Financial Stability Report

September 2008

FINANCIAL STABILITY REPORT

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

ISSN - 1692 - 4029

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Executive Summary

The downturn in the increase in financial activity witnessed since 2007 continued during the first half of the year. The economic slowdown, the country's monetary policy, and better selection practices for granting loans help explain the performance of this sector.

The lower growth rate registered in June 2008 for the total gross loan portfolio (13.3% real annual growth as opposed to 22.6% a year earlier) is largely due to the dynamics of the consumer loan portfolio and, to a lesser extent, to the commercial loan portfolio (despite its recent rebound). The consumer loan portfolio increased by 13.7% and the commercial loan portfolio by 12.7%, in real terms. These are lower than the figures reported a year ago (36.9% and 17.3% respectively). Growth in the mortgage loan portfolio has remained relatively stable (7.73%). The slowdown in traditional financial intermediation activities was accompanied by deterioration in indicators of arrears and loan portfolio quality. However, the quality indicator for new loans; namely, the one that measures loans granted during the first half of 2008, has improved compared to the same indicator in past years.

The expansion in the loan portfolio was funded primarily by an increase in deposits (7.5%), in real terms. This growth, in turn, was fueled basically by term deposits (CDT in Spanish), which rose at a real rate of 29.8%, especially long-term certificates of deposit. Current accounts remained stable during the first half of the year, with a variation of 3.24%, while the increase in savings deposits was negative (-6.63%).

Despite deterioration in the loan portfolio quality and arrears indicators, credit institutions enjoyed a relatively constant return on assets during the period in question (2.4%). This was due to broader margin spreads, which originated with a larger rise in the lending rate than in the deposit rate in the financial system.

The loan portfolio of non-bank financial institutions was up by 0.32%, in real terms, during the first half of 2008, when there was a slight shift from foreign assets to certificates of deposit (CDT), bonds and local stocks.

Market risk is at historically low levels, given the sharp drop witnessed since mid-2006 in outstanding TES B held by credit institutions. However, the prices of the assets that comprise the portfolio held by financial institutions grew increasingly volatile during the first half of 2008, and the value at risk - as a percentage of each institution's exposed portfolio - has increased. In this sense, the development of market risk during the remainder of the year is expected to continue at low levels.

Liquidity risk has increased during the course of 2008 due to both local and international factors. As to the local factors, the liquidation of positions in high liquidity assets during the last few years weakens the ability of financial institutions to cope with low-liquidity situations. Internationally, the liquidity squeeze on global financial markets during recent months also could adversely affect liquidity for credit institutions. Due to the increase in reserve requirement during the last few months, reserves are now at higher levels, which is positive in terms of systemic liquidity crises.

Finally, it is important to mention that consolidation of the credit risk management system (SARC), which took effect for the commercial loan portfolio as of the second half of 2007 and as of the second half of 2008 for the consumer loan portfolio, represents significant progress towards a more efficient financial system in terms of risk calculation and management. Preparations to implement the liquidity risk management system (SARL) are crucial at this point in time. SARL defines liquidity risk as "the contingency of failing to comply fully and in due course with the obligation to make payments on time, which is manifest in the lack of liquid assets on hand to do so and / or the need to assume unusual funding costs." Furthermore, it leaves room to consider market liquidity risk by stating "this risk can affect liquidity in the market, which is understood as the ability institutions have to create or dissolve financial positions in a particular market situation."

Board of Directors
Banco de la República

Financial Stability Report

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

One of the duties of the Banco de la República, as stipulated in the Colombian Constitution and in Law 31/1992, is to ensure price stability. This depends largely on maintaining financial stability, which is understood as a situation where the financial system is able to broker financial flows efficiently. 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 the Central Bank's capacity to fulfill its constitutional mandate. In short, monitoring and maintaining financial stability are crucial to that activity.

The Banco de la República provides for financial stability in a variety of ways. To begin with, it ensures 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 credit authority, it designs financial regulatory mechanisms to reduce episodes of instability. It does so in conjunction with the Superintendencia Financiera de Colombia (national office of the financial superintendent). In addition, the Central Bank 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 how the financial system has performed of late and its principal debtors. 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 affect the financial system as a whole.

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I. The Macroeconomic Environment

Traditional financial intermediation activities (deposit-taking and loan supplying) continued to gain strength as a balance sheet item (although with lower growth rates). On the other hand, the combination of local and international macroeconomic elements warns about the possible emergence of risks in the system, particularly credit and liquidity risks.

A. BACKGROUND: THE INTERNATIONAL ENVIRONMENT

The outlook for Latin America has become moderately optimistic during the course of the year, even considering the impact of recent developments in the world's financial markets, economic growth in developed economies and the adjustments made by the emerging market economies in this respect.

Therefore, although the effects of the international financial crisis have not had a direct impact on emerging economies such as Colombia, they have led to a qualitative change in terms of greater risk aversion on the part of investors worldwide, an increase in financing costs at the international level, and an adjustment in external demand. This has important implications on the development of the local macroeconomic environment.

Global growth rates are expected to be lower, and therefore, a downward adjustment of external demand.

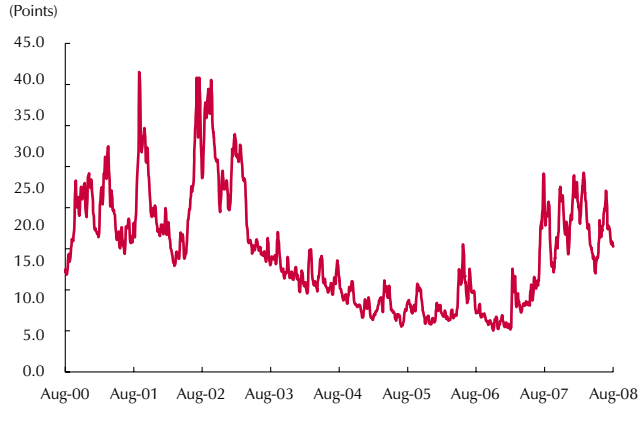
So far this year, the predictions on economic growth in the United States and the European Union have been adjusted downwards. The data on India and China also show an adjustment in the same direction. This could mean less external demand, which would reduce Colombian exports and affect our economic growth as a result (Table 1). A reduction in external demand also could produce a downward adjustment in prices for raw materials, which have been a factor that has benefited every country in the region during the last few years.

Table 1
Economic Growth
(Annual Variation - %)

	Observed		Current Projections		Difference with the Projections in June 2007	
	2005	2006	2007	2008	2007	2008
World output	**4.8**	**5.4**	**5.2**	**4.8**		**(0.4)**
Advanced Economies	**2.5**	**2.9**	**2.5**	**2.2**	**(0.1)**	**(0.6)**
United States	3.1	2.9	1.9	1.9	(0.1)	(0.9)
Euro Zone	1.5	2.8	2.5	2.1	(0.1)	(0.4)
Germany	0.8	2.9	2.4	2.0	(0.2)	(0.4)
France	1.7	2.0	1.9	2.0	(0.3)	(0.3)
Italy	0.1	1.9	1.7	1.3	(0.1)	(0.4)
Spain	3.6	3.9	3.7	2.7	(0.1)	(0.7)
Japon	1.9	2.2	2.0	1.7	(0.6)	(0.3)
United Kingdom	1.8	2.8	3.1	2.3	0.2	(0.4)
Canada	3.1	2.8	2.5	2.3		(0.5)
Other Emerging Market Economies and Developing Countries	**7.5**	**8.1**	**8.1**	**7.4**	**0.1**	**(0.2)**
Latin America	4.6	5.5	5.0	4.3		(0.1)
Brazil	2.9	3.7	4.4	4.0		(0.2)
Mexico	2.8	4.8	2.9	3.0	(0.2)	(0.5)
Developing Asian Countries	**9.2**	**9.8**	**9.8**	**8.8**	**0.2**	**(0.3)**
China	10.4	11.1	11.5	10.0	0.3	(0.5)
India	9.0	9.7	8.9	8.4	(0.1)	
Colombia	**4.9**	**7.4**	**5.0**	**5.2**		

Sources: International Monetary Fund, "Global Perspectives and Policy Issues" (April 2008) and the Banco de la República.

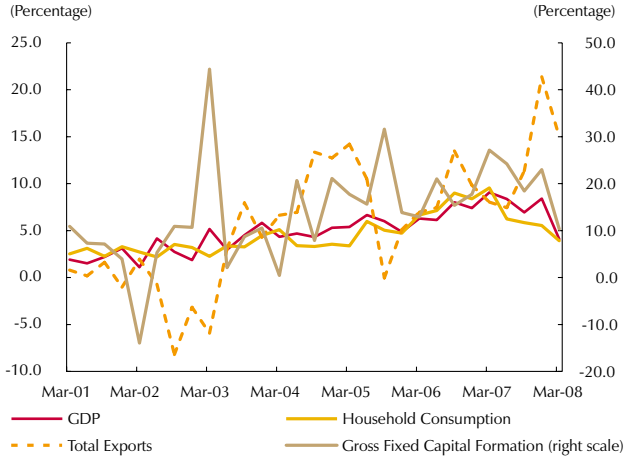
Graph 1
Risk Aversion Index (VIX)



Source: Bloomberg.

Despite improvements in export diversification, Colombia is still dependent on its major trading partner (the United States), which makes us vulnerable to the changes in that economy. Moreover, the increase in risk aversion among investors (Graph 1) could influence the cost of borrowing in the short term, thereby affecting the liquidity positions of local financial intermediaries. This phenomenon also would be explained by the added need to raise interest rates in developed countries as a result of the inflationary pressure witnessed in recent months and the pressure that would be exerted for mid-term appreciation of the dollar.

Graph 2
Growth in GDP and Its Private Spending Components



Source: DANE (national bureau of statistics)

B. THE FINANCIAL SYSTEM DURING THE FIRST HALF OF 2008

The tendency towards a slowdown in the credit growth rate during the second half of 2007 was still evident in the first half of 2008. This is explained by less economic growth and by the set of monetary policy measures adopted by the Board of Directors of the Banco de la República (BDBR).[1]

The pace of economic growth slowed during 2008. While the increase in real gross domestic product (GDP) was 8.4% between December 2006 and the same month in 2007, it was 4.1% between March 2007 and March 2008 (Graph 2). All private spending components showed less growth. For example, the increase in gross capital formation went from 23% to 10.3%. This trend is possibly due, in part, to the decline in public investment made by mayors and governors. Household consumption was the component that slowed the least (from 5.6% to 3.9% growth); however, it accounts for the largest share of GDP (66.2%).

The past year saw a shift in the components of deposit-taking on the part of credit institutions. The proportion of longer term deposits increased, especially certificates of deposit (CDT) for more than 180 days. However, this shift slowed in the second half of 2008. Credit institutions reduced their TES holdings, but less so than in previous periods. In fact, between December 2007 and June 2008, banks reduced their TES by approximately COP$2 t.[2] Credit institutions also decided to keep a portion of these investments to maturity, thereby reducing the effects of a possible materialization of market risk.

Although this risk declined, the one that materialized the most during the first half of the year was credit risk, because overdue loans rose significantly as a result of the sharp increase in the total loan portfolio in past years.[3]

1 Banks will have to earmark approximately COP$2 trillion (t) to meet the new reserve requirements that took effect in September 2008. This could restrict loan portfolio growth even more.

2 This is a reduction in nominal values.

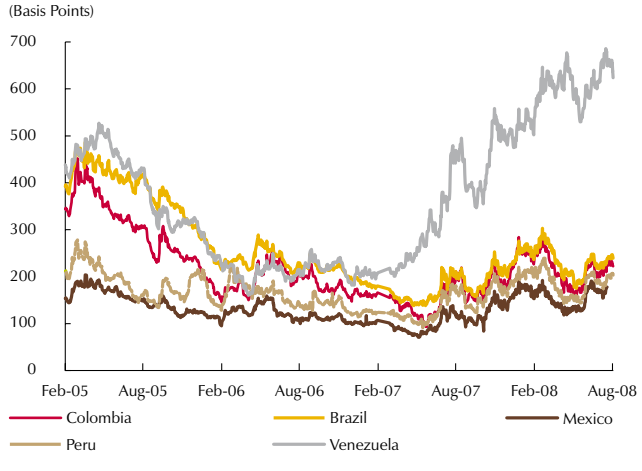
3 These figures are outlined in more detailed in Chapter II, which deals with the financial system.

C. OUTLOOK FOR THE FINANCIAL SYSTEM

Economic growth during the second half of 2008 is expected to remain at levels below those witnessed in recent years.[4] Less growth leads to a lower demand for credit, while the reserve requirements limit the supply of credit. The result is smaller growth in the financial system. These figures were corroborated by the latest survey of the credit situation, which showed that financial intermediaries expect the supply of credit to decline.[5]

Less growth in the system increases potential risks and the possibility they might materialize. In December 2007, credit posed the greatest potential risk; now, liquidity risk is also quite high, due to local and international reasons. As to the local factors, the ruling on reserve requirements absorbed in large portion the resources obtained from the liquidation of TES that matured in 2008, limiting funds that could be used to purchase new securities. Coupled with fewer TES holdings, this adds to liquidity risk. In terms of the international environment, uncertainty in the developed economies has been transmitted to the emerging countries, as evidenced by higher risk premiums (Graph 3). So far this year, the spreads have increased by 16%, on average, which would translate into more liquidity risk by reducing the influx of capital into these countries.

Graph 3
EMBI + Spread for Several Latin American Countries



Source: Bloomberg.

Some credit risk has materialized this year, limiting access to loans for more risky customers and increasing loan-loss provisioning. Moreover, the "harvests" (new loans) for some of the portfolios have improved.

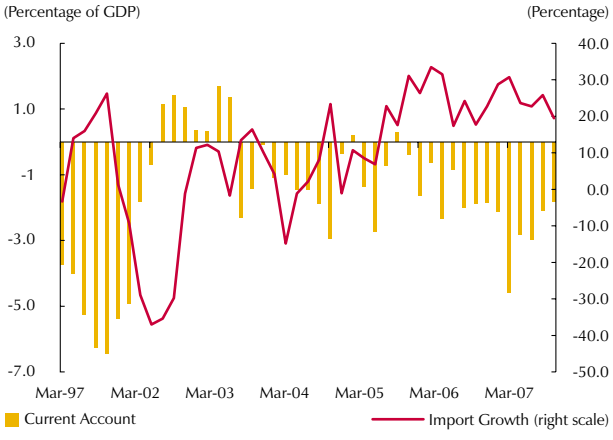
As mentioned earlier, the accumulated current account deficit in the balance of payments rose considerably during 2007, making the economy sensitive to a reduction in capital flows. However, this deficit was reduced during the first half of the year, thereby lessening the country's exposure to a liquidity squeeze on the international financial market (Graph 4).

With respect to market risk, Graph 5 shows the recent development in the returns on the market representative exchange rate (TRM in Spanish), the overall

4 According to projections by the Banco de la República, growth of the Colombian economy will be between 3.3% and to 5.3%.

5 The latest results of the loan status survey are available at the Central Bank's website: <http://www.banrep.gov.co/informes-economicos/.

Graph 4
The Current Account as a Percentage of GDP and Import Growth



Sources: DANE; calculations by the Banco de la República.

Graph 5
Developments in IGBC, TRM and TES (2020) Yield Index

Source: Bloomberg.

index of the Colombian Stock Exchange (IGBC in Spanish), and yields associated with the market price of government bonds that mature in 2020. According to the graph, the interest rate on government bonds declined, which implies an increase in their market price and, therefore, valuation of the portfolio between July and August 2008.

The same graph also indicates the Central Bank's policy rate hike in July of this year lowered inflation expectations. This was reflected in the drop in the interest rate on government bonds as of that date.

Consequently, for these reasons, Colombia could be affected by a less optimistic international environment. Events on the international financial market have led to important changes in the variables that would affect liquidity and credit at the local level, such as increased risk aversion, higher international interest rates and less external demand. Therefore, the outlook is somewhat pessimistic, particularly considering some of the other factors related to exports and growth, such as the recent sharp drop in terms of trade, which implies a decline in exports.

At the local level, the slowdown in economic growth has occasioned less demand for credit, while the policies on reserve requirements have reduced the supply of loans. The expectation for the second half of the year is that credit risk will remain high, liquidity risk will increase, and market risk will remain low in relative terms.

II. The Financial System

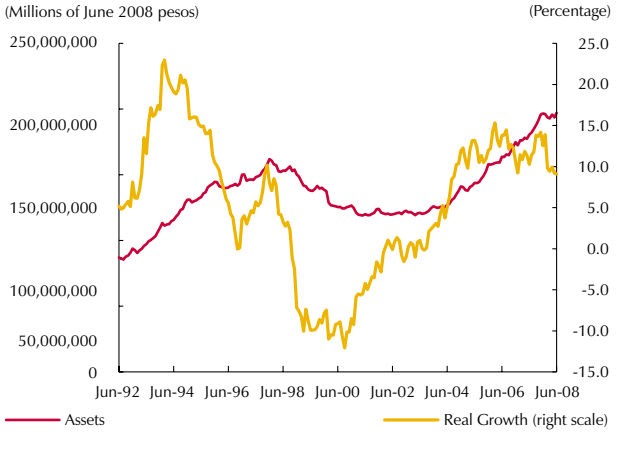
Loan portfolio growth continued to slow during the first half of 2008. Deposits are the principal source of funding for new loans (particularly long-term deposits). They have also appeared signs of credit risk materialization.

A. CREDIT INSTITUTIONS

The loan portfolio in the financial system continues to grow, although not as much as in years past, and is being funded mainly by term deposits. Investments, on the other hand, seem to have stabilized after the sharp sell-off of securities observed since mid-2006.

Materialization of the credit risk assumed by financial institutions in years past, fewer loan-loss provisions as a proportion of the risky portfolio (particularly the commercial loan portfolio), and the fact that growth of the risky loan portfolio has outpaced growth in the total loan portfolio, point to possible vulnerabilities in the system. However, sound financial ratios on the part of credit institutions, in terms of profit and solvency, could indicate this is not an especially troublesome situation for financial stability.

Graph 6
The Assets of Credit Institutions



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

1. General Balance Sheet Positions

a. Asset Accounts

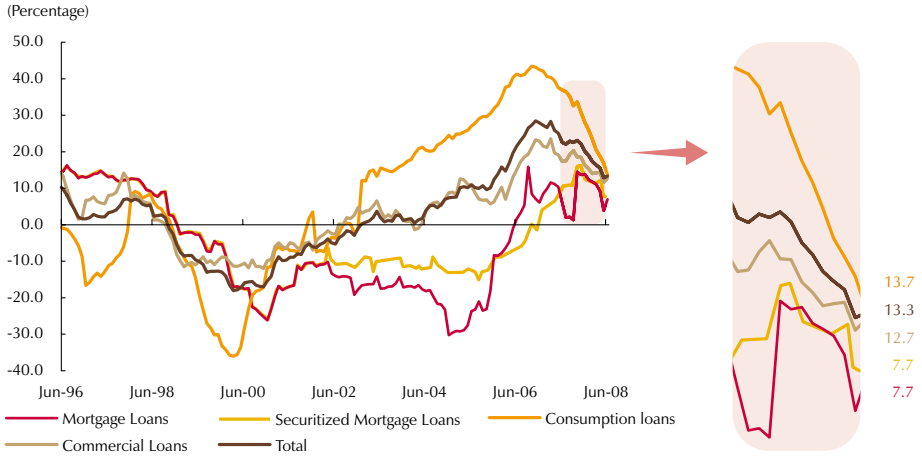
Credit institutions reported COP$196.9 t in assets by June 2008, which represents a real annual growth of 9.1% (Graph 6). This figure is a historic maximum

Growth in all the loan portfolios continued to slow during 2008, particular the consumer loan portfolio.

for the series, although the pace of growth has slowed conspicuously from an annual average rate of 13.1% in 2006 to 11.9% in 2007 and to 10.2% in the first half of 2008.

The increase in assets, as well as the decline in the pace at which they have grown, is explained largely by the development of the gross loan portfolio, which registered a real annual increase of 13.3% by June 2008. This figure is well below the one recorded in June of last year (22.6%). It is worth noting that the momentum in the portfolio has slowed steadily since October 2007 (Graph 7).

Graph 7
Real Annual Gross Loan Portfolio Growth of Credit Institutions



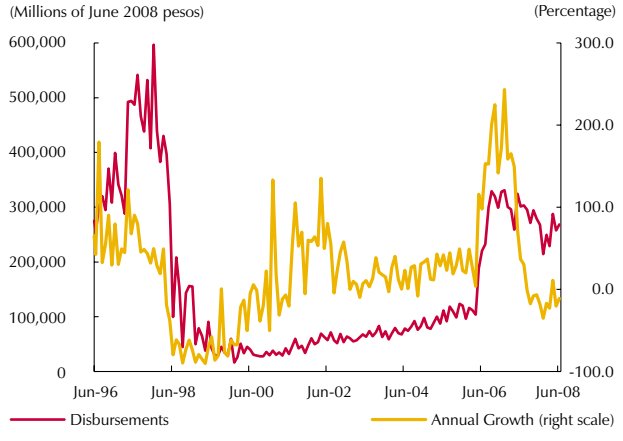
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República.

The change in the total gross portfolio is explained by the dynamics of the consumption and commercial loan portfolios. The former continues to exhibit the marked downward trend in growth begun in October 2006, when it peaked at 43.4%. By June 2008, it had fallen to a real annual increase of 13.7%. For its part, the commercial loan portfolio, which generally follows a similar trend, saw an increase of 12.7%. This is lower than the rate reported in December 2007, which was 16.3%. A slowdown of this extent in commercial and consumer loan portfolio growth –since mid-2006, as noted in past editions of the *Financial Stability Report*– may be the result of several factors, most notably the Central Bank's intervention policy, which is being applied through the interest rate and the marginal reserve requirements. Less GDP growth during the first half of 2008 also may have adversely affected the demand for credit.

The recent surge in the commercial loan portfolio may be due to a substitution of debt denominated in US dollars for debt in pesos.

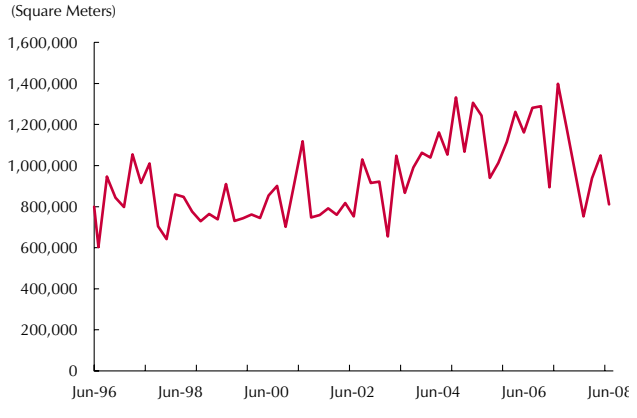
The recent increase in the commercial loan portfolio, as evidenced by the data for June 2008, is important. It reflects the ongoing acceleration since March this year, when the annualized quarterly growth rate in the commercial loan portfolio rose from 7.8% to 20.2% in just six months. The explanation for this

Graph 8
Monthly Disbursements on Mortgage Loan



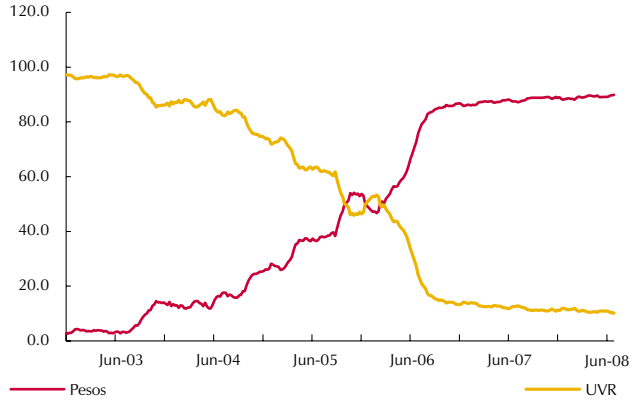
Source: Banco de la República

Graph 9
Area Licensed for Housing, According to Building Permits



Source: ICAV; calculations by Banco de la República

Graph 10
Share of Disbursements in UVR and in Pesos as a Share of Total Mortgage Loan Disbursements
(8-order Moving Average)



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

phenomenon lies with the slowdown in the pace of external borrowing by the non-financial sector, which went from an increase of 22.4% at February 2008 to 8.0% five months later. This is an indication of the shift in the liabilities of domestic firms from foreign debt to debt denominated in pesos, which is consistent with the expectation of peso devaluation against the dollar, and may be the result of the in liquidity contraction in international financial markets.

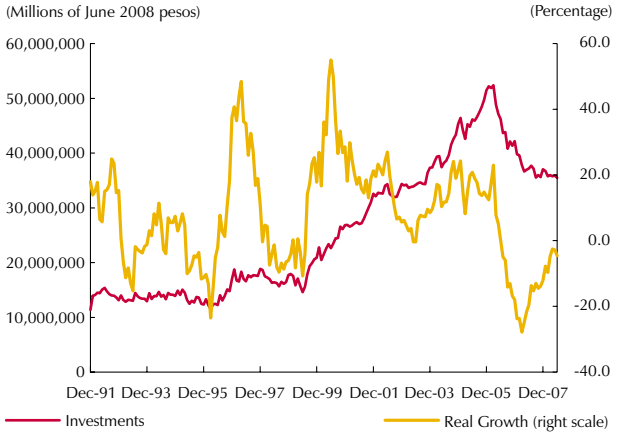
The performance of the mortgage loan portfolio with securitization has been linked closely to that of disbursements registered on the books by the Colombian Savings and Housing Institute (ICAV). As mentioned in past editions of this report, the increase in the mortgage loan portfolio as of December 2006 goes hand in hand with the increase in disbursements.[6] The tendency in the pace of annual mortgage loan portfolio growth reversed as of December 2007, due to the hike in interest rates on loans and because of less momentum in demand (as mentioned earlier). This can be corroborated by a look at the momentum in the area licensed monthly for new housing (Graph 8), which has dropped sharply since early 2008. The mortgage loan portfolio with securitization went from 16.4% real annual growth in November 2007 to 7.7% in June 2008.

In contrast to previous years, the increase in disbursements for new homes has slowed. It has been at negative levels since August 2007 and was near -10.3% by June 2008 (Graph 9).

On the other hand, one can see there has been a shift in the make-up of disbursements in the mortgage loan market since 2003, from variable to fixed rate, particularly as of early 2006. Graph 10 shows the share of disbursements at a variable rate (UVR) went from 97% in July 2003 to 53% in January 2006, and

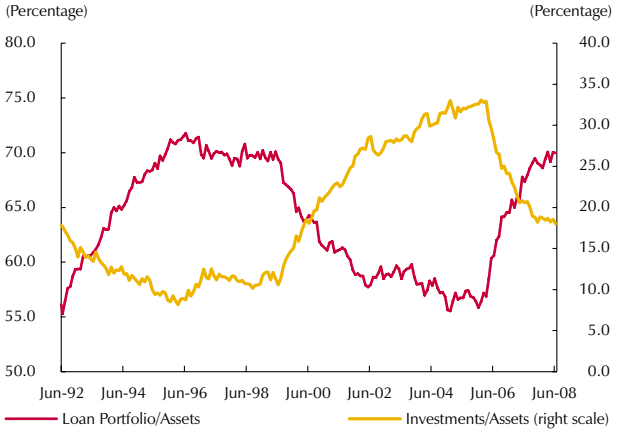
6 At the time, this growth was explained by the decline in interest rates on mortgage loans. This, in turn, was due to the BDBR resolution issued on September 08, 2006, which lowered the limit for the rate on mortgage loans, and to the fact that new credit institutions specializing in this niche entered the market.

