1)	(546)	(12.4)
CF	3.63	1.16	0.99	1.15	1.26	0.73	(131)	(18.0)	(88)	(12.2)	(67)	(9.2)
CFC	2.20	0.27	0.70	0.19	0.19	0.30	(12)	(4.0)	(8)	(2.9)	(7)	(2.2)
Cooperativas financieras	2.52	0.05	0.57	0.03	0.03	0.06	(3)	(4.4)	(2)	(2.9)	(1)	(2.2)

B. Resultados del ejercicio de sensibilidad para las IFNB

Name	Duration (years)	Exposed Balance (COP$t)	Market Price (COP$t)	Portfolio Value (COP$t)	Scenario 1		Scenario 2		Scenario 3	
					(COP$b)	(%)[a/]	(COP$b)	(%)[a/]	(COP$b)	(%)[a/]
PFM	5.05	27.35	31.61	94.29	(4.569)	(4.8)	(3.083)	(3.3)	(2.322)	(2.5)
Trust companies	3.36	4.46	4.91	15.24	(505)	(3.3)	(337)	(2.2)	(253)	(1.7)
Insurance companies	4.45	4.46	4.74	19.12	(674)	(3.5)	(449)	(2.3)	(337)	(1.8)
Brokerage firms	2.45	0.42	0.41	3.41	(35)	(1.0)	(23)	(0.7)	(17)	(0.5)

a/ Percentage of annualized profits at December 2009.
b/ Percentage of the portfolio value at December 2009.
Source: Banco de la República.

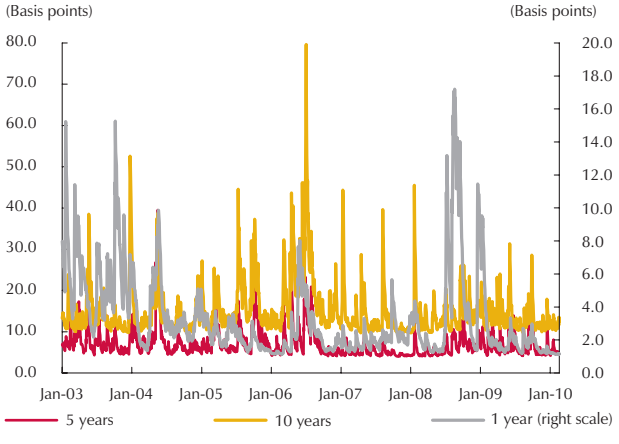
in the portfolio of these institutions. However, the latter assumes the players behave in a dynamic way and restructure their portfolios in a parallel response to expectations of an interest rate increase.

3. Value at Risk

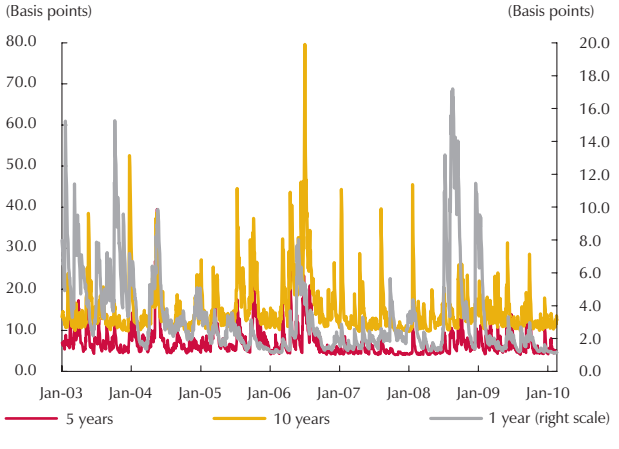
Value at risk (VaR) is an approximate measure of the maximum loss the system could incur based on the investment portfolio registered during a specific time period. It is included to obtain a more rigorous estimate to the market risk facing credit institutions and NBFI alike. Specifically, in defining the VaR of each of these sectors as the aggregate of the individual VaR of each of their institutions, this indicator more accurately reflects the market risk exposure facing each system and each institution in particular.[41]

Graph 98

A. Annualized Daily Volatility of the Zero-coupon Yield Curve for Peso-denominated TES



B. Annualized Daily Volatility of the Zero-coupon Yield Curve for UVR-TES



Source: Banco de la República.

The procedure used to calculate the VaR involves daily estimates of the correlations and return variances for each of the risk factors. According to the methodology suggested by RiskMetrics,[42] these factors were established for specific maturities on the zero-coupon yield curve for TES denominated in pesos and for UVR-denominated TES with respect to the period from January 3, 2003 to February 19, 2010. The results in terms of the annualized volatility of returns, which were obtained using constant correlations (CCC model), are shown in Graph 98.

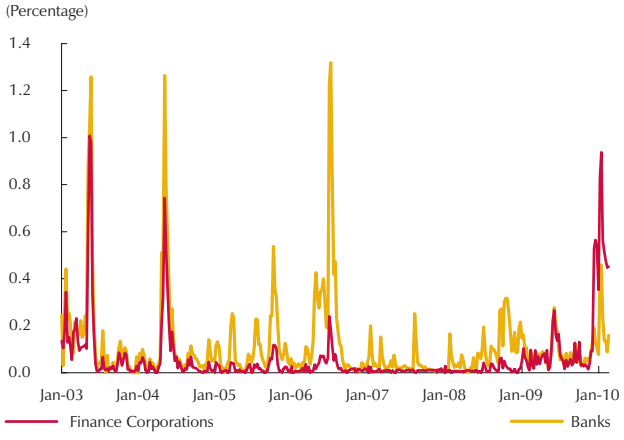
On the one hand, the volatility of the short-term (one year) segment of the peso-denominated curve (Panel A) has risen considerably since the second half of 2008. This steady increase, derived from the market's response to Banco de la República's benchmark rate cuts and, hence, from the changes in inflation expectations, has taken volatility to levels similar to those observed in June 2006, a period characterized by high and rapid devaluation in these bonds.

41 For further details on the methodology used, see O. Martínez and J. M. Uribe Gil (2008),"Una aproximación dinámica ala medición del riesgo de mercado para los bancos comerciales en Colombia", in "Financial Stability Issues," Financial Stability Department, Financial Stability Report No. 31, Banco de la República.

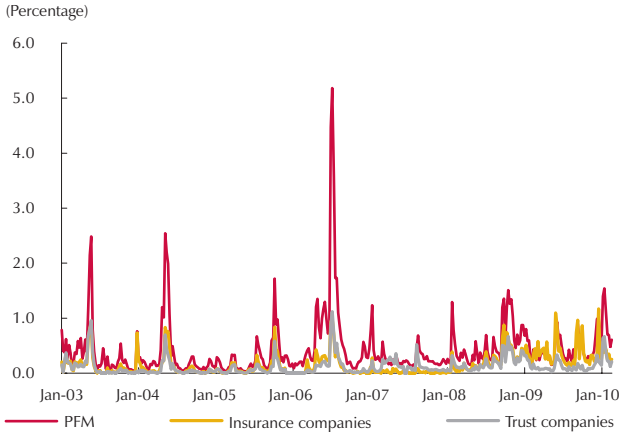
42 Risk Metrics (1996), Technical Document, J.P. Morgan/Reuters, Fourth Edition, December 1996.

Graph 99

A. VaR of Credit Institutions as a Percentage of the Value of their Exposed Balance



B. VaR of NBFI as a Percentage of the Value of their Exposed Balance



Source: Banco de la República.

Similarly, volatility at the middle of the curve and at the long end (five and 10 years, respectively) increased substantially since November 2009. Although these results are less than those observed in the two previous periods of high volatility in these segments of the yield curve (June 2006 and September 2008), they do represent an important increase, one that responses to the rapid rise in the rates at which TES were traded in recent months. Consequently, the added volatility in all segments of the yield curve denominated in pesos suggests an important rise in market risk for peso-denominated TES.

Moreover, during the last half-year period, the volatility of the yield curve for UVR-denominated TES registered stable levels at the middle and at the long end compared to the results observed during the two previous years (Panel B). Volatility at the short end declined sharply during 2009, following a major increase during the second half of 2008, a period that marked the beginning of Banco de la República's benchmark rate cuts. This decline in volatility in every segment of the yield curve and, therefore, in market risk, may be due to the limited amount of trading in UVR-TES on the secondary market, given the sharp drop in inflation witnessed last semester.

The volatility graphs allow us to identify recent periods of increased variability in returns on the TES market. Accordingly, it is possible to say that October 2008, May and October 2009 and January 2010 were the periods of greatest volatility between 2008 and 2010.

Based on the estimates of volatility in returns, the VaR was calculated for the sectors whose TES portfolio accounts for a substantial portion of their total investments. The portfolios observed each Friday from January 2003 to February 2010 for each of the institutions in these sectors were used for this purpose. With this information, the risk measurement was calculated daily, with 99% confidence, assuming normality (Graph 99).

In the case of credit institutions, the VaR was calculated for the banks and finance corporations (Panel A). Despite registering low variability between July and November 2009, a period when the one-day VaR averaged 0.06% and 0.05% of the total TES portfolio of these institutions, respectively, this indicator increased considerably during the period from December to January

2010. In those two months, the average VaR rose to 0.19% and 0.52% of the exposed balance of TES, clearly in response to the increased volatility of returns. In the case of NBFI, the one-day VaR was estimated for PFM, insurance companies and trust companies. As illustrated in Panel B, the second half of 2009 was characterized by an increase in the VaR, especially during October with respect to insurance companies and PFM. The volatility in the TES markets had more of an impact on the portfolio of institutions in these sectors compared to others. Moreover, as with banks and finance corporations, the VaR of NBFI rose considerably during the last two months, reaching levels similar to those observed during October 2008.

With these calculations, it is possible to infer that NBFIs have more market risk than banks and finance corporations, measured on the basis of VaR. This can be explained by the make-up of the portfolio of these institutions, both in terms of instruments and denomination. On the one hand, the investment portfolios of insurance companies and pension fund managers have a much longer duration than those of banks and financial corporations. When duration is a measure of the change in the value of a security in the event of interest-rate variations, institutions with longer duration see more of a change in the value of their portfolio in response to negative events concerning the return on TES. Therefore, PFM and insurance companies are more sensitive to market risk.

Moreover, banks and financial corporations have TES portfolios that are highly concentrated in peso-denominated TES. Non-bank financial institutions, on the other hand, divide their portfolio between peso-denominated TES and UVR-TES. Therefore, funds managed by these institutions are subject to fluctuations in returns on both these markets, as evidenced by an increase in the maximum one-day loss they might incur with variations in TES returns.

Given to the increase in volatility and in the VaR of these institutions, the analysis suggests the market risk for credit institutions and NBFI has increased in recent months. Furthermore, the increase in the exposed balance during 2009, coupled with the recent rise in market interest rates, suggest this risk could lead to more losses for these institutions. The stress tests show signs of increased propability for this type of events.

B. CREDIT RISK

1. Credit Institutions

The slowdown in the commercial portfolio during the last six months influenced the reduced rate of growth in the total loan portfolio. This was accompanied by an improvement in the default rate, given less of a relative increase in non-performing loans. However, the risks facing the system are still latent, which means it is important to analyze the impact an adverse macroeconomic situation could have on the performance of credit

institutions. To do so, several stress tests were developed on the basis of two different scenarios: i) moderate and ii) extreme but unlikely. A summarized description of these shocks is provided in Table 11.

Table 11
Description of the Shocks in Each Scenario

	Macroeconomic Variable	Moderate	Extreme
Shock 1	**GDP**	1.0% decline in GDP	6.8% decline in GDP
	Local Demand	1.0% decline in local demand	13.7% decline in local demand[a/]
Shock 2	**Interest Rates**	25 bp increase	450 bp increase[b/].
	NHPI	1.0% decline in home prices	8.0% decline in home prices[c/]
Shock 3	**Unemployment**	1.0 pp rise in unemployment	4.2 pp rise in unemployment[d/]
Shock 4	**All of the Above**	All of the Above	All of the Above

a/ The reductions witnessed during the second quarter of 1999.
b/ The increase on record between May and June 1998.
c/ The average of the reductions that occurred during 1996-2000.
d/ The average increase observed 1999.
Source: Banco de la República.

The exercises outlined as follows show the effects the shocks in question would have on the on-performing portfolio and the profits of financial intermediaries.[43] The shocks to macroeconomic variables increase the non-performing portfolio for the different types of loans, which means fewer profits as a result of increased costs for loan-loss provisioning and less income from interest. Higher interest rates imply an increase in deposit-taking costs, accompanied by more income from loans placed at variable rates. Depending on the extent of the increases in lending and deposit rates, this effect will be positive or negative for bank profits. See the highlighted section on credit risk (pg. 96) for a more detailed explanation of the exercise.

The results obtained with the moderate scenario show the macroeconomic shocks in question have a slight effect on bank profits (Table 12). When considering the aggregate shock, one sees the ROA would decline from 3.1% to 2.4%, which is equivalent to a reduction of 74 bp. With this scenario, only one institution would post a negative profit as a result of the Shock 4.

The extreme scenario shows that a shock to economic activity such as the one observed in the late nineties would lower the ROA for commercial banks from 3.1% to 1.0%, which means 69% fewer profits (Table 13). In the case of the shock to the unemployment rate, profits would fall by about 27%, which means two of the banks would register negative profits. With the simultaneous or combined shock, the ROA would drop from 3.1% to 0.5% and returns for six of the institutions would be negative as a result of the shock.

43 For more information on these methods, see "Una análisis de cointegración para el riesgo de crédito" in "*Financial Stability Issues," Financial Stability Repor*t, September 2008.

CREDIT RISK STRESS TEST

Credit risk is regarded as a factor of potential instability for the financial system. Consequently, it is extremely important that it be assessed and measured continuously. Stress tests are designed to gauge the soundness and capacity of an intermediary to absorb unexpected shocks that affect credit risks.

The credit risk stress test presented in this report is intended to quantify the effect changes in macroeconomic variables would have on bank profits. The shocks analyzed affect two scenarios where consideration is given to individual and collective changes in output, interest rates, home prices and unemployment. The expected change in these variables affects the banking system through two channels: one direct and one indirect. The direct effect is related to increases in earning and outlays for interest that occur as a result higher interest rates on lending and deposits. The indirect effect is determined by the increase in provisions and the decline in earnings from interest as a result of changes in the quality of loans.

To measure the direct effect, the increase in interest rates on lending and deposits resulting from a shock to Banco de la República's policy rate (benchmark rate) is calculated for sight deposits and time certificates of deposit. The models developed by Vargas et al. (2010)[1] and Saade and Pérez (2009) are used for that purpose, along with the average of the results for the exercises done in the report. The increases in lending and deposit rates in the two scenarios are shown in Table A.

The increases in interest rates on loans assume an increase in interest earnings from loans contracted at a variable rate.[2] The increase in interest on deposits leads to an increase in outlays for interest paid on deposits. In this case, sight deposits are distinguished from CDs, inasmuch as the rise in these rates affects the stock of sight deposits and only the marginal placement of CDs.[3] The total cost of the direct effect is calculated as the difference between interest earnings and outlays for interest.

If the resulting difference is positive, profits increase; if it is negative, they decline. The tests done up to now show lending rates are more elastic than deposit rates. Therefore, the general result is that profit increases as a result of these variations.

Following Gutiérrez and Vásquez (2008), a VEC model is used for the indirect effect to quantify the deterioration in loan quality. With this model, it is possible to estimate the change in the default indicator[4] as a result of shocks to output, interest rates, home prices and employment. The exercise presented in this report was done for two scenarios, both of which are described in Table B.

A rise in the default indicator translates into an increase in the non-performing portfolio, which implies two costs for banks: i) an increase in provisions and ii) less income from interest.

The increase in provisions is calculated by multiplying the change in the non-performing portfolio by the provisioning coefficient.[5] The decline in earned interest is estimated by multiplying the increase in the non-performing portfolio by the implicit rate of each of the portfolios.[6] The sum of these two costs is the total cost of the indirect effect.[7]

The sum of the costs of the direct and indirect effects indicates the amount of the decline in profits before taxes. These are the stressed profits.

The results of this exercise are presented in this report, specifically in the section on credit risk in Chapter IV.

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1 The result of the asymmetric model is used for the test.

2 The percentage of variable interest rate loans each bank has is calculated for each type of lending. On average, 57.8% of the portfolio is contracted at a variable interest rate.

3 Only savings accounts were used to calculate the increase in outlays for interest on sight deposits, since most checking accounts are not interest-bearing. As for CDs, the calculation is done on the marginal sale, since certificates marketed prior to the shock will see no change in interest rate.

4 The default indicator is defined as the ratio of the non-performing portfolio to the gross portfolio.

5 The provisioning coefficient is the ratio of provisions to the non-performing portfolio. It indicates the amount of pesos in provisions required for each peso in the non-performing portfolio listed on the balance sheet.

6 The implicit rate is the ratio of earned interest to the performing portfolio.

7 This sum always is a negative number, since more provisions and less earned interest have a negative effect on the profits of financial intermediaries.