Graph 11
Investments by Credit Institution



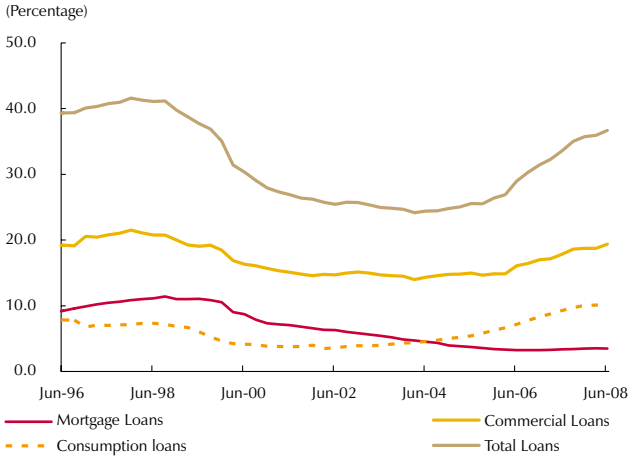
Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 12
Investments and the Gross Loan Portfolio as a Percentage of Total Credit Institutions Assets



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

Graph 13
Financial Depth (Loan Portfolio/GDP)



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

continued to decline rapidly until reaching 10.1% in June 2008.

So far this year, the investments made by credit institutions have continued to grow at negative real annual rates: -4.6% by June this year, bringing assets to COP$35.5 t in that same month. As shown in Graph 11, there has been a downward trend in investment growth since March 2006, when investments came to COP$52.4 t and registered an annual increase of 22.9%. Real annual rates began to be negative as of July 2007. However, the relative stabilization in the level of investment by mid-2008 is obvious, with relatively few changes registered in the portfolio held by credit institutions between January (COP$36.7 t) and June (COP$35.5 t).

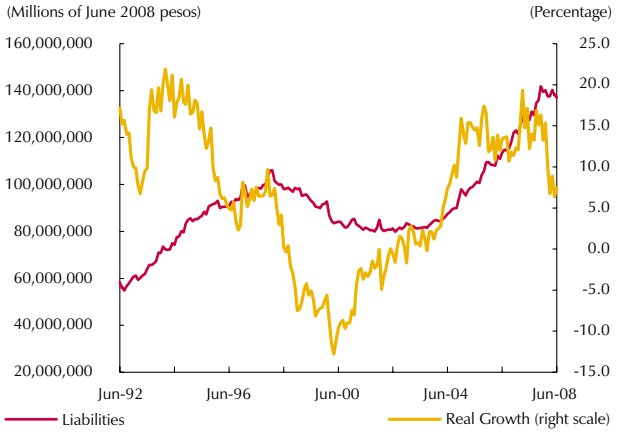
The tendency for investments to increase their share in the total assets held by credit institutions reversed in January 2006, when the loan portfolio began to rebound and to command a larger share of the total. That momentum continued during 2008, even though at a less pronounced level. Accordingly, by June of this year, the loan portfolio accounted for 70% of assets and investments, 18% (Graph 12).

The composition of assets in favor of the loan portfolio, coupled with the positive growth in that portfolio, has led to greater financial depth. This is consistent with its recent momentum, as emphasized in past editions of this Report. The indicator stood at 36.7% in June 2008, the highest it has been since the end of the nineties and higher than those witnessed in the pre-crisis period. The indicators for the commercial and consumer loan portfolios came to 19.4% and 10.2%, respectively, which also are the highest they have been since the periods preceding the financial crisis in the late nineties (Graph 13).

b. Liability Accounts

Traditional financial intermediation continues to expand, but not as quickly. Lower - although positive – portfolio growth was funded with a

Graph 14
Liabilities: Credit Institution Liabilities

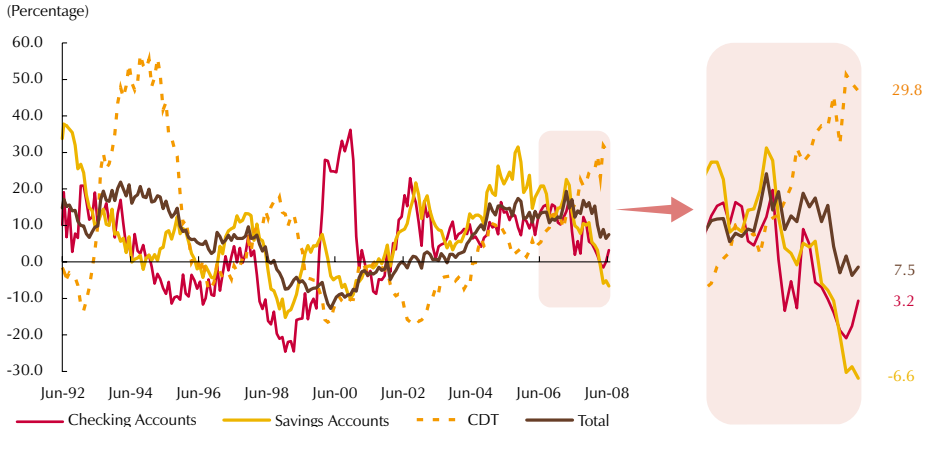


Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República

real increase in deposits. By December 2007, that increase was 13.3%; six months later, it was 7.5%, having amounted to COP$137.0 t (Graph 14). This momentum, in turn, was due to the tendency in time deposits (CDT), which were up by 29.8% at June 2008. Checking accounts remained relatively stable throughout the first half of the year, registering a real annual increase of 3.24% by June 2008, while savings accounts continued to show a negative trend for that period (- 6.63%) (Graph 15).

The reason for the positive development in time certificates of deposit (CDT) compared to demand deposits (savings plus checking accounts) lies with the marginal reserve requirements imposed by Banco de la República in May 2007,[7] which prompted a shift in liabilities in that direction. For that reason, the annual change in demand deposits has declined since the measure was adopted, and was negative (-4.1%) by June 2008.

Graph 15
Real Annual Growth in Deposits with Credit Institutions, by Type of Deposit



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

Funding credit institutions through time deposits (CDT) has added benefits in terms of liquidity. Because they are less volatile than sight deposits, these liabilities offer institutions a more stable source of funding for their intermediation activities and to deal with periods of low liquidity, particularly when portfolio

Deposits were the main source of funding for the loan portfolio, particularly longer term deposits.

7 This reserve requirement was an incentive for commercial banks to shift from demand deposits to term deposits, inasmuch as the marginal increase in the reserve requirement was proportionally larger for the latter than for the former.

growth is propelled basically by an increase in the commercial loan portfolio, which has a longer average duration than the consumer loan portfolio.

2. Credit Institutions Exposure to their Major Debtors

Credit institution's exposure came to COP$148.9 t in June 2008. This represents a real increase of 9.6% compared to the amount reported in June 2007, but is quite similar to the figure registered in December 2007 (COP$147.7 t). The exposed amount, as a percentage of assets, is similar to the levels observed since 2003 (75.6% in June 2008), but is up slightly with respect to the amount exposed at June 2007 (Table 2).

As to the composition of exposure in the financial system, the decline in exposure to the public sector as of December 2005 continues, while exposure to the private corporate sector is growing, as shown in Graph 16. During the past year, both the loan portfolio and local government bond holdings declined, reducing exposure to the public sector from 20.7% to 18.2%. In turn,

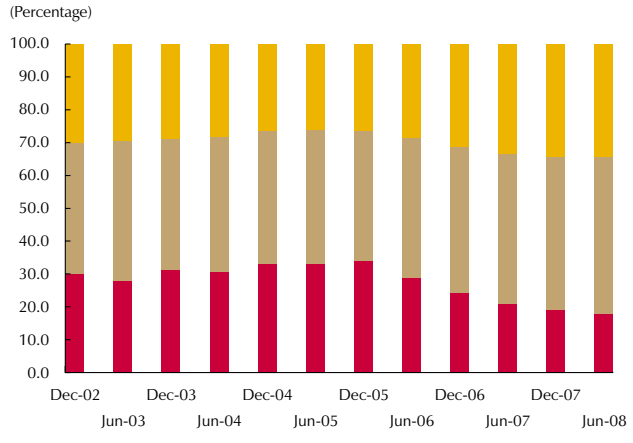
Table 2
Credit Institutions Exposure to their Major Borrowers

Type	Jun-07		Jun-08		Real Annual Growth (%)
	Trillions of June 2008 pesos	Share (%)	Trillions of June 2008 pesos	Share (%)	
Public sector					
Loan Portfolio	5.08	3.7	4.80	3.2	(5.6)
Securities	23.09	17.0	22.14	14.9	(4.1)
Total	**28.17**	**20.7**	**26.94**	**18.1**	**(4.4)**
Private corporate sector					
Loan Portfolio	61.47	45.2	70.20	47.1	14.2
Securities	0.40	0.3	0.36	0.2	(11.4)
Total	**61.87**	**45.5**	**70.56**	**47.4**	**14.0**
Household sector					
Loan Portfolio	42.86	31.5	48.11	32.3	12.2
Consumption	33.69	24.8	38.29	25.7	13.7
Mortgage	9.17	6.8	9.81	6.6	7.0
Securitizations	2.97	2.2	3.32	2.2	11.8
Total	**45.83**	**33.7**	**51.43**	**34.5**	**12.2**
Total Exposed Amount	**135.87**	**100.0**	**148.92**	**100.0**	**9.6**
Exposed Amount over Assets (%)	**75.3**		**75.6**		

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

With respect to debtors, credit institutions continue to be less exposed to the public sector, while their exposure to the private sector (households and firms) is on the rise.

Graph 16
Financial System Exposure by Borrower



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

the share pertaining to the private corporate sector continued to increase (from 45.5% to 47.4%), as has been the case since March 2006, due to growth in the commercial loan portfolio (14.2% in real terms over the past year). In the case of households, the overall increase in items related to this sector meant the financial system is much more exposed to it.

3. Loan Portfolio Quality and Loan-loss Provisioning

Loan portfolio quality in the financial system, which is measured as the ratio of risky loans[8] to the total gross loan portfolio, by means of the portfolio quality indicators (QI), remains relatively low within the sample: 7.3% for June 2008. However, there has been an upward trend in this indicator since the second half of 2007 (one year ago, it was t 6.7%). This is largely the result of deterioration in the QI for the consumption loan portfolio; micro-loan portfolio is responsible as well, but to a lesser extent (these indicators rose from 7.9% to 10.1% and from 7.1% to 8.5%, respectively).

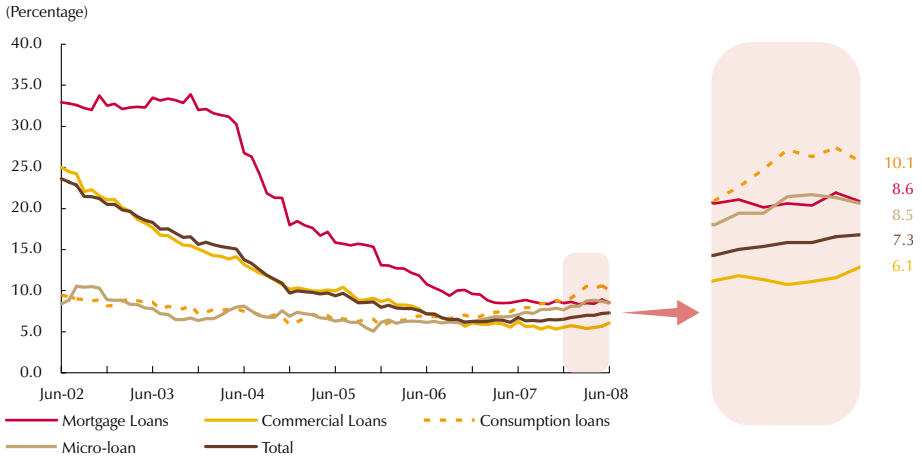
The quality indicator for the mortgage loan portfolio has been relatively stable throughout 2008 compared to the improvement made since before December 2006, as mentioned in past editions of the *Financial Stability Report*. It has stabilized at around 8.6% so far this year, but deterioration in the commercial and consumption loan portfolios underscores the need for further progress towards better monitoring and a more thorough assessment of the customers for these types of loans (Graph 17).

There also was a generalized deterioration in the arrears indicator (AI), which is measured as the ratio of non-performing to total gross loans.[9] The mortgage loan portfolio was the only exception, having been stable since June 2007 (11.1%). The total AI went from 3% to 3.9% during that period, thanks to an increase in the AI for consumption loan portfolio, which rose from 5.3% to 6.8%. The AI for the commercial portfolio went from 1.6% to 2.3% and the AI for the micro-loan portfolio went from 6.2% to 7.4% (Graph 18). This increase in the arrears indicator may have been detrimental to the QI mentioned earlier; after falling due, some loans may have been reclassified into categories other than type-A

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

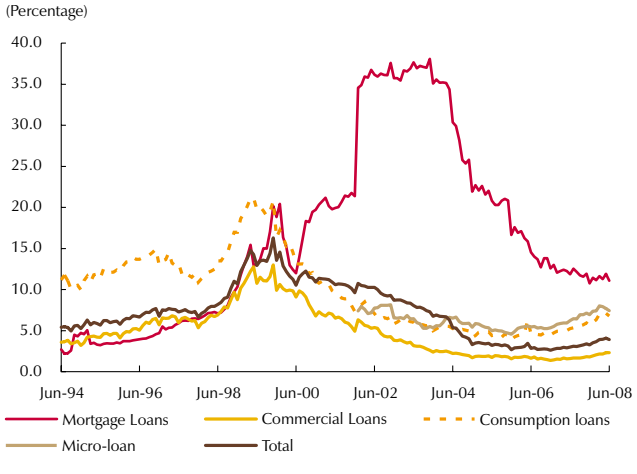
9 The non-performing loan portfolio is comprised of loans that are overdue 30 days or more.

Graph 17
Loan Portfolio Quality, by Type of Loan Portfolio (Risky/Gross Portfolio)



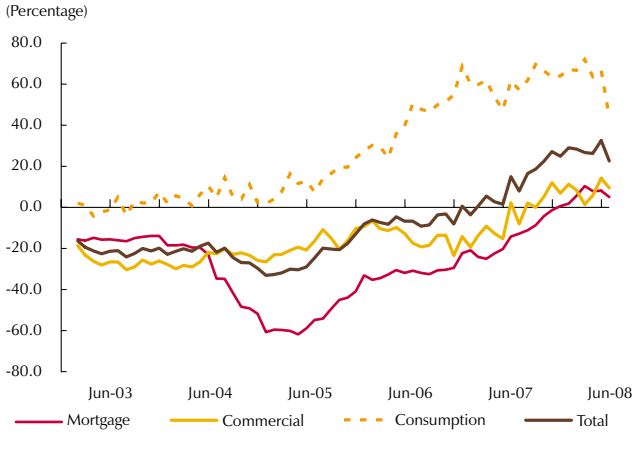
Sources: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 18
Arrears Indicator: Non-performing/Gross Loan Portfolio



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

Graph 19
Real Annual Risky Loan Portfolio Growth



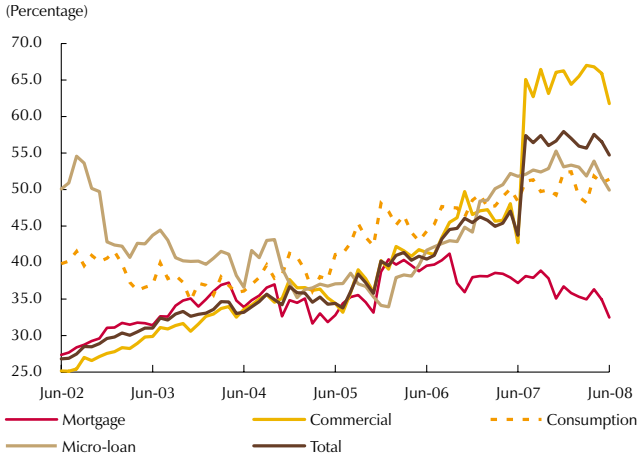
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

The deterioration in the micro-loan and consumption loan portfolios is important to mention, both in the *ex ante* credit risk measurement (the QI) and the *ex post* (the AI). The upward trend in these indicators for both portfolios has been more pronounced than for any other type of loan.

Real annual growth in the risky loan portfolio declined from 24.9% in December 2007 to 22.6% in June 2008 (Graph 19). This was due to the momentum in the risky consumption loan portfolio, which went from an increase of 63.9% at the end of last year to 44.2% in June 2008. The annual rates of growth in the risky portfolio (for all types of credit) are far greater than those for the total loan portfolio.

Moreover, unlike what happened in late 2007 (see the March 2008 edition of the *Financial Stability Report*), the increase in the risky loan portfolio so far this year has been accompanied by a decline in the relative levels of loan-loss provisioning. As shown in Graph 20, the coverage indicator, which is measured as the ratio of loan-loss provisioning to the risky portfolio for each type of credit, has deteriorated during 2008 with respect to the total loan portfolio, having gone 58.0% to 54.7%. This decrease was propelled by the coverage indicator for the commercial loan portfolio, which went from 66.3% to 61.8% in six months, and by the micro-credit coverage indicator, which went from 53.1% 49.9%. The coverage indicator for the

Graph 20
Coverage: Provisioning/Risky Portfolio



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

consumption loan portfolio remained relatively stable during this period, registering a slight reduction from 52.3% to 51.4%. Provisioning for the mortgage loan portfolio, as a percentage of the total, continued the downward tendency observed since late 2006. By June 2008, it was 32.5%, which is the lowest it has been in the last three years.

However, loan-loss provisioning for the commercial and total loan portfolios is high compared to a year ago, when it was 42.7% and 43.7%, respectively. This added provisioning is attributed to the credit risk management system (SARC), which the Superintendencia Financiera de Colombia is now applying to the commercial loan portfolio. The difference witnessed in loan-loss provisioning for the consumption loan portfolio compared to other types of loans may be the result of preparations by lenders in view of the fact that the SARC was scheduled to take effect for consumption loans as of July 2008.

The deterioration in the quality and arrears indicators, coupled with the fact that the growth rate for the risky loan portfolio remains well above that of the total portfolio, indicates the risks assumed by the system in the past have materialized, and this may be perceived as a source of financial instability.

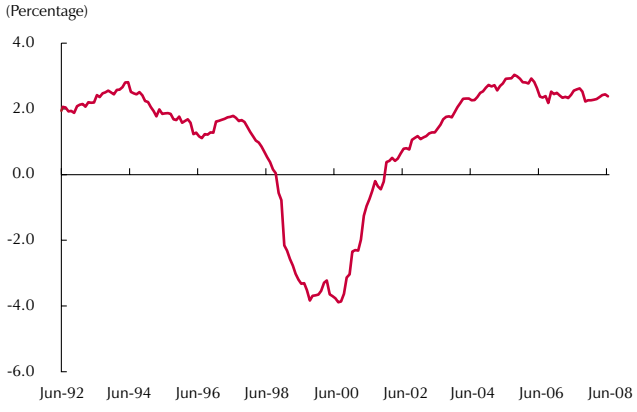
This highlights the importance of continuing to work towards accurate credit-risk measurement and monitoring. Progress in this regard, such as the application SARC to the commercial and consumption loan portfolios, is positive. However, it is only a first step in a process where the initiative of those who are exposed to credit risks is a fundamental factor.

4. Earnings, Profitability and Capital Soundness

The financial system continues to see increased profits. In fact, they were up by a real average annual rate of 2.7% in June 2008, which is higher than the rate in December 2007 (1.3%). However, when comparing this figure to the one registered a year earlier (19.2% in June 2007), we see a sharp decline. This is due to an unusual rise in profits within the financial system during 2007, following the initial scenario in 2006, when profits in the system plunged due to valuation losses on investments and because credit institutions had a great deal of exposure to those risky assets (Graph 21).

The rise in profits during the first half of 2008 was due to several factors, such as portfolio growth, which has slowed but continues to register positive values.

Graph 21
Return on assets (ROA)



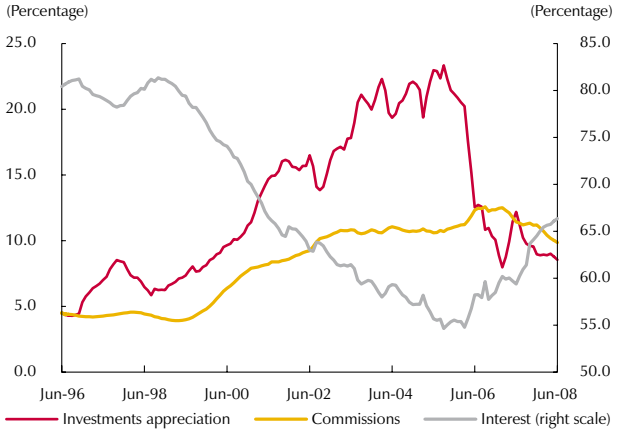
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Larger spreads are another factor that generated more income for credit institutions. This being the case, the added importance of the portfolio in the banking business has enabled the financial system to generate a relatively high level of income.

The return on assets (ROA) reported by financial institutions has been stable since June 2006 at about 2.4%, which is also the average reported two years later (Graph 21). This is an indication of how financial intermediaries reacted to the rise in interest rates ruled by the Central Bank. The change in the composition of liabilities induced by to the marginal reserve requirement, which raised the average deposit rate and led to an increase in disbursements by credit institutions, was transferred to the borrowers in the system. This helped increase revenue in the same proportion as disbursements, thereby leaving the indicator of return on assets constant.

The changes in the composition of financial income are not that much different from what was reported in the past. The bulk of revenue comes from interest earnings (66.4% of the total at June 2008). Also, the growing tendency towards interest as a source of revenue appears to be confirmed by a higher share than was reported six months earlier: 64.51% in December 2007. Investments, on the other hand, went from 8.96% of total revenue to 8.56%. This is consistent with the larger share of assets in the banking system attributed to the loan portfolio, as opposed to investments. It is important to point out that change in investments has been far less pronounced during 2008, compared to all of 2007 and 2006. In fact, the share of the former continues to grow, thanks to an expanding loan portfolio and a stable level of investments so far this year.

Graph 22
Financial Income Components

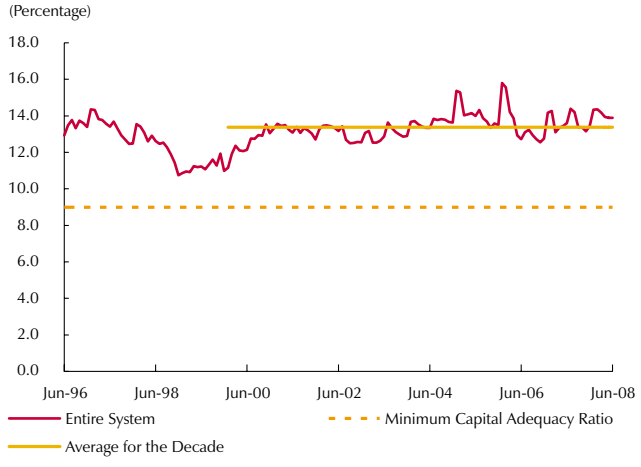


Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Despite fewer commissions as a share of the total revenue reported by credit institutions from December 2007 to June 2008 (135 basis points [bp]), it is important to highlight the considerable momentum in commissions during that period, when they rose by nearly 25.8% (Graph 22).

So far this year, the capital adequacy ratio has stayed above the average for the decade (13.4%) and was 13.9% in June. This is well above the regulatory minimum, which is 9% (Graph 23). This means that, by the end of the first half of 2008, risky assets in the financial system were backed by more capital than in past years. However, it is worth noting that

Graph 23
Capital Adequacy Ratio of Credit Institutions

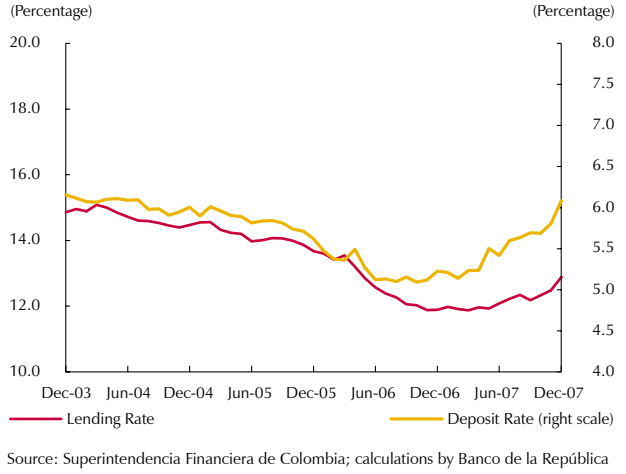


Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 24
Ex post Intermediation Spread

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

Graph 25
Credit Institutions' Implicit Interest Rates



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

the total capital adequacy ratio of credit institutions may decline when calculated on a consolidated basis, depending on the liability structure of the subsidiaries involved.

5. Intermediation Spreads

As mentioned in earlier editions of the *Financial Stability Report,* the increase in lending during 2006 and early 2007 was accompanied by low interest rates and narrower intermediation spreads. However, this scenario was reversed due to contractionist monetary-policy measures adopted by Banco de la República since mid-2006. Financial intermediaries reacted by raising interest rates on lending more than on deposits. Not surprisingly, the result was larger intermediation spreads for the system as a whole. This momentum has continued during 2008, as illustrated below, and explains much of the way *ex post* intermediation spreads[10] and implicit interest rates have behaved (Graphs 24 and 25, respectively).

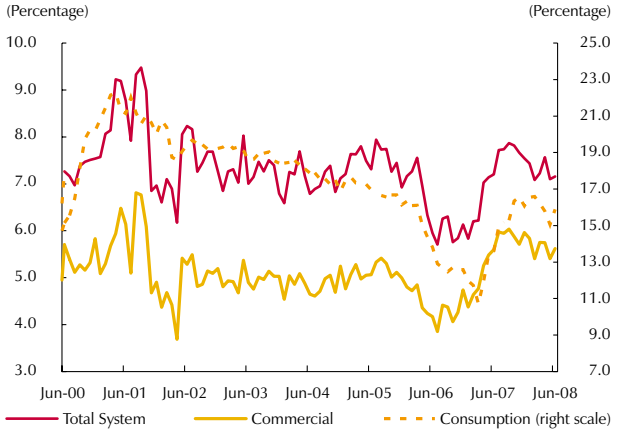
The *ex ante* spread[11] was 7.15% in June 2008, which is close to the figure reported a year earlier (7.20%). This level was reached following a peak of 7.9% in September 2007 and is due to the shift from demand deposits to longer term liabilities, thanks to implementation of the marginal reserve requirement. That shift meant an increase in the average deposit rate. The *ex ante* margin is now similar to what it was during 2002-2005 (Graph 26).

The *ex post* intermediation spread was 7.6% in June 2008, which is significantly higher than the 6.8% recorded in December 2007 or the 6.7% in June 2007.

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

11 The *ex ante* spread is the difference between the rates charged by intermediaries for the different types of loans and the average rate on certificates of deposit (CDT).