Table A
Increase in Lending and Deposit Rates with a Benchmark Rate Shock

	Vargas et al (2010)		Saade y Pérez (2009)		Average	
	Moderate[a/]	Extreme[b/]	Moderate	Extreme	Moderate	Extreme
Lending rate	+ 33 pb	+ 300 pb	+ 25 pb	+ 225 pb	+ 29 pb	+ 262 pb
Rate on sight deposits	+ 15 pb	+ 136 pb	+ 22 pb	+ 200 pb	+ 18 pb	+ 168 pb
Rate on CDs	+ 42 pb	+ 378 pb	+ 23 pb	+ 214 pb	+ 32 pb	+ 296 pb

a/ Moderate shock: 50 bp benchmark rate increase
b/ Extreme shock: 450 bp benchmark rate increase
Source: Banco de la República.

Table B
Shocks Occasioned by Macroeconomic Variables

	Macroeconomic Variable	Moderate	Extreme
Shock 1	GDP	1.0% decline in GDP	6.8% decline in GDP
	Internal demand	1.0% decline in internal demand	13.7% decline in internal demand [a/]
Shock 2	Interest rate	25 bp increase	450 bp increase[b/]
	NHPI	Home prices down 1.0%	Home prices down 8.0%[c/]
Shock 3	Unemployment	1.0 pp increase in unemployment	4.2 pp increase in unemployment[d/]
Shock 4	Aggregate	All the above	All the above

a/ The declines observed during the second quarter of 1999.
b/ The increase posted between May and June 1998.
c/ Equals the average decline during 1996-2000.
d/ The average increase in 1999.
Source: Banco de la República.

References

Gutiérrez Rueda, J.; Vásquez E., D. "Un análisis de cointegración para el riesgo de crédito". Financial Stability Issues, *Financial Stability Report*, Banco de la República, September 2008.

Saade Ospina, A.; Pérez Reyna, D. "Cambios en los incentivos de los bancos como consecuencia de modificaciones en los esquemas de encaje". Financial Stability Issues, *Financial Stability Report,* Banco de la República, September 2009.

Vargas Herrera, H.; Varela Barrios, C.; Betancourt García, Y.; Rodríguez Niño, N. "Effects of Reserve Requirements in an Inflation Targeting Regime: The Case of Colombia," *Borradores de Economía* 587, Banco de la República, February 2010.

Table 12
Stressed ROA, Stressed Profits and the Number of Banks with Negative Profitability after the Moderate Shock

	Shock 1[a/]	Shock 2[b/]	Shock 3[c/]	Shock 4[d/]
ROA at December 2009 (percentage)	3.08	3.08	3.08	3.08
Commercial	2.76	3.06	3.03	2.73
Consumer	2.92	3.04	2.90	2.88
Mortgage	2.97	2.99	2.96	2.94
Total	2.52	2.93	2.74	2.35
Profit at December 2009 (COP billions)	5,997	5,997	5,997	5,997
Stressed Profit (COP billions)	4,897	5,700	5,336	4,563
Percentage Change in Profit (%)	(18.34)	(4.95)	(11.02)	(23.91)
Number of banks with negative profits due to the shock	**0**	**0**	**0**	**1**

a/ Internal demand (commercial and consumer loans) or GDP (mortgage)
b/ Interest rates (consumer and commercial loans) or housing prices (mortgage)
c/ Unemployment
d/ Combination
Source: Banco de la República.

Table 13
Stressed ROA, Stressed Profits and the Number of Banks with Negative Profitability after the Extreme Shock

	Shock 1[a/]	Shock 2[b/]	Shock 3[c/]	Shock 4[d/]
ROA at December 2009 (percentage)	3.08	3.08	3.08	3.08
Commercial	1.92	3.04	2.88	2.22
Consumer	2.17	3.03	2.63	1.88
Mortgage	2.92	2.99	2.86	2.81
Total	0.96	2.83	2.26	0.47
Profit at December 2009 (COP billions)	5.997	5.997	5.997	5.997
Stressed Profit (COP billions)	1.859	5.498	4.393	919
Percentage Change in Profit (%)	(69.00)	(8.33)	(26.74)	(84.68)
Number of banks with negative profits due to the shock	**5**	**0**	**2**	**6**

a/ Internal demand (commercial and consumer loans) or GDP (mortgage)
b/ Interest rates (consumer and commercial loans) or housing prices (mortgage)
c/ Unemployment
d/ Combination
Source: Banco de la República.

2. Analysis of Loan Portfolio Concentration and Credit Risk[44]

a. Commercial Loan Portfolio

The commercial loan portfolio accounts for the largest share: 53.9% in December 2009. Therefore, an analysis of its characteristics and players is relevant when considering the risks facing institutions in the financial system.

44 The information on individual loans in each of the portfolios was taken from Form 341 filed with the Superintendencia Financiera de Colombia. It includes loans given by special and official institutions (IOES in Spanish), apart from rediscount loans (which are not considered in the section on the financial system).

In looking at how the total amount has evolved, it is important to emphasize the negative growth witnessed in December 2009 (-0.92% in real terms), since growth in previous years was sustained. Moreover, there was a proportional decline the number of borrowers; consequently, the average amount per borrower remained at COP$ 249.6 m (Table 14).

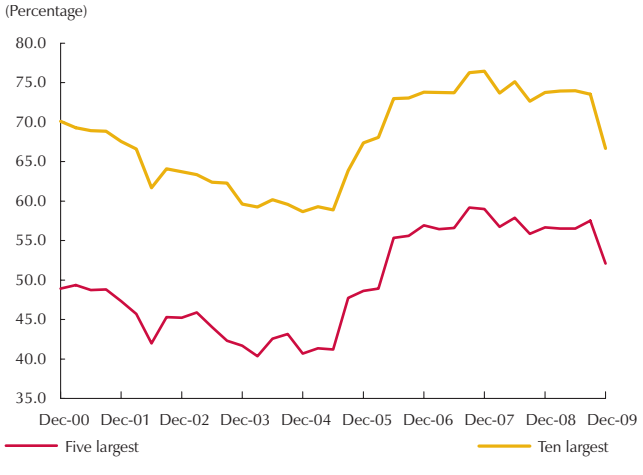
The situation with respect to the outstanding balance can be explained by two factors: i) asmentioned in Chapter II, Section A, the quality indicator for the commercial loan portfolio deteriorated, so the supply of credit is less and ii) less momentum in the economy means less demand for commercial loans.

Table 14
Outstanding Principal: Commercial Loan Portfolio

Date	Amount Outstanding[a/]	Number of Borrowers	Average amount per Borrower[b/]
Jun-04	49,931	263,478	189.51
Dec-04	57,840	274,543	210.68
Jun-05	58,916	289,018	203.85
Dec-05	59,986	312,687	191.84
Jun-06	66,172	333,934	198.16
Dec-06	73,841	362,943	203.45
Jun-07	78,266	395,963	197.66
Dec-07	86,925	432,588	200.94
Jun-08	87,023	431,552	201.65
Dec-08	99,445	415,472	239.35
Jun-09	100,122	401,073	249.63
Dec-09	98,531	394,741	249.61

a/ Graphs in billions of December 2009 pesos.
b/ Graphs in millions of December 2009 pesos.
Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 100
Commercial Loan Portfolio Concentration in the Five and Ten Largest Financial Institutions



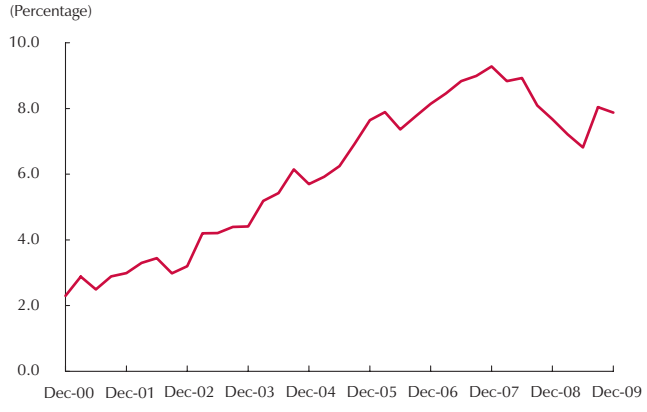
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

1. Commercial Loan Portfolio Concentration

When analyzing the concentration of the system, by institutions, one sees more diversification among them. In December 2008, the five largest financial institutions accounted for 56.7% of the portfolio; a year later, the indicator was 4.6 pp lower (52.1%). A look t the ten largest institutions shows a similar situation. Their share declined by 7.1 percentage points, having gone from 73.7% at the end of 2008 to 66.7% by December 2009. Graph 100 shows the evolution of this indicator for both groups.

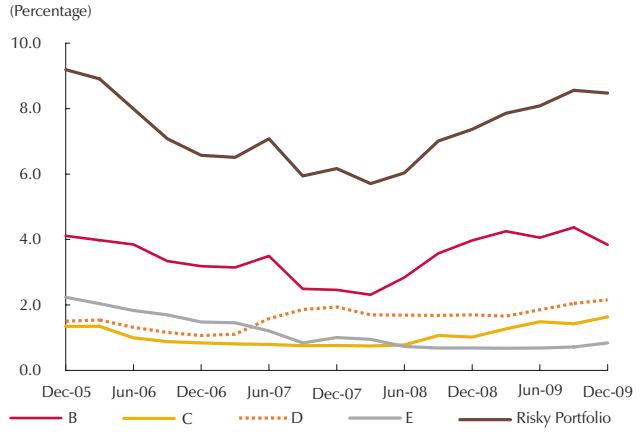
The extent of portfolio concentration also can be evaluated on the basis of borrowers and the amount they have taken on loan. Graph 101 show more diversification, since the number of borrowers who

Graph 101
Percentage of Borrowers Accounting for 90% of the Commercial Loan Portfolio



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 102
Share of the Risky Loan Portfolio, by Rating



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

account for 90% of the portfolio increased from 6.8% to 7.9% between June and December 2009, but is still less than the record high observed in December 2007.

In the last edition of this report, it was noted that an increase in concentration was associated with the slowdown in the economy as of 2007. Accordingly, one would expect the opposite of the situation observed during the last half of 2009. However, since the outstanding principal in the commercial loan portfolio and the number of commercial loan borrowers declined (Table 14), this could mean the reduction in concentration is explained by a lower amount of principal awarded to more commercial loan borrowers.

2. Credit Risk

When looking at how the risky loan portfolio has evolved, once sees it continues to worsen steadily, although not as quickly. The QI increased 2.1 pp between June 2007 and the same month in 2008, when it went from 6.0% to 8.1%. In December 2009, the deterioration was 1.1 pp more than a year earlier, having reached 8.5% (Graph 102).

Yet, it is important to point out that the growth in the risky loan portfolio is due to more ratings associated with a higher level of risk. The proportion of loans rated as moderately risky (category B) declined between December 2008 (4.3%) and December 2009 (3.8%), while the proportion of C and D rated loans increased by 60 bp and 50 bp, respectively, during the same period.

The change in the risky loan portfolio also can be examined using transition matrices, which show the probability of loans preserving a particular rating or moving to another rating. Table 15, Panel A shows the average matrix for the period analyzed.[45] The highest probabilities are located on the diagonal, which show signs of persistence, especially for A ratings (95.2%) and E ratings (91.4%). However, as noted in previous reports, the probability of passing

45 It's important to point out that this matrix is constructed with information from periods of economic recovery or economic growth. Accordingly, in times of crisis, it can be expected to lose its validity as an early warning indicator.

Table 15
Transition Matrices for Total Commercial Loan Portfolio
(Percentage)

A. Average Transition Matrix between March 2002 and December 2009

	A	B	C	D	E
A	95.2	3.7	0.8	0.2	0.1
B	34.1	42.1	18.2	4.9	0.7
C	13.0	8.0	29.4	46.0	3.7
D	6.0	2.1	2.0	66.4	23.6
E	3.4	1.0	0.6	3.6	91.4

B. Transition Matrix at December 2009

	A	B	C	D	E
A	94.0	4.6	1.0	0.3	0.1
B	29.1	42.1	18.5	9.7	0.6
C	8.6	12.4	31.8	43.0	4.3
D	2.4	1.2	4.0	84.1	8.3
E	1.1	0.6	1.3	4.8	92.2

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

from a C rating to a D rating (46.0%) is still higher than the probability of keeping a C rating (29.4%).

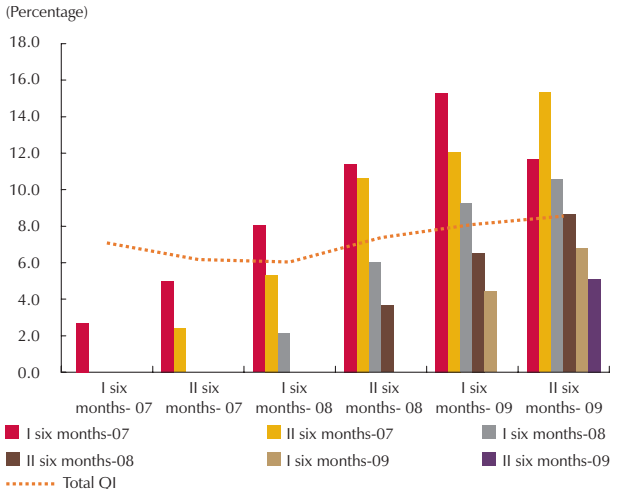
The transition matrix at December 2009 continues to show signs of persistence, inasmuch as the highest frequencies are on the diagonal. The probability of deterioration is greater than the likelihood of improvement, since the density of the upper triangle is greater (Table 15, Panel B). In addition, when comparing it to the average matrix, one sees there was more possibility of deterioration during the final quarter of 2009, because the likelihood of passing to riskier ratings, especially D and E, or maintaining those ratings is greater.

Lastly, it is interesting to look at the developments in the quality of the portfolio when segmented by harvests of borrowers.[46] This analysis tracks the loan portfolio quality indicator for each harvest throughout its duration, making it possible to determine the extent to which the actual performance of the indicator is explained by the borrower selection criteria used in past harvests, or in the most recent ones.

Graph 103 shows the QI for each harvest and for the total commercial loan portfolio as of the first half of 2007. The bars represent each of the harvests evaluated in different half-year periods. By December 2009, the loans showing the most deterioration were those granted during the second half of 2007; their QI went 12.1% in June 2009 to 15.3% six months later. Deterioration

46 A harvest is comprised of the group of loans granted during a specific time period.

Graph 103
Analysis of Quality Index, by Harvests



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

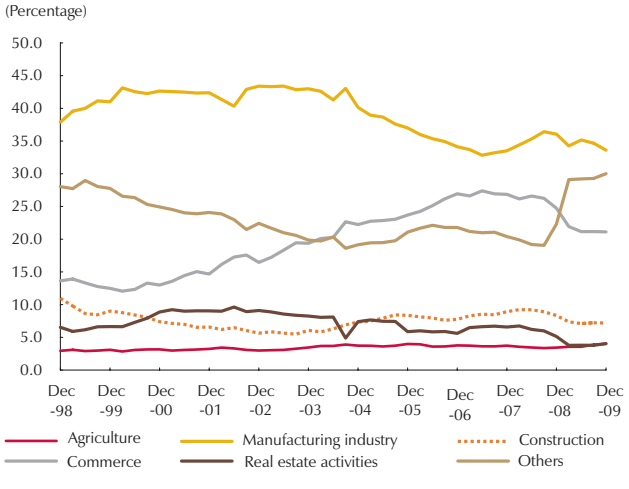
in the QI was apparent for all the harvests, except those originating in the first half of 2007. Their quality indicator declined 3.6 pp between June and December 2009, while the increase in deterioration for all other loans averaged 2.3 percentage points.

In addition, when analyzing the quality indicator at the time the harvests originate, one sees it has deteriorated gradually. The loans being granted are associated with increased risk at birth. The QI for loans in June 2009 was 4.4%; for those granted six months later, it was 5.1%.

The analysis also shows the longer the duration of the harvests, the higher the QI. Consequently, we can expect in the loan portfolio quality indicator to deteriorate even more during the first half of 2010, since the values of the indicator at the time of birth are greater than those observed for the harvests from earlier periods.

3. Analysis by Productive Sector of the Economy [47]

Graph 104
Share of the Commercial Loan Portfolio, by Productive Sector of the Economy



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

An analysis of the commercial loan portfolio by economic sector, pursuant to the CIIU classification,[48] show it remains highly concentrated. The manufacturing industry is the sector with the largest share, having accounted for 33.6% of all commercial loans at December 2009 (Graph 104).

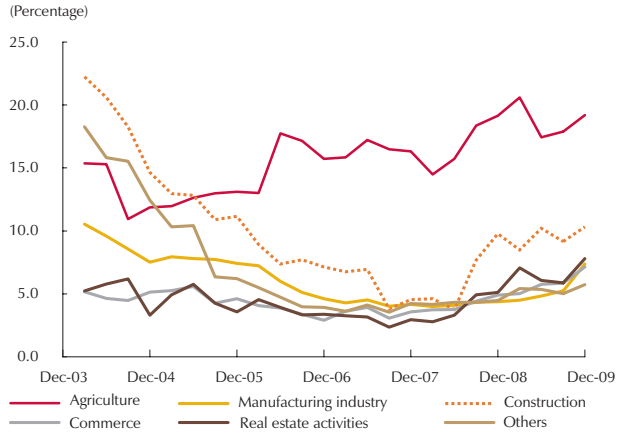
There were major changes in the dynamics of commercial loan portfolio concentration during 2009. This was due to the increased share occupied by "Other loans", thanks to a more than 100% increase in the outstanding balance on loans to the transportation and communications sector and to the electricity, water and gas sector.