Graph 26
Ex ante Intermediation Spread, Using the Interest Rate of Term Deposits (CDT)



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

This situation, as already explained, goes hand in hand with the increase in the system's implicit lending rates from 12.9% to 14.4% between December and June, coupled with a less than proportional rise in implicit deposit rates from 6.1% to 6.7% during the same period.

The increase in average deposit rates might be reversed in the near future to the extent that elimination of the marginal reserve requirement (scheduled for September 2008) provokes a new shift in the liabilities of credit institutions, this time in the opposite direction: from CDT to demand deposits with less yield.

The evolution in measurements of credit quality and arrears show that much of the risk taken by financial institutions in past years has materialized in 2008. Broadly speaking, the outlook is not particularly alarming, considering that profits in the financial system continue to rise, largely because of the increase in intermediation spreads, loan portfolio growth, and stabilization in the revenue generated by investments.

As long as the materialization of credit risk is accompanied by accurate and responsible measurements of future risk, which means new loans contracted with the system will be better rated and less susceptible to default, this will have no serious implications for the stability of the financial system as a whole.

The fact that SARC is in effect for consumption loans and that preparations for the other risk management systems (liquidity, operational and asset laundering) are underway is welcome news. This is consistent with development of the financial system towards greater efficiency in terms of risk measurement and management, and in favor of better intermediation of resources among agents in the economy. As part of this process, it is imperative to stress the role financial institutions should play as proactive agents in measuring the risks to which they are exposed and in managing those risks appropriately. In this way, risk management regulation should serve to encourage the development of comprehensive models that are increasingly effective and help to make the right decisions.

The increase in the weighted deposit rate, due to the change in the composition of liabilities, was less than the increase in the lending rate. The result was larger intermediation spreads.

B. NON-BANK FINANCIAL INSTITUTIONS

A detailed analysis of non-bank financial institutions (NBFI) is crucial to financial stability. In addition to managing large public-sector and household portfolios, these institutions account for a considerable share of Colombia's

financial system. Therefore, in certain unforeseen situations, they could act as systemic agents. The institutions on which this section focuses include pension funds managers (PFM), general insurance companies (GIC) and life insurance companies (LIC), collective portfolio managers and brokerage firms (BF), and investment management companies (IMC).

Contrary to what was indicated in the last two editions of the *Financial Stability Report*, the value of the NBFI investment portfolio rose slightly for each of the groups surveyed, amounting to COP$ 245.34 t in all, with 0.32% semi-annual growth. However, the momentum in nominal GDP was greater than those increases, which meant a reduction in the portfolios as a percentage of nominal GDP. Severance-pay funds and ordinary mutual funds (OMF) were the only exceptions. The NBFI-managed portfolio at June 2008 accounted for 21.85% of GDP, as opposed to 22.91% in December 2007 (Table 3).

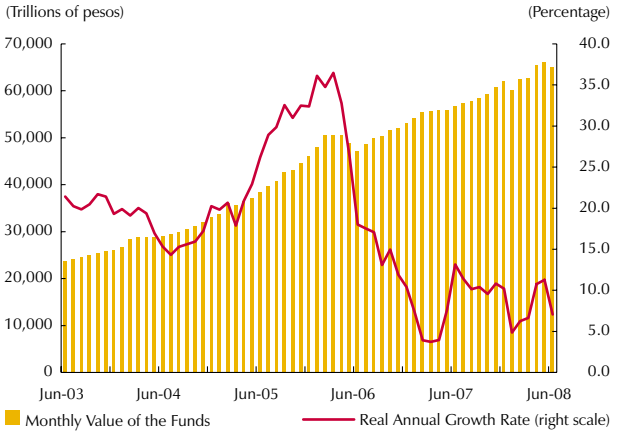
The high concentration of PFM in local markets, especially in government securities, makes them extremely sensitive to any domestic price change. The drop in portfolio value reported earlier was due largely to valuation losses in the markets. However, this effect was mitigated during the first half of 2008.

Table 3
Investment Portfolio of Financial Institutions

	2006		2007		2008 a/	
	Trillions of pesos	Percentage of GDP	Trillions of pesos	Percentage of GDP	Trillions of pesos	Percentage of GDP (proj)
Credit Institutions						
Investment	37.65	11.72	34.95	9.78	35.46	8.87
Loan Portfolio	100.63	31.34	127.73	35.74	122.58	30.68
Total Credit Institutions	138.28	43.06	162.68	45.52	158.04	39.55
Non-bank Financial Institutions						
Mandatory Pension Funds	43.17	13.47	51.11	14.30	53.38	13.36
Voluntary Pension Funds	7.15	2.23	7.11	1.99	7.21	1.81
Severance-pay Funds	3.77	1.17	3.82	1.07	4.55	1.14
General Insurance	3.35	1.04	3.62	1.01	3.69	0.92
Life Insurance	6.19	1.93	6.96	1.95	7.61	1.90
Ordinary Mutual Funds	3.79	1.18	4.33	1.21	5.60	1.40
Special Mutual Funds	1.54	0.48	1.82	0.51	2.05	0.51
Stock Brokerage Firms & Investment Management Companies	3.12	0.97	3.13	0.87	3.22	0.80
Total Non-bank Financial Institutions	72.07	22.48	81.89	22.91	87.30	21.85
Total	**210.35**	**65.54**	**244.58**	**68.43**	**245.34**	**61.40**

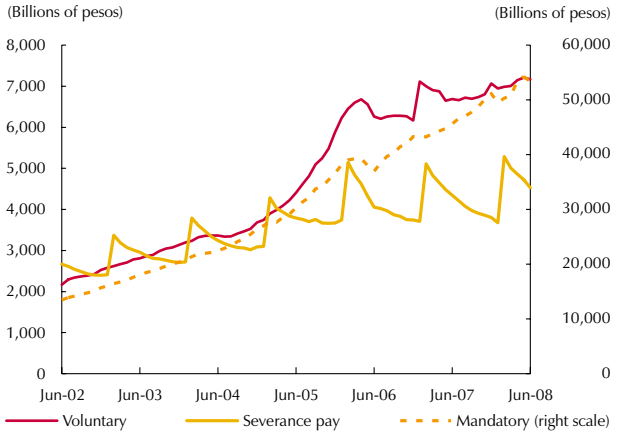
(proj) projected
a/ Datos a junio.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 27
Pension Funds Value and Real Growth



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

Graph 28
Pension Funds Portfolio Value



Source: Superintendencia Financiera de Colombia

Additionally, these institutions changed the portfolio slightly by increasing the proportion of local assets, especially from the financial sector, thereby reducing their exposure to the volatility on international markets. This shift, coupled with less revaluation than in 2007 and the increase in the number of contributors to the system,[12] helps explain the slight rise in PFM portfolio value.[13]

1. Pension and Severance-pay Fund Managers

a. Portfolio Value and Profitability

The portfolio of funds administered by the PFM is the largest component (21.8%) of the NBFI. At June 2008, that portfolio was valued at COP$65 t. Although this figure is higher than the one observed in June 2007, with a real annual growth rate of 7.06%, the annual increase by May was even more (11.26%) (Graph 27); the portfolio devaluated in June, unlike the situation in the preceding months.

The annual increase was due mainly to the mandatory pension funds (MPF), although the severance-pay funds (SF) have added to the value of the portfolio, in real terms, so far this year (Graph 28). However, SF performance is explained by their seasonal nature. Since the severance pay of their members is deposited each year in February. In January 2008, these deposits came to COP$87.7 billion, in February they reached COP$1.86 t.

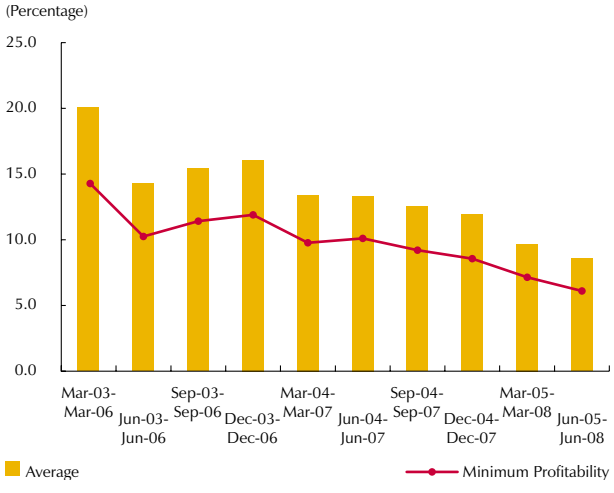
As in 2007, the current slowdown in the growth of these portfolios is because they have become less profitable. In the case of MPF, their tri-annual return[14] dropped by 4.7 percentage points (pp) during the first half of 2008, compared

12 The number of affiliates increased by more than 300,000 between December 2007 and May 2008. Representing a 4% growth.

13 It would have declined if only peso valuation of the PFM portfolio were taken into account, without considering the increase in contributions.

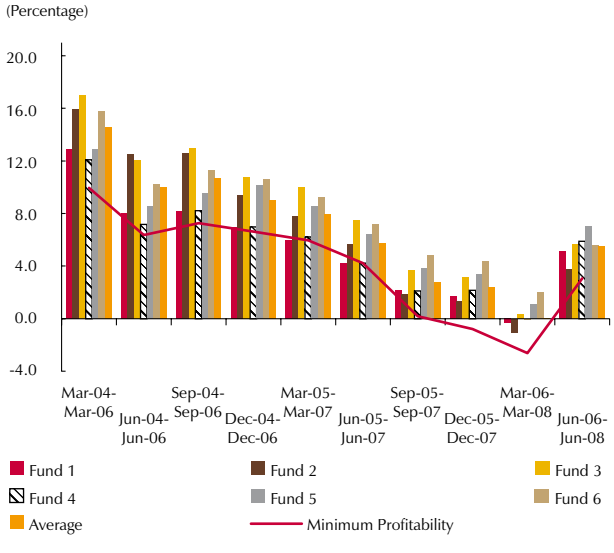
14 In the case of mandatory pension funds (MPF), the reference period for calculating minimum profitability is three years. It is two years for severance-pay funds (SF).

Graph 29
Average Tri-annual MPF Return and Minimum Profitability



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

Graph 30
Bi-annual and Minimum Profitability on Severance Pay Funds



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

to the same period last year (Graph 29). However, the SF behaved differently.

The steady decline in the biannual profitability of severance-pay funds since December 2006 was reversed during the second quarter of this year, reaching levels similar to those recorded in June 2007. As illustrated in Graph 30, the bi-annual returns reported in June 2008 were up by 5.4 pp compared to the first quarter of the year, when biannual profitability averaged 0.05%. This change in trend also was true for minimum profitability, which went from negative levels during the first quarter of the year (-2.63%) to 3.5% in June 2008.

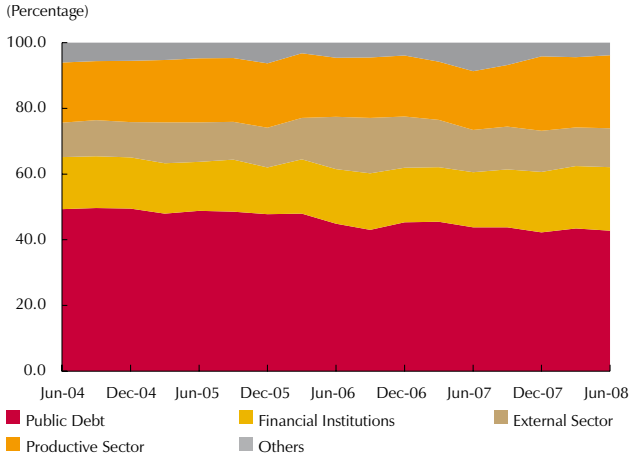
In this scenario, none of the funds failed to offer the required minimum profitability. As a matter of fact, they were more than 1.5 pp above that limit. In June 2008, all the funds had no trouble complying with the minimum profitability requirements.

b. Portfolio Composition, by Issuer, Maturity and Currency

The PFM continue to focus on local assets, especially government bonds, which accounted for nearly 42% in June 2008 (Graph 31). However, during the last year of the sample, there was a shift towards assets in the financial and productive sectors. In the case of the financial sector, the proportion rose from 16.7% in June 2007 to 19.3% a year later. The percentage pertaining to the productive sector went from 17.9% to 22.2% during the same period. This shift had been underway since the second half of 2007.

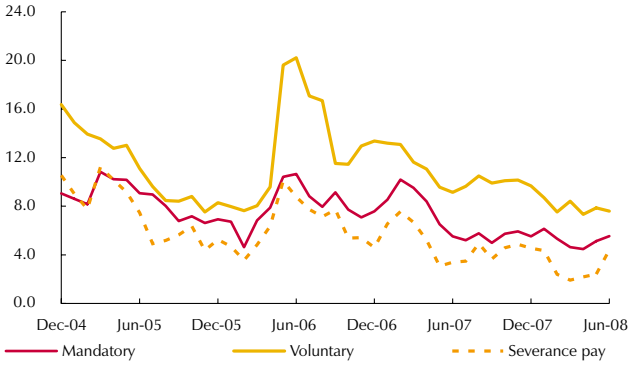
As was mentioned, the situation on international markets encouraged the PFM to reduce their participation in the external sector. By June 2008, this group of investments accounted for 11.8% of the portfolio, as opposed to 13% a year earlier. Although the limit on the uncovered position in foreign currency was raised from 20% to 30%, this measure has not affected PFM investment decisions, given their demonstrated preference for local assets. Moreover, the international situation has increased the risk of foreign investments. The voluntary pension funds are those with the largest share of these assets in their portfolios. However, the proportion of the portfolio denominated in foreign

Graph 31
Pension Funds Portfolio Composition, by Issuer



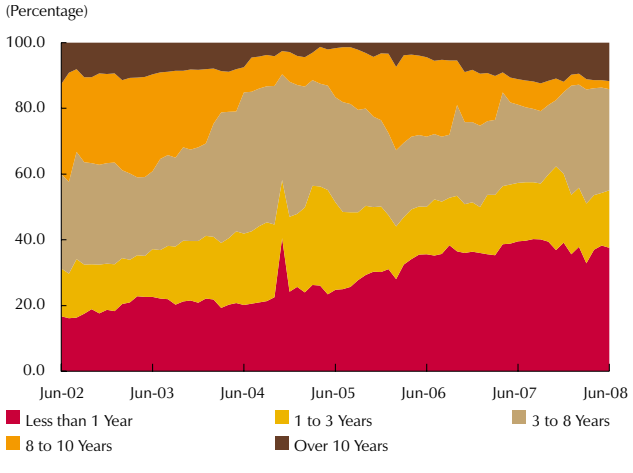
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 32
Percentage of Portfolio Value Denominated in Foreign Currency, without Coverage



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

Graph 33
Pension Fund Portfolios, by Maturity



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

currency without coverage is only 7.6%, which is well below the indicated limit (Graph 32).

This high concentration in local assets is accompanied by a focus on short-term assets. As shown in Graph 33, by June 2008, 37.6% of the portfolio was comprised of assets with maturities of less than one year; the share of assets that mature in more than ten years was 11.7%. Moreover, a look at the tendency between June 2007 and June of this year shows the PFM liquidated their positions in assets maturing at eight to ten years in order to invest primarily in assets maturing at three to eight years, which increased by 7 pp, while investment periods exceeding eight years rose slightly. However, the first quarter 2008 saw a new shift in portfolio composition that increased the share of assets maturing in less than one year.

Given the long-term nature of pension fund payments, which makes them long-term liabilities, the concentration in short-term assets is undesirable. The limited supply of long-term instruments in the local market partly explains the focus on short-term assets, as does the market's expectations of persistent inflation up to that point in time. However, regardless the volatility in the international market and the different scenarios for economic prospects, this has been the focus for more than three years.

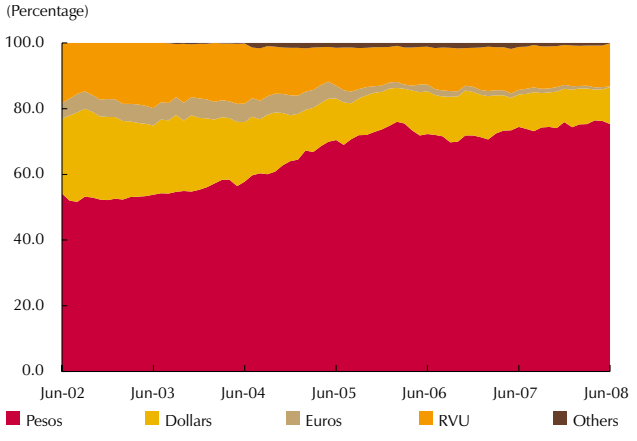
The incentive scheme for pension funds will have to be revised to offset this tendency, while recognizing that, so far, the PFM have very few intermediate and long-term instruments at their disposal.

A look at the PFM portfolio with respect to currency showed no significant change in composition. In fact, 75.3% is denominated in pesos and 13.2% in UVR. Only 11.2% is denominated in dollars and less than 1% in euros (Graph 34).

2. General and Life Insurance

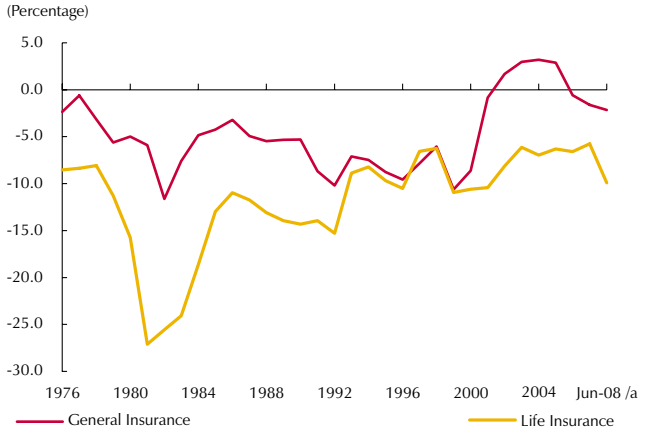
In June 2008, the GIC portfolio came to COP$3.69 t and the LIC portfolio was valued at COP$7.61 t. These

Graph 34
Pension Fund Portfolio Composition by Currency



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

Graph 35
Technical Profit Margin



a/ year to year
Source: Fasecolda

figures imply respective semi-annual growth rates of 1.8% and 9.4%. The technical margin, defined as the ratio of technical results to issued premiums,[15] decline for both corporate groups, but especially for the LIC. The LIC technical margin, in June, was -10%, as opposed to -2% for the GIC (Graph 35). Although the value of GIC technical margin is near zero, which is an indication of effective operations, in the case of LIC, it shows possible problems in measuring potential claims payable with respect to issued premiums.

A negative technical margin is a sign of inadequate actuarial calculations in terms of probable claims payable compared to the premiums charged, which underestimate the extent of the risk posed by the client. In other words, a negative indicator shows the projections on how much should be paid in the event the insured contingencies arise is less than what, in fact, should be paid.

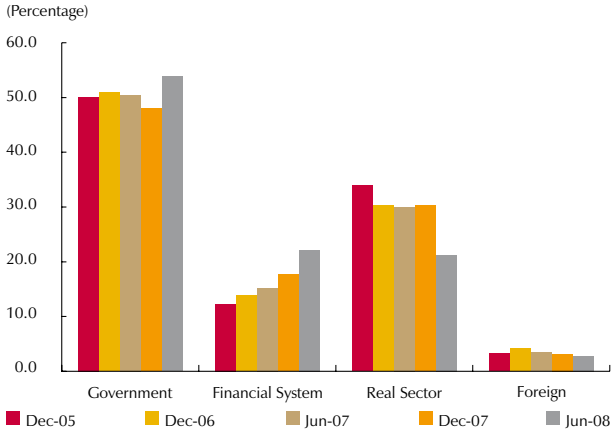
On the other hand, a positive technical margin is indicative of lack of competition among insurers. It reflects a certain degree of market power, inasmuch as companies are able to charge higher premiums than those suggested by the risk associated with the customers.

As illustrated in Graph 36 (Panel A), life insurance companies are more concentrated in local assets than general insurance companies. A detailed look at their portfolio shows that the government bond component in the LIC portfolio accounts for 53.8% (3.4 pp higher than the year before); less than 3% is in foreign assets and the rest pertains to the real sector and the financial system, in similar proportions. It is worth noting that the last six months witnessed a shift in the LIC portfolio from the real sector to government and financial assets, given better prospects for the performance of these assets.

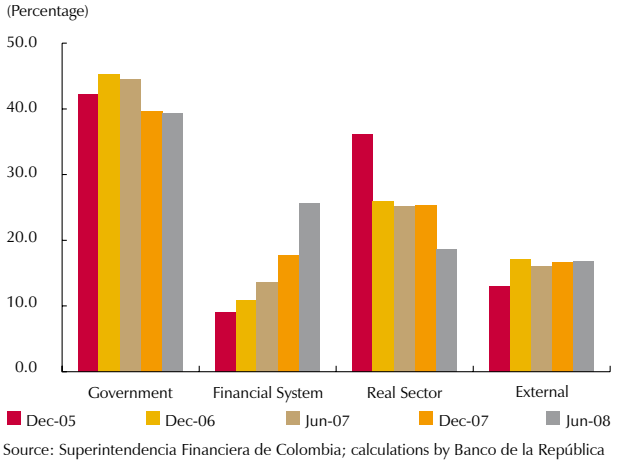
15 The technical result is the operational profit of the insurance industry. It includes income from insurance and reinsurance, minus outlays for those items, commissions and general expenses. Therefore, the technical margin indicates the proportional surplus or deficit these companies have in terms of their business. Technical margins near zero are a sign of competitive and efficient insurance systems.

Graph 36
Investment Portfolio, by Issuer

A. Life Insurance Companies

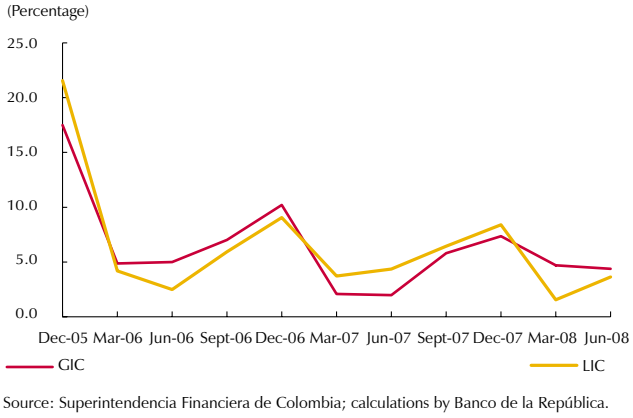


B. General Insurance Companies



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

Graph 37
Return on Investment



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

The GIC portfolio also is concentrated in the government sector (39.4%), although less so, while foreign assets account for 16.8%. There has been no substantial change in the proportion of the GIC portfolio that is comprised of government and foreign assets, but there has been a shift from the real sector to the financial system (Panel B, Graph 36).

Because their portfolios are less diversified, the returns for life insurance companies are more volatile than those of general insurance companies. The variation in investment yields for insurance companies at June 2008 was 4.39% for GIC and 3.62% for LIC. Graph 27 shows the investments profit evolution for insurance companies.

Graph 37 shows the investment yield for insurance companies. LIC yield declined considerably in the first quarter and recovered partially in the second, when it was 3.62%. For their part, the general insurance companies registered a 4.39% yield on investment in June, which represents a slight decline. Due to a larger concentration of assets in government securities, yield on investment has been more volatile for life insurance companies than for general insurance companies. By the same token, a look at profitability in light of the operational return on assets shows the LIC group is more volatile. In June 2008, ROA for the GIC was 4.8%, higher than ROA for the LIC (2.7%) (Graph 38).

The coverage levels in the insurance industry, which are measured as the ratio of technical reserves to investments, are good; namely, 102% for GIC and 87% for LIC.

3. Mutual Portfolios[16]

Funds managed by trust companies, such as ordinary mutual funds (OMF) and special mutual funds (SMF), are evaluated in this section. Their portfolio

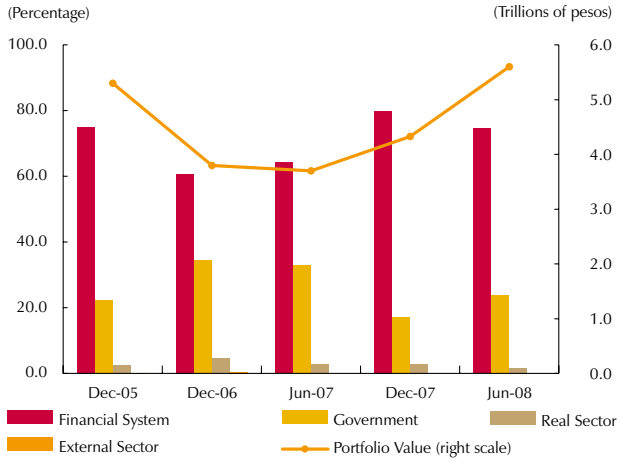
16 As of June 2007, all deposit or money-management mechanisms involving funds raised from a group of persons for a common economic purpose are known as mutual portfolios (Decree 2175 issued in 2007 by the Ministry of Finance and Public Credit).

Graph 38
ROA of Life Insurance Companies (LIC) and General Insurance Companies (GIC)

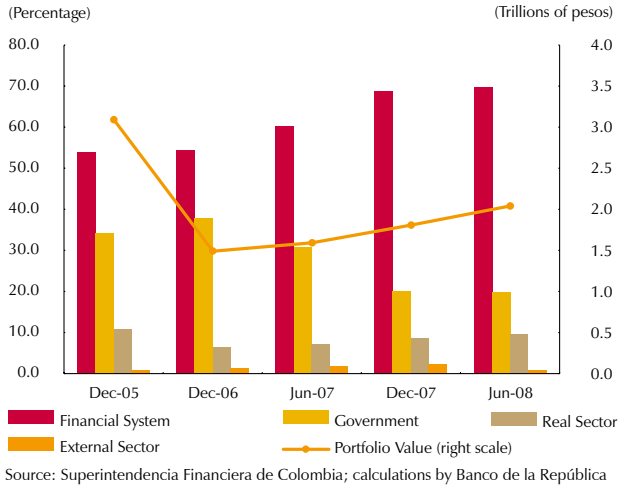
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 39
Portfolio Value and Composition, by Issuer

A. Ordinary Mutual Funds



B. Special Mutual Funds



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

value came to COP$7.65 t, with 24.5% semi-annual growth. Ordinary mutual funds account for most of the portfolio (73%), inasmuch as their portion is valued at COP$5.6 t (Graph 39, Panel A); the SMF portfolio is valued at COP$2.1 t (Graph 39 B).

The real annual increase in the OMF portfolio at June 2008 (44.2%) was considerably higher than during the period from December 2006 to December 2007 (8.2%). For the most part, this elevated growth can be explained by high exposure to financial system assets and by considerable growth in investments, which were up 52.5% between June 2007 and June 2008.

The SMF experienced similar portfolio and investment growth, but to a lesser extent: 20.98% real annual growth at 2008 following 15.47% at December 2007. The real annual increase in investments at June 2008 was 27.7%.

The composition of the OMF portfolio shows its concentration in financial system assets (particularly CDTs) remains high (74.5%), despite somewhat of a shift towards government bonds (23.7%), and a decline in trend-sector assets (1.8%). This restructuring represents a change in course compared to past years, when the OMF reduced their government holdings. However, the share of government securities is still lower than it was in December 2006 (34.4%).