This level of concentration implies an inherent risk for the business cycle, as negative shocks in the activity of sectors with a high share can pass through more

47 A sample that represents 63.0% of the total amount of the commercial loan portfolio was used to develop this section.

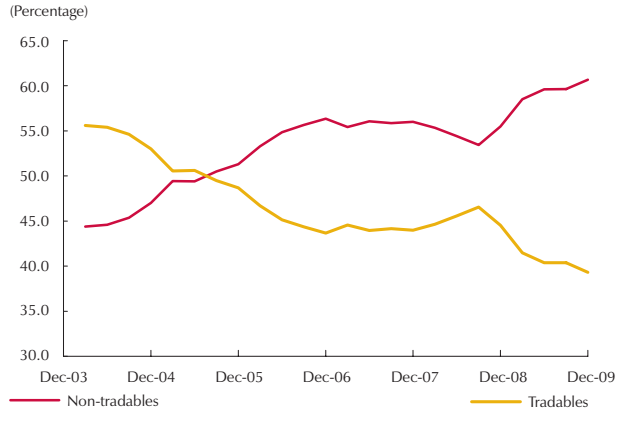
48 Assigned by DANE, this is an adaptation of the international economic classification proposed by the United Nations.

Graph 105
Changes in Quality Index, by Productive Sector of the Economy



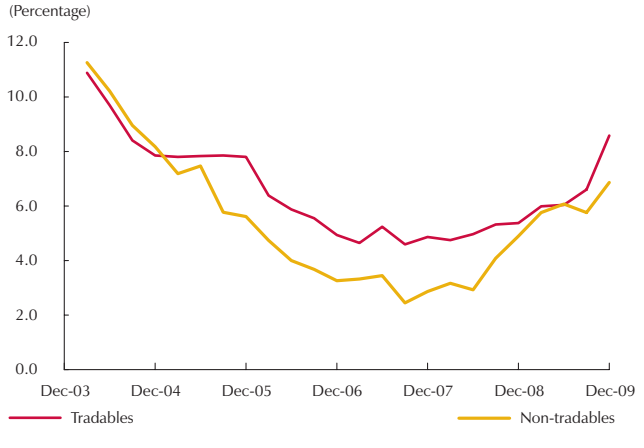
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 106
Commercial Loan Share, by Type of Sector



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 107
Loan Portfolio Quality Indicator, by Type of Sector



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

easily to the financial system; for example, via an increase in default, as occurred in the manufacturing sector in recent months.

Continuing with this analysis, it is interesting to look at how the risky portfolio behaves in terms of the different productive sectors (Graph 105). Generally speaking, there was an upward trend in the QI between July 2008 and December 2009. Agriculture still is the sector with the most deterioration (19.2%), although its share of the total portfolio is only 4.0%.

Manufacturing and real estate activities are among the sectors where the QI increased the most: 3 pp and 2.7 pp, respectively, between December 2008 and the same month in 2009. Together, these two sectors account for 37.7% of all commercial loans, which could explain much of the increase in the risky portfolio observed in recent months.

An aggregate analysis of the companies producing tradables and non-tradables shows the concentration begins to increase in 2009 (Graph 106). In fact, by December of that year, the share pertaining to the non-tradable sector had risen 8 pp to 60.7%. Moreover, contrary to what was observed during 2008, the gap between both these sectors widened.

As for the risky portfolio, Graph 107 shows the tradable sector was the one that suffered the most deterioration; its QI went from 5.4% in December 2008 to 8.6% one year later. However, its share of the commercial loan portfolio is relatively small (39,3%). Accordingly, one can say that the increase in the total risky portfolio is related more to the deterioration in loans in the non-tradable sector, since their QI increased by 2 pp.

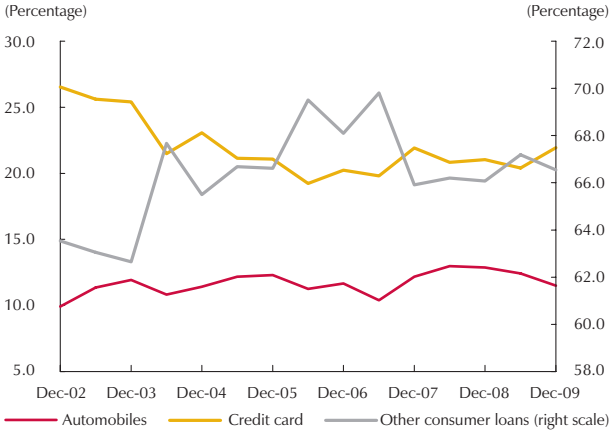
b. Consumer Loan Portfolio

There are three types of consumption loans: credit card, automobile and "other" consumer loans.[49]

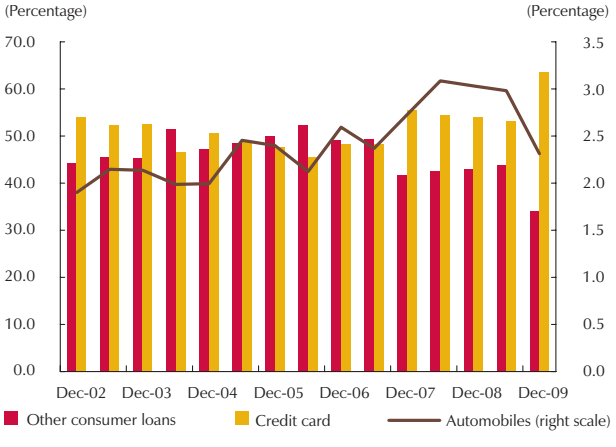
49 "Others" include free investment, revolving credit, overdrafts, portfolio purchase and school loans.

Graph 108

A. Percentage of the Amount of the Consumer Loan Portfolio, by Type



B. Percentage of the Number of Consumer Loan Transactions, by Type



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Each has its own characteristics in terms of average amount, average maturity, type of collateral and changes in quality. The characteristics of consumer loans and the risk profile for each type of consumer lending are described in this section.[50]

1. General Characteristics of Consumer Loans

By the end of 2009, credit cards accounted for 21.9% of the total consumer loan portfolio, while loans for automobiles and other private vehicles represented 11.5%. Other types of consumer loans accounted for 66.5% (Graph 108, Panel A). These proportions did not changed substantially during the year. At the close of 2009, the credit card portfolio came to COP$9,2 t, automobile loans totaled COP$4.8 t and other consumer lending came to COP$27.8 t, with 5.2%, -10.2% and 1.5% annual real growth, respectively.

There were 15.1 million consumer loans at December 2009. With respect to the share of all transactions for lending of this type, 63.5% are credit card loans, 2.3% are loans to purchase a vehicle and 34.2% are other types of consumer loans. As illustrated in Graph 108, Panel B, which shows the change in proportion with respect to the number of transactions, credit card loans increased sharply during the second half of 2009, thanks to the growing number of new accounts (this increase came to 10.4 pp.).

The average amounts on loan differ according to the various types of lending, given their different uses and features. In December 2009, the average amount of debt to purchase a vehicle was COP$13.8 m, while the average amount on credit cards and for other types of consumer lending was COP$1.0 m and COP $5.4 m per transaction, in that order (Table 16). The annual real increase in average amounts per type of lending was -4.8%, -28.4% and 3.0% for automobiles, credit cards and other consumer loans, respectively. Despite a significant drop in the average amount for credit card loans, the increase in the

50 The database used for this purpose has approximately 190 million entries between March 2002 and December 2009, and includes every consumer loan transaction. A number of institutions did not report data for 2002 and 2003, which creates a discrepancy. For example, this database shows 10% fewer consumer loans in those years, compared to the total consumer loan portfolio during that period. However, as of 2004, the discrepancy is less than 7% in each quarter, except during the third quarter of 2007, when there was a discrepancy of close to 10%.

Table 16
Average Amount of Debt, by Type of Loan
(Millions of Pesos) December Each Year

Date	Automobiles	Credit Card	Other Consumer Loans	Total Consumer Lending
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

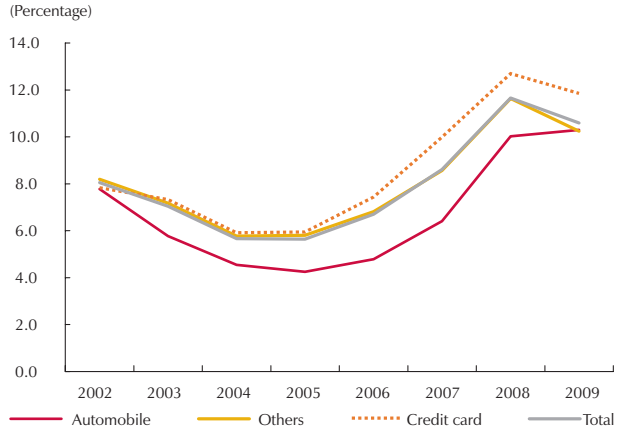
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

number of credit card loans surpassed that decline. One possible explanation for this contraction is an apparent substitution of credit cards for other types of consumer lending.

2. Credit Risk and Loan Portfolio Quality

Graph 109 shows the loan portfolio quality indicator for the different types of consumer lending. The data at December 2009 reflects a break in the upward trend observed in the loan portfolio quality indicator since 2005 for all types of consumer loans. However, the QI for automobile loans continues to grow, although less so than during the last three years. Consequently, between December 2008 and December 2009, one sees an improvement in this indicator for both credit card loans and other consumer lending: 11.8% and 10.2%, respectively, by the end of the period. The QI for automobile loans worsened slightly during the period in question. As usual, the credit card QI is higher than the QI for consumer lending as a whole (10.6%), because credit card loans have no collateral and the policies for giving out new cards are normally not as strict as for other types of consumer lending.

Graph 109
Loan Portfolio Quality Indicator, by Type of Consumer Lending: Risky Portfolio/Gross Portfolio



Note: At December each year
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Quarterly transition matrices were calculated for the total consumer loan portfolio to provide a more detailed look at how credit risk has evolved. The average transition matrices between 2002 and 2009 are shown in Table 17 (Panel A), along with the transition matrix at December 2009 (Panel B). The elements on the diagonal show the persistence of loans in their category or rating. By the end of

Table 17
Transition Matrices for the Total Consumer Loan Portfolio (Percentage)

A. Average of the Transition Matrices between March 2002 and December 2009					
	A	B	C	D	E
A	95.2	2.9	1.2	0.6	0.1
B	46.9	25.4	8.7	18.1	0.8
C	25.6	11.1	16.2	45.0	2.1
D	13.6	4.9	5.7	29.9	45.9
E	5.9	1.4	1.6	3.6	87.5
B. Transition from 2009-III to 2009-IV					
	A	B	C	D	E
A	95.2	2.8	1.2	0.8	0.0
B	33.4	39.7	11.8	13.8	1.3
C	12.9	12.4	37.3	33.1	4.3
D	3.3	2.6	10.3	59.1	24.7
E	3.1	0.9	4.2	3.2	88.7

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

2009, persistence was high for the A-rated (94.4%), D (53.8%) and E (77.2%) portfolios. In the A-rated category, persistence is similar to the average for the sample and exceeds the persistence registered six months earlier (93,4%). This increased persistence in the A-rated category reflects less likelihood of migration from this category to more risky ones, which is consistent with the improved portfolio quality indicators on record.

The higher probabilities below the diagonal are associated with improvements in rating, while the percentages on the diagonal refer to the probability of moving to a lower category. When comparing the matrix for the fourth quarter of 2009 to the average matrix for the sample, on the one hand, and to the matrix for the second quarter of 2009, on the other, we see that despite continued migrations towards the more deteriorated part compared to the averages for the sample, they are better than the migrations registered six months earlier (see Table 19 in the last edition of the *Financial Stability Report* and Table 17 in this edition). In the fourth quarter of 2009, one sees lower probabilities than those in the second quarter of that year with respect to migrating from A, B and C to ratings that imply more risk (see the upper triangles), and higher probabilities of migrating up from category B (see the lower triangles).

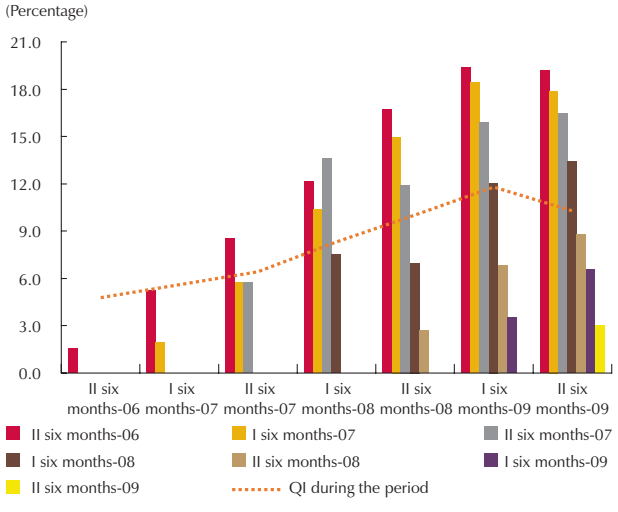
As was done for the commercial portfolio, the evolution of credit risk was analyzed for the different types of consumer lending based on harvests of borrowers. This analysis identifies, over time, the quality of the loans held by borrowers from the financial system in a given half-year period (harvest), making it possible to distinguish the risk profiles of new loans compared to old

ones. This is essential to determining whether or not the current dynamics of the portfolio are based on a more flexible or stricter selection process used by financial institutions to allocate new loans.

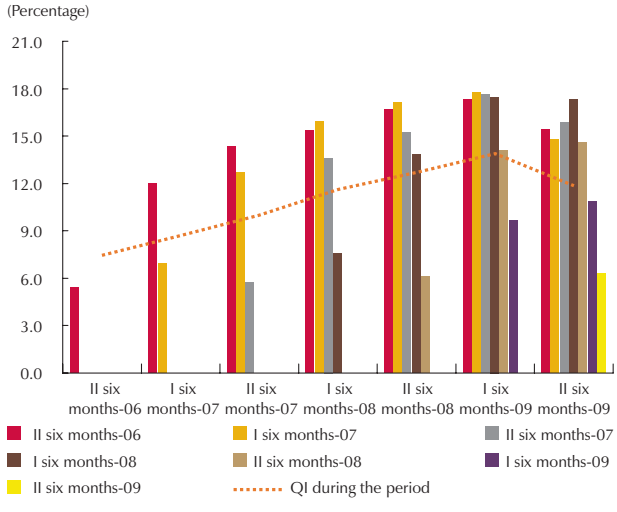
Graph 110 shows the quality of the loan portfolio according to the harvests and the different types of consumer lending.[51] As illustrated in the panels in Graph

Graph 110
Consumer Loan Portfolio Quality Indicator, by Harvests

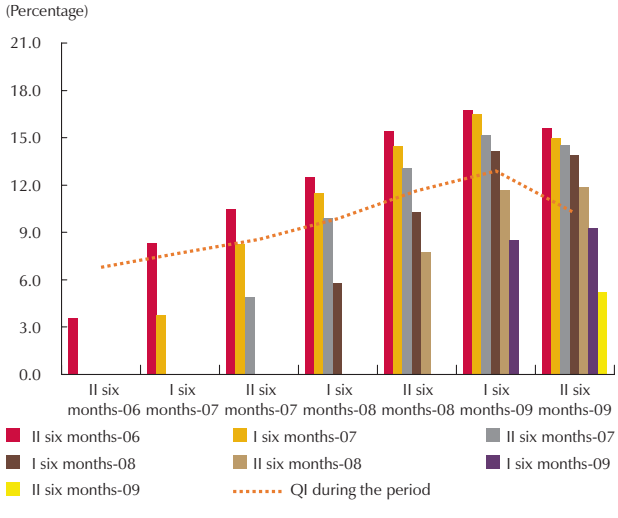
A. Automobiles



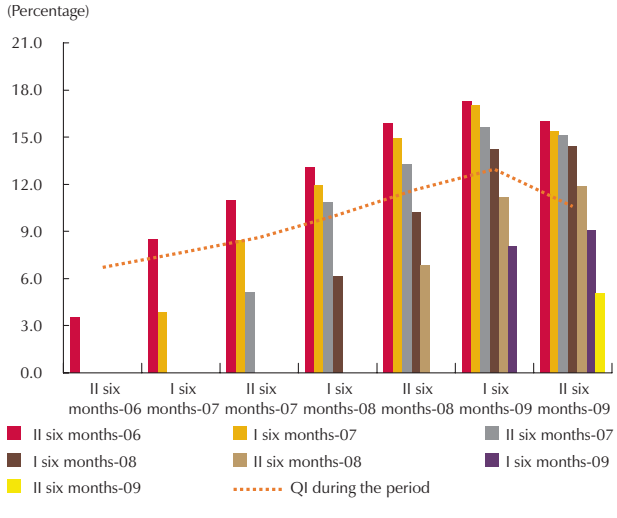
B. Credit Cards



C. Other Consumer Loans



D. Total Consumer Lending



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

51 The "harvest" graphs are to be read as follows. The horizontal scale shows the assessment of the harvest during the six-month evaluation period. The colors of the bars are related to each "harvest". The line indicates the quality of the total portfolio for each type of loan in each period. When analyzing the quality of a "harvest" several half-year periods after the harvest is issued, it is important to remember that the riskiest loans account for a larger share of the balance outstanding. However, that bias is common to all the "harvests" and, for that reason, they can be compared to one another.