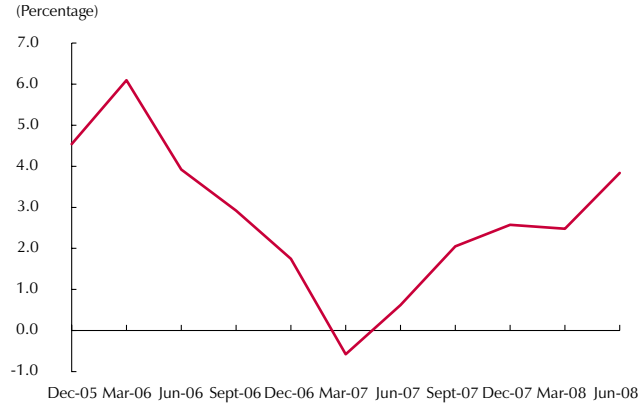
As with the OMF portfolio, most of the SMF portfolio are financial system assets (69.7%). However, there was no shift in portfolio composition, since there has been virtually no change in the proportions represented by the different sectors. The biggest change was in the real sector; its share went from 8.7% in December 2007 to 9.6% in June of this year, at the expense of the share represented by the external sector (Graph 39, panel B).

The upward tendency in the value of these funds also has been reflected in the profitability of their portfolios. ROA for each of these funds is at historically high levels. As shown in Graph 40, ROA for the SMF was 7.9%; in the case of the OMF, it was 6.2%.

Graph 40
ROA of Mutual Funds

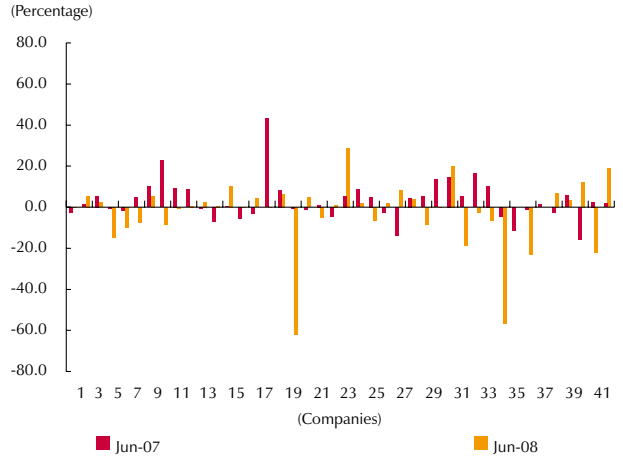
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 41
Return on Assets for Brokerage Firms (BF) and Investment Management Companies (IMC)



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

Graph 42
A. ROA of Brokerage Firms and Investment Management Companies



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

4. Brokerage Firms (BF) and Investment Management Companies (IMC)

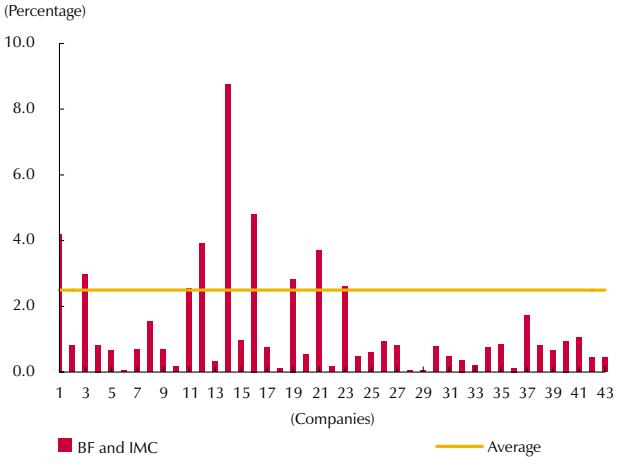
By June 2008, the investment portfolio of the BF and the IMC was valued at COP$3.22 t. This implies a real annual increase of 8.15% that contrasts with the annual drop observed in the portfolio at December 2007 (-5.45%).

This investment portfolio growth was accompanied by an improvement of 3.48% in ROA (Graph 41) at June this year for all these funds. However, individually speaking, the returns vary widely. A comparison of ROA, by company, between June 2007 and June 2008 shows that 40% have improved their profitability. However, it is important to point out that this group includes the larger firms (Graph 42, panel A).

Contrary to what was indicated in the March 2008 edition of the Financial Stability Report, the firms with a highly negative ROA for this semester are not overly leveraged and, as with ROA, this level differs between while in firms (Graph 42, panel B). The average investment/equity ratio for the system is 2.47 times larger; in December 2007 it was 3.25.

In short, as the second half of 2007 was a period of high volatility and losses for the system, a comparative

B. Investment / Equity (Jun-08): Brokerage Firms and Investment Management Companies



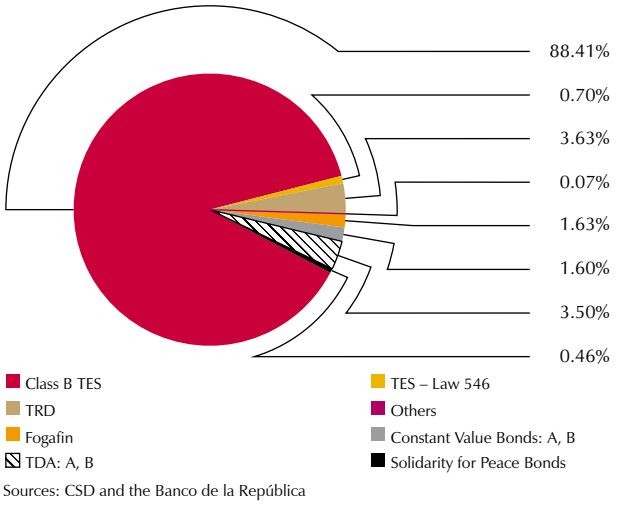
analysis indicates NBFS returns during the first half of 2008 were better. The figures show an increase in both the investment portfolio and its profitability. However, the increases were less than the economy growth, which means that these portfolios account for less as a percentage of GDP.

Moreover, some decisions made in 2007 were reversed during the first half of this year due to the way behavior of international markets and the relative stability on local markets. In fact, the extent to which some of these firms invested in foreign assets declined, while the share of government securities and financial-sector assets increased. This concentration in sharply correlated local assets makes them more susceptible to domestic market changes and volatility.

C. FINANCIAL MARKETS

The developments in Colombia's major financial markets between January and August 2008 are discussed in this section. In the case of the domestic government debt market, an account of the characteristics of issues, primary and secondary market activity is given, and the investors who purchase these assets. As to the foreign exchange market, the behavior of the exchange rate during the course of the year is described, and the activity in the derivatives market. Finally, there is a description of the momentum in the stock market.

Graph 43
Composition of Local Government Securities, Outstanding Principal at July 2008



Sources: CSD and the Banco de la República

1. Local Government Debt Market

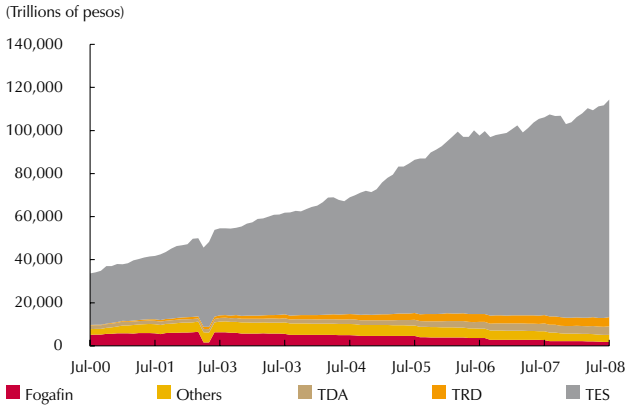
a. Characteristics of the Local Government Debt and the Primary Market

Graphs 43 and 44 show the public debt is concentrated in domestic treasury bonds (Class B TES), with COP$101 t outstanding at July 2008. This is equivalent to 88.4% of the total outstanding government debt (principal only).

For 2008 the target of long-maturity TES issuing is COP$22.6 t. By the end of August COP$19.7 t of that amount had been issued[17]. On the run, there are long- maturity issues denominated in Colombian pesos (COP) (May.-2011, Nov.-2013 and Oct.-

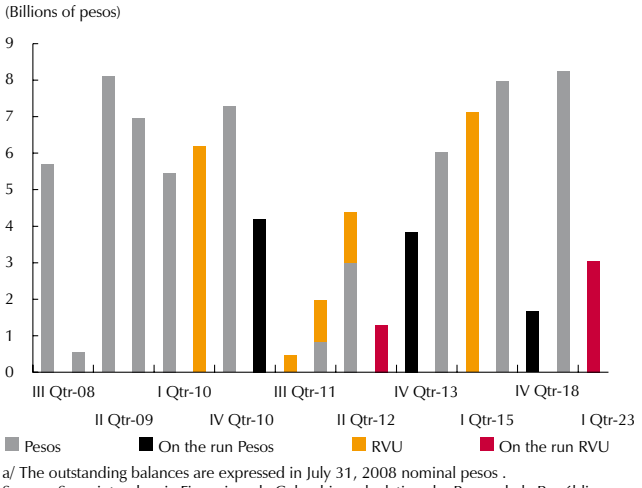
17 According to the Ministry of Finance and Public Credit, the assigned quotas for auctions, agreed operations, and forced operations during the year are Col$ 10.5, Col$ 4.5 and Col$ 6.4 t, respectively. By the end of August, Col$ 9.2 t had been sold by auction (Col$ 3.6 t through agreed operations and Col$ 6.9 t through forced operations).

Graph 44
History of Outstanding Balances, by Type of Security in the CDV



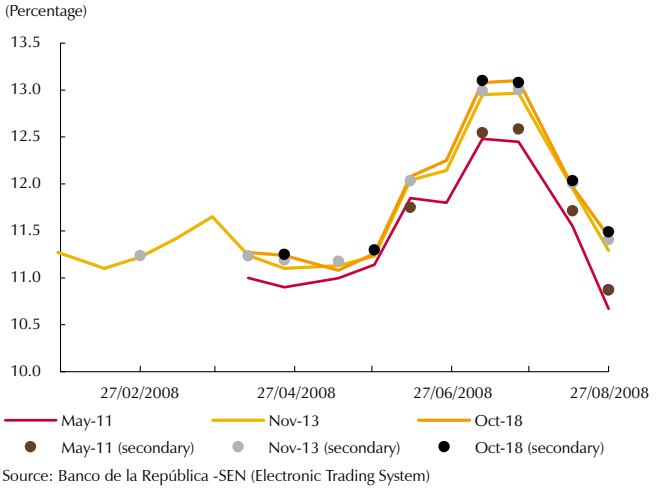
Source: CDV Statistical Bulletin

Graph 45
Quarterly Future Payments Long-Maturity TES in Pesos and UVR[a/]



a/ The outstanding balances are expressed in July 31, 2008 nominal pesos .
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Graph 46
Yield Rates on TES in Pesos and on the run Issues on the Secondary Market



Source: Banco de la República -SEN (Electronic Trading System)

2018) and in UVR (March-2013 and Feb.-2023). Graph 45 shows the future payments of all long-maturity TES (peso and UVR denominated). The quarters highlighted in red show when the open TES-UVR issues mature; and the black one show when the TES denominated in Colombian pesos do.

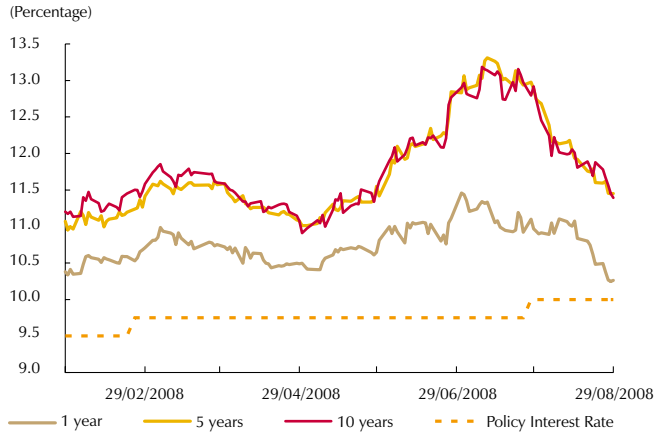
The central government faced an increase in the cost of financing through TES issued during the first half of the year, due to the rise in interest rates. However, the drop in rates on the secondary market after July lowered financing costs during August. Graph 46 shows the rates for treasury paper in the primary market (continuous lines) and in the secondary market for the issues open on auction days. One can see the rates for treasury paper averaged 5 basis points less than the trading rates in the secondary market on auction days, which is beneficial for government financing through this means.

The balance approved for short-maturity TES during 2008 is COP$5.6 t, of which COP$3.6 t are currently in the market. The issue of short-maturity TES consists of issuing these securities at an initial term of 357 days. Each issue or maturity is accomplished in four auctions (weekly), and every four weeks there is a new placement at 357 days. Each issue is reopened when the remaining term is 189 and 106 days, with the bonds being auctioned on a weekly basis for four weeks. Accordingly, each placement acquires a cumulative outstanding balance of almost COP$600 b by the end of the auction.

b. Secondary Market for the Local Government Debt

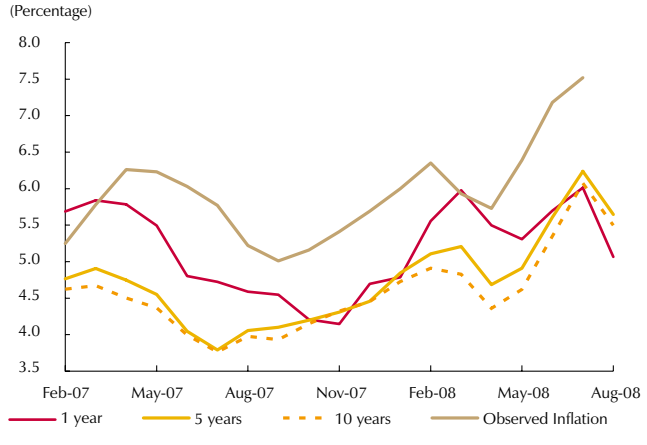
The first half of 2008 was not a favorable period for the local government debt market. The rates on TES of all maturities on the curve tended to increase, meaning a fall in price, considering the inverse relationship between rate and price. For example, the bond that matures in 2020 went from 10.30% in January to 12.52% at the end of June, while the

Graph 47
Zero-coupon Yield Curve for TES in Pesos and the Policy Interest Rate



Source: Banco de la República -SEN (electronic trading system)

Graph 48
Monthly Average Inflation Expectations Implicit in Zero-coupon Yield Rates on TES and Observed Inflation: January 2, 2007 to August 22, 2008



Source: Infoval; calculations by Banco de la República

bond scheduled to mature in May 2009 –the most liquid during the semester– went from 10.01% to 10.74% in the same period (Graph 47).

TES rates were influenced by the downturn in inflation expectations, following a major price hike during the semester. This steepened the interest rate curve, since the intermediate and long-maturity rates rose more than the short-term ones. Between January and July, the Board of Directors of Banco de la República (BDBR) made two adjustments in the benchmark interest rate (in February and July), raising it from 9.5% to 10.0%.[18]

However, TES rates have declined since late July, especially the intermediate and long-maturity rates, showing a correction in the steep interest rate curve. This is largely due to lower inflation expectations (Graph 48) following the BDBR rate rise on July 25 of this year and the publication of the July inflation rate, which was less than what the market expected.

The reduction in TES rates, especially the long-maturity rates, has been accompanied by a rebound in liquidity on this stretch of the curve. It is important to point out that, during the first half of the year, liquidity was concentrated in the short-maturity bonds, because they are less exposed to interest rate increases. With the recent change in the rates trend, the bond that matures in July 2020 has registered the most liquidity, concentrating more than 30% of the total volume traded on the secondary market.

Agents continue to expect the policy interest rate[19] to remain stable in the short and median term. This would free the market from the upward pressure on interest rates observed since the end of last year and during the first half of 2008. However, the tendency with respect to interest rates on public debt will depend on how inflation expectations behave in the coming months. This, in turn, will be determined by the inflation figures to be published during the remainder of the year; they are expected to reflect a slowdown in inflation. It

18 The Board of Directors of the Banco de la República has raised the benchmark rate by 400 bp since April 2006, when the cycle of interest rate hikes began.

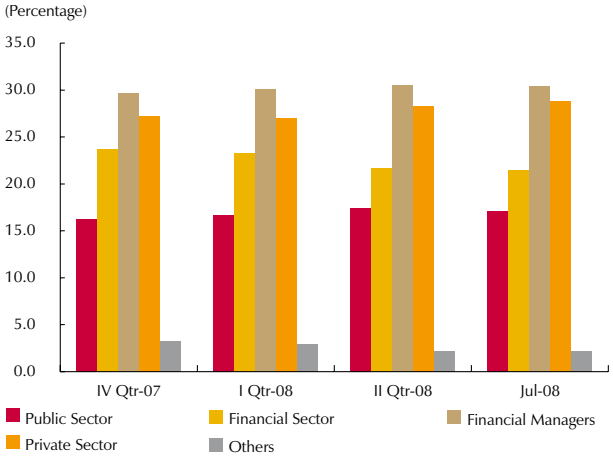
19 The latest survey of expectations among financial market analysts, published by Citibank in August, shows agents, on average, expect the interest rate to be 10.07% by the end the year.

should be noted that the BDBR has placed an emphasis on maintaining control over inflation expectations. Accordingly, a build-up in those expectations could prompt a further adjustment in the policy interest rate.

c. Major Investors[20]

According to the July 2008 edition of the *Statistical Bulletin*, which is published by the Central Securities Depository (DCV), 31% of all local government bonds on the market are held by financial managers, of which 73% are pension and severance-pay fund managers (23% of all bond issues). However, legal entities constitute the subgroup of investors with the largest share (28% of all bond issues) (Graph 49). The share represented by each group has not changed significantly for any group of investors since December 2007.

Graph 49
Total Value Deposited in the DVC by Type of Intermediary, Outstanding Principal in Pesos



Source: *DVC Statistical Bulletin*.

2. Foreign Exchange Market

Banco de la República intervened in the foreign exchange market during the first half of 2008 through put auction of US$ 513.2 million (m) for volatility control. Put auctions to accumulate US$450 m in reserves were held between March and May.

At the end of June, the BDBR replaced the reserve accumulation scheme based on monthly options of US$150 m with daily purchases of US$20 m through competitive auctions. US$831.8 m in international reserves were accumulated between June 24 and August 26. In all, during 2008,[21] Banco de la República has purchased US$1,795 m on the market.

Up until mid-June, the exchange rate showed a tendency to revaluate. This was consistent with what was happening on Latin American markets in response to the capital inflows reserved (Graph 50). The behavior of the exchange rate in Colombia has changed since the end of June, coinciding with the

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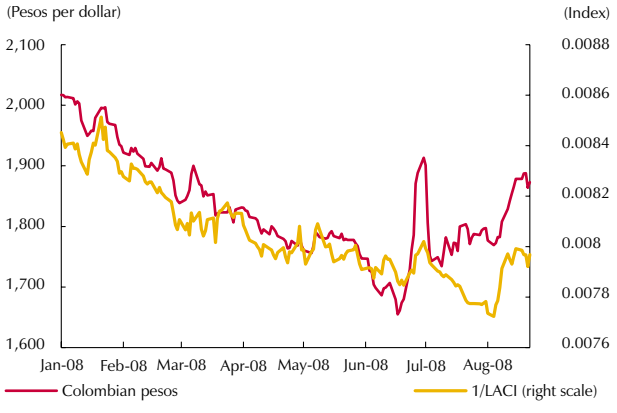
20 In this section, the principal investors were classified into five major groups. The public sector includes both financial and non-financial institutions. Financial sector includes commercial banks, financial corporations, commercial finance companies and cooperatives. Financial managers include trust companies, brokerage firms, insurance, reinsurance and capitalization companies, pension and severance-pay fund managers, mutual investment funds and bonded warehouses. The private sector includes private individuals, legal entities and non-profit organizations. The "others" include Banco de la República, Bancoldex and Deceval.

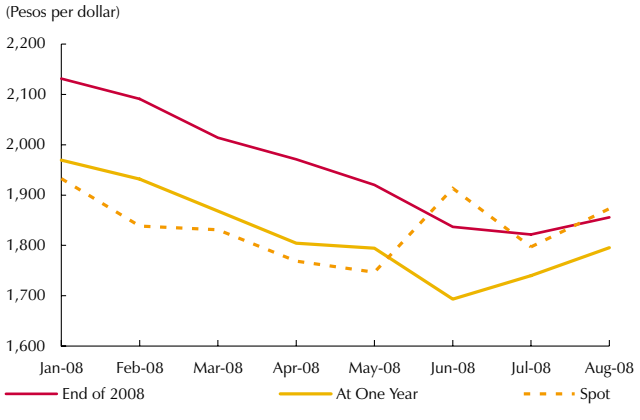
21 Data until August 26, 2008

Graph 50
Exchange Rate in Colombia and the Latin American Currency Index (LACI)



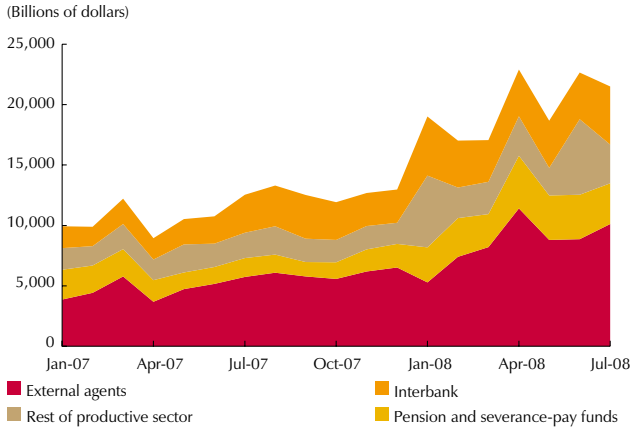
Source: Bloomberg.

Graph 51
Expectations for the Exchange Rate at the End of 2008 and at Twelve Months, and the Exchange Rate Observed at the End of the Month



Source: Banco de la República

Graph 52
Nominal Amounts of FX Forwards Traded by Exchange Intermediaries with Other Agents, by Sector



Source: Banco de la República.

BDBR's decision to purchase U.S. dollars on a daily basis, through competitive auctions, in addition to the recent change in the trend toward currency revaluation at the international level. Consequently, by August 22, the exchange rate had undergone a cumulative revaluation of 7.15%. However, as mentioned, revaluation during 2008 peaked at 18% in mid-June.

Banco de la República monthly survey of exchange rate expectations shows the agents who were polled believe this variable to remain relatively stable until the end of the year, following the swing in the tendency of the exchange since June. They also anticipate a slight revaluation over the next twelve months (Graph 51).

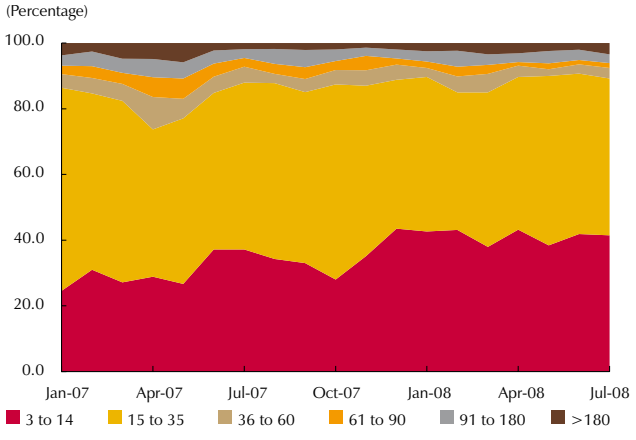
3. The Derivatives Market

Exchange market intermediaries have increased their trading by about 72% during 2008, compared to the monthly average in 2007. This increase has been proportional in their trading with the other agents in the market. Accordingly, the share of the total pertaining to each of these groups has remained stable. External agents are the group that accounts for the largest percentage of trading with intermediaries and is responsible for 43% of all transactions, on average (Graph 52).

However, it should be noted that the increase in amounts traded in forwards has been mostly in very short-maturity trades (between three and fourteen days) (Graph 53). After the limit on the gross leverage position (PBA) was implemented in May 2007,[22] the share of longer term trades declined as a portion of the total, have been displaced by extremely short-maturity trades. This is because they offer greater flexibility for managing the PBA limit.

22 The PBA limit imposed in May 2007 means gross positions in forwards traded by exchange market intermediaries (amount of purchases, plus sales) cannot exceed 500% of their assets.

Graph 53
Nominal Amounts of FX Forwards Traded by Exchange Intermediaries with Other Agents, by Term



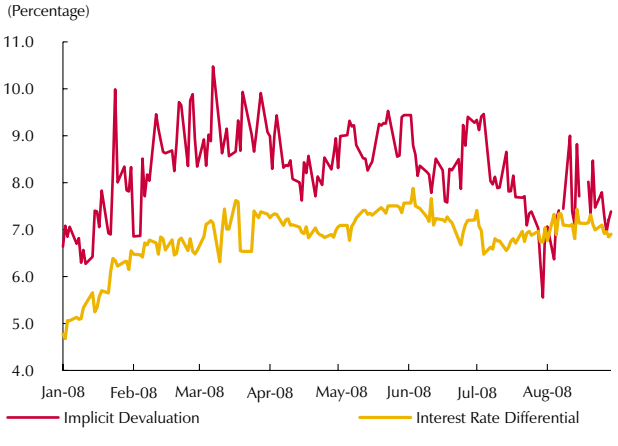
Source: Banco de la República

Table 4
Average Daily Forward and Spot Trades in Latin American Countries

Countries	Market Average		(A)/(B) (Percentage)
	Forward (A)	Spot (B)	
Colombia	488	1,295	38
Argentina	18	1,095	2
Brazil	348	5,077	7
Chile	1,496	2,036	73
Mexico	415	4,519	9
Peru	214	591	36
Latin America	545	2,436	22

Source: BIS – Tri-annual survey of central banks, December 2007.

Graph 54
Annualized Implicit Devaluation in Forward Contracts (Peso / Dollar) and Interest Rate Differential /a



a/ The interest rate differential was calculated using the interest rate of the zero-coupon yield curve for TES in pesos at 30 days and the one-month Libor rate in dollars.
Sources: Bloomberg and Infoval.

According to the tri-annual central bank´s survey published in December 2007 by the Bank for International Settlements (BIS), the daily turnover in the FX forwards market in Colombia was, on average, US$488 m. This is more than Mexico and Brazil (with US$415 m and US$348 m, respectively) (Table 4). However, those countries have a developed futures market; that has not been development yet in Colombia. In Chile, the average daily trading in the forwards market comes to $ 1,496 m. In relative terms, compared to the average amount traded on the spot market, Colombia accounts for 38%, while Brazil, Mexico and Chile have 7%, 9% and 73%, respectively. The relative share of the forwards market compared to the spot market for Latin America as a whole is.

During July, there was a sharp drop in the implicit devaluation in forward contracts. It was accompanied by an increase in net sales of forward contracts by external agents. However, this decline reversed itself in the wake of the BDBR interest rate hike, which raised the interest rate differential that determines the theoretical value of implicit devaluation (Graph 54).