110, the portfolio quality indicators for new loans had improved by the end of 2009 for all types of consumer lending. In effect, the QI for new loans in the second half of 2009 is 3.0% for automobile loans, 6.3% for credit cards and 5.2% for other consumer lending. These numbers are less than those registered in June 2009 harvests.

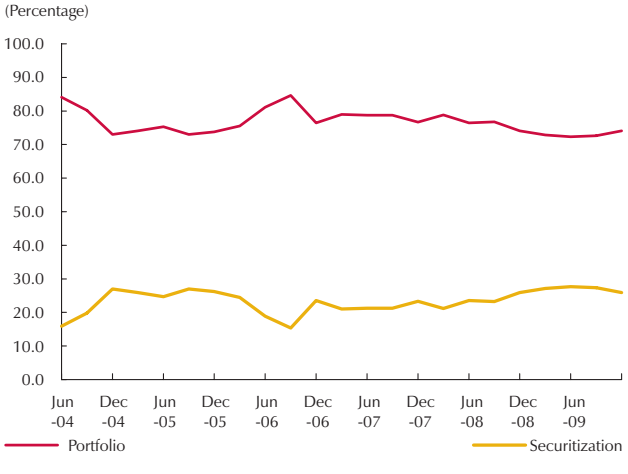
Panel A in Graph 110 reflects the performance of the automobile loan portfolio. In addition to the aforementioned improvement in the new harvest, one sees the pace of deterioration in previous harvests has declined compared to the pace registered in the last two editions of this report. This favorable performance for the risk indicators is duplicated in the portfolios for credit cards and other consumer loans (panels B and C in Graph 110), and is part of the reason for the overall improvement in loan portfolio quality indicators.

Panel D in Graph 110 shows the aggregate performance of the consumer loan harvests. As a whole, the new loans in the second half of the year had an QI of 5.1%, which is 3.0 pp less than the QI registered for the new harvest six months earlier. This outcome is consistent with the improvement in standards for allocating consumer loans and with the increased demand for new loans, as reflected in the December 2009 edition of the RSCC. It is worth noting that this generalized improvement in the harvests of different types of loans occurred even prior to a scenario of near-zero economic growth. If the economy continues to recover, the consumer loan harvest can be expected to continue to improve, since these loans are extremely sensitive to the economic cycle.

c. Mortgage Loan Portfolio

1. Credit Risk

Graph 111
Elements of the Mortgage Loan Portfolio, by Portfolio and Securitization



Sources: Superintendencia Financiera de Colombia and Titularizadora Colombiana; calculations by Banco de la República.

Contrary to the information provided in the last edition of this report, the share of the total mortgage loan portfolio pertaining to securitizations decline and accounted for 25.9% in December 2009, which is 1.8 percentage points less than the proportion registered six months earlier (Graph 111). This implies a change in the upward trend exhibited by this share of the portfolio and, because portfolio securitizations are not included on bank balance sheets, it leads to increased exposure to credit risk for the portfolio mortgage. In fact, during the last half of 2009, the outstanding mortgage portfolio grew by 6.3%, while the balance for securitizations fell 1.2%.

Moreover, when analyzing the mortgage loan portfolio by ratings, one sees the QI declined during

Graph 112
Share of the Risky Portfolio, by Ratings

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

the second half of 2009 due to fewer B, C and D-rated loans as a portion of the total. However, the percentage of E-rated loans was higher in December 2009 than it was six months earlier (Graph 112).

The transition matrix reflects the reduction in the QI, given that the frequency of migrating to a better rating between one period and another was greater in December 2009 compared to the average for the last three years. However, in keeping with what was mentioned earlier, the percentage of loans that migrated from an E rating to a better one declined during the last quarter of 2009 (Table 18).

As illustrated in Graph 113, which shows the QI by mortgage loan harvest, the credit risk posed by loans allocated during the second half of 2009 is similar to what it was for the harvest during the same period the year before. It is important to look at the deterioration in the harvest corresponding to the second half of 2007; the most recent analysis shows its QI increased to a level similar to that of the harvest in the second half of 2006.

Table 18
Transition Matrices for the Total Mortgage Loan Portfolio
(Percentage)

	a. Average 2007-2009						b. December 2009				
	A	B	C	D	E		A	B	C	D	E
A	96.2	3.6	0.1	0.0	0.0	A	97.1	2.8	0.1	0.0	0.0
B	31.0	50.2	17.9	0.4	0.5	B	34.1	46.7	18.3	0.5	0.4
C	14.3	7.6	60.8	16.3	0.9	C	16.9	8.7	57.1	16.4	0.8
D	8.5	2.3	5.4	56.2	27.8	D	10.5	2.3	6.8	56.3	24.2
E	4.8	1.2	1.7	2.9	89.4	E	3.6	1.2	1.5	3.9	89.8

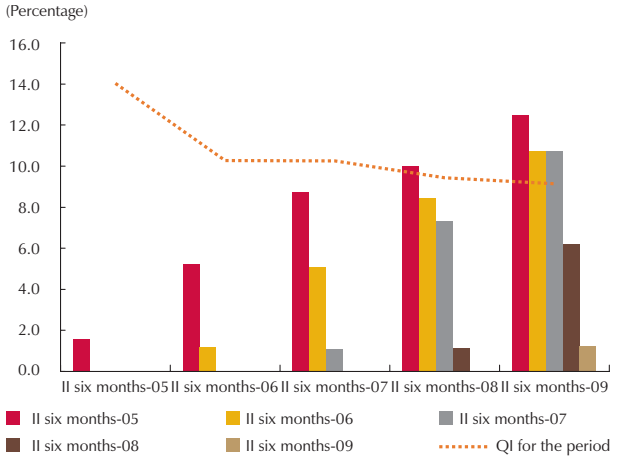
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

In short, during the second half of 2009, financial institutions were less exposed to credit risk stemming from the mortgage loan portfolio. However, the decline in the securitized portion of that portfolio offsets the drop in the QI. Moreover, the portfolio that poses the greatest risk (E-rated loans) increased as a share of the total, which means these loans will have to be monitored carefully.

2. Credit Risk Combined with the Consumer Loan Portfolio

The exposure of financial institutions to credit risk posed by agents with more than one type of loan is analyzed in this section. A database with borrowers who have both mortgage and consumer loans was constructed for that purpose,

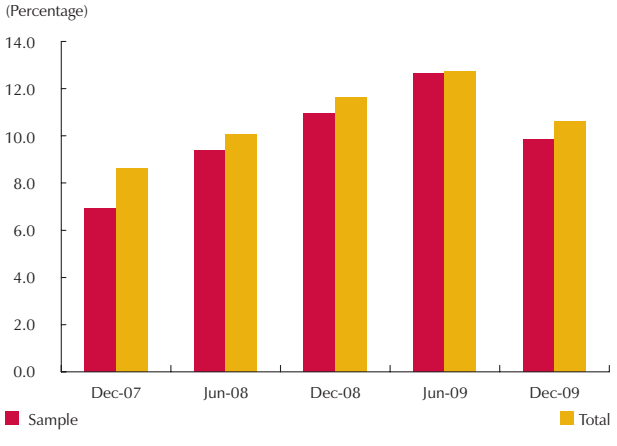
Graph 113
Analysis of Mortgage QI, by Harvests



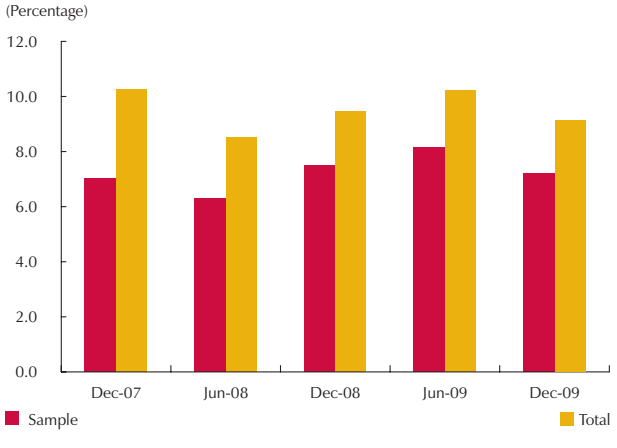
Source: Superintendencia Financiera de Colombia: calculations by Banco de la República.

Graph 114
QI Comparison between the Sample and the Total

A. Consumer Loan Portfolio



B. Mortgage Loan Portfolio



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

using half-year figures as of December 2007. By December 2009, borrowers with both types of loans represented 69.9% of all mortgage borrowers and their loans accounted for 78.8% of the total balance of this portfolio. The foregoing suggests that borrowers with both mortgage and consumer loans have contracted larger loans than those with only mortgage loans. The consumer loan portfolio shows a similar situation; however, these borrowers do not account for the bulk of the portfolio (11.1% of the principal and 6.9% of the number of borrowers).

When analyzing how each type of loan contributes to the risky loan portfolio, from a percentage standpoint, we see the indicator for the portfolio is less compared to the total QI for all the half-year periods taken into consideration. This suggests that borrowers with both types of loans are, on average, less risky than the borrowers as a whole in each of the portfolios. Moreover, the QI for the sample and for the portfolios as a whole declined during the second half of 2009. In the case of the consumer loan portfolio, there was a change in the upward trend witnessed in the indicator during the last two years, and the difference between the QI for the same and for the total widened (Graph 114).

d. Micro-loan Portfolio

The analysis presented in this section is based on the figures credit institutions report quarterly to the *Superintendent of Financial Institutions* concerning each micro-loan transaction. The respective database includes information on each micro-loan made between March 2002 and December 2009 and contains nearly 15 thousand entries.

Micro-lending is related directly to financing for micro-enterprises,[52, 53] which are defined as companies with no more than 10 employees or total

52 Law 100 of 1995, Chapter II.

53 Besides offering loans to micro-enterprises, this financial service also is directed to programs for Colombian artisans and the national plan to promote equal opportunities for women.

assets equal to less than 501 times the minimum monthly legal wage (SMMLV is the Spanish acronym)[54] In addition, there are certain restrictions on the total amount of financing micro-enterprises may receive from the Colombian financial system. As specified in Law 580 of 2000, the maximum amount per loan transaction may not exceed 25 SMMLV (COP$12.4 million at December 2009) and borrowing from the system may not exceed 120 SMMLV (COP$59.6 million at December 2009).

A look at the full amount of capital in the micro-loan portfolio (Table 19) shows it has increased steadily since 2002 and was equal to COP$3.8 t by December 2009. This amounts to 2.5% of the total for the portfolio, with a annual real increase of 22.0%. Although considerable, this growth is below the average for the period (33.9%). However, the number of borrowers in the micro-loan portfolio has grown in proportion, thanks to an average annual real increase of 34.1%, since the average amount per borrower has remained relatively constant and was COP$3.7 million in December 2009.

Table 19
Micro-loan Portfolio: Capital and Borrowers

Date	Balance[a/]	Borrowers				Average amount per borrower[a/]
		Number	Number Persons[b/]	Companies[c/]	Foreigners[d/]	
			(Percentage)			
Dec-02	516,716	136,506	99.51	0.43	0.06	3.79
Dec-03	685,535	190,872	99.29	0.64	0.06	3.59
Dec-04	1,073,575	272,868	99.30	0.64	0.06	3.93
Dec-05	1,524,231	398,892	99.52	0.43	0.05	3.82
Dec-06	1,955,540	540,209	99.63	0.32	0.05	3.62
Dec-07	2,173,897	631,161	99.71	0.24	0.05	3.44
Dec-08	3,146,814	897,340	99.64	0.29	0.06	3.51
Dec-09	3,839,127	1,037,664	99.55	0.39	0.06	3.70

a/ Balances in millions of December 2009 pesos.
b/ Borrowers identified by a Colombia citizen card, an identification card or a birth certificate.
c/ Borrowers identified by a Colombian tax number (NIT).
d/ Borrowers identified by a Colombian alien identification card, passport, diplomatic credential or foreign companies with no tax number (NIT) in Colombia.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

On the other hand, when looking look at the type of borrower to whom these loans are allocated, one sees that most are individuals (not companies). This is not to say that loans are not made to micro-enterprises, but that not all of them have a Colombian tax identification number (NIT). This is due to their structure, since the cost of formally establishing a company and the additional

54 Law 590 of 2000, Article 39. At December 2009, the total amount of assets came to COP$248.45 million.

requirements are high compared to the kinds of assets micro-enterprises possess.[55]

1. Micro-loan Portfolio Concentration

Table 20 shows the percentages of micro-loan operations in real pesos (December 2009). The median at the end of 2009 was COP$2.2 million, which is 8.2% less than the median registered a year earlier. This decline in loans in the 50th percentile has been steady since June 2005, in contrast to the growth in loans in the 95th percentile. For the last quarter of 2009, the value of the loans in this percentile was COP $11.4 m. This represents an increase of 17.2% compared to the value one year earlier, since the concentration in terms of the amount per borrower has increased considerably as of June 2005.

Table 20
Distribution of Amounts per Micro-loan Operation[a/]

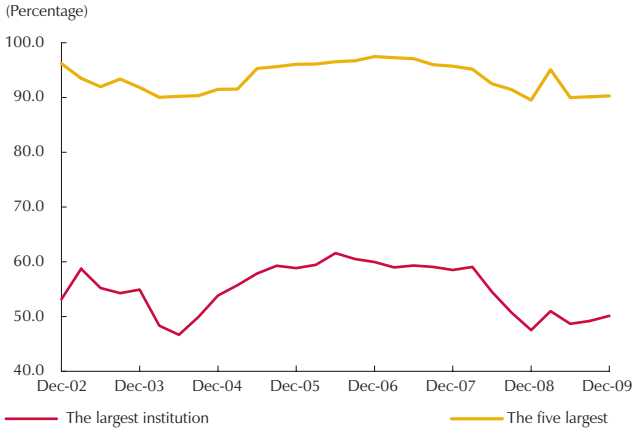
Date	5th Percentile	Lower Quartile	Median	Upper Quartile	95th Percentile
Jun-04	0.32	1.33	2.95	5.13	7.71
Dec-04	0.48	1.65	3.31	5.35	7.84
Jun-05	0.47	1.71	3.43	5.51	7.48
Dec-05	0.50	1.73	3.40	5.46	7.28
Jun-06	0.50	1.74	3.32	5.32	7.30
Dec-06	0.51	1.68	3.25	5.22	7.63
Jun-07	0.44	1.51	3.02	4.97	7.53
Dec-07	0.47	1.54	3.02	4.98	7.71
Jun-08	0.40	1.35	2.73	4.67	8.11
Dec-08	0.33	1.09	2.35	4.59	9.75
Jun-09	0.28	1.00	2.20	4.51	10.68
Dec-09	0.30	1.00	2.16	4.69	11.43

a/ Balances in millions of December 2009 pesos.
Source: Superintendent of Financial Institutions, calculations by Banco de la República.

When analyzing the level of concentration per institution, we see that one institution has more than half the loans and, by December 2009, had allocated 50.1% of the total amount of micro-loans (Graph 115). This level of concentration is, however, less than the average witnessed since June 2002 (55.2%). Moreover, when this indicator is analyzed for the five largest institutions, we see they accounted for 90.3% of these loans by the end of 2009, which is a high level of concentration, particularly considering that 23 financial institutions had allocated micro-loans by that date.

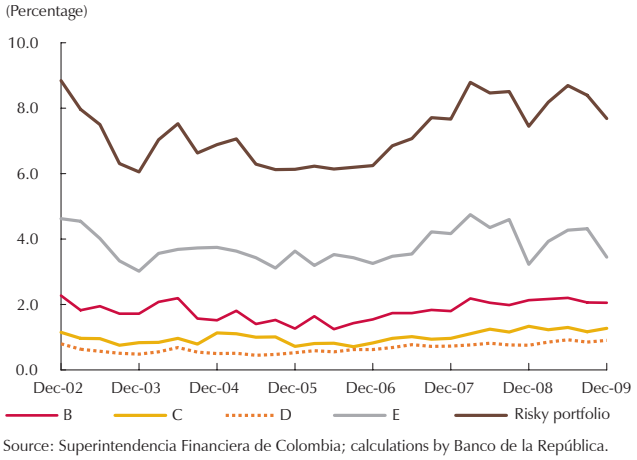
55 A company must be prepared to spend an average of COP$80,000 for each of the required registration procedures, such as the commercial registry, registration of by-laws, ledgers with balances and inventories, appointments and other procedures. Accordingly, to be legally constituted, a company must pay on average COP$400,000 a year to the Chamber of Commerce.

Graph 115
Concentration of Micro-loans in the Largest Institutions



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 116
Share of the Risky Loan Portfolio, by Ratings



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

2. Credit Risk

The quality indicator for the micro-loan portfolio and its components is shown in Graph 116. The QI for this type of lending was 7.7% at the end of 2009, which is 1.0 pp less than what it was in June of that year. The last half of 2009 witnessed a slight improvement in this indicator of credit risk, which reached its latest high in mid-2008 (8.8%).

The risky micro-loan portfolio is comprised primarily of E-rated loans. In the case of consumer, commercial and mortgage loans, the B-rated portfolio weighs the heaviest on the QI. This particular feature persists throughout the sample, as illustrated in Graph 116. By December 2009, 3.4% of all micro-loans were E-rated, while the B-rated loans accounted for 2.1% of the total.

The high number of E-rated micro-loans is explained by the migration characteristics of this portfolio, which can be understood better by analyzing the transition matrices. Table 21 shows the average matrices between 2004 and 2009 (Panel A), the transition matrix at June 2009 (Panel C), and the one in December of that same year (Panel C).

Even though the likelihood of migrating directly from A to E is low in the case of micro-loans (0.1% for the sample, on average), the likelihood of migrating from categories B, C and D to E during a quarter are significantly higher compared to other types of lending. For instance, 26.3% of the migration to an E-rating during the last quarter of 2009 was from the B category, 53.7% was from C, and 71.4% from D (Panel B, Table 21). Moreover, average persistence for the E-rated portfolio is high throughout the sample (95.8%), although it was less during the latest quarter analyzed (83.8%).

The highest probabilities below the diagonal of the matrices are associated with improvements in rating, while the numbers located in the upper triangle indicate the probabilities of a decline in rating. If the matrix for the fourth quarter of 2009 is compared to the average for the sample and to the matrix for the second quarter of 2009 (Panel C, Table 21), one sees that, although the situation with respect to migration shows more deterioration than the average for the sample, it has improved in the last six months.

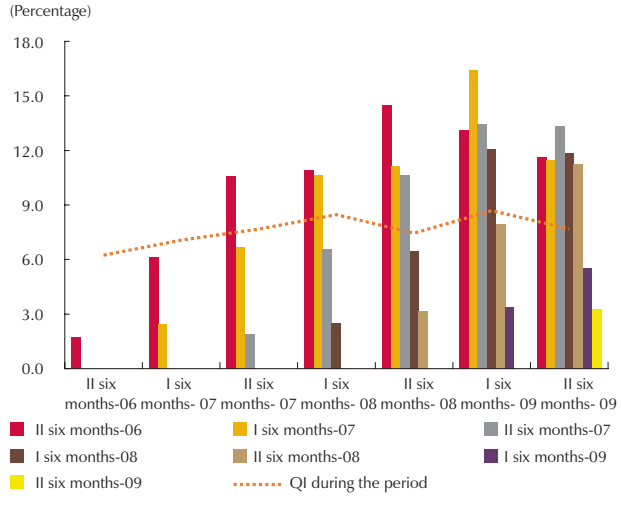
Table 21
Transition Matrices: Total Micro-loan Portfolio
(Percentage)

A. Average of the Transition Matrices between March 2004 and December 2009					
	A	**B**	**C**	**D**	**E**
A	96.4	1.9	0.9	0.6	0.1
B	30.4	22.7	10.5	8.1	28.3
C	13.6	5.3	16.9	8.3	55.9
D	7.4	2.2	2.1	13.6	74.8
E	2.9	0.5	0.4	0.5	95.8
B. Transition between 2009-III and 2009-IV					
	A	**B**	**C**	**D**	**E**
A	96.2	1.9	1.1	0.7	0.0
B	26.4	28.1	10.6	8.6	26.3
C	10.6	6.1	22.4	7.2	53.7
D	6.1	1.8	3.3	17.2	71.7
E	12.9	1.5	1.1	1.3	83.2
C. Transition between 2009-I and 2009-II					
	A	**B**	**C**	**D**	**E**
A	95.3	2.4	1.3	0.9	0.1
B	22.9	22.2	10.4	9.5	35.0
C	10.2	4.0	18.0	8.0	59.9
D	5.4	1.5	1.8	13.0	78.2
E	3.3	1.6	0.9	0.7	93.5

Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Finally, to understand the dynamics of credit risk, it is useful to take a close look at how the quality of the loan portfolio has evolved by breaking the sample up into harvests of micro-loan borrowers. This analysis allows us to monitor the QI for loans originating in each half-year period during a specific expanse of time and makes it easier to differentiate the risk profiles of new clients from those of old borrowers.

Graph 117
Analysis of Micro-loan Portfolio QI, by Harvests



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 117 shows the portfolio quality for each micro-loan harvest and for the total. The loans originating in the second half of 2009 did so with QI of 3.2%, which is 20 bp less than the QI registered for new loans six months earlier. Micro-loan harvests typically behave in a similar way, with little sensitivity to the economic cycle. Usually, they are born with a QI of more than 2,4% and less than 3.4%, which is duplicated afterwards, in the second six months of the life of the harvest, and peaks in the second year of life. After that point, it declines.

C. LIQUIDITY RISK

There are two dimensions or notions of liquidity risk widely discussed in literature. The first is the risk associated with the inability of an institution to cover its liquid liabilities on time, because it does not have enough liquid assets on hand. This is known as funding liquidity risk. The other is market liquidity risk, which is manifest when assets cannot be liquidated at an adequate price and at the right time.

Exercises to measure the liquidity risk associated with each of these dimensions or notions are presented in this section. Stress tests are included as well to analyze how sensitive the system is to extreme but unlikely scenarios of low liquidity. The section concludes with an analysis of the structure of the interbank market network.

1. Funding Liquidity Risk

The uncovered liability ratio (ULR) and the scaled liquidity risk indicator (LRI) are used to measure liquidity risk, taking advantage of the new information that has been available to the Superintendent of Financial Institutions ever since the liquidity risk management system took effect (SARL for the Spanish acronym).[56]

a. Uncovered Liability Ratio (ULR)

The uncovered liability ratio (ULR) is calculated as follows to measure the liquidity shortage financial institutions could face as a result of changes in terms or due dates.

$$ULR = \frac{LL + TrL - (LA - INS + \lambda\, INS)}{TA - LA}$$

56 See the September 2008 edition of the *Financial Stability Report* for a description of the SARL and the method used by the Financial Superintendence to calculate the LRI.

Where *LL* are liquid liabilities,[57] *TrL* is the temporary component of all other liabilities,[58] *INS* are tradable investments available for sale, *LA* are liquid assets[59] and *TA* are total assets.[60]

In this equation, the liabilities susceptible to redemption are comprised of the sum of *LL* and *TrL*..The support institutions have (in square brackets) is determined by: i) liquid assets other than tradable investments available for sale (*LA – INS*), and ii) tradable investments available for sale multiplied by a discount (λ).This discount means the value of *INS* - in terms of liquidity risk – is slightly less than its market value (λ<1).[61]

The ULR can be interpreted using the following table:

ULR	Reason	Liquidity Risk
Positive	$(TrL + LL) > [\lambda\ INS+(LA – INS)]$	Low
Zero	$(TrL + LL) = [\lambda\ INS+(LA – INS)]$	Medium
Negative	$(TrL + LL) < [\lambda\ INS+(LA – INS)]$	High

Graph 118 shows the recent evolution of the ULR, which was -14.7% at the close of 2009. The indicator is less than zero, which suggests low funding liquidity risk. However, it experienced a moderate amount of deterioration (1.1 pp) during the second half of 2009. Nevertheless, the ULR has remained relatively stable since the second quarter of 2009 and at levels that reflect more funding liquidity than during 2008 and 2007.

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57 Liquid liabilities include the following accounts: Banco de la República and other negotiated repo agreements, with time certificate and liability positions in money market operations and related transactions.

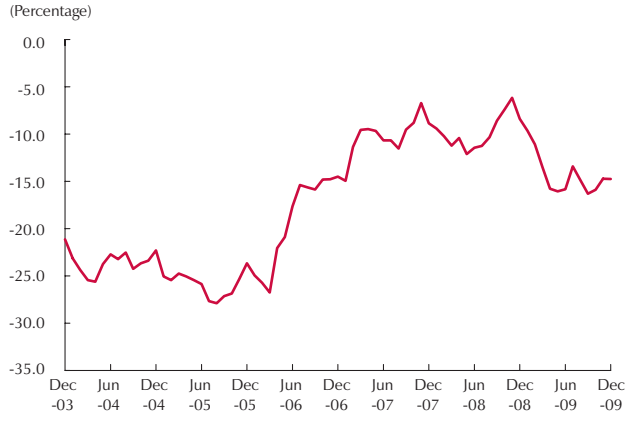
58 This component includes the following accounts: regular assets, real-value savings accounts, special savings accounts, real-value term deposits, documents payable, the centralized account, funds placed in trust and special accounts, banks and correspondents, bank collection services, affiliate establishments, bank current account deposits, term deposits, special deposits, investment instruments in circulation, collections made, simple deposits, banker's acceptances in circulation, bank loans and other financial obligations, inactive ordinary accounts and current liabilities for bank services, all calculated using a Hodrick and Prescott filter.

59 Includes the following accounts: liquid assets minus cash and Banco de la República, interbank funds sold, repos and tradable investments available for sale

60 The reserve requirement is not included in total assets, because the liquidity risk measurement presented in this section is limited to funding liquidity. The reserve requirement can be used to deal with systemic liquidity shocks, but not as a source of funding in normal situations.

61 λ is calculated as (1-haircut), where the haircut is the discount applied by Banco de la República to the value of credit institutions' portfolios in their repo operations. Consequently, the information on haircuts can be used to calculate the value of the tradable investment portfolio discounted for repo operations.

Graph 118
ULR of Credit Institutions



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

The decline in the ULR as of November 2008, when it was -5.8%, is explained by the added investment in government bonds. Although they raise market risk (see Section A in this chapter on market risk),they improve the situation in terms of funding liquidity risk.

b. Liquidity Risk Indicator (LRI)

The LRI is a short-term liquidity gap calculated for seven, 15 and 30-day horizons, The Financial Superintendence introduced this indicator in Colombia when the liquidity risk management system took effect (SARL) in the first half of 2009.

For a one-week horizon, the LRI formula is equal to the sum of market-liquidity-adjusted liquid assets (MLA) and the net liquidity requirement (NLR), estimated for the first time range.

$$LRI_1 = MLA + RNL_1$$

Where $LNR_1 = FNVC_1 + FNVNC_1$, with $FNVC_1$ as the net cash flow from the contractual maturity of assets, liabilities and off-balance sheet positions in the following seven calendar days and $FNVNC_1$ is the net cash flow estimated for the next seven days from sight deposits and liabilities that do not pertain to contractual maturities. The *FNVC* can be positive or negative, depending on whether cash income exceeds outlays, but the *FNVNC* has a negative sign.

$$FNVNC_1 = -frn_1 \times [\textit{demand deposits and sight instruments to date}]$$

Where *frn*1 is the net withdrawal factor for a seven-day horizon, calculated as the maximum percentage of net reduction in the sum of demand deposits 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 estimate of a stressed withdrawal scenario.

On the other hand, market-liquidity-adjusted liquid assets (MLA) are calculated with the following equation, where securities are entered at fair market price:

$$\textit{MLA} = \textit{quick assets} + (\textit{bonds issued by the national government, Banco de la República, Fogafín}) \times (1 - \textit{haircut TES}) + (\textit{all other securities}) \times (1 - 1,2 \times \textit{haircut TES}) - (\textit{total required daily average reserve})$$

When calculating the LRI , an additional 3.7% haircut is applied to the foreign currency component of the institution's liquid assets. Besides

including the adjustment for market liquidity risk, the ideas is to do the same for exchange risk.

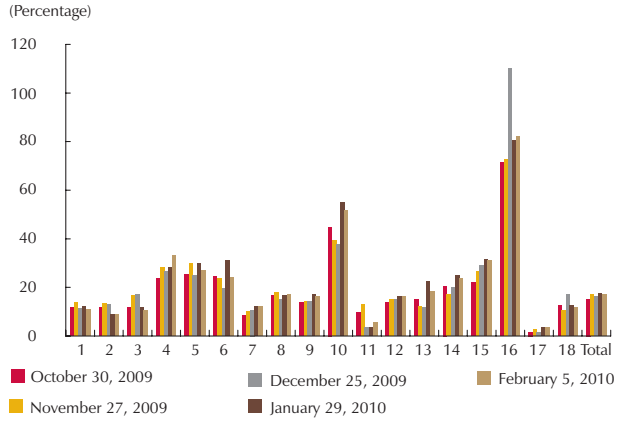
In addition, this indicator is scaled by liquid assets to permit a comparison among the different financial institutions; that is:

$$\widehat{LRI}_{1t} = \frac{LRI_{it}}{TA_{it} - MLA_{it}}$$

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

Because the *LRI* is the liquidity gap calculated on the basis of "liquid assets minus liquid obligations and liabilities," $\widehat{LRI}_{1t}<0$ implies high risk, and higher $\widehat{LRI}_{1t}$ are associated with a better liquidity situation for the institution in question.

Graph 119
LRI/(TA-LA) Banks



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 119 shows how the *LRI* for commercial banks has evolved, taking into account the last week of each month from October 30, 2009 to February 5, 2010. Although there is considerable variation in the liquidity levels of these institutions, in no case was the indicator negative. This suggests that funding liquidity risk for the institutions in question is low.

The *LRI* for commercial banks as a whole was 17% at February 5, which is 1 pp more than it was at the end of December and 4 pp more than the ratio observed in the last week a year earlier. This indicates the funding liquidity position has improved in recent months.

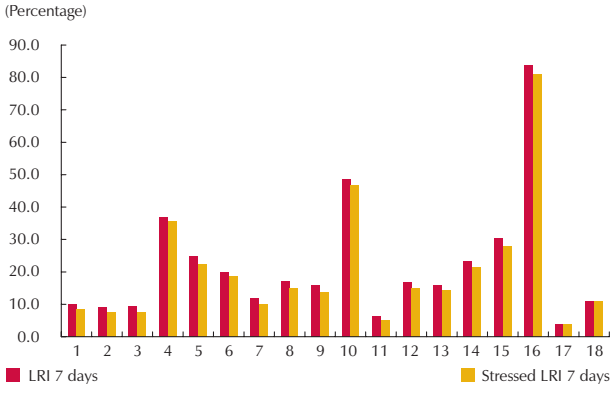
Stress Test

Stress tests can be used to assess the capacity of institutions to respond to shocks to certain variables in extreme but highly unlikely scenarios. The following test was performed in a deposit-withdrawal scenario, additional to the one already incorporated by the LRI. The stressed indicator was calculated for the commercial banks and is defined as:

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

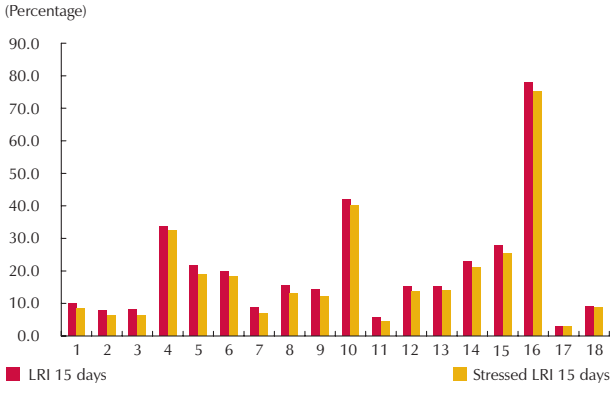
Using the latest data for $LRI_{i,t}$, (seven days), the stress scenario for banks was calculated assuming that $x = 4\%$. All the banks considered in the analysis were affected only slightly in the stress test, which suggests the system is resistant to withdrawal shocks (Graph 120).

Graph 120
Stress Test for LRI7/(TA-LA), February 5, 2010



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Graph 121
Stress Test for LRI5/(TA-LA), February 5, 2010



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

In contrast to what was noted in the last edition of this report, two banks experienced an important deterioration in their indicator during the second half of 2009, when the stress tests were applied ($\widehat{LRI}_{i,t\ stressed} < 0$); nevertheless, they have recovered considerably since then.

To simulate a withdrawal shock in the second week, the same stress test was performed with the *LRI* ratio at fifteen days. This scenario also assumed $x = 4\%$. The results point to resistance by all banks in a broader forecast window, with a positive $\widehat{LRI}_{i,t\ stressed}$ for each of them (Graph 121).

2. Liquidity-adjusted Value at Risk (L-VaR): A Market Liquidity Risk Indicator[62]

L-VaR can be used to determine by what percentage VaR estimates would have to increase to include liquidity considerations. The larger this percentage is, the greater the market liquidity risk and, therefore, the greater the necessary adjustment in VaR.[63] The results of the L-VaR estimated for credit institutions are presented in this section. The exercise focused only on their TES portfolio with data at February 19, 2010 (Table 22).

The results suggest the VaR for credit institutions as a whole should increase by 9.6% to include market liquidity risk. This figure is 4.1 pp higher than the one registered six month earlier, denoting an increase in the system's market liquidity risk. It is important to point out that this percentage of adjustment is less than what it was during 2007 and 2008. The increase in market liquidity risk is explained by the shift in the make-up of the portfolio towards ranges with a larger bid-ask-spread (BAS)[64] even though BAS volatility declined during the last semester.

62 The method used to calculate L-VaR is outlined in González and Osorio (2007), "El valor en riesgo ajustado por liquidez en Colombia" Financial Stability Report, Banco de la República, March 2007.

63 Due to limited information on bid-ask spreads for government bonds, the VaR calculated in this exercise differs from the one presented in the section on market risk.

64 BAS is a measure of the distance between the points registered for bid and for purchase of a security. A larger BAS is associated with more liquidity risk, as it indicates difficulty for a transaction to occur.