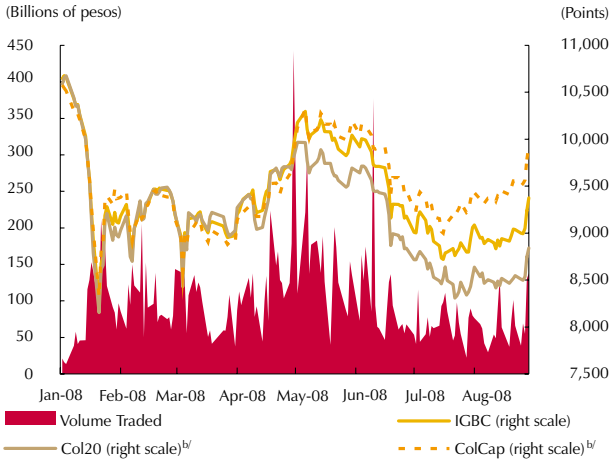
Given expected interest rate stability, both locally and in the United States, the interest rate differential is expected to remain relatively constant.[23] Therefore, the implicit devaluation in forward contracts is expected to behave similarly.

4. The Stock Market

The indexes that reflect performance on the Colombian stock market registered a sharp drop during the first weeks of the year, due to positions sold off by agents who had increased their stock holdings at the end of the 2007 accounting year to take advantage of tax benefits (Graph 55). This was a constant during the

23 According to the probabilities implicit in US Fed funds futures, the market has assigned a nearly 80% probability to the odds that the U.S. rate will not change during the remainder of the year.

Graph 55
IGBC, Col20 and ColCap [a/] Performance and Daily Volume Traded: January 2 to August 22, 2008



a/ The Col20 and ColCap indexes were introduced by the Colombian Stock Exchange (BVC) at the beginning of the year to broaden the range of measurements it publishes. The Col20 index is weighted by stock liquidity, while the ColCap is weighted by stock market capitalization of the companies listed on the exchange. Given the high liquidity and capitalization of Ecopetrol, it is among the companies with the most weight in both indexes. See the BVC website (http://www.bvc. com.co/) for more information on the composition and weight of stock in each of the indexes.
b/ The Col20 and ColCap indexes, multiplied by ten, appear on the right scale.
Source: BVC: Colombian Stock Exchange

early part of the year and was reinforced by the rise in risk aversion at the international level, which led to a sell off of risky assets that affected stock indexes in both the United States and Latin America. The added aversion was prompted by the reports of negative earnings released by financial institutions in the United States, which saw their profits jeopardized due to loss of value in the subprime market.

In Colombia, as of the second quarter, the addition of Ecopetrol stock to the calculation of several indexes and the rising price of oil, favored their valuation during the two months thereafter. However, the recent trend in the Colombian stock market indexes has been determined by the generalized decline in international stock indexes witnessed since June, due to the rise in risk aversion.

Interestingly, the corporate figures released at the end of the first half of the year, which showed good performance for the most part,[24] failed to generate a significant reaction in the stock market indexes. This was due to the considerable weight exerted on those indexes by Ecopetrol stock and the amount of market liquidity it concentrated (on average, 56% of the total volume traded daily during 2008 has been concentrated in Ecopetrol stock).

The drop in stock market indexes at the start of the year was reinforced by the increase in risk aversion at the international level.

Colombian stocks are expected to perform well in the short and intermediate term, now that a deposit on foreign investment in shares on the Colombian stock market is no longer required. This measure was implemented in May 2007, along with other capital controls on external borrowing and portfolio investment. Its elimination is expected to generate an increase in demand that would favor a rise in stock prices during the coming months.

24 According to profits reported during 2008.

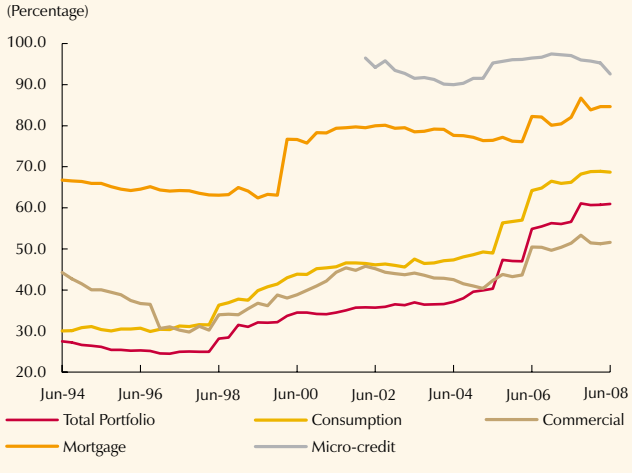
BOX 1
AN ANALYSIS OF CONCENTRATION AND COMPETITION[1]

Several issues related to the extent of concentration and competition among credit institutions are analyzed in this section. It starts by looking at the share of the five largest institutions in the credit and deposit markets. This analysis is supplemented with a Herfindahl-Hirschman index that makes it possible to quantify the level of concentration in these markets. It is important to emphasize that high levels of concentration do not means that markets are not competitive. Therefore, additional exercises are done to determine the degree of competition among credit institutions.

1. Concentration

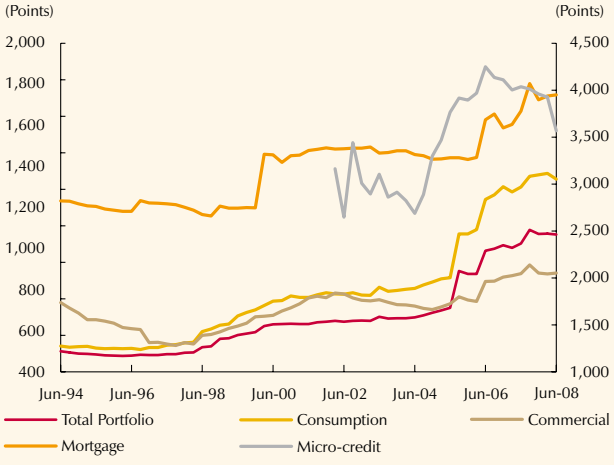
The extent to which the five largest intermediaries (RC5) participated in the credit market remained stable during the first half of 2008 (Graph B1.1, Panel A, and Table B1.1). In terms of the total portfolio, the levels of participation showed no major changes, registering an increase of almost 20 bp with respect to December 2007. As for the types of loans, the five largest intermediaries showed a slight decline in their share of the consumer and micro-loan portfolios, 5 bp and 1.61 pp, respectively. In the case of the commercial and mortgage loan portfolios, there was a slight increase. Despite of the stability of these indicators, it is important to point out that participation of the five largest institutions remains high, inasmuch as they account for more than 50% of the portfolio for each of type of loan.

Graph B1.1
A. Portfolio Share of the Five Largest Institutions



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

Graph B1.1 (continue)
B. HHI for the Loan Portfolio



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

The Herfindahl-Hirschman indexes (HHI)[2] showed a drop in concentration levels, both in the total portfolio and in the different types of portfolios. The mortgage loan portfolio was the only exception (Graph B1.1, Panel B). Despite the reduction in the HHI for the total loan portfolio, it is still close to that of a moderately concentrated market. The most significant decline was in the micro-loan portfolio, with a reduction of 391 points compared to December 2007; however, this portfolio continues to reflect a high degree of concentration. The mortgage portfolio of registered an increase of nearly 30 points, which brings it close to high market concentration.

The participation of the five largest intermediaries in the deposit market is similar to their share of the credit market (Graph B1.2, Panel A and Table B1.2). These institutions reduced their participation in the deposit market by nearly 50 bp during the first six months of 2008. In that period, their share of checking account and savings deposits was down by 2.1 pp and 30 bp, respectively. As to certificates of deposit (CDT), the share pertaining to the five largest institutions continues to climb, as it has for the last two years. In fact, it was up by 2.2% between December 2007 and June 2008.

The changes in the HHI during the first half of 2008 reflect a similar pattern to that of the (RC5) with respect to deposits. During that period, the HHI showed a reduction of 14 points

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

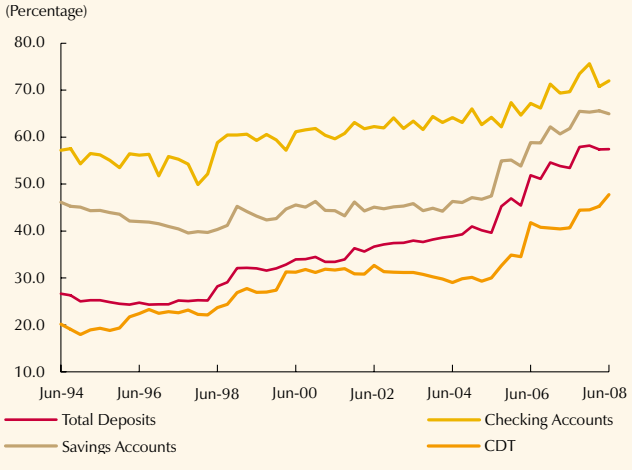
2 The HHI is an index that measures the degree to which a market is concentrated. The indicator is within a range of 0 <HHI <10,000. An index below 1,000 is considered low concentration; between 1,000 and 1,800 is average or moderate concentration. An index above 1,800 is indicative of high concentration.

Table B1.1
Loan Portfolio Concentration Indicators at June 2008

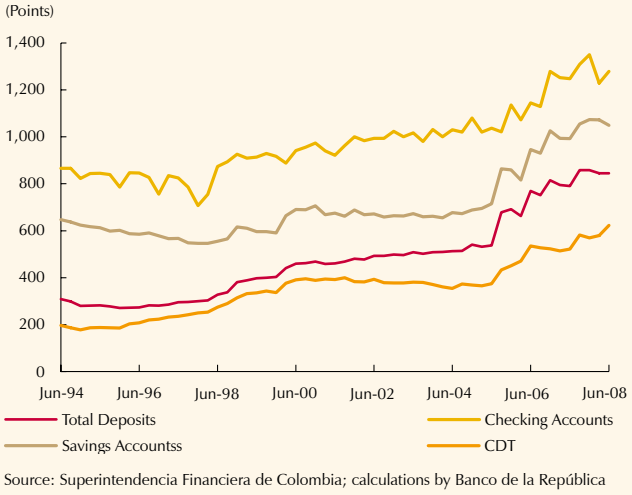
	Total Loan Portfolio	Consumer consumption	Commercial	Mortgage	Micro-loan
Share (%)					
2 largest	33.08	43.37	24.80	46.42	76.92
5 largest	60.97	68.71	51.56	84.63	92.56
HHI	952	1.255	741	1.718	3.568

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

Graph B1.2
A. Share of Deposits Represented by the Five Largest Institutions



B. HHI for Deposits



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

in total deposits, which keeps it at a low level of concentration. This decline is explained mainly by the downturn in HHI of checking and savings account markets, which showed respective reductions of 71 and 25 points. Similarly, the HHI for the CDT market maintained its trend, registering an increase of 20% during the past year. Despite this performance, the HHI for CDTs showed lowest degree of concentration among all types of deposits.

Table B1.2
Deposit Concentration Indicators at June 2008

	Total Deposits	Checking Accounts	Savings Accounts	Certificates of Deposit (CDT)
Share (%)				
2 Largest	29.44	41.05	32.17	23.29
5 Largest	57.45	71.99	64.96	47.73
HHI	844	1,279	1,049	623

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

In short, the momentum in the concentration indicators registered for credit and deposit markets during the last six months shows that participation in the different segments of the financial system has stabilized after the mergers in the past three years. The trend in concentration with respect to the micro-loan portfolio and certificates of deposit (CDT) is important to point out. The reduction in concentration levels for the micro-loan portfolio is due mainly to a change in regulations, which resulted in some consumer and commercial loans being considered micro-loans as of March 2008. On the other hand, the increase in concentration levels within the CDT market reflects the shift in the funding sources being used by intermediaries, particularly the largest ones.

2. Competition

Several methods are used in this section to identify the competition structure that characterizes the loan and deposit markets of financial intermediaries. The results of each of these exercises are presented below.

The first method is the one introduced by Panzar and Rosse,[3] which can be used to analyze how bank income responds to changes in production factor prices. The response is measured with an H indicator, which represents the sum of

3 This estimate was done with pooled unbalanced least squares. The regression takes the entire financial system into account, with annual data between 1994 and 2007.

income elasticities with respect to changes in the price of input, the value of which reflects the structure that characterizes the market.

The results show that competition varies in intensity from one type of banking activity to another. However, all the markets are characterized by the same competition structure (Table B1.3). The levels of the H statistics indicate that, on average, financial intermediaries see their income change in the same direction as the change in prices of input, but in a lesser degree. This suggests that the structure of this market is one of monopolistic competition with free entry. The data also indicate that the mortgage loan market is the most competitive, while the consumer loan market leans towards a monopolistic equilibrium.

Table B1.3
H Statistics by Portfolio Type

Portfolio	H
Total	0.231
Consumption	0.180
Commercial	0.370
Mortgage	0.502

Note: Estimations by random effects with a unbalanced panel. The exercise was performed for the entire financial system, minus leasing institutions, with quarterly data for the period from March 1995 to June 2008.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República.

Panzar and Rosse's analysis is supplemented with an analysis of market power to identify the relationship between market power, concentration and risk. A Lerner index is used as a proxy of market power and is estimated as a function of the loan concentration index and the ratio of non-performing loans to total loans. The results point to a positive relationship between market power, concentration and risk. This suggests that the greater the levels of concentration, the more capacity intermediaries have to control the market by means of transmitting their business risks to the consumer through higher costs of financial services (Table B1.4).

Table B1.4
Relationship between Market Power, Concentration and Risk
Dependent variable: Lerner Index

Financial System	
HHI	0.2156***
	(0.0236)
Loan Portfolio Quality	0.0831***
	(0.0083)

Note: Pooled estimation. The exercise was performed for the financial system as a whole, minus leasing companies, with monthly data from May 2002 to June 2008.
*** Indicates statistical significance at one percent
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

Another way to specify market structure is through a conjectural analysis, which is focused on a study of the reaction functions in loan and deposit markets. In this case, the conjectural parameter (γ) indicates how an intermediary reacts to changes in the strategies of its competitors. This shows the competition structure that characterizes a particular market. When the conjectural parameter is equal to zero, the market is one of Nash equilibrium.[4]

The results for the loan market are similar to those obtained through statistical analysis H (Table B1.5), the conjectural parameter suggest that this market operates under monopolistic competition.[5] According to the results, financial intermediaries are less competitive that in the Nash equilibrium, because they benefit more by operating that way.

Table B1.5
Conjectural Parameters for the Loan Portfolio and Deposits

γ of the Loan Portfolio	1,614E+08***
	(4,149E+06)
γ of Deposits	-1,4847***
	(0,2734)

Note: Estimation of the reduced forms by full information maximum likelihood method. The exercise was performed for the financial system as a whole, minus leasing companies, with quarterly data from March 1995 to June 2008.
*** Indicates statistical significance at one percent.
Source: Superintendencia Financiera de Colombia; calculations by Banco de la República

The results of the exercise suggest the deposit market operates under a more competitive scheme than the Nash equilibrium.[6] This may be associated with the fact that deposits are one of the primary sources of funding for intermediaries, which is why they are highly competitive when it comes to attracting them.

In short, the pattern of competition in the loan market is of monopolistic competition. This structure is maintained within the different credit segments. On the other hand, the deposit market presents is highly competitive structure, possible due to the intense rivalry to attract different types of deposits. Moreover, the results of the exercises suggest that concentration could have a positive effect on market power of financial institutions. This outcome warrants special attention, since intermediaries can use that power to transfer their costs to consumers, which would make the market less efficient.

4 A situation where the agents are price takers, but the economic benefits can be above zero.

5 The conjectural parameter (γ) is greater than zero.

6 The conjectural parameter (γ) is less than zero.

BOX 2
INTERNATIONAL INDICATORS

The most recent international events concerning productive and financial conditions in the developed economies, pose a challenge to emerging market economies in terms of the sustainability of their internal markets and the extent of their vulnerability to external shocks.

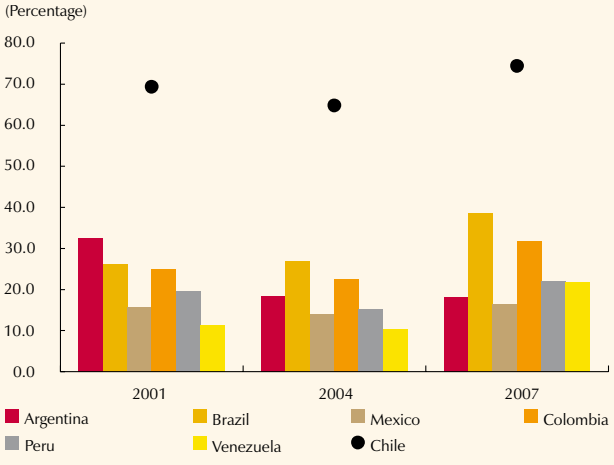
Several major indicators of the banking system in Colombia and in other Latin American countries[1] are analyzed in this section. The objective is to assess the efficiency, profitability and portfolio quality of the Colombian financial system and to compare it to the development of the financial systems in other countries of the region.

The banking systems in Latin America underwent some important changes during the first quarter of the year with respect to performance in past years. Less dependence on international financing flows, the increase in financial depth within the system, and more of a focus on financial intermediation are some of the reasons why the turbulence in the worlds major financial centers has had less of an impact (compared to previous crises).

The behavior in the indicator of financial depth (Graph B2.1) is positive for the region. Countries such as Chile and Colombia have improved over the past seven years to the point where they are now at respective levels of 74% and 31%. Argentina, for its part, suffered a major setback at the start of the decade, but is now close to the average for the region.[2] Mexico also had a low indicator (averaging 15% for the last seven years). This is because loans accounts for less of a share of the total assets of loan institutions than the share represented by broad money, investments and operations involving securities and derivatives.

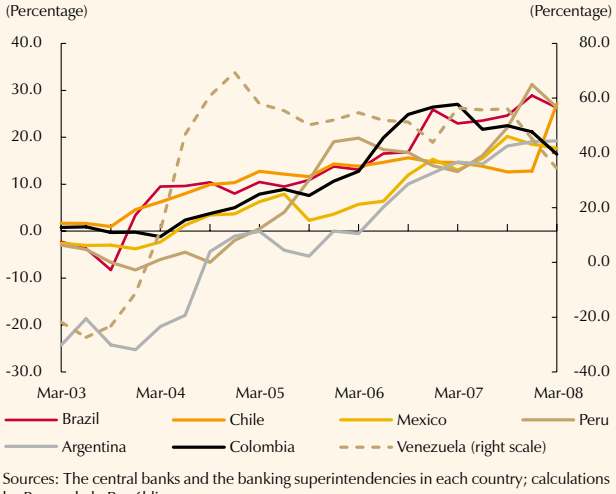
The real annual increase in loans (Graph B2.2) clearly reflects the impact of worsening international conditions, evidencing the slowdown in growth since 2007. Colombia is the country where the slowdown has been most severe, with a growth rate of 16.4% for March 2008 (the regional average for this period was 24%). The countries with most growth were Brazil and Chile, with 26.3% and 27.1%, respectively.[3] Peru also reflects a serious setback. Since March 2007, loans had increased at rates above those registered since 2003.

Graph B2.1
Financial Depth: Gross Loan /GDP



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

Graph B2.2
Real Gross Loan Portfolio Growth



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

On this point, it is worth noting that the slowdown in loan portfolio growth in Colombia also is due to the impact of monetary policy measures adopted recently by the Central Bank with respect to reserve requirements.

The loan quality index[4] (Graph B2.3) has improved substantially for the region in general since 2006. Nevertheless, sharp

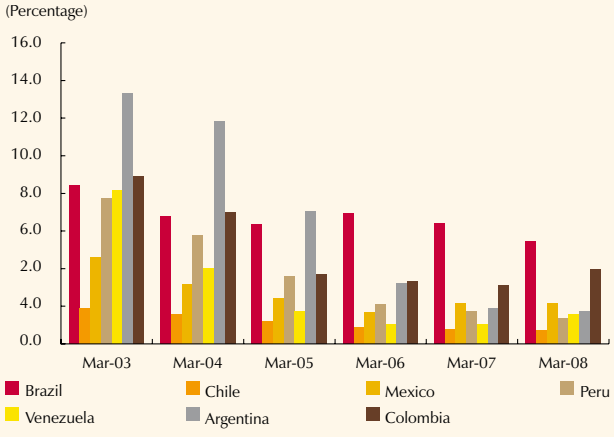
1 Argentina, Brazil, Chile, Mexico, Peru and Venezuela are the countries analyzed, with data to March 2008.

2 The average, excluding Chile, was 24.8% in 2007, which means Argentina (18.1%) is almost 7 pp below the mean.

3 In this edition, the figures for Chile reflect the change in the method used to report financial data. In the case of loans, the high growth rate is due to an increase in contingent loans and to the addition of new definitions of credit.

4 The loan quality index used in this section is the ratio of the non-performing loan to gross loan. Hereinafter, it will be understood as the arrears indicators, so as to have an equivalent measurement for the region.

Graph B2.3
Loan Quality: Non-performing Loans/Gross Loans



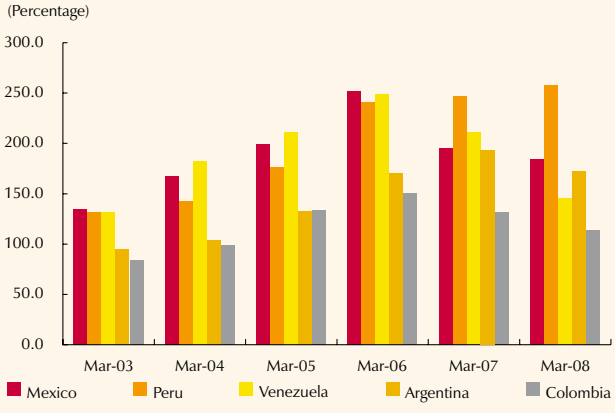
Sources: The central banks and the banking superintendences in each country; calculations by Banco de la República.

differences among the countries became evident towards the end of 2007 and early 2008. While Mexico (2.14%) and Brazil (5.47%) continued the favorable trend witnessed in recent years, Colombia (3.94%), Peru (1.36%) and Venezuela (1.56%) saw their indicators deteriorate. Those for Argentina and Chile remained constant. However, in the case of Chile, increases due to the change in method with respect to financial information cannot be ruled out. In the Colombian case, the indicator is 66 bp higher than it was in December 2007; in fact, it went from 3.28% to 3.94% in March 2008.

Improvement in the loan coverage indicator[5] is something the Latin American countries have been working to achieve since the start of this decade. Although the levels have been much higher in recent years than they were in the nineties, the tendency towards deterioration was explicit in 2007, as it has been so far this year. The negative annual growth rates observed throughout the region, except in Peru, may be a sign of deteriorating credit conditions within the countries. The most pronounced annual negative growth rate was in Venezuela (-30.8%), followed by Colombia (-13.4%).

As illustrated in Graph B2.4, the past year was marked by a sharp drop in the indicator. Peru is the only country to register an increase (11 pp). Colombia, which also experienced that decline, continued to remain well below the average for Latin America.[6]

Graph B2.4
Coverage: Loan Loss Provisioning/Non-performing Loan Portfolio

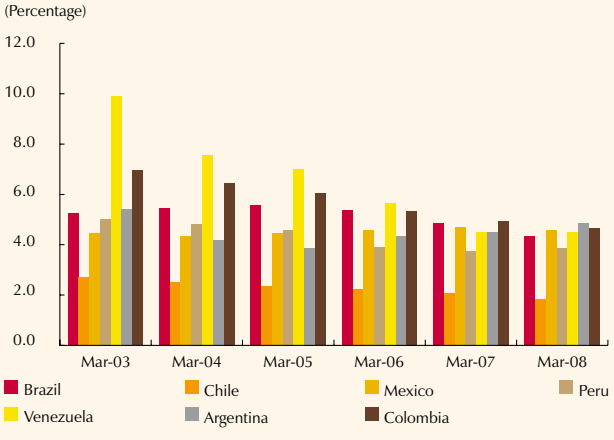


Sources: The central banks and the banking superintendents in each country; calculations by Banco de la República.

As to conditions within credit institutions, the efficiency indicator (Graph B2.5) has improved throughout the decade, despite the downturn at the start of 2008. Countries such as Venezuela, Brazil and Colombia witnessed a rise in their indicators at the end of the first quarter of 2008 (4.5%, 4.3% and 4.6%, respectively). The country that has seen its indicator deteriorate the most since 2006 is Argentina, with an average annual growth rate of 6% so far this year. Chile registered the best levels for this indicator and is always below average.[7]

The *ex post* intermediation spread (Graph B2.6) increased for

Graph B2.5
Efficiency: GAL/Assets



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

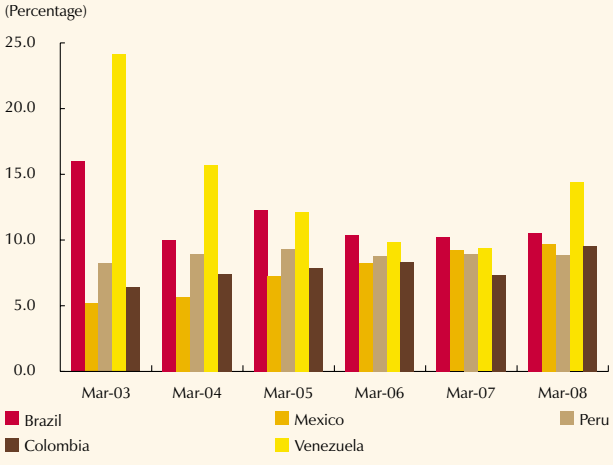
some economies as of the second half of 2007. This tendency in countries such as Peru and Colombia may be due to the benchmark rate hikes ruled by their central banks and to the impact of policies on reserve requirements. In Mexico, this

5 Loan coverage index used in this section is the ratio of loan-loss provisioning to non-performing loans. Hereinafter, it shall be understood as the loan-loss provision/ gross loans ratio, so as to have an equivalent measure for the region.

6 In the first quarter of 2008, Colombia registered an index of 114%. The average for the Latin American countries during that period was 175%.

7 At March 2008, the Latin American average was 4% and the indicator for Chile was 1.8%.

Graph B2.6
***Ex post* Intermediation Spread**



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

tendency may be due to less competition for deposits and higher regulatory and recovery costs for problematic loans. The average for the sample was 8.8% in December 2007; it was 10.4% in March. These increases in intermediation spreads brought an end to the stability registered since early 2006.

The margin in Venezuela increased the most (448 bp), followed by Colombia, with an increase of 2.84 pp (from 6.53% to 9.37%) and Peru (8.7%), with an additional 67 bp.

In short, Latin America has improved its financial depth levels. Even so, external macroeconomic conditions and the contractive policies of some central banks affected quality, coverage and efficiency indicators and the pace of gross loans growth.

III. The Current Situation and the Outlook for Borrowers in the Financial System

Corporate profitability and liquidity indicators were positive during the period in question, although some restriction in liquidity is expected in the near future. The household financial burden is high, which means the process of extending new loans, particularly consumption loans, must continue to be improved.