Table 22
Market Liquidity Risk: L-VaR
Percentage Correction

Institutions	August 21, 2009		February 19, 2010	
	No volatility	Volatile scenario [a/]	No volatility	Volatile scenario[a/]
1	16.6	17.0	12.3	13.2
2	4.7	24.4	9.4	20.9
3	9.6	31.6	6.4	21.8
4	1.9	21.4	5.8	13.5
5	15.9	24.0	10.3	25.3
6	4.0	41.2	15.9	22.1
7	5.8	24.2	10.7	26.4
8	7.6	33.4	13.1	20.3
9	1.8	31.0	17.7	24.8
10	4.5	41.7	8.1	28.1
11	16.8	11.4	16.2	21.3
12	10.2	32.4	12.6	23.1
13	2.0	22.1	8.0	13.6
14	2.8	29.6	8.0	28.5
15	3.9	30.4	13.2	21.4
16	5.7	32.9	12.1	18.8
Total	5.8	31.1	9.6	22.4

a/ According to volatility in the second quarter of 2006.
Source: Banco de la República.

The dispersion of the results per institution between August 21, 2009 and February 19, 2010 reflects a similar level of exposure to market risk liquidity for these institutions. The recent increase in these levels of exposure underscores the importance of continuing to monitor market conditions and the liquidity of the securities frequently use by institutions to manage their funding needs.

A stress test also was done to assess how the adjustment for liquidity behaves under extremely illiquid market conditions. This scenario simulates market performance akin to that observed during the first quarter of 2006, a time of high and extremely volatile bid-ask-spreads for all ranges. In this case, the percentage of adjustment for liquidity would be 22.4%, which is 8.7 pp less than the percentage registered on August 21, 2009. The current composition of the portfolio shows the system is more resistant to an adverse liquidity shock such as the one experienced in 2006, which was particularly hard on the ranges that are now the most liquid.

3. Interbank Market for Government Bonds: Structure of the Network

Financial institutions now manage much of their liquidity through repos operations for government bonds, which can be negotiated through two trading systems. One is the Colombian Electronic Market (MEC in Spanish), managed

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

The networks comprised of institutions (nodes) and the transactions among them (arches) are analyzed to determine the pattern of the performance of financial institutions in the interbank market for government bonds (TES).[6565]

Graph 122 shows the SEN structure on each Friday from January 29 to February 19, 2010, taking only collateralized transactions between commercial banks into account. As illustrated, the network was not complete on January 29 and February 12, which is contrary to the situation observed on the other two dates. One can see persistence during the month of February in terms of the net supply and demand for liquidity with respect to the performance of banks.

To analyze the role the different institutions play within the current structure of the government bond market, we also examined the structure of this market in MEC at January 29, 2010. However, since 835 institutions participated on that date, we took a sample of the transactions conducted by 30 institutions that were considered most representative of the market, given the amount of their transactions. The transactions conducted on that day among the institutions in the sample came to COP$1.5 t and accounted for 38% of the total amount traded through MEC (COP$4.4 t). The sample includes 16 banks, 11 brokerage firms, one financial corporation, a life insurance company and a trust company.

A comparison between the number of connections made and the number of possible connections among the institutions in the sample shows that only 24.9% were carried out. This is a low figure with respect to the findings for SEN (more than 80% connection) and reflects the low level of connectivity in MEC.

Graph 123 shows the structure of the MEC-managed government bond market on January 29, 2010. The color of the arches changes with respect to the amount traded between each pair of institutions, while the color of the nodes differs according to each agent's net position, with the lighter colors denoting the net suppliers of liquidity. Each institution's position within the network represents the extent of its connectivity. Intermediaries with a high degree of connectivity are found in the central part of the network, while those with a low degree of connectivity are on the periphery.

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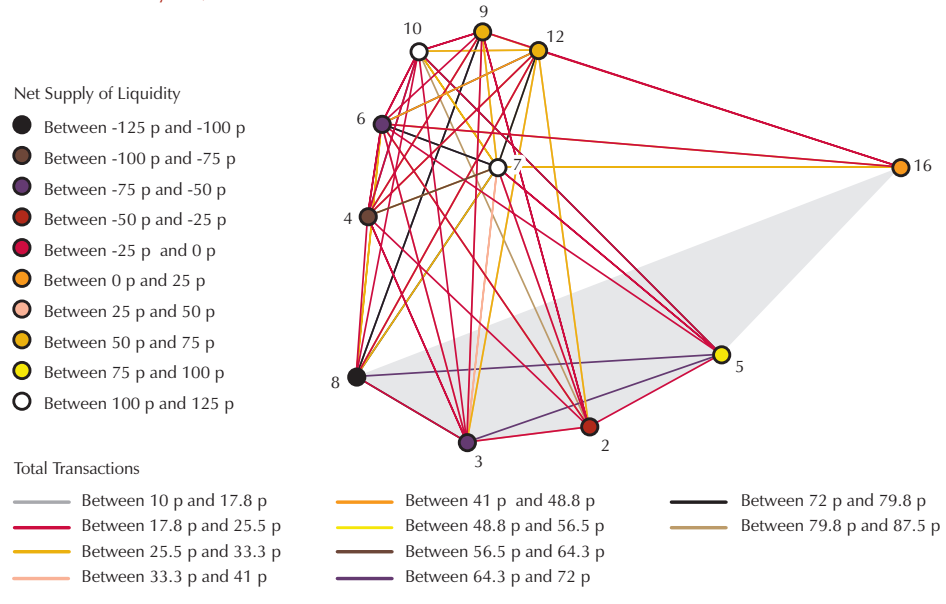
65 1) The transactions between agents participating in SEN and MEC were used, with information on repo and simultaneous operations. 2)The centrality indexes described in Saade (2008) also were employed to assign them a radius in the network: the more central agents are situated at the hub of the network, while the more peripheral ones are located at a greater radius. According to the centrality index, the peripheral agents are shown within a dark gray zone. 3) The color of each node depends on the extent to which an agent is a net supplier or provider of liquidity during the day. The lighter-colored nodes represent the larger suppliers of liquidity, while the darker nodes are the agents most in need of liquidity. 4) A line between nodes indicates there were transactions between the agents. The color of the line indicates, in an absolute value, the sum of the transactions back and forth. The bars at the bottom of the figure describe the colors associated with the different amounts.

Brokerage firms are the central-most institutions in the MEC network , given their high number of connections. Only three of the banks that participate in MEC approach the extend of connection enjoyed by the most connected brokerage firms. In fact, banks have few connections within MEC, although their transactions are of high value relative to the market.

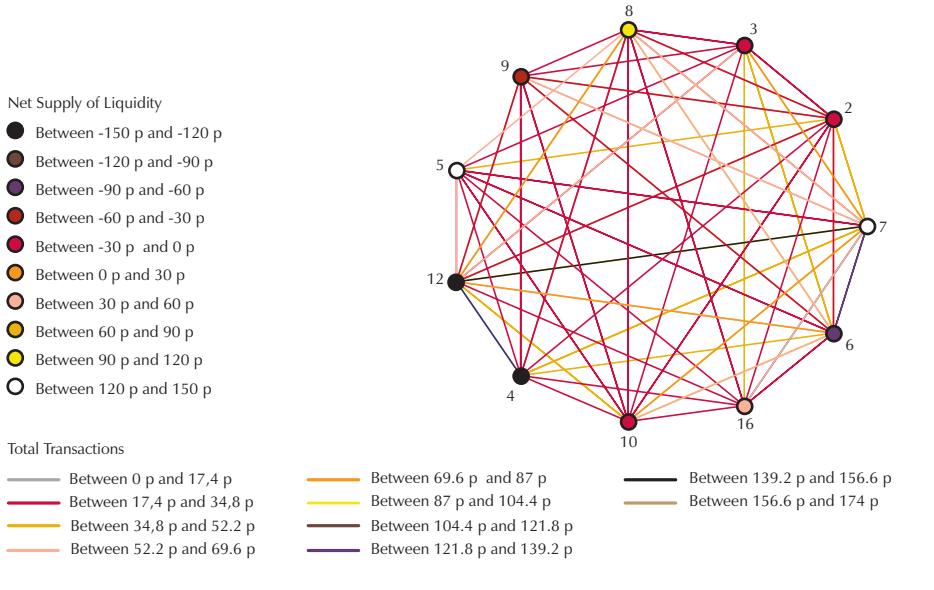
Compared to the structure of SEN for the same day, the banks persist in their net positions as net suppliers or consumers of liquidity (Graph 122).

Graph 122
SEN Structure

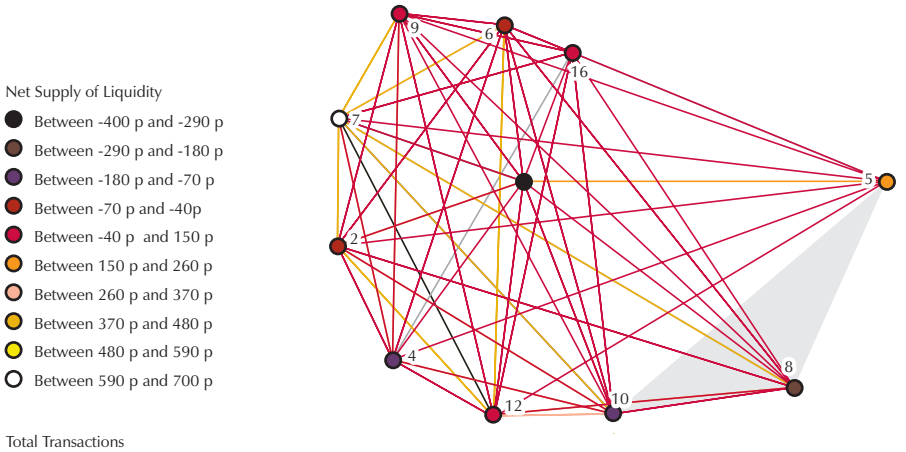
A. January 29, 2010



B. February 5, 2010



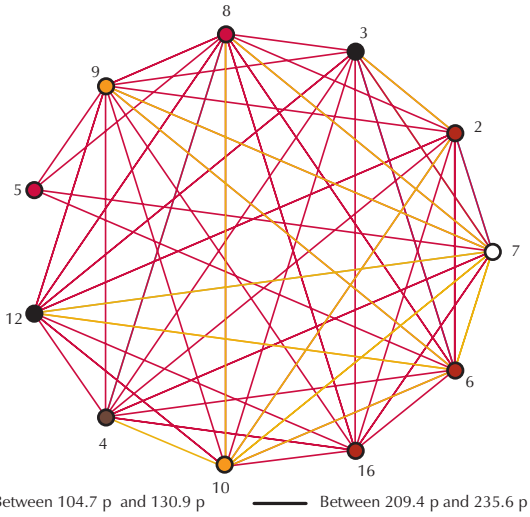
C. February 12, 2010



Net Supply of Liquidity
- Between -400 p and -290 p
- Between -290 p and -180 p
- Between -180 p and -70 p
- Between -70 p and -40p
- Between -40 p and 150 p
- Between 150 p and 260 p
- Between 260 p and 370 p
- Between 370 p and 480 p
- Between 480 p and 590 p
- Between 590 p and 700 p

Total Transactions
- Between 1 p and 33.3 p
- Between 33.3 p and 65.7 p
- Between 65.7 p and 98 p
- Between 98 p and 130.4 p
- Between130.4 p and 162.7 p
- Between 162.7 p and 195.1 p
- Between 195.1 p and 227.4 p
- Between 227.4 p and 259.8 p
- Between 259.8 p and 292.1 p
- Between 292.1 p and 324.5 p

D. February 19, 2010



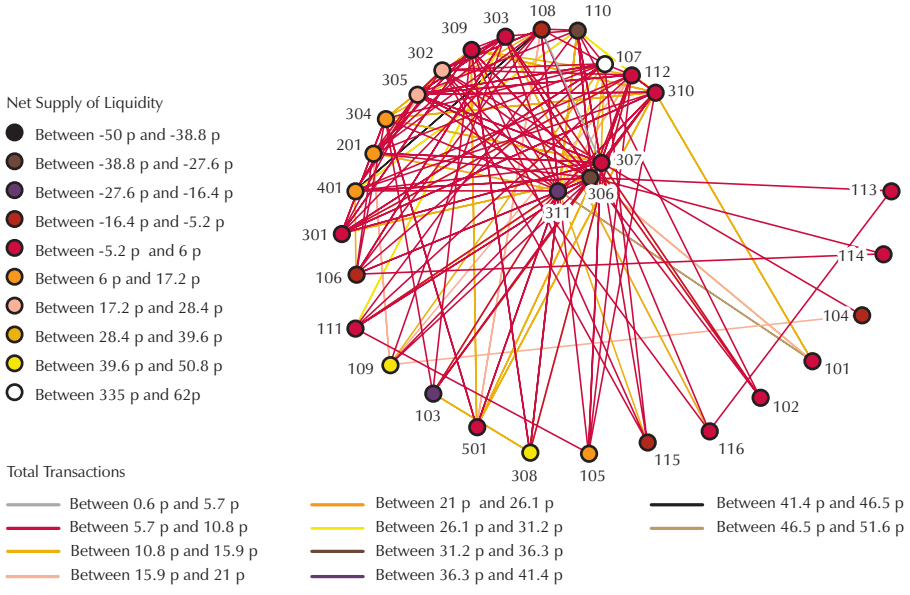
Net Supply of Liquidity
- Between -250 p and -185 p
- Between -185 p and -120 p
- Between -120 p and -55 p
- Between -55 p and 10p
- Between 10 p and 75 p
- Between 75 p and 140 p
- Between 140 p and 205 p
- Between 205 p and 270 p
- Between 270 p and 335 p
- Between 335 p and 400 p

Total Transactions
- Between 0 p and 26.2 p
- Between 26.2 p and 52.4 p
- Between 52.4 p and 78.5 p
- Between 78.5 p and 104.7 p
- Between 104.7 p and 130.9 p
- Between 130.9 p and 157 p
- Between 157 p and 183.2 p
- Between 183.2 p and 209.4 p
- Between 209.4 p and 235.6 p
- Between 235.6 p and 261.7 p

Right scale: Extent, in pesos, to which an agent was a net supplier of liquidity. This is shown graphically by the size and color of the node.
Lower scale: Total sum of transactions among the institutions in question. Shown graphically by the color of the lines. The dark grey area denotes the set of peripheral banks on that day, if any.
Source: Banco de la República.

According to the literature, the extent to which an interbank market is able to liquidity shocks depends on its structure. Complete interbank markets are more robust and allow risk to be distributed among the participating agents in the best possible way compared to incomplete markets.

Graph 123
MEC Structure – January 29, 2010



Notes:
Right scale: Extent to which an agent was a net supplier of liquidity on that day. This is shown graphically by the size and color of the node.
Lower scale: Sum of all transactions among the institutions in question; shown graphically by the color of the lines.
Dark grey area: Agents peripheral to the network on that day
Legend: Banks start with 1; financial corporations, with 2; brokerage firms, with 3; insurance companies, with 4 and trust companies, with 5.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

D. COMBINED RISK ANALYSIS: FINANCIAL STABILITY MAP

In terms of financial stability, it is important that the different kinds of risks be monitored continuously, along with the profitability and capital adequacy ratios of financial intermediaries and the macroeconomic conditions they face.

A financial stability map (FSM) was developed for this edition of the *Financial Stability Report* to measure the stability of the financial system on the basis of six aspects or dimensions. Three are related to current risk conditions, two deal with the macroeconomic environment and one is associated with the financial soundness and profitability of the system. The method used ranks the risk situation on a scale of one to nine, with one being the lowest level of risk. The model is designed to provide an indicator of the current situation in the financial system and should not be interpreted as an early warning indicator.[66]

66 The method used to construct the FSM is based on the IMF Global Financial Stability Map and on the Financial Stability Cobweb of the Central Bank of New Zealand.

As mentioned earlier in this report, specifically in the section on liquidity risk, the interbank market plays a very important role in redistributing liquid resources. Institutions use the interbank market to sell or purchase new positions in government bonds (they will sell when they need liquidity and buy when they offer it). As a result, the proper functioning of this market is crucial to managing the liquidity risk facing each institution faces.

The results of the model proposed by Estrada and Morales (2008)[1] are presented in this section. It simulates how the flow in the arches could be affected by unexpected liquidity shocks to the nodes in the network. The model makes it possible to assess how robust the government bond market is during a particular period of time.

In this model, the risk of contagion is defined as the risk of an institution not being able to obtain enough liquidity on the interbank market, due to unexpected shocks affecting the institutions offering liquidity.

Given this definition, institutions with less of a liquidity gap are more exposed to risk of contagion. In other words, they will depend less on positive flows from the interbank market.

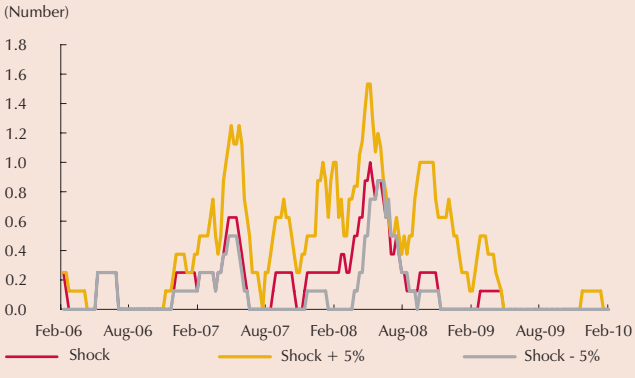
This being the case, it is important that institutions have a measure of the likelihood of obtaining liquid resources on the interbank market. In short, they must have a notion of the strength of that market under stressed conditions.