A. THE PRIVATE CORPORATE SECTOR

The sample of companies that report balance sheet information to the Financial and Corporate Superintendencies was used to analyze the situation in the corporate sector.[25] The financial indicators were analyzed for all companies and separately for producers of tradable goods and non-tradable goods and services.[26] A classification by size was done as well, according to the value of sales reported for 2007.[27] The indicators analyzed are identical to those examined in past editions of the *Financial Stability Report* and are the ones that have been identified as determinants of the weakness of Colombian companies.[28]

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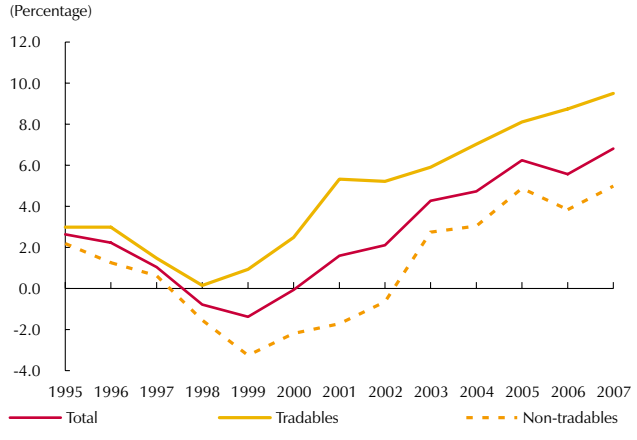
25 Two samples were used. The first includes all companies that reported information during the 1995-2007 period. The second is a homogeneous sample constructed with the companies that jointly have information for the years 2004, 2005, 2006 and 2007.

26 The companies producing tradables are those in the agriculture, cattle-raising, hunting, fishing, mining and quarry sectors and in the manufacturing industry. Those producing non-tradables belong to the other sectors.

27 Ten percent of the companies with more sales were classified as large firms, while the 60% with fewer sales were classified as small companies.

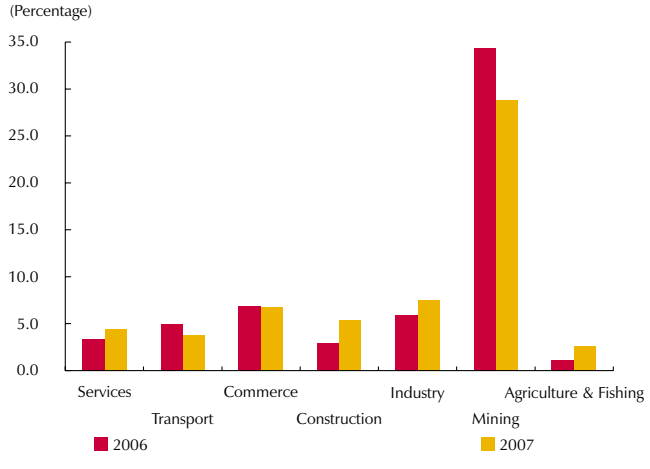
28 Óscar Martínez (2003). "Determinantes de fragilidad de las empresas colombianas", in Borradores de Economía, No. 259, Banco de la República.

Graph 56
Return on Assets
(Profit before taxes/total assets)



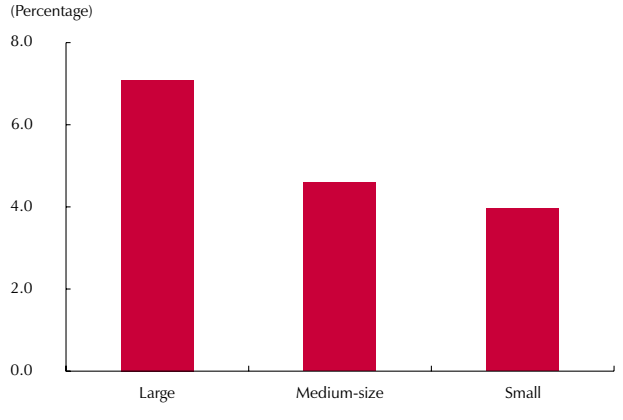
Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

Graph 57
Return on Assets by Sector



Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

Graph 58
Return on Assets by Size



Sources: Financial and Corporate Superintendences; calculations by the Banco de la República.

1. Profitability

Return on assets (ROA), defined as profit before taxes on total assets, increased between December 2006 and a year thereafter, having gone from 5.6% to 6.8% (Graph 56). This performance is explained by sales growth (5.7% in real terms), which exceeded the increase in costs (3.8% real). Likewise, both administrative spending and non-operational costs registered less of an average increase than the one reported in 2006. This, in turn, generated 19.8% more profit between 2005 and 2006 for the companies as a whole, which showed COP$20,8 t in earnings at the end of 2007 (Table 5).

By sectors, the companies producing tradables raised their profitability from 8.7% a 9.5% between December 2006 and December 2007, registering an annual increase of 22.7%. Mining was the sector within this group of companies that had the highest level of profitability (11.2%). Producers of non-tradables goods raised their profitability from 3.8% to 5.0% during the same period. However, the increase in profitability for these companies is explained by the less than proportional reduction in sales (-0,4%) with respect to the level of costs (-2,8%). Their annual increase in profits came to 15.9%.[29] The transport sector as part of the group of companies producing non-tradable goods and services reported the highest level of profitability (8.9%) (Graph 57).

In terms of size, the most profitable companies were the large ones, as would be expected, followed by the medium-size companies, with a difference of 2.4 pp (Graph 58).

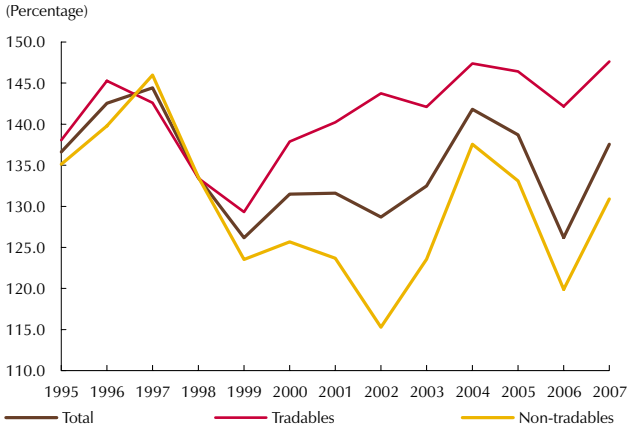
29 The difference in profitability between companies producing tradables and those producing non-tradables was due to the difference in the rate of growth in profits and to the extent of profits compared to the growth in assets. In the case of companies producing tradables, profits were up by 8 pp above assets; in the case of non-tradable producers, profits increased 14.8 pp above assets.

Table 5
Private Corporate Sector Income Statement

	Trillions of December 2007 Pesos				Growth Rate (%)		
	2004	2005	2006	2007	2005	2006	2007
Total							
Sales	234.3	248.7	294.3	311.2	0.1	0.2	0.1
Costs	167.2	176.5	211.9	219.8	0.1	0.2	0.0
Gross Profit	67.1	72.2	82.4	91.4	0.1	0.1	0.1
Administrative Expenses	23.1	22.6	25.9	27.4	(0.0)	0.1	0.1
Sales Expenses	24.3	25.9	29.8	33.4	0.1	0.2	0.1
Operational Profit	19.7	23.7	26.7	30.5	0.2	0.1	0.1
Non-operational Income	31.3	14.7	20.4	23.8	(0.5)	0.4	0.2
Non-operational Expenses	33.7	15.4	22.5	25.8	(0.5)	0.5	0.1
Profit before Taxes	17.4	23.0	24.6	28.5	0.3	0.1	0.2
Adjustments for Inflation	1.7	1.4	1.2	0.0	(0.2)	(0.2)	(1.0)
Taxes	6.6	7.3	8.5	7.8	0.1	0.2	(0.1)
End Profit	12.5	17.1	17.3	20.8	0.4	0.0	0.2
Tradables							
Sales	115.1	116.0	130.0	147.6	0.0	0.1	0.1
Costs	80.8	82.0	91.1	102.5	0.0	0.1	0.1
Gross Profit	34.4	34.0	38.9	45.2	(0.0)	0.1	0.2
Administrative Expenses	9.1	8.4	8.9	10.2	(0.1)	0.1	0.1
Sales Expenses	11.8	12.1	13.5	17.0	0.0	0.1	0.3
Operational Profit	13.4	13.5	16.5	18.0	0.0	0.2	0.1
Non-operational Income	21.3	7.1	10.7	13.7	(0.7)	0.5	0.3
Non-operational Expenses	24.0	7.9	12.4	14.6	(0.7)	0.6	0.2
Profit before Taxes	10.8	12.7	14.9	17.1	0.2	0.2	0.1
Adjustments for Inflation	0.8	0.6	0.5	0.0	(0.2)	(0.2)	(1.0)
Taxes	4.4	4.7	5.5	4.9	0.1	0.2	(0.1)
End Profit	7.2	8.6	9.9	12.2	0.2	0.2	0.2
Non-tradables							
Sales	119.2	132.6	164.2	163.5	0.1	0.2	(0.0)
Costs	86.4	94.5	120.8	117.3	0.1	0.3	(0.0)
Gross Profit	32.7	38.2	43.5	46.2	0.2	0.1	0.1
Administrative Expenses	14.0	14.2	17.0	17.2	0.0	0.2	0.0
Sales Expenses	12.5	13.8	16.3	16.4	0.1	0.2	0.0
Operational Profit	6.2	10.2	10.2	12.5	0.6	0.0	0.2
Non-operational Income	10.0	7.6	9.6	10.1	(0.2)	0.3	0.0
Non-operational Expenses	9.7	7.5	10.1	11.2	(0.2)	0.3	0.1
Profit before Taxes	6.5	10.3	9.8	11.4	0.6	(0.1)	0.2
Adjustments for Inflation	0.9	0.8	0.7	0.0	(0.2)	(0.1)	(1.0)
Taxes	2.2	2.6	3.0	2.8	0.2	0.2	(0.1)
End Profit	5.3	8.5	7.4	8.6	0.6	(0.1)	0.2

Sources: Financial and Corporate Superintendences; calculations by Banco de la República

Graph 59
Current Liquidity
(Current Assets /Current Liabilities)



Sources: Financial and Corporate Superintendences; calculations by Banco de la República

2. Liquidity

The liquidity indicator, measured as the ratio of current assets to current liabilities, remains high. It was equal to 137.5% at December 2007 (in other words, current assets were 1.37 times current liabilities), which shows that companies in the corporate sector are able to meet their short-term obligations with their more liquid assets. It is worth noting that 2007 witnessed the reversal of the downward trend observed in this indicator during the two previous years. As illustrated in Graph 59, companies producing tradable goods have higher liquidity indicators than those producing non-tradables. Essentially, this is because, non-tradable producers have more current assets but their current liabilities are much greater, because they have more financial liabilities.

According to the general balance (Table 6), the rise in liquidity is due to more of an increase in current assets (8.3% real growth) than in current liabilities (4.3% real growth). That momentum was fueled largely by the increase in accounts receivable (11.2%) and in inventories (6.4%), which are items that account for a larger share of current assets.

Table 6
Private Corporate Sector General Balance Sheet

	Trillions of December 2007 Pesos				Growth Rate (%)			Share (%)	
	2004	2005	2006	2007	2005	2006	2007	2006	2007
Assets									
Available Funds	7.9	9.0	9.7	11.0	14.3	7.2	13.9	2.5	2.8
Investments	13.5	13.7	13.8	13.7	1.3	1.2	(1.0)	3.6	3.4
Debtors	51.6	54.7	64.2	71.3	5.9	17.3	11.2	16.8	17.9
Inventories	32.8	33.0	39.2	41.8	0.7	18.9	6.4	10.3	10.5
Deferred	1.9	1.8	2.0	1.7	(4.9)	11.9	(12.2)	0.5	0.4
Current Assets	**107.7**	**112.1**	**128.9**	**139.5**	**4.2**	**14.9**	**8.3**	**33.8**	**35.1**
Investments	55.2	70.8	79.6	77.0	28.2	12.3	(3.2)	20.9	19.4
Debtors	6.1	6.0	6.0	7.3	(1.3)	(0.1)	22.2	1.6	1.8
Property, Plant and Equipment	52.1	55.7	61.0	64.8	6.8	9.6	6.2	16.0	16.3
Intangibles	14.8	12.6	12.5	12.0	(14.9)	(0.3)	(4.3)	3.3	3.0
Deferred	9.0	8.9	9.5	10.1	(1.1)	6.0	7.2	2.5	2.5
Other Assets	0.9	0.9	0.8	1.1	(3.9)	(9.7)	41.1	0.2	0.3
Valuations	67.6	74.4	83.1	86.0	10.0	11.8	3.5	21.8	21.6
Non-current Assets	**205.8**	**229.2**	**252.5**	**258.4**	**11.4**	**10.1**	**2.3**	**66.2**	**64.9**
Total Assets	**313.5**	**341.4**	**381.4**	**397.9**	**8.9**	**11.7**	**4.3**	**100.0**	**100.0**

Table 6 (continue)
Private Corporate Sector General Balance Sheet

	Trillions of December 2007 Pesos				Growth Rate (%)			Share (%)	
	2004	2005	2006	2007	2005	2006	2007	2006	2007
Financial Obligations	22.4	21.9	25.9	27.5	(2.1)	18.1	6.0	26.9	27.4
Suppliers	22.1	23.6	28.0	28.0	6.9	18.6	0.2	29.1	28.0
Accounts Payable	15.1	15.6	19.8	20.3	3.5	26.5	2.9	20.5	20.3
Taxes	5.5	6.0	7.1	7.1	10.2	17.9	(0.5)	7.4	7.0
Labor Obligations	1.9	2.0	2.5	2.6	1.8	24.2	4.5	2.6	2.6
Estimated Liabilities and Provisions	3.8	4.3	4.8	5.5	14.9	10.3	14.2	5.0	5.5
Deferred	0.8	0.8	1.1	1.2	3.3	40.2	7.4	1.2	1.2
Other Liabilities	4.2	5.1	6.0	7.5	21.9	18.4	24.1	6.3	7.5
Bonds and Commercial Paper	0.9	0.9	1.0	0.6	1.4	3.8	(36.6)	1.0	0.6
Current Liabilities	**76.6**	**80.3**	**96.1**	**100.3**	**4.8**	**19.7**	**4.3**	**100.0**	**100.0**
Financial Obligations	16.4	13.9	16.9	19.6	(15.8)	22.2	15.6	12.6	13.8
Suppliers	0.0	0.0	0.0	0.9	-	-	-	0.0	0.7
Accounts Payable	5.6	6.0	6.4	6.2	7.2	7.5	(3.9)	4.8	4.3
Taxes	0.0	0.0	0.0	0.1	-	-	-	0.0	0.1
Labor Obligations	0.2	0.1	0.1	0.1	(11.1)	3.5	(0.2)	0.1	0.1
Estimated Liabilities and Provisions	3.6	3.7	3.6	3.5	1.7	(3.5)	(0.5)	2.6	2.5
Deferred	3.0	3.2	3.4	3.3	6.8	6.0	(4.7)	2.5	2.3
Other Liabilities	2.1	1.9	2.3	2.1	(9.6)	19.6	(5.7)	1.7	1.5
Bonds and Commercial Paper	6.6	7.6	5.9	5.5	14.8	(22.3)	(6.7)	4.4	3.9
Non-current Liabilities	**37.5**	**36.3**	**38.6**	**41.3**	**(3.1)**	**6.3**	**7.1**	**28.7**	**29.2**
Total Liabilities	**114.1**	**116.6**	**134.7**	**141.6**	**2.2**	**15.5**	**5.1**	**100.0**	**100.0**
Equity	8.9	8.1	6.9	8.1	(8.9)	(14.4)	17.1	2.8	3.2
Surplus Capital	39.3	48.4	48.5	49.1	23.0	0.3	1.2	19.7	19.2
Reserves	18.7	21.0	25.8	28.8	12.3	23.1	11.6	10.5	11.2
Equity Revaluation	57.4	57.9	61.8	58.8	0.8	6.8	(4.9)	25.1	22.9
Dividends	0.0	0.0	0.0	0.0	(10.6)	21.4	99.3	0.0	0.0
Profit in the Accounting Period	12.3	16.8	17.0	20.5	37.0	1.2	20.3	6.9	8.0
Profits from Previous Accounting Periods	(5.0)	(1.8)	3.1	5.6	(63.3)	(268.6)	83.4	1.2	2.2
Valuation Surplus	67.7	74.4	83.5	85.4	9.9	12.2	2.3	33.8	33.3
Total Equity	**199.3**	**224.7**	**246.6**	**256.3**	**12.7**	**9.7**	**3.9**	**100.0**	**100.0**

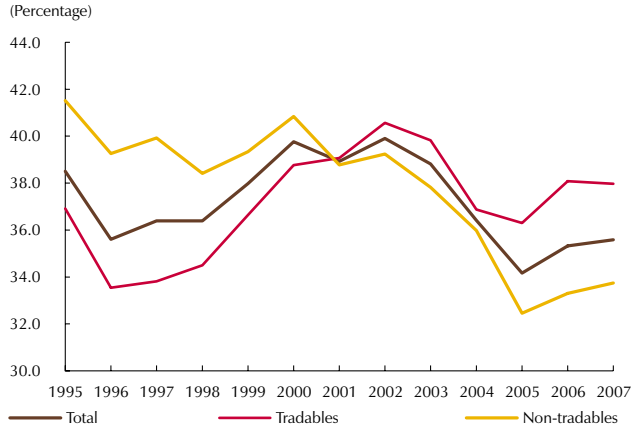
Sources: Financial and Corporate Superintendences; calculations by the Banco de la República

3. Indebtedness

The total indebtedness level for the same sample of companies rose slightly from 35.3% to 35.6% between December 2006 and the same month in 2007. It declined for the companies producing tradables and increased for those producing non-tradables (Graph 60).

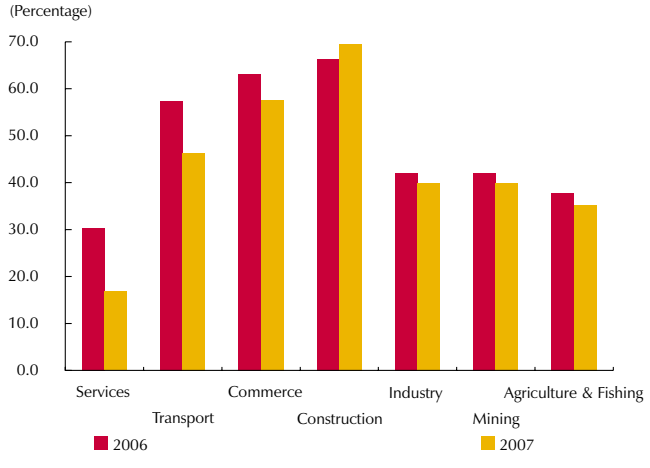
The growth in liabilities is explained primarily by the increase in both short-term and long-term financial obligations. It is important to point out that the

Graph 60
Total Indebtedness
(Total Liabilities /Total Assets)



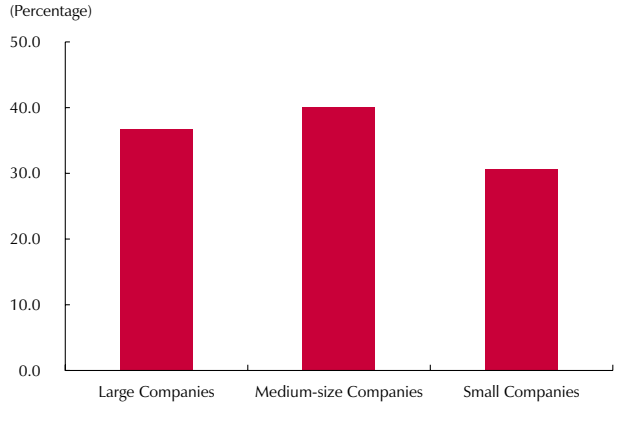
Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

Graph 61
Total Indebtedness by Sector



Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

Graph 62
Total Indebtedness by Size



Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

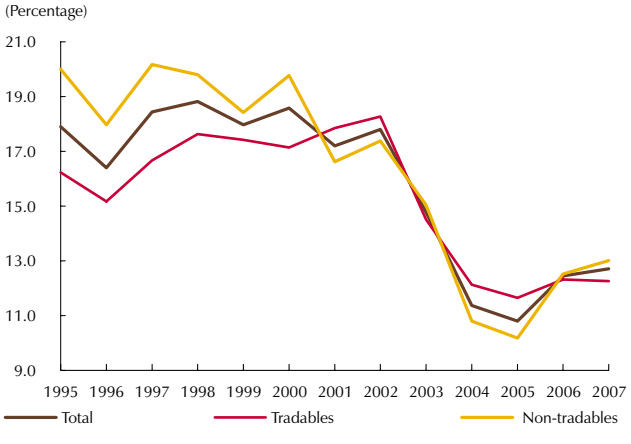
share of financial obligations has increased, while that of bonds and commercial paper has declined, thereby losing ground as a proportion of total liabilities (Table 6).

Between December 2006 and December 2007 every sector reduced its total indebtedness level. The only exception was the construction sector, which registered more indebtedness during the period in question. Therefore, the rise in the indicator of total indebtedness for the entire sample is due solely to the behavior of the construction sector (Graph 61).

In terms of size, as illustrated in Graph 62, the medium-sized companies were those most in debt at December 2007, followed first by the largest companies and them by the smallest. Interestingly, a comparison between this behavior and the return on assets shows the companies most in debt are not those with the most profit, which might suggest these are relatively riskier firms.

The increase in corporate financial obligations led to a higher indicator of financial indebtedness (ratio of financial obligations to total assets), which went from 12.4% to 12.7% in 2007 (Graph 63). Compared to December 2006, this indicator remained unchanged at 12.3% for the companies producing tradable

Graph 63
Financial Indebtedness
(Financial Obligations/Total Assets)



Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

goods. In contrast, it was up from 12.5% to 13.0% at December 2007 for the companies producing non-tradables.

The results for the indicator of financial indebtedness show that companies continue to include an important amount of financial debt in their capital structure. Although the indicator does not reflect exceptional growth, there was quite an increase in financial obligations during 2007. Long-term financial obligations in particular were up by a real rate of 15.6%, while the real increase in short-term financial obligations was 6.0% (Table 6).

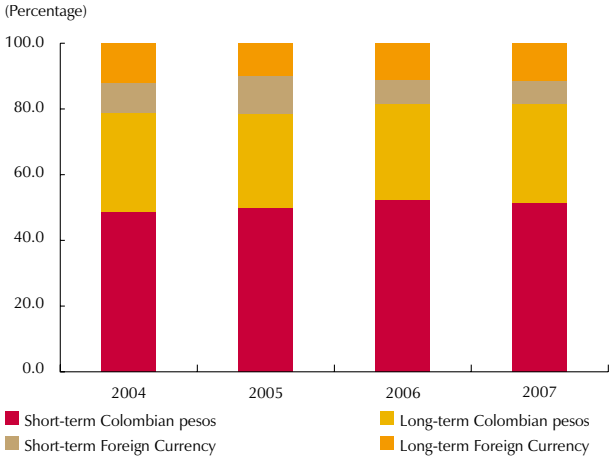
The growth in short-term financial obligations during 2007 is explained by debts contracted with commercial banks (Table 7). The other debt items with maturity under one year varied considerably, but did not account for a major share of the increase in short-term financial obligations.

Table 7
Corporate Sector Financial Indebtedness

	Trillions of December 2007 Pesos				Growth Rate			Share (%)	
	2004	2005	2006	2007	2005	2006	2007	2006	2007
Short-term Financial Obligations									
Local Banks	14.8	14.6	18.5	19.9	(1.5)	26.7	7.7	74.5	72.6
Foreign Banks	2.8	3.5	2.7	3.1	23.5	(21.0)	14.7	11.0	11.4
Financial Corporations	1.2	0.9	0.4	0.4	(25.8)	(59.3)	13.1	1.5	1.5
Commercial Finance Companies	0.6	0.7	0.8	1.0	5.6	18.2	18.7	3.2	3.5
Mortgage Banks	0.2	0.2	0.2	0.2	24.3	(11.1)	19.6	0.8	0.9
Foreign Lenders	0.8	0.6	0.3	0.3	(18.4)	(49.6)	(19.2)	1.3	0.9
Investment Repurchase Agreements	0.7	0.2	0.2	0.3	(69.0)	(30.8)	92.6	0.6	1.1
Loan Portfolio Repurchase Agreements	0.0	0.0	0.0	0.0	9.8	(1.6)	51.0	0.1	0.2
Governmental Obligations	0.1	0.1	0.0	0.1	0.7	(36.6)	151.9	0.1	0.3
Other Obligations	1.2	1.1	1.7	2.1	(3.1)	50.6	25.9	6.8	7.7
Total Short-term Financial Obligations	22.4	21.9	24.8	27.5	(2.1)	13.2	10.6	100.0	100.0
Long-term Financial Obligations									
Local Banks	6.7	6.4	8.4	9.7	(4.4)	31.5	15.3	49.8	49.5
Foreign Banks	3.5	3.3	4.3	5.1	(4.8)	28.2	18.8	25.3	26.0
Financial Corporations	1.4	0.9	0.5	0.5	(37.6)	(49.3)	2.5	2.7	2.4
Commercial Finance Companies	0.9	0.7	0.8	1.1	(22.8)	12.6	40.6	4.8	5.8
Mortgage Banks	0.1	0.1	0.1	0.2	(16.4)	14.5	37.3	0.8	0.9
Foreign Lenders	1.2	0.3	0.4	0.3	(78.2)	30.6	(22.5)	2.1	1.4
Investment Repurchase Agreements	0.0	0.1	0.0	0.0	82.7	(52.1)	(74.3)	0.2	0.0
Loan Portfolio Repurchase Agreements	0.0	0.0	0.0	0.0	14.8	(1.8)	56.7	0.1	0.2
Governmental Obligations	0.7	0.3	0.1	0.1	(60.2)	(60.9)	(27.4)	0.6	0.4
Other Obligations	1.8	1.8	2.3	2.6	(0.3)	28.7	15.1	13.6	13.5
Total Short-term Financial Obligations	16.4	13.9	16.8	19.5	(15.8)	21.6	16.0	100.0	100.0

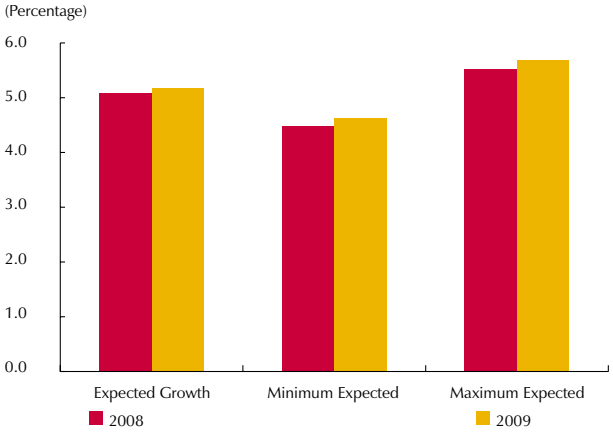
Note: The information for 2006 includes only companies that reported attachments to accounts to the Financial and Corporate Superintendents that year.
Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

Graph 64
Indebtedness by Currency and Loan Life



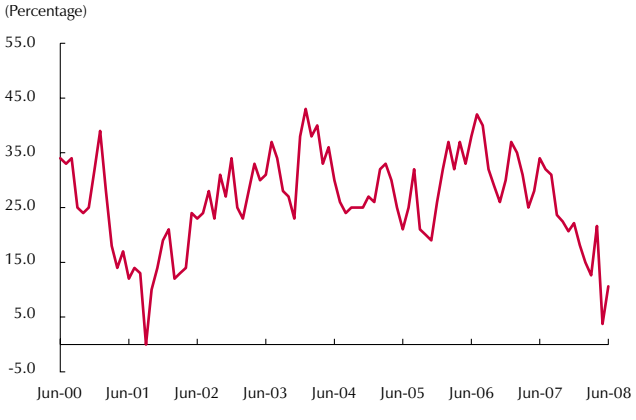
Sources: Financial and Corporate Superintendences; calculations by Banco de la República.