Two of the measures proposed by the aforementioned authors are: i) the number of institutions whose demand for liquidity is not met entirely, due to shocks facing other institutions; and ii) the number of institutions that reduce their offer of liquidity when confronted by unexpected shocks.

Presented below are the result for three scenarios. The first uses, as an initial shock, the highest percentage of savings and checking account withdrawals in the history of each bank. The second uses a shock equivalent to the sum of the highest percentage, plus 5%, while the third features a shock equivalent to the highest percentage, minus 5%. Although these scenarios are extreme, they are plausible. The model is simulated for each Friday during the period from January 2006 to February 2010. The reported statistics are calculated based on the average of a total of 1,000 simulations for each day.

Graph A shows the average number of institutions whose demand for liquidity was not met entirely, due to shocks passed on via a decline in the supply of liquidity. As one can see, the highest levels of contagion occurred during mid-2007 and 2008. By 2009 and so far during 2010, the risk of contagion is low. In other words, it is highly probable that institutions will be able to satisfy their demand for liquidity on the interbank market.

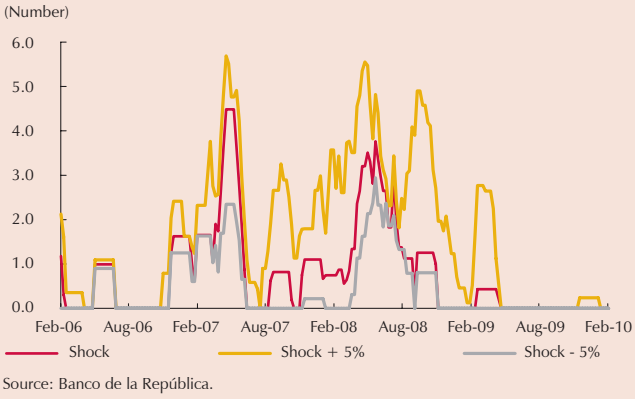
Graph A
Number Of Institutions Whose Demand For Liquidity Was Not Satisfied Entirely. Eight-week Moving Average



Source: Banco de la República.

The number of institutions that cease to offer all or part of the liquidity they would offer in the absence of shocks is shown in Graph B. As illustrated, this number also has declined as of last year. Hence, it is possible to conclude that institutions have expanded their liquidity gaps, thereby reducing their vulnerability to eventual distortions in the interbank market.

Graph B
Number Of Institutions Offering Less Liquidity Than They Would In The Absence Of Shocks. Eight-week Moving Average



Source: Banco de la República.

1 Estrada, D. and P. Morales (2008), "La estructura del mercado interbancario y del riesgo de contagio en Colombia" in "Financial Stability Issues," Financial Stability Report, March 2008.

1. Design of the Diagram

As mentioned, the FSM takes into account six dimensions: the macroeconomic environment, exposure to the external sector, profitability and capital adequacy, and credit, market and liquidity risk. Representative variables were selected for each of the categories to evaluate the level of risk facing each institution,[67] pursuant to the method suggested by the IMF[68] and by Bedford y Bloor (2009).[69] The indicators considered for each of the dimensions are shown in Table 23.

Table 23
FSM: Dimensions and Variables

Internal Macroeconomic Environment	Exposure to the External Sector	Credit Risk	Liquidity Risk	Market Risk	Profitability and Capital Adequacy
GDP Growth	EMBI + Colombia	Default Indicator	ULR	Percentage of tradable securities	Capital adequacy
Inflation	Exports/Imports	Non-performing loan portfolio growth	Liquid liabilities/ liquid assets	VaR	ROE
Unemployment	Current account		Deposits/gross portfolio		ex-post intermediation spread
Fiscal deficit	Foreign direct investment		Interbank funds/ liquid assets		Leveraging

Source: Banco de la República.

The model was constructed on a quarterly basis for the dimensions related to the macroeconomic environment and monthly for those pertaining to the financial system.[70] The longest time series available for each of the indicators was used, as some dimensions have a very small simple.

The method suggested by Bedford and Bloor (2009) was used to construct the model. The first step was to standardize each of the series in z-scores; where the standardized series is defined as:

$$z - score = \frac{x_t - \mu}{\sigma}$$

67 Indicators with a monotonic behavior in terms of the risk to be analyzed in each aspect or dimension were taken into account when selecting the variables. However, in some cases, it is difficult to find indicators that fit this description..

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

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

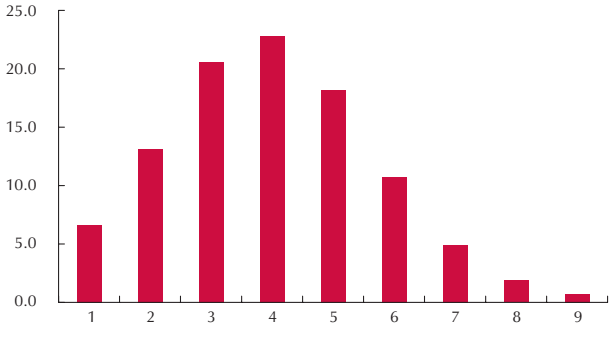
70 The difference in the frequency of each of the dimensions poses no difficulty, since each was constructed independent of the others.

In which x represents each of the variables at moment t, μ Is the mean of each series and σ is its respective standard deviation. After being standardized, the series were weighted using the principal components technique.[71] The first principal component (FPC) was used for each dimension. The FPC is defined as the risk indicator for each of the dimensions. The next step was to convert the FPC into a accumulated probability distribution, using the normal distribution; that is:

$$\Pr(X < FPC_t) = F_X(FPC_t)$$

Where $FX(\bullet)$ is the cumulative normal distribution function. The final step was to convert the cumulative probability values into an ordinal classification from one to nine.[72] The objective is to construct an asymmetrically distributed scale where the right tail has a low probability of occurrence, given the reduced frequency of high risk events, such as a financial crisis. To do so, we used the average of the Poisson distribution probabilities with $\lambda = 4$ and the binomial with $n = 9$ and $p = 4/9$. Given these cutoff points, the mean and the median of the indicators is equal to four and a positive bias is obtained in the range distribution. The distribution function of the classification is shown in Graph 124.

Graph 124
Distribution Function of the Classification



Source: Banco de la República.

Graph 125 illustrates the behavior of each dimension over time. One sees the risk classification is high for each of the categories during the stress periods of each of the series, which shows good adjustment by the model.

The comparative results of the FSM are shown in Graph 126. The black line represents the median and is regarded as a normal risk level. However, Graph 126 should be interpreted carefully, as the description of the risks does not imply an analysis of a measure of systemic risk, nor does it consider the relationship between the different risks.

In the case of the macroeconomic environment, one sees an increase in the level of vulnerability during 2009, which can be explained by an increase in the fiscal deficit, less economic growth and a higher unemployment rate. On the other hand, exposure to the external sector showed no major changes. Although indicators such as EMBI+ Colombia, the current account and the ratio of exports to imports demonstrated an improvement during 2009, foreign direct investment deteriorated sharply.

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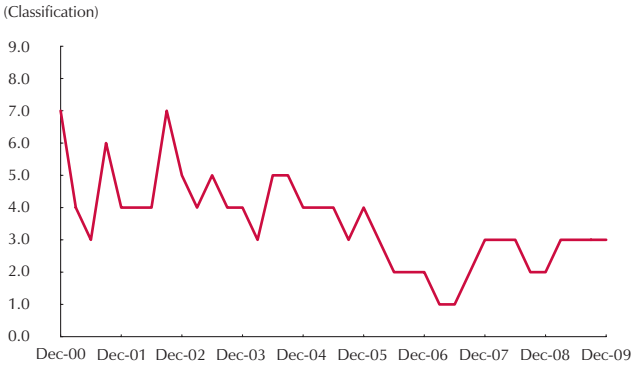
71 The principal components technique consists of obtaining an index based on the combination of a set of indicators that reflects the maximum variance of the indicators used.

72 A classification with nine ranges makes it possible to better adjust the theoretic distribution to the desired performance of the ranges in the sample.

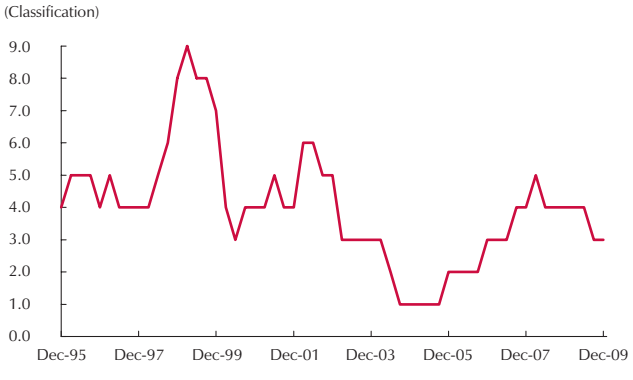
Graph 125

A. Internal Macroeconomic Environment

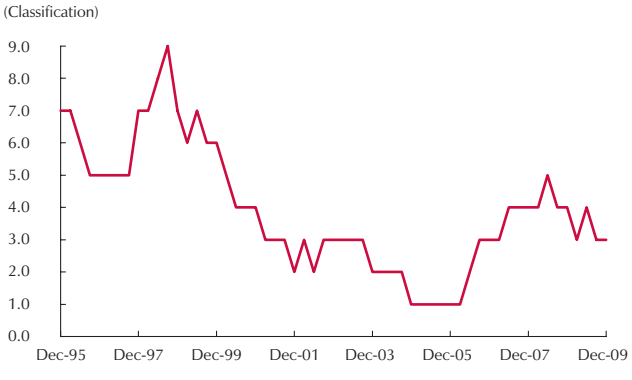
B. Exposure to the External Sector



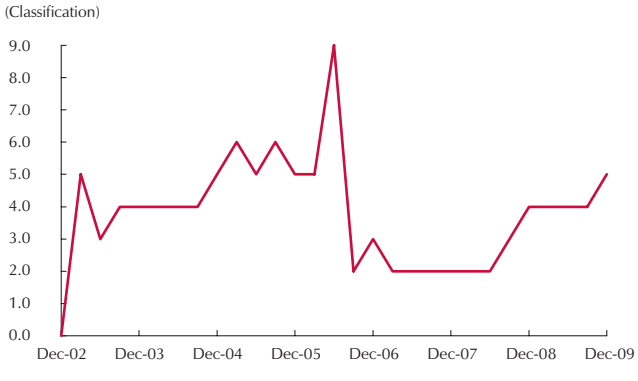
C. Credit Risk



D. Liquidity Risk



E. Market Risk

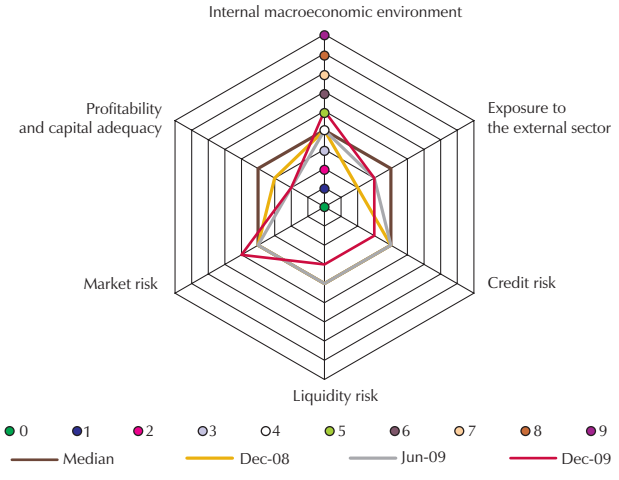


F. Profitability and Capital Adequacy

Source: Banco de la República

As for risk, the FSM shows deterioration in the market during the last half of 2009 to a risk level of five by December. The change in market risk is explained by growth in the size of the tradable portfolio and by an increase in value at risk (VaR). This occurrence is consistent with the reduction in the liquidity risk level witnessed during the past year, given the increase in the amount of TES held by financial intermediaries. Also, credit risk declined

Graph 126
Financial Stability Map



Source: Banco de la República.

during the second half of 2009, because of a drop in the default indicator and in the pace of growth in the non-performing loan portfolio.

Profitability and capital adequacy improved in terms of their risk level, which went from three in December 2008 to two a year later. This is explained primarily by the higher level of capital adequacy reported by financial intermediaries during the past year, by increased profitability and by less leveraging.

In short, the added vulnerability facing the system on December 2009 is the result of market risk and conditions in the internal macroeconomic environment. If the improved economic prospects for 2010, as summarized in the macroeconomic environment described in this report, firm up and consolidate, it is reasonable to expect the level of vulnerability could decline during the current year.

Box 7
RESULTS OF THE SINGLE FINANCIAL INDICATOR (SFI) AT DECEMBER 2009

The single financial indicator (SFI) is an accounting and financial model used to evaluate and hierarchically organize the performance of lending institutions by means of a single financial indicator.[1] The SFI constitutes and early warning system when used to monitor lenders on a regular basis.

The SFI classifies lenders into four zones. The best-rated institutions are in Zone I (SFI between 1.5 and 2.0) and Zone II (between 1.0 and 1.49). Their profitability is rated as outstanding and acceptable, in that order, and their basic indicators are consistent with a sound financial position. Zone III (SFI between 0.5 and 0.99) is regarded as risky. This category includes institutions with slightly positive profitability, in real terms, but core indicators that show signs of financial frailty. Zone IV (SFI between 0.0 and 0.49) is considered impaired. The institutions in this category have poor core indicators, and real negative returns have begun to undermine their equity. In short, the financial institutions in Zone IV are not sustainable in the mid-term, unless they are shored up by their shareholders or by an outside entity (Table B7.1).

1. Evolution of the Financial Situation, by Groups of Lenders[2]

Graph B7.1 shows how the financial situation of each of the four lending groups has evolved. Almost none of the groups has been in the warning zones (II and IV) since the start of the period in question (December 2006), with the exception of CFC, which are in Zone III (risk zone). Their financial situation has declined gradually throughout the period in question. However, it recovered somewhat during the final quarter of 2009, reaching an SFI of 0.73 by the end of December.

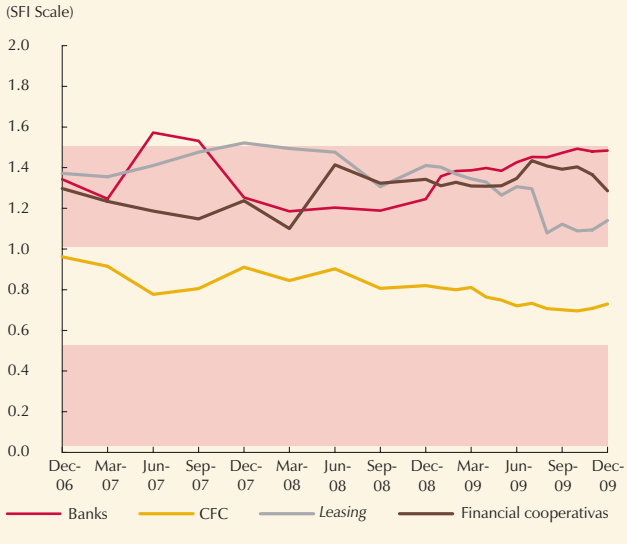
The systematic rise in the indictor for banks during a last year suggests their financial performance was satisfactory, despite the slowdown in the economy. Indeed, by the end of 2009, this group of lenders was close to the outstanding zone, with a SFI of 1.5.

Table B7.1
Classification by Zones

Zone	SIF Value	Status
I	1.50 - 2.00	Outstanding
II	1.00 - 1.49	Acceptable
III	0.50 - 0.99	Risk
IV	0.00 - 0.49	Impaired

Source: Banco de la República.

Graph B7.1
Financial Institutions (Evolution in the SFI, 2000-2009)



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

In contrast to the favorable financial situation registered by banks, the rating for financial cooperatives declined in the last two months of 2009 and was 1.3 on December.

Following a sharp drop in August of last year, the SFI for leasing companies stabilized at around 1.1 during the four months thereafter.

2. Order within Each Group

Graph B7.2 (panels A, B, C and D) shows the order by group for each of the financial institutions, according to their performance measured by the SFI at December 2009.

1 For more information on the model, see Pineda, F. and Piñeros, H., "El IFU como mecanismo de alerta temprana: una nueva versión" in Financial Stability Issues, *Financial Stability Report,* March 2009.

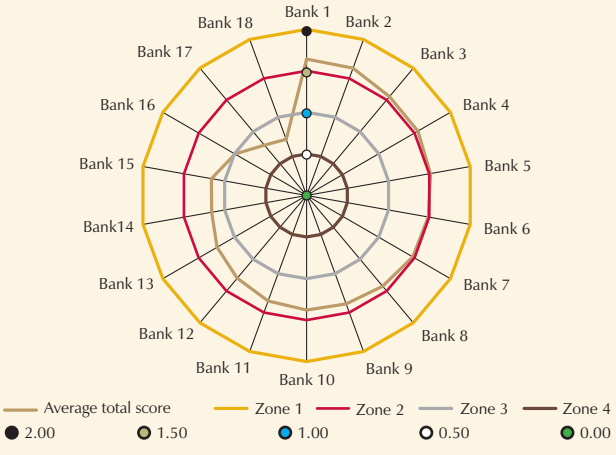
2 Includes banks (commercial and those specializing in mortgage loans: BECH), finance companies (CFC) and those specialized in leasing, and financial cooperatives. Financial corporations are not taken into account as they are not lenders; their activity is primarily investment banking.