Graph 65
Expected GDP Growth



Source: Expectation Survey, Banco de la República, July 2008.

Graph 66
Corporate Expectations on the Economic Situation



Source: Business Opinion Survey, Fedesarrollo, June 2008.

In the case of long-term debts, obligations with local banks –although less important than the short-term obligations– were up by 15.3% during 2007, while those contracted with foreign banks rose 18.8%.

In terms of the composition of financial obligations by maturity and currency, 58.4% were contracted at less than one year, a proportion that has remained more or less stable throughout the period in question. As to financial obligations in foreign currency, the debt with foreign institutions gained 1 pp, primarily due to the increase in long-term obligations (Graph 64). Nevertheless, it is worth noting during 2007 companies began to substitute foreign debt with local funding during the course of the year.

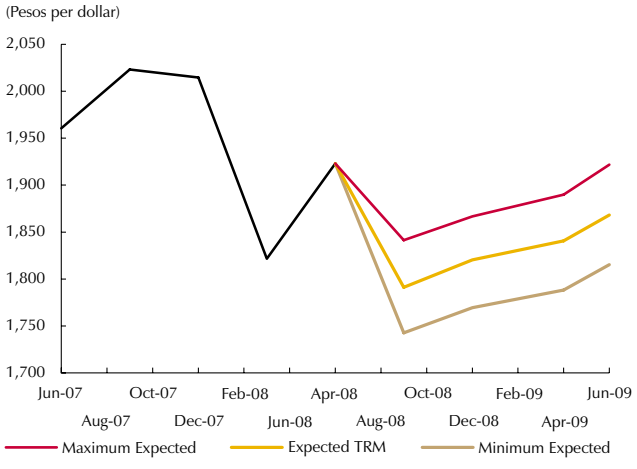
In short, the private corporate sector continues to experience important sales growth. This has enabled it to achieve good profitability, thus continuing the tendency observed since the crisis in 1999. At the same time, liquidity has remained acceptable and, for 2007, it increased as opposed to the situation in years past. In term of indebtedness, the rise in financial obligations is worth noting, particularly the increased level of indebtedness among companies in the construction sector.

4. Expectations of the Business Community

According to the expectation survey conducted by Banco de la República in July 2008, businessmen expect the economy to grow by 5.1% this year and 5.2% in 2009. One year ago, the expectation for 2008 was 6.0%; in April of this year, it was 6.1%. The decline in expectations is in keeping with the growth observed during the first quarter of the year, which was less than expected (Graph 65).

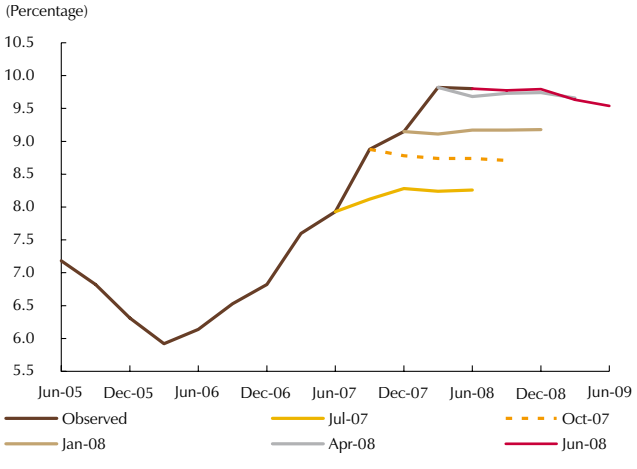
The results of the Fedesarrollo business opinion survey (EOE in Spanish) in June 2008 concerning the economic outlook for companies in the next six months are consistent with the expectation for economic growth. Graph 66 shows this perception has declined since mid-June 2006, reaching a relatively low point

Graph 67
Expected and Observed Market Exchange Rate (TRM)



Source: Expectation Survey, Banco de la República, July 2008.

Graph 68
Expected and Observed DTF



Source: Expectation Survey, Banco de la República, July 2008.

in June 2008 (which indicates the proportion of businessmen with positive expectations has declined compared to those who are pessimistic).

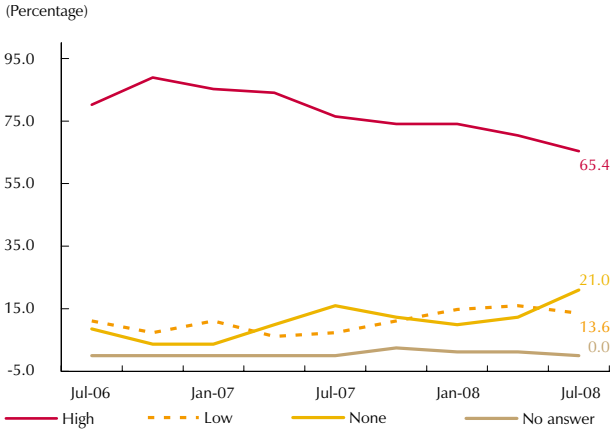
According to the combined industrial opinion survey (EOIC) done by the Asociación Nacional de Empresarios de Colombia (ANDI) in June 2008, a comparison between the January-June period in 2008 and the same period in 2007 shows production rose by 1.2% and total sales by 0.6% (a year ago, these increases were around 8.0%). Use of installed capacity was 77.0% at June 2008, which is less than the figure registered for the same month in 2007 (81.6%). Moreover, only 56.1% of those interviewed believe their company is currently in a good economic position and 36.4% believe it will improve in the short-term. In December 2007, these indicators were 71.0% y 40.3%, respectively. The behavior of the exchange rate, low demand, higher costs for raw materials and competition are among the main hurdles companies face.

Going back to Banco de la República's survey in July 2008, the businessmen who were polled expect the market exchange rate (TRM) to devaluate to COP$1,820 by December 2008 (Graph 67). This is consistent with the trend towards devaluation observed in most Latin American currencies since early August 2008.

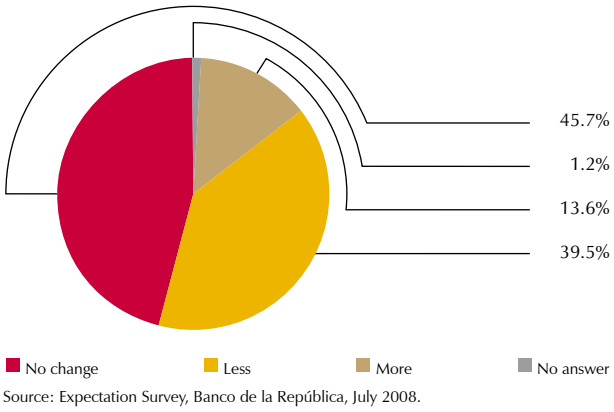
Businessmen had raised their expectations with respect to the DTF. Compared to the value of the DTF in June 2008, agents now expect it to decline gradually during each quarter to 9.54% in June 2009, which is 26 bp above the value registered in June of this year. Businessmen expect the DTF to be 9.77% by September, which is 60 and 4 bp higher than the respective estimates in January and April. They expect it to be 9.79% by December 2008, which is 61 and 5 bp higher than the values registered in the last two surveys (Graph 68).

As to the question about the state and development of liquidity and the availability of credit in the next six months, those interviewed were quite pessimistic compared to earlier surveys. The downward tendency in the percentage of those interviewed who perceive liquidity in the economy as being high continued for the most part. In fact, it was 65.4% in July 2008, which is the lowest percentage since early 2002. The group of businessmen who believe liquidity in the economy is low (13.6%) increased by 6.2 pp compared to June.

Graph 69
A. Actual Perception of Liquidity in the Economy

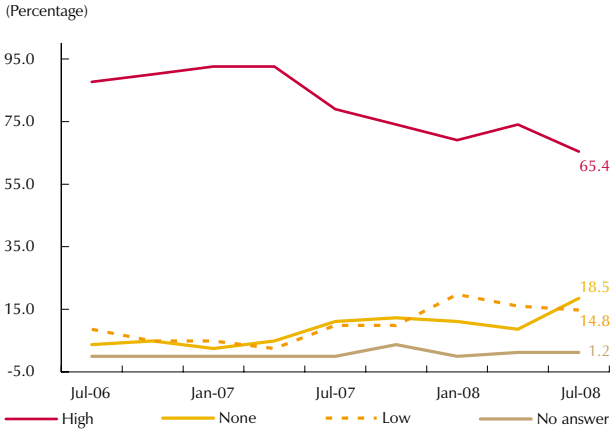


B. Changes in Liquidity in the Next Six Months



Source: Expectation Survey, Banco de la República, July 2008.

Graph 70
A. Actual Perception of Credit Availability



With respect to liquidity in the next six months, the balance in Graph 69 suggests that expectations point to a decline. Transport and communications is the sector with the largest percentage of those interviewed who believe liquidity is high (73.1%). However, in the financial sector, this proportion is only 36.4%.

Finally, the positive perception of companies with respect to loan availability has declined since April 2007. The results of the July 2008 survey show that 65.4% of the businessmen polled believe loans are widely available. A comparison between this figure and those reported in surveys done prior to July 2007 shows it is relatively low (Graph 70). Moreover, it is worth noting that the percentage of businessmen who believe there is no available credit was 18.5%, which is a historically high figure in terms of what has been reported so far.

As to the availability of loans in the next six months, 8.6% believe it will be more than at present, 39.5% believe it will be less and 50.6% expect no change. This suggests that businessmen, on average, expect to find it more difficult to obtain new loans.

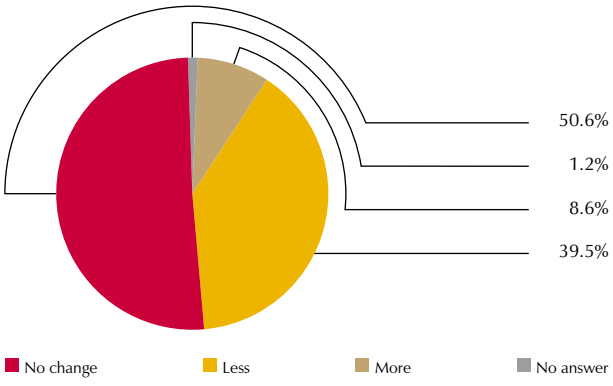
According to the July 2008 survey on the credit situation in Colombia and keeping with businessmen's perception in terms of the availability of loans during the last three months, financial institutions raised their requirements for granting new loans and expect to continue to do so (Graph 71).

In short, although companies reported favorable profitability and liquidity indicators, and their total indebtedness levels for 2007 did not increase considerably, current perceptions and expectations for the future suggest that businessmen anticipate difficult times ahead in terms of demand, liquidity and the availability of loans.

B. HOUSEHOLDS

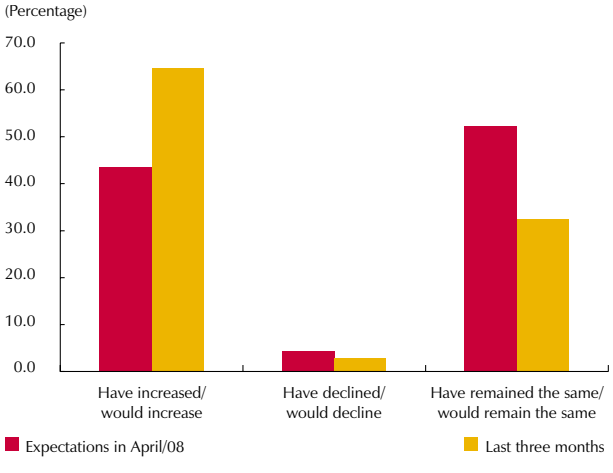
Recent household finances are the subject of this section in which the characteristics of household

Graph 70 (continue)
B. Changes in Perception of Credit Availability in the Next Six Months



Source: Expectation Survey, Banco de la República, July 2008.

Graph 71
Changes in Policy on Allocation of New Loans in the Commercial Portfolio



Source: Expectation Survey, Banco de la República, July 2008.

borrowing are analyzed, along with the changes in household consumption, the labor market in terms of unemployment and wages, and the household financial burden. The idea is to shed light on the current situation in which households find themselves with respect to creditworthiness. Coupled with an analysis of indexes of expectations, economic conditions and perception on the purchase of homes and durable goods, this offers a look at the future of the household sector in terms of financial stability.

1. Household Economic and Financial Situation

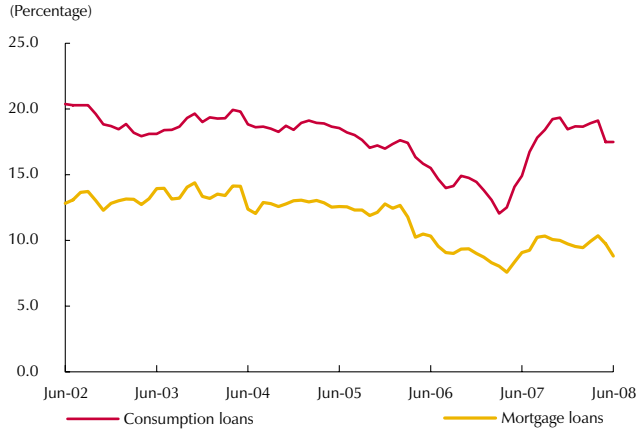
If we assume that mortgage and consumption from the financial sector represent the household debt as a whole, and if we compare it to total assets or to the GDP, the borrowing level is still well below the standards observed during the financial crisis at the end of the nineties. However, as mentioned in the March 2008 edition of the *Financial Stability Report,* the behavior and features of the mortgage debt, as well as its extent of risk exposure are very different from those of the consumer debt.[30] The factors that most affect households in terms of their economic and financial situation are analyzed in the following section, with an emphasis on the effect of interest rates and household exposure in the mortgage and consumption portfolio.

a. Interest Rates

The perception of risk exposure in the financial market, coupled with higher management costs for consumption loans in relation to those for mortgage loans, make interest on rates consumption loans higher than those on mortgage loans. Also, the drop in consumption loan portfolio quality (the non-performing consumption loan portfolio increased by more than 57.1% in the last twelve months) and the recent monetary-policy shocks appear to have more of an impact on interest rates for consumption loans than on those for mortgages (Graph 72). The average *ex ante* real credit interest during the second half of last year and the first four months of 2008 was similar to what it was during the post-crisis

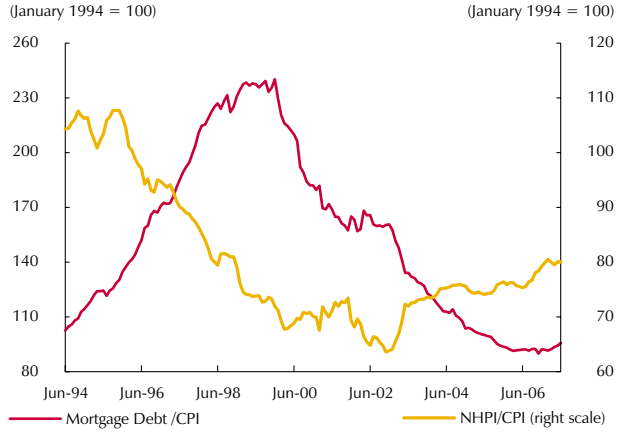
30 See the March 2008 edition of the *Financial Stability Report*, pg. 42.

Graph 72
Real Credit Interest Rates



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

Graph 73
Ratio of the Mortgage Debt Growth Index to the NHPI and Real Growth in the NHPI



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

period (19%); nevertheless, it dropped to around 17% in May and June of this year. On the other hand, the real interest rate on the mortgage loan portfolio in the last twelve months was around 10%, which is below its historic average (13%).

b. Exposure

Mortgage and consumption loans have performed very differently and, therefore, should be analyzed separately. The high interest rates on the consumption loan portfolio imply more credit risk by jeopardizing household borrowing capacity in the short term.

1. Mortgage Loan Portfolio

The current momentum in the mortgage loan portfolio is one of a slowdown in real annual growth since October of last year, when it peaked at 15.5% in comparison to the figure observed in June 2008 (9.9%). This behavior was associated with an average annual decline of 10% in individual disbursements on that portfolio during the first half of the year.

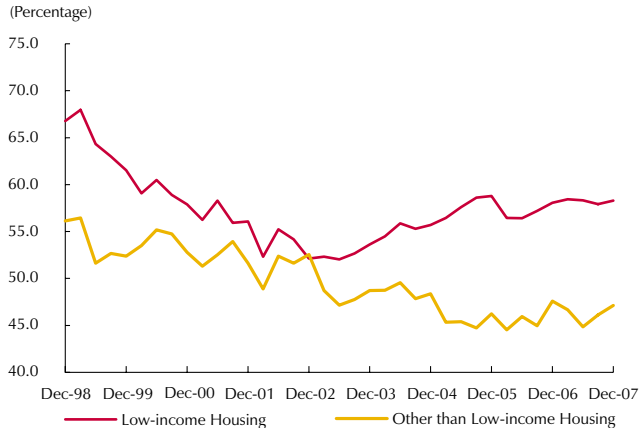
The downward tendencies in the mortgage loan portfolio and its disbursements were accompanied by an annual reduction of 24.5% in the area approved for construction by June 2008, compared to 39.1% by June 2007.

Although the new housing price index (NHPI) has grown less than the consumer price index (CPI) after so-called "asset inflation" (in the first five years of the nineties), its tendency reversed thanks to a moderate improvement since 2002 (Graph 73). These facts suggest that a portion of household wealth remained stable after the crisis period. The same can be said of mortgage loan collateral.

Even if the real annual growth rates for mortgage loans (NHPI deflated) have risen steadily for nearly the last two years, mortgage borrowing levels are much lower than they were during the financial crisis (Graph 73).

Furthermore, because mortgage loan obligations are tied to inflation or to a fixed rate, as long as the NHPI remains stable or increases more than the CPI, the amount

Graph 74
Mortgage Loan to Value



Source: Asobancaria (preliminary figures)

of housing debt will not exceed respective home prices. In other words, families will have an incentive to continue to pay off their loans, which is contrary to what happened in 1999. This behavior is reflected in the loan-to-value (LTV) ratio. Information on that ratio is available up to December 2007 (Graph 74).

There also is evidence of a shift in the composition of the mortgage portfolio towards peso-denominated loans at a fixed rate, in detriment of UVR-denominated loans. By June 2007, 69.3% of the total mortgage loan portfolio was contracted at variable rates; this share had declined to 58.5% by June 2008. These considerations suggest that the probability of default or exposure to credit risk as a result of household mortgage over indebtedness or a drop in housing prices (below the value of the home loan) is relatively low compared to what happened in the pre-crisis period and during the financial crisis at the end of the nineties. Therefore, a radical change in credit risk exposure coming from the mortgage loan portfolio in the next six months does not appear to be likely.

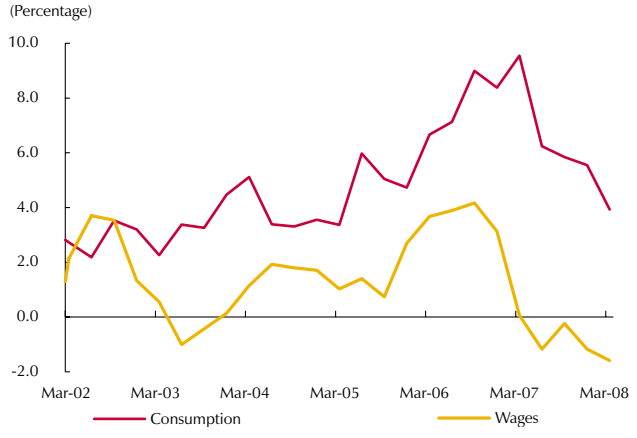
2. Consumption Loan Portfolio

Consumption loans continue to account for the added exposure to household credit risk, primarily because of the deterioration in consumption loan-portfolio quality. The characteristics of this type of borrowing (short term) make it far more sensitive to external shocks than longer term borrowing. In this sense, the rise in market interest rates has had a great deal of impact on the demand for consumption loans, on consumption and, more importantly, on the level of household borrowing. In fact, the annual increase in the gross consumer loan portfolio was 49% by December 2006 and 22% by June 2008.

In addition, as mentioned in the March 2008 edition of the *Financial Stability Report,* the rise in interest rates (originating, on this occasion, with the rates on consumption loans) produces a shock to demand that diminishes household creditworthiness by reducing future household income and by virtue of the added financial burden that increase represents.

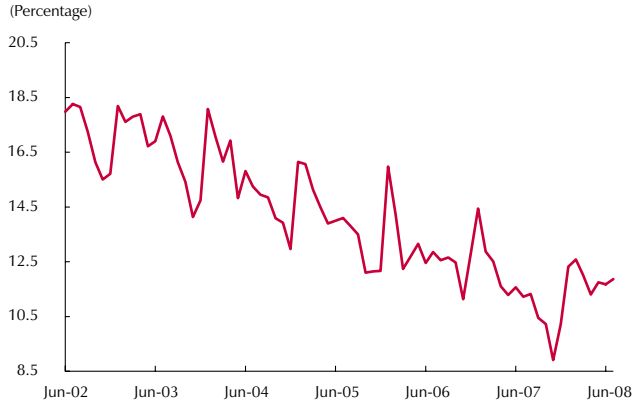
To begin with, the contractionist monetary policy being applied since April 2006, which took a year to work its way through to the credit channel (when loan interest rates began to rise), ended the positive trend in real wage increases observed since September 2006. This break is due, in part, to the change in expectations among economic agents, who foresee less demand and less corporate income in the future.

Graph 75
Real Annual Growth in Wages and Household Consumption



Source: DANE; calculations by Banco de la República.

Graph 76
Unemployment Rate: Thirteen Cities and Their Metropolitan Areas



Source: DANE; calculations by Banco de la República.

Secondly, higher interest rates mean more of a financial burden for households and, therefore, less availability of real wages for the consumption of other goods and services. In either case, the result is a reduction in consumption (Graph 75).

In fact, since March 2007, household consumption[31] (registered in the DANE national accounts) has slowed from a historic real annual rate of 9.5% to 3.9% for the first quarter of 2008, which is consistent with the decline in consumption loan-portfolio growth.

The slowdown in this portfolio has been accompanied by a less favorable situation on the job market. The unemployment rate had increased 60 bp by July 2008, having gone from 11.22% in July 2007 to 11.86%. This is attributed to less of an average increase in the economically active population (5.72%) than in the unoccupied population (11.74%) during that period (Graph 76).

3. Household Financial Burden

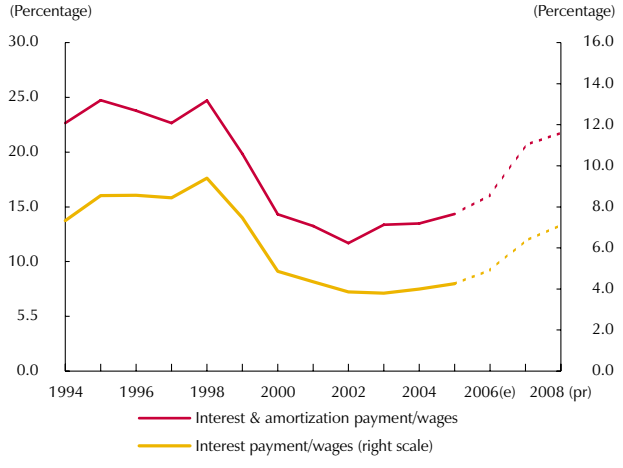
The indicator of household financial burden[32] continued to climb, as illustrated in Graph 77, Panel A, but began to ease in 2008. It is expected to be around 21.8% this year, which is close to the 22.6% observed in 1994. This level emphasizes the importance of credit institutions reducing the pace of loan growth through a more rigorous risk-selection process, since vulnerability due to high borrowing does not leave households much room to maneuver in the face of possible adverse changes, such as higher unemployment or higher inflation. It is essential to bear in mind that the unemployment figures between May and July of this year are higher than they were twelve months ago.

31 The 1994 and 2000 methodological bases for the quarterly nationwide surveys conducted by DANE were combined to estimate household consumption. The real annual growth rates determined with the second method were applied for the 2000 quarterly figures, which were obtained with the 1994 method, in order to forecast household consumption up to March 2008.

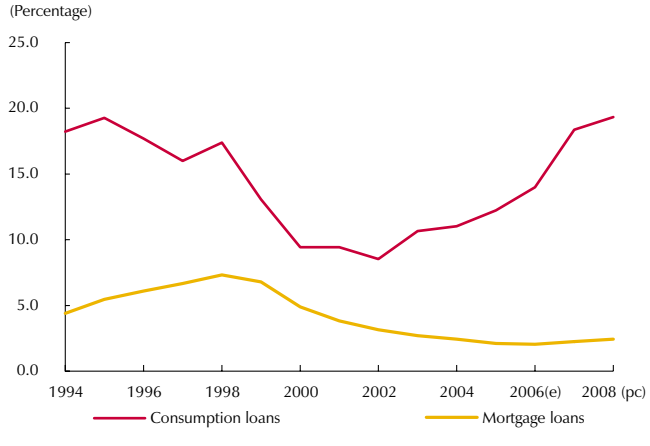
32 The indicator was modified for this report, as described in Box 3. It is defined as payment for interest and amortization of principal on the consumer and mortgage loan portfolios divided by the pay wage earners received. Accordingly, wage compensation in 2006 and 2007 was forecast using the increases in the real wage index for industrial manufacturing.

Graph 77

A. Household Financial Burden



B. Household Financial Burden (Including Amortizations)



C. Household Financial Burden: Real Component of Interest/Wages

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

Interest rate variations are another important factor in debtor creditworthiness. An exercise to quantify scenarios with consumer-loan interest rate changes was done to determine how sensitive the financial burden is to interest rate hikes. Graph 77, Panel B, shows a scenario where the interest rates on consumption loans undergo no change during 2008; in this case, the financial burden indicator is 21.8% for 2008.[33]

The reason why the household financial burden is not more sensitive to changes in interest rates is because most household loans (76.6%) are contracted at a fixed rate. Consequently, it is credit institutions, not households that assume most of the risk posed by the interest rate on the consumer loan portfolio. In this sense, the amortization burden is nearly three times larger than the interest rate burden (Graph 77, Panel A). Therefore, in the composition of household creditworthiness, the quantity effect (stock of consumption loans) is more important than the price effect (interest rate).

On the other hand, when separating the components of the financial burden posed by the consumption and mortgage loan portfolios, we see the former takes the bulk of responsibility for that burden, as it is more than nine times the payments households must make for mortgage loans (Graph 77, Panel B). A supplementary indicator of financial burden was constructed as well (Graph 77, Panel C[34]). Two things stand out in that respect. First, the level of household spending on real interest payments reached the same levels reported in 1996, which places them in a high-vulnerability range, primarily when considering the recent increase in unemployment. Secondly, there is a change in the slope of the indicator as of 2008, which suggests there

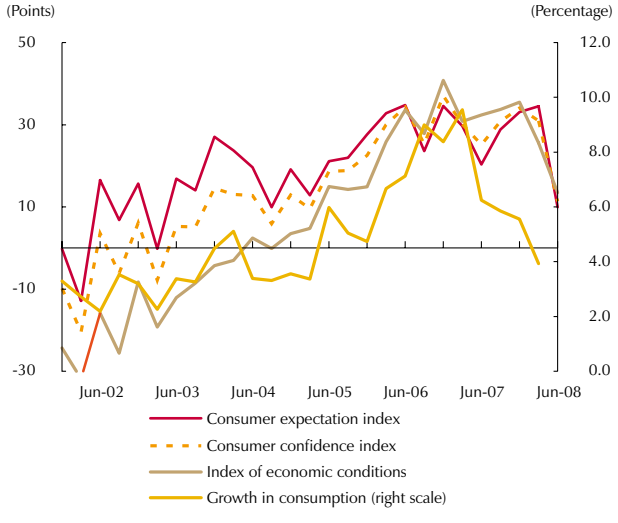
33 Two additional scenarios were constructed as well. In one, the real increase in the rate is four points (which pertains to the 50 percentile of the distribution of frequencies of the annual increases in that rate since March 1998); it showed a financial burden indicator of 22,0%. The other features a real increase of 17 points (99 percentile), in which case the indicator was 22.9%.