Only two financial institutions (CFC) out of a total of 54 lenders were in the impaired zone (VI) at December 2009.

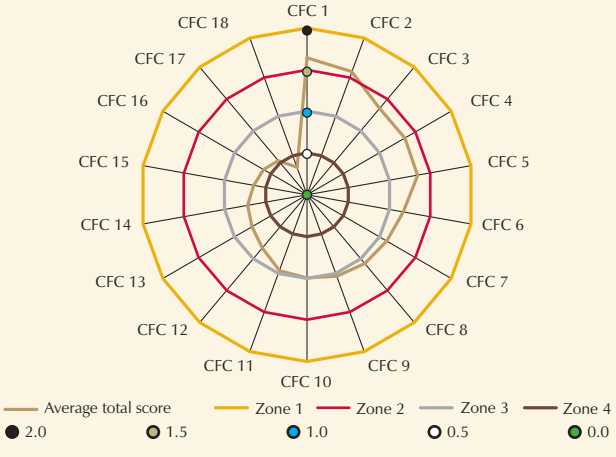
Finally, it is important to emphasize that, despite the slowdown in economic growth in Colombia last year, the performance of financial intermediaries in general was not affected, since the number of institutions in the warning zones (risk and impaired) did not increase. On the contrary, it declined from 17 to 16 institutions between December 2008 and the same month in 2009.

Graph B7.2

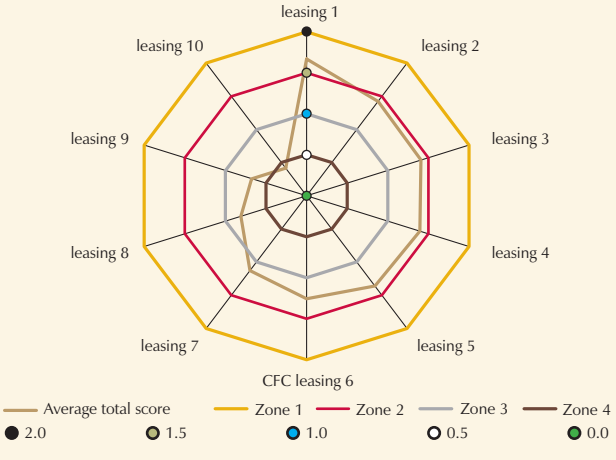
A. Banking System: Classification at December 2009



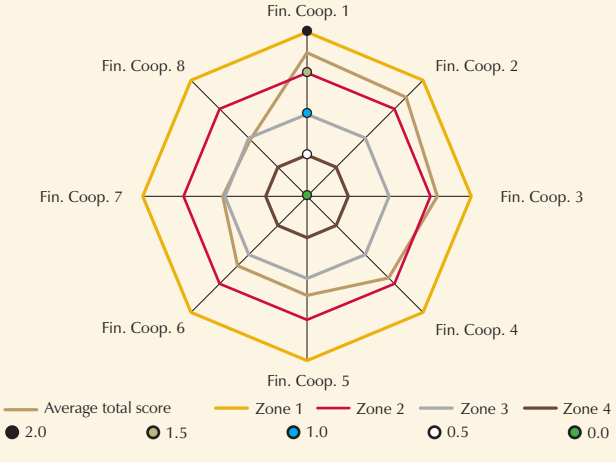
B. CFC: Classification at December 2009



C. Leasing: Classification at December 2009



D. Financial Cooperatives: Classification at December 2009



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Box 8
A FINANCIAL STABILITY INDEX FOR COLOMBIA

The financial stability index (FSI)[1] for Colombia is updated in this section as a continuous and quantifiable measure used to determine the stress level of the Colombian financial system over time. The indicator is monthly and takes into account profitability and likelihood of default.

The capital, profitability, credit risk and liquidity ratios of financial intermediaries were used to construct the indicator. Accordingly, the variables selected to develop the FSI were the return on assets (ROA), return on equity (ROE), Deliquency Ratio (DR), the non-performing ratio (NR), the interest rate spread (S),the ratio of liquid liabilities to liquid assets (LL), the ratio of interbank funds to liquid assets (IF) and the uncovered liabilities ratio (ULR).

These financial ratios were weighted using several different methods suggested in international literature on the subject; namely, the equal variance approach,[2] the principal components method [3] and count data models:[4] zero-inflated Poisson and zero-inflated binominal negative regressions. The indicator was constructed at the aggregate level and by type of institution, including commercial banks (CB), banks specializing in mortgage loans (BECH),[5] commercial finance companies (CFC), and financial cooperatives (COOP).

The indexes developed using these different methods show highly similar behavior and, for the most part, gave considerable weight to the profitability and credit risk ratios (Table B8.1). The results were used to construct an index that considers different aspects of the Colombian financial system over the course of time.

Table B8.1
Weights of the Variables in the Indicator, according to the Method Used (Percentage)

	Equal Variance	Principal Components	Zero-inflated Binomial Negative
ROA	12.50	17.53	7.65
ROE	12.50	17.79	11.75
DR	12.50	18.01	15.69
NR	12.50	15.81	6.17
S	12.50	12.79	23.03
LL	12.50	6.55	11.95
IF	12.50	7.41	12.03
ULR	12.50	4.12	11.73

Source: Calculations by Banco de la República.

The data generated by the FSI is easy to interpret, because each variable has been standardized. Therefore, the stress level for the current period can be compared to the historic level with respect to deviation from the mean. Indicator values above zero denote periods when financial stress is above average, while negative values indicate times of greater stability. Moreover, increases in the indicator during a particular period provide useful information on changes in the level of stress over time.

Graph R8.1 shows how the FSI evolved between January 1995 and December 2009. The financial stress level detected by the indicator has been on the rise since late 2005 and became more pronounced with the international crisis that began in mid-2007. It is important to note that the indicator begins to stabilize by the end of the period in question. However, these levels are well below those witnessed at the onset of the financial crisis in Colombia at the end of the nineties. In fact, the current levels are below the stress line marked on the scale as zero, which indicates the system is at a stress level below the historic average.

Graph B8.2 shows the four indicators[6] that pertain to the different types of institutions analyzed. In the case of CB, the financial stress level has been stable since last year. The BECH, on the other hand, have seen their stress

1 For more information, see D. Estrada and M. Morales (2009), "Índice de estabilidad financiera para Colombia," in" Financial Stability Issues," *Financial Stability Report,* Banco de la República, March 2009.

2 With this method, the variables are standardized so they can be expressed in a single unit, then aggregated using identical weights.

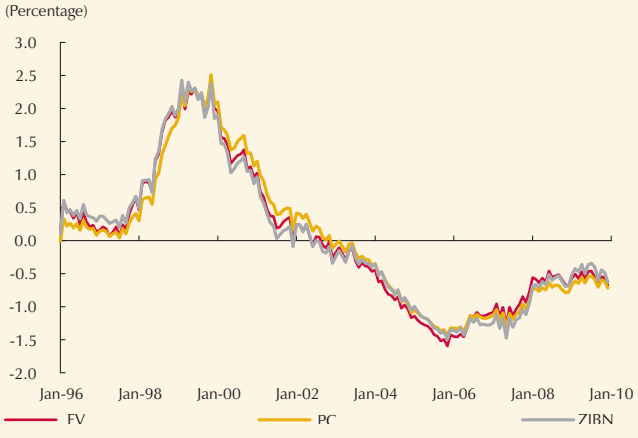
3 The idea is to obtain an indicator based on the weight of the selected variables; namely, a combination that should explain the maximum combined variance of the variables.

4 This approach uses econometric models to frame the relationship between the stress-indicative variables and the dependent variable, which is defined, in this case, as the number of banks in stress per period. The weights are found on the basis of the estimated coefficients.

5 This category does not exist at present, but was included because institutions that specialized in mortgage lending at some point in time continue to perform differently than other financial intermediaries.

6 Equal variance and principal components are the approaches used. Count data models are not employed in this case.

Graph B8.1
Financial Stability Indicator



Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

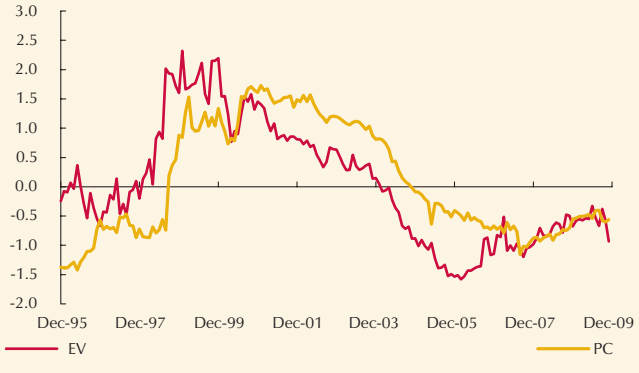
level decline somewhat. Both indicators have remained below the historic average; in other words, their levels are not alarming. In contrast, during the recent financial crisis, the CFC and COOP indicators showed stress levels equal to the average, although they did begin to stabilize during the last half-year period at levels indicative of more stability; that is, below the historic average.

Broadly speaking, the pattern of the indicators for the different types of institutions is similar to that of the indicator for the system as a whole, but this breakdown makes it possible to identify the institutions with higher stress level. Ultimately, the indicators identify the contemporary stress level of the system, both globally and separately, which makes it possible to arrive at a diagnosis of financial stability in Colombia. The results of the update indicate the stress levels for the system and the different types of institutions that make up the system are not alarming, although they have begun to stabilize at levels close to the historic average, which should be the subject of ongoing analysis, since these levels indicate the extent to which these institutions are vulnerable.

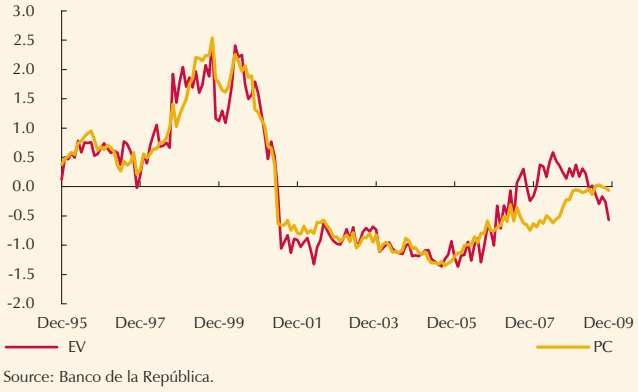
Graph B8.2
Financial Stress Indicator by Type of Intermediary

A. CB Indicator

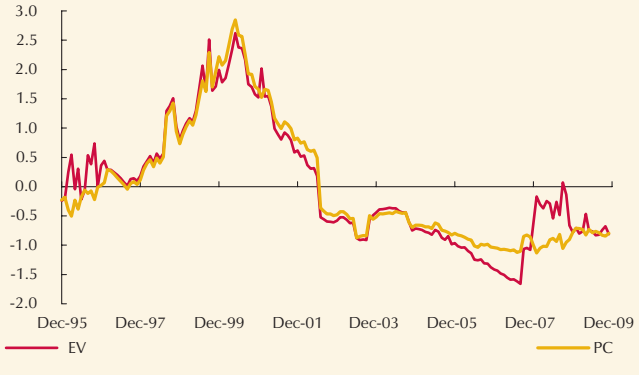
B. BECH Indicator



C. CFC Indicator



D. COOP Indicator



Source: Banco de la República.

FINANCIAL STABILITY ISSUES

The full text of these articles is available at http://www.banrep.gov.co/publicaciones/pub_es_fin.htm

UN ANÁLISIS DE RIESGO DE CRÉDITO DE LAS EMPRESAS DEL SECTOR REAL Y SUS DETERMINANTES

JAVIER ALEXANDER GUTIÉRREZ RUEDA

En la literatura se considera al riesgo de crédito como una de las principales fuentes de vulnerabilidad para el sistema financiero. por lo que su correcta medición resulta de vital importancia tanto para el sistema como para los agentes que hacen parte del mercado de crédito. Este documento tiene como objetivo identificar los determinantes del riesgo de crédito mediante estudio de la probabilidad de que una empresa incumpla con el pago de sus créditos. El análisis se realiza para el período comprendido entre 1998 y 2007. Siguiendo los hallazgos de la literatura relacionada con este tema. se emplea un modelo *probit* heteroscedástico con efectos no lineales. el cual muestra que la rentabilidad. la liquidez y el endeudamiento son los principales determinantes de este incumplimiento. Adicionalmente. se utiliza un modelo de regresión por cuantiles para identificar los efectos de los factores macroeconómicos sobre dicha probabilidad. Los resultados de este análisis indican que el impacto de estos factores varía a lo largo de la distribución de *default* y que estos tienen un mayor efecto sobre los deudores más riesgosos. Estos ejercicios se complementan con un análisis de sensibilidad. el cual evidencia la vulnerabilidad de los intermediarios de crédito ante cambios en el ritmo de crecimiento del la economía.

THE DETERMINANTS OF THE PROBABILITY OF DEFAULT AND THE EFFECTS OF MACROECONOMIC FACTORS: A QUANTILE REGRESSION APPROACH

Risk literature considers credit risk as a major source of vulnerability for the financial system. Thus its correct assessment is of great importance for both the system and the agents that are part of the credit market. This document aims to identify the determinants of credit risk through the study of the probability that a company fails to pay its claims. The analysis is performed for the period between 1998 and 2007. Following the findings of the literature on this subject. we use a heteroskedastic probit model with nonlinear effects. which shows that profitability. liquidity and debt are the main determinants of this type of failure. Additionally. we employ a quantile regression model in order to identify the effects of macroeconomic factors on that probability. The results of this analysis indicate that the impact of these factors vary along the distribution of default and that they have a greater effect on the riskiest borrowers. These exercises are supplemented by a sensitivity analysis. which highlighted the vulnerability of credit intermediaries to changes in the rate of growth of the economy.

COVAR COMO MEDIDA DE RIESGO DE MERCADO SISTÉMICO: UNA APLICACIÓN PARA EL CASO COLOMBIANO

MAURICIO ARIAS
JUAN CARLOS MENDOZA
DAVID PÉREZ REYNA

El análisis del riesgo sistémico ha tomado especial relevancia entre las autoridades financieras. en particular desde la crisis financiera internacional más reciente. Debido a esto. se han desarrollado diferentes metodologías con el fin de identificar cuáles son las entidades sistémicas. cuya exposición a los diferentes riesgos puede representar una amenaza a la estabilidad del sistema financiero. En Colombia. aunque la exposición del sistema al riesgo de mercado se ha incrementado significativamente desde 2009. aún no existe un análisis de este riesgo desde una perspectiva que permita identificar la importancia relativa de los agentes. Este trabajo presenta una metodología para estimar dicha importancia en el contexto de riesgo de mercado. Para esto se implementa la definición de CoVaR. propuesta por Adrian y Brunnermeier (2009). que es suficientemente flexible para permitir el cálculo de la contribución sistémica de los bancos comerciales y los fondos de pensiones. y entre diferentes tipos de entidades financieras.

APPLYING COVAR TO MEASURE SYSTEMIC MARKET RISK: THE COLOMBIAN CASE

The analysis of systemic risk has been a common interest for policy makers. especially since the recent financial crisis. Due to this. different approaches have been developed to identify systemic entities. whose exposition to different risks could be a threat to financial systems. In Colombia the exposition to market risk has increased since 2009; nonetheless the relative importance of agents has not been analyzed yet from the perspective of this risk. This paper presents an approach to estimate such relevance. in the context of market risk. We follow the definition of CoVaR introduced by Adrian and Brunnermeier (2009). which is flexible enough to allow the estimation of the systemic contribution of commercial banks. pension funds. and between different types of financial institutions.

DETERMINANTES DEL RIESGO DE CRÉDITO COMERCIAL EN COLOMBIA

ÁNGELA GONZÁLEZ ARBELÁEZ

En este trabajo se estima la probabilidad de incumplimiento de las empresas. sus determinantes y el nivel de riesgo crediticio corporativo agregado del sistema financiero. Se utiliza un modelo *logit* ordenado generalizado con variables explicativas que contienen información de firmas y variables macroeconómicas que no han sido utilizadas en otros trabajos para Colombia. de tal manera que se puedan capturar los efectos que tiene la dinámica de la economía sobre la probabilidad de default. diferenciando por las categorías de riesgo asociadas con los créditos corporativos. Los resultados muestran que el conjunto de variables macroeconómicas mejora el poder explicativo del modelo. a la vez que se encuentra una alta persistencia en las categorías asociadas con mayor riesgo crediticio.

COMMERCIAL CREDIT RISK DETERMINANTS FOR COLOMBIA

The probability of default for firms is estimated in this paper. as well as its determinants and the level of aggregate corporate credit risk for the Colombian Financial System. A Generalized Ordered Logit model is used with firm-level information and macroeconomic variables that haven't been used in previous works for Colombia. in order to capture the effects of economic dynamics on probability of default. As a result. the differences between risk categories of corporate loans can be identified. finding a high persistence in categories related with higher credit risk. In addition. results show that when a set of macroeconomic variables is included. the explanatory power of the model improves.

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Translated by Sharon Terry de Navarro

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