34 This indicator is defined as: financial burden = real component of interest paid/wages.

might be a corrective process that distances households from what occurred in the pre-crisis and crisis periods at the end of the nineties.

In short, the slowdown in consumer and mortgage loan portfolio growth reflects a general decline in household creditworthiness resulting from less growth in real wages and a higher level of debt. In this respect, the July 2008 edition of the *Report on the Credit Situation in Colombia* (RSCC) indicates that creditworthiness is the main factor that credit institutions take into account when allocating new loans. Consequently, if the current trend in wages continues and unemployment increases, we can expect to see more restrictions on loan supply and more exposure to credit risk.

Graph 78
Growth in Household Consumption and Indexes of Consumer Expectations, Confidence and Economic Conditions



a/ Percentage of households that believe it is a good time to buy a house and durables, minus the percentage who do not.
Source: Fedesarrollo, DANE; calculations by Banco de la República,

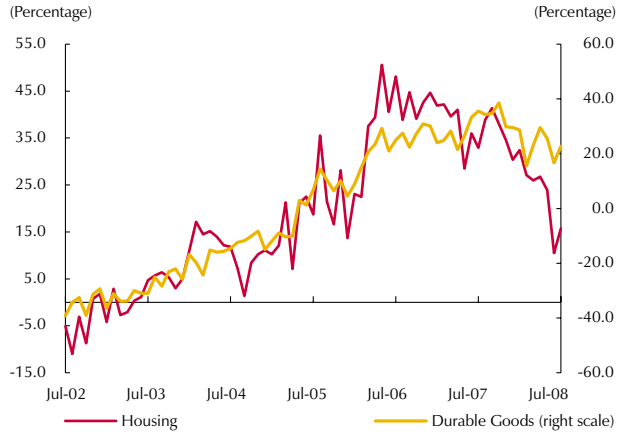
4. The Outlook

Household expectations for the Colombian economy are not optimistic. The Fedesarrollo consumer expectation index (IEC in Spanish) (Graph 78) shows a drop from 32.8 points in January 2008 to 10 points in June. This is the most pessimistic outlook since 2004. Indicators of confidence and economic conditions show the same tendency; their levels have declined as well. These expectations have translated, to some extent, into the momentum in consumption. Its growth, which lags a quarter behind, showed an average positive correlation of 0.75 with these indexes, which is why the slowdown in household consumption is expected to continue in the coming months, consistent with the forecast slowdown in household demand for loans.

Likewise, the indicators of perception on housing and durable purchases showed a drop beginning in the second half of last year (Graph 79). In the case of durables, it was 16.8% in June of this year compared to 33% in June 2007. That decline was reflected in 3.22% less average real annual growth in vehicle sales for the first half of 2008, as opposed to 37% during the first six months of 2007, and a real decline of 3.2% in annual sales of furniture and electrical appliances by June 2008. The home-purchase perception index is less dynamic, having gone from 36% in June 2007 to 10% in June of this year (Graph 79). As indicated in the July 2008 edition of the RSCC, credit institutions expect to maintain their requirements for the allocation of new mortgage loans and to increase them for the consumption loan portfolio.

In short, the outlook for growth in household borrowing is not the most favorable, since current household financial conditions might not be enough to reverse the

Graph 79
Home and Durable Goods Purchase Perception Index
(Balance)



Source: Fedesarrollo; calculations by Banco de la República.

tendency in the consumer loan portfolio. In turn, its increased financial burden has been accompanied by more pessimistic consumer expectations. Coupled with the situation on the job market, this does not offer enough support to improve household finances. The foregoing could eventually affect the ability to pay off consumer and mortgage loans, which would make it difficult for the financial system to perform well. For this reason, as emphasized earlier, it is important that credit-risk monitoring and the selection of new loan recipients be reinforced, given the momentum in the household financial burden.

C. NON-FINANCIAL PUBLIC SECTOR (NFPS)

1. NFPS Aggregate Debt

NFPS gross debt came to COP$172.1 t at June 2008. This is slightly less with respect to the amount registered last year in December (COP$172.8 t), primarily because of peso appreciation. The NFPS consolidated debt as a percentage of GDP (45.8% in June 2008) continued the downward course observed since December 2002, when it was 63.8% (Table 8).

When excluding the value of the peso debt in central government bonds, net NFPS obligations come to COP$134.9 t and account for 3.9% of GDP. As with the gross debt, it has tended to decline.

Corporate profitability and liquidity indicators were positive during the period in question, although some restriction in liquidity is expected in the near future. The household financial burden is high, which means the process of extending new loans, particularly consumption loans, must continue to be improved.

The shift in the NFPS debt from external to internal borrowing continued during the first half of 2008, thereby reducing gross and net debt exchange exposure. Consequently, by June 2008, the share of the debt denominated in foreign currency came to 31.5% of the gross debt and 40.2% of the net debt. Moreover, when taking into account the global TES placed on the international market for nearly four years by the central government, that exposure is even lower for the gross and net debts (28.3% and 36.2%, respectively).

Less NFPS borrowing in terms of GDP, coupled with the shift in the composition of the debt during past years and in the first half of 2008, was determined by the financing needs of the central government. Its debt accounts for nearly 90% of the consolidated NFPS debt.

Although the annual rates of growth in central government revenue have declined (from an annual increase of 27.5% in June 2007 to 11.1% one year later), due to the slowdown in economic activity and less income from

Table 8
NFPS Gross Debt

	Internal [a/]	External	Total	Internal	External	Total	Internal	External	Internal	External	Total
	Total (Billions of pesos)			Total (Percentage of GDP) [b/]			Total (share-%)		(Percentage Nominal Annual Growth)		
Dec-95	9,929	12,018	21,946	11.8	14.2	26.0	45.2	54.8			
Dec-97	18,774	17,609	36,383	15.4	14.5	29.9	51.6	48.4	48.1	36.2	42.1
Dec-99	32,928	32,879	65,808	21.7	21.7	43.4	50.0	50.0	37.5	34.5	36.0
Dec-00	46,653	41,965	88,618	26.7	24.0	50.7	52.6	47.4	41.7	27.6	34.7
Dec-01	54,905	50,796	105,701	29.1	26.9	56.1	51.9	48.1	17.7	21.0	19.3
Dec-02	67,838	61,975	129,813	33.3	30.5	63.8	52.3	47.7	23.6	22.0	22.8
Dec-03	75,078	65,883	140,961	32.9	28.8	61.7	53.3	46.7	10.7	6.3	8.6
Dec-04	84,322	59,779	144,101	32.7	23.2	55.9	58.5	41.5	12.3	(9.3)	2.2
Dec-05	102,408	53,339	155,747	35.9	18.7	54.6	65.8	34.2	21.4	(10.8)	8.1
Dec-06	106,911	57,961	164,872	33.4	18.1	51.5	64.8	35.2	4.4	8.7	5.9
Mar-07	109,333	58,959	168,292	33.0	17.8	50.9	65.0	35.0	4.4	14.4	7.7
Jun-07	111,551	53,697	165,248	33.0	15.9	48.9	67.5	32.5	6.0	(7.4)	1.2
Dec-07	116,519	56,259	172,778	32.6	15.7	48.3	67.4	32.6	9.0	(2.9)	4.8
Mar-08	117,435	51,819	169,254	32.0	14.1	46.2	69.4	30.6	7.4	(12.1)	0.6
Jun-08	117,878	54,252	172,130	31.4	14.4	45.8	68.5	31.5	5.7	1.0	4.2

a/ Government-owned bank capitalization bonds are included in the central government's domestic debt.
b/ GDP in the last twelve months.
Source: Banco de la República, Ministerio de Hacienda y Crédito Público.

privatization (not as much as last year), the reduction in borrowing as a share of GDP and the central government's efforts to reduce its expenses could allow for a reduction in the fiscal deficit and in the marketing of TES during the remainder of 2008. Although a bit premature to verify, this can be surmised in

As a matter of fact, the NFPS registered a surplus of 0.8% of GDP during the first quarter of 2008, while the central government achieved fiscal balance, because revenue increased more than spending. Revenue was strengthened by the added volume of capital resources coming from the Petroleum Savings and Stabilization Fund (FAEP) and, to a lesser extent, by the rise in tax revenue.[35] However, it is important to warn that reinforcement of the democratic security policy (which means a sharp build-up in military spending), coupled with higher costs to liquidate the Social Security Institute (ISS) and the fact that Isagen and Ecopetrol are no longer part of the fiscal accounts,[36] will complicate the government's efforts to cut spending even further and to have less of a fiscal imbalance, as called for in the latest updated version of the Financial Plan.

35 "First Quarter Fiscal Cut-off: 2008" (Consultant Document No. 07/2008), Fiscal Policy Board

36 "Mid-term Fiscal Framework: 2008" (latest update - June 16, 2008), Ministry of Finance and Public Credit.

The shift in the NFPS debt from external to internal borrowing continued during the first half of 2008, reducing exchange exposure as a result.

2. Creditworthiness

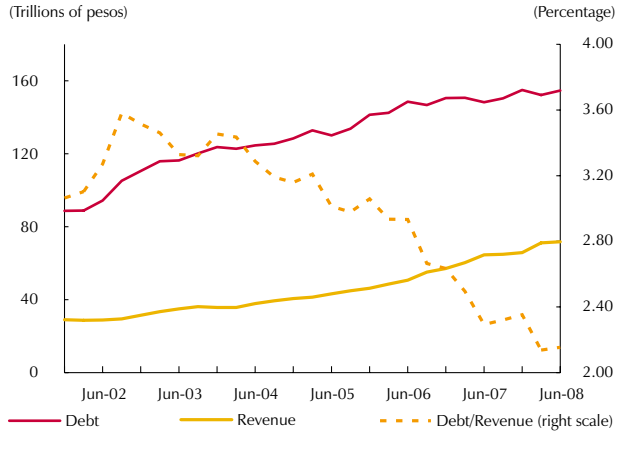
As Graph 80 illustrates, the central government's creditworthiness (measured as the ratio of debt to income) improved during the first six months of 2008 compared to previous years. This was due to the added increase in revenue compared to the increase in the debt. Revenue was up at an annual rate of 11.1%, while the debt increased by 4.3%.

3. Outlook

The slowdown in economic activity so far this year surely will undermine the rate of growth in tax revenue, making it difficult to reduce the central government's need for financing, as was the case in recent years. Consequently, external debt levels and the amount of TES placed on the market can be expected to increase during 2009.

The target for the consolidated fiscal deficit in the public sector was reduced from 1.4% to 1% of GDP (announced by the government on July 21 of this year), thanks to a national budget cut of $1.500 b.[37] This reduction is consistent with a fiscal gap equal to 3.1% of GDP for the central government, which is less than the 3.3% of GDP prior to that announcement. In addition, the estimated placement of long-term TES comes to COP$22.5 t, which represents an annual increase of 18.3%. There are plans to place COP$4.6 t through agreed operations and nearly COP$12 t by auction, which is COP$5.5 t more than last year. The total amount of TES to be placed, together with a smaller portion of external debt, will make it possible to finance a central government deficit estimated at COP$14.1 t.[38] To avoid further pressure for revaluation, the central government plans to turn to the local market to obtain approximately US$317 m on the spot market.

Graph 80
National Central Government Creditworthiness



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

As in the March 2008 edition of the *Financial Stability Report,* it is important to underscore the provisional nature of the tax revenue for this year. Temporary collections on equity tax and the FAEP will compensate for the amounts not to be collected, due to less revenue from income and the stamp tax, as provided for in the 2006 tax reform.

37 *Report by the Board of Directors to the Congress of the Republic of Colombia*, Banco de la República, pg. 100.

38 "2008 Mid-term Fiscal Framework" (latest update at June 16, 2008), Ministry of Finance and Public Credit.

It is important to underscore the provisional nature of the tax resources for this year.

Although budget performance up until March 2008 was quite favorable in terms of a smaller deficit or fiscal balance, the steady improvement that has been observed for years in the central government's creditworthiness might be cut short due to weaker tax revenue, coupled with less income from privatizations, temporary FAEP collections and the equity tax.

Box 3
CHANGES IN THE METHOD USED TO CALCULATE THE INDICATOR OF HOUSEHOLD FINANCIAL BURDEN

In past editions of the *Financial Stability Report,* the household financial burden was calculated as the ratio of consumer and mortgage loan interest payments to a proxy of household income, which is defined as wage earners' pay.[1]

This measurement has a major constraint, as it does not consider what households must pay on the principal amount of a loan. Together with interest, those payments are part of the cash households are required to allocate every month to meet their financial obligations.

A variation of the indicator is presented in this section, with three modifications: the payment-on.-principal component is included, monetary correction as part of the interest households pay is eliminated, and forecasts for the indicator in 2008 are developed in light of possible shocks to the interest rates on consumption loans.

a) Estimated capital repayment of the outstanding debt is calculated as the amount of consumer lending divided by the number of months remaining to maturity or payment in full.[2] In turn, this average period remaining on loans reported to the Superintendencia Financiera de Colombia (on FSC Form 341) was calculated by adding the information for each of the years between 2002 and 2008.[3] In the case of mortgage loans, the total outstanding portfolio (including securitizations) was divided by 7.5 years, which is assumed to be the average amount of time remaining to pay off loans of this type.

b) Elimination of the monetary correction and the UVR adjustment the highest value of UPAC or UVR, respectively, which raises the value of the loan in pesos. The counter party entry is listed by financial institutions on the income statement as financial income and, up until the last report, it was part of household financial outlays. However, this monetary correction is capitalized, thereby increasing the outstanding debt, which means it is not part of the installment to be paid by the borrower. Therefore, households only pay interest and principal in cash; the monetary correction is capitalized as an increase in the value of their loans.

c) The indicator was projected for 2008 to quantify the possible effect that could have consumption interest rate hikes on credit worthiness of borrowers. The Basel methodology[4] was used, which measures the risk of the trading book interest rate. The exercise was done to project the financial burden posed exclusively by consumption loans, which has fueled the financial burden in recent years.[5]

The method outlined above separates fixed-rate loans from those with a variable rate. The former (85% of the entire consumer loan portfolio) are not sensitive to interest-rate shocks, with the exception of loans that are paid in each period, which banks reallocate at the new rate. This leaves the outstanding loan portfolio unaltered.

It is, therefore, important to estimate capital repayment of the outstanding debt throughout the year. To do so, the outstanding debt is classified into 12 time bands (one per month), and the debt recovered in each band is reallocated at the new rates (which pertain to the rate shocks). The shocks are weighed according to the month being projected. For example, the shock in the first month will be weighed by 1, since it persists throughout the entire year. The shock in the second month will be weighed by 11/12, the third by 10/12 and so on.

In order to set the shocks, we considered the median of the scenarios (50 percentile) with the annual interest rate hikes on consumption loans since March 1998. The increase in the real annual interest rate was 4%. It is expressed in nominal terms and on a monthly basis for the 2008 projection, so the increase is materialized in the consolidated figure for the year. The 99 percentile showed a real increase of 17%.

In the case of variable-rate loans (15% of the total consumer loan portfolio), the shock directly affects the total value of the debt, regardless of the payment schedule. The Basel

1 This variable is available up to 2005. As of that point, it is projected with the annual growth in manufacturing wages.

2 The assumption that repayment is linear does not appear to coincide with reality. As loans near maturity, the percentage of repayment increases. However, since the sample combines loans at different stages of maturity (both new and old loans), the error in the aggregate is not expected to be significant.

3 For example, the average term remaining on consumption loans in 2008 was 2.4 years. For the years prior to 2002, the remaining terms on loans are assumed to be equal to the average term between 2002 and 2003; that is, 1.5 years.

4 Basel (1993), "Measurement of Banks´ Exposure to Interest Rate Risk," Bank for International Settlements (BIS).

5 For the purpose of the projection, it is assumed the financial burden posed by home loans remains constant.

methodology is applied up to this point, since projections on the increase in the portfolio are not included.

However, in this exercise, portfolio growth projections were done. Considering the slowdown in the consumer loan portfolio, an annual increase equal to 12% was assumed for 2008, which would be allocated at the new interest rates during that year.

As to the denominator of the financial burden indicator, it is important to point out that household income may be underestimated by using wage earners' pay as a proxy, which ignores the recent importance of remittances and capital earnings as additional sources. Consequently, it is important to continue to perfect the measure of household income.

Therefore, the indicator measures the portion of income households must use to meet their financial obligations. It is similar to creditworthiness or ability to pay (ratio of loan installment to wage), which some institutions to evaluate in order to allocate a loan. This indicator is particularly important to determining the creditworthiness of households, when faced with an eventual refusal by the banks to grant new refinancing.

The following is another indicator that helps to understand the dynamics of the household financial burden:

financial burden = real component of paid interest/wages[6]

The numerator includes only the real component of the interest payment; the inflationary component would be a kind of capital "credit" that offsets the loss in the value of the nominal outstanding debt. That "credit" reduces the debt in real terms, leaving household wealth unaltered, which is why households "spend" only the real component of the interest. Retirement of the debt is not included for the same reason. In other words, this indicator measures the portion of household financial spending that reduces household wealth.

Finally, it is important to emphasize the complementary nature of the two indicators presented in this section when analyzing the way households meet their loan obligations.

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6 Constructed as follows:
implicit rate = interest plus monetary correction /performing portfolio
real component of interest (%) = ((1 + *implicit rate)*/(1 + *inflation*)) – 1
real component ($) = *performing portfolio* * *real component* (%)
financial burden = real component ($)/*wages*

IV. Potential Risks

A certain amount of credit risk materialized during the first half of 2008, along with a considerable increase in liquidity risk. Market risk remained relatively low.

A. MARKET RISK

1. TES B Market Exposure for the Financial System

Securities were priced using the same method of previous editions of this report. It consists in pricing each security according to the average price at which the issue was traded on the market.[39]

Table 9 shows all outstanding TES B marked to market.[40] Credit institutions held COP$15.46 t in TES B at August 22, 2008, which is well below the amount reported on February 29 of this year COP$21.9 t). The amount held by commercial banks continues to account for the bulk of outstanding TES B: 89.67% of the total. It is worth noting that this figures is less than the one published in the March 2008 edition of this report (90.81%), which indicates that, although most credit institutions reduced their TES B holdings, the banks did so in a more pronounced way.

The decline in the value of the portfolio held by financial institutions was due to a drop in prices and a reduction in outstanding balances.

39 For further details on the method used, see the December 2005 edition of the *Financial Stability Report, pg. 54.*

40 The valuation exercise includes all TES B held by agents (tradable, available for sale and at maturity).

Table 9
Outstanding TES B Valued at Market Prices: Credit Institutions
(Millions of pesos)

	In pesos	At Variable Rate	In UVR	Total
Outstanding at February 29, 2008				
Commercial banks	17,228,674	573,627	2,105,231	19,907,532
Commercial finance companies	84,248	2,308	0	86,556
Upper-grade financial cooperatives	31,128	0	1,090	32,219
Financial corporations	1,653,632	2,888	239,488	1,896,008
Total: Credit Institutions	**18,997,683**	**578,823**	**2,345,809**	**21,922,314**
Outstanding at August 22, 2008				
Commercial banks	10,492,954	388,901	2,982,199	13,864,053
Commercial finance companies	52,036	2,190	0	54,226
Upper-grade financial cooperatives	13,523	0	253	13,775
Financial corporations	1,292,931	3,287	233,260	1,529,478
Total: Credit Institutions	**11,851,444**	**394,378**	**3,215,711**	**15,461,533**

Source: Banco de la República

The TES B portfolio of non-bank financial institutions (NBFI)[41] came to COP$33.31 t, which also is far less than the figure registered at the end of February 2008 (COP$40.41 t). Pension and severance-pay fund managers (PFM), as part of NBFI, still hold the largest quantity of TES B (Table 10), with 74.7% of the total. This share is 100 bp higher than it was in February 2008.

The reduction in the amount of TES B held by credit institutions during the period in question is explained primarily by the decline in holdings and the prices of peso-denominated TES, which fell by 39% during these six months. The COP$189 b reduction in outstanding variable-rate TES was also a contributing factor. However, this is to be expected, as there are no new issues of this type of securities.

The amount of outstanding UVR-denominated TES held by credit institutions increased by 37%, which is equivalent to COP$869 b. This is a clear indication that credit institutions are shifting their portfolio composition from securities in pesos to CPI-indexed securities, which is consistent with the high inflation expectations witnessed so far this year. This shift applied to all maturities on the yield curve. However, in absolute terms, it was more predominant in the short stretch of the curve for securities denominated in pesos. Therefore, the biggest sell off was among securities that mature in less than two years. On the other

41 Trust companies, as part of the NBFI considered in this section, include mutual investment funds.

hand, purchases of UVR-denominated securities leaned towards the mid-term (between two and five years).

The NBFI behaved similarly to credit institutions by shifting an important share of their holdings from securities denominated in pesos to those denominated in UVR (Table 10).

Table 10
Outstanding TES B Valued at Market Prices: Non-bank Financial System
(Millions of pesos)

	In pesos	At Variable Rate	In UVR	Total
Outstanding at February 29, 2008				
Broker firms	481,500	22,241	101,977	605,718
Insurance and investment companies	1,753,250	217,699	1,640,905	3,611,854
Pension fund managers (PFM)	22,160,936	758,295	6,873,050	29,792,282
Trust companies	5,618,634	84,285	703,806	6,406,725
Total: Credit Institutions	**30,014,321**	**1,082,520**	**9,319,738**	**40,416,579**
Outstanding at August 22, 2008				
Broker firms	584,019	9,092	59,773	652,884
Insurance and investment companies	1,784,481	187,306	2,091,624	4,063,410
Pension fund managers (PFM)	15,863,164	576,225	8,448,724	24,888,113
Trust companies	2,789,751	37,957	883,751	3,711,459
Total: Non-bank Financial Sector	**21,021,414**	**810,580**	**11,483,872**	**33,315,866**

Source: Banco de la República

Given the foregoing, one can say that financial institutions, both banks and non-bank institutions, reduced their net exposure during the period from February 29 to August 22, 2008, since the downturn in TES B continued. Broker firms and insurance and capitalization companies were the only two exceptions; their TES holdings marked to market prices –even their holdings of peso-denominated securities– increased.

A breakdown of the variation in TES B holdings by quantity and price is provided in Table 11. The variation in price is the result of a shift towards securities with prices that rose or fell during the period in question and is calculated as the residue between the total variation and the variation in quantity.

As mentioned earlier, most of the total variations were negative. This was due, in most cases, to the effect of both price and quantity. Consequently, for credit institutions as a whole, the value of their outstanding TES B at market prices was less in August than in February 2008, since they now have fewer securities and those securities are now worth less. At any rate, on this point, it is important to emphasize the valuation of securities on every stretch of the curve, particularly on the short stretch of the curve in August and the first weeks of September 2008.

There was a shift towards longer term securities denominated in UVR

Table 11
Variations in TES B Holdings [a/]
(Millions of pesos)

Subsector	Variation in Quantity	Variation in Price	Total Variation
Total: Credit Institutions	**(3,368,675)**	**(3,777,564)**	**(7,146,239)**
Commercial banks	(3,117,990)	(3,617,731)	(6,735,721)
Commercial finance companies	(19,381)	(12,831)	(32,212)
Upper-grade financial cooperatives	(13,330)	(4,275)	(17,606)
Financial corporations	(217,975)	(142,726)	(360,701)
Total: Non-bank Financial Sector	**790,982**	**(9,783,890)**	**(8,992,907)**
Broker firms	179,524	(77,006)	102,518
Insurance and investment companies	501,519	(470,289)	31,230
Pension fund managers (PFM)	1,342,806	(7,640,578)	(6,297,772)
Trust companies	(1,232,866)	(1,596,017)	(2,828,883)

a/ Variations between February 29, 2008 and August 22, 2008,
Source: Banco de la República

The foregoing is a different phenomenon from the one exhibited by NBFI; most of non-bank financial institutions (with the exception of trust companies) increased their TES B holdings. The final variation in the case of PFM was negative, due to a drop in prices that was more than proportional to the increase in quantities. In the case of insurance companies and brokerage firms, the final variation was positive, but considerably less than it would have been were it not for the price drop.

2. Sensitivity to TES B Rate Increases

The valuation losses that would occur with a 200 bp change in the zero-coupon yield curve for fixed-rate TES[42] and TES-UVR[43] was calculated to measure how portfolio value would respond to changes in interest rates. As with the exercises done in the past, only the trading book positions of these securities were included.[44, 45]

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42 This is the shock suggested by the Basel Committee on Banking Supervision for countries other than the G-10.

43 There is assumed to be an increase in the real spread on the UVR reference rate for TES-UVR. Higher inflation expectations would result in losses only on fixed-rate TES, since the real return on TES-UVR would not change.

44 The trading book is the portfolio of financial instruments each bank holds for the benefits to be derived from their short-term purchase and sale. In the Colombian case, it includes the positions in tradable securities available for sale.

45 The Risk Metrics method was used to calculate the change in portfolio value. See the December 2005 edition of the *Financial Stability Report* for a more detailed explanation.

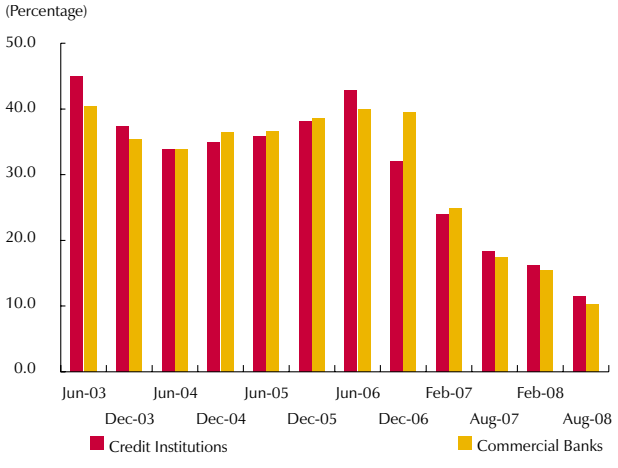
Valuation losses were estimated with the portfolio at August 22, 2008 (Table 12). The losses credit institutions would incur with a hypothetical interest rate hike came to COP$467.7 b. This is equivalent to 11.5% of annualized profits at June 2008. In the case of commercial banks, the amount was COP$383.4 b (10.22% of profits during the same period).

Table 12
Valuation Losses with a 200 bp Shock
(Millions of pesos)

	In pesos	In UVR	Total	Annualized Loss/Profits (June) (%)
Total Credit Institutions	**(251,998)**	**(215,708)**	**(467,707)**	**11,49**
Commercial banks	(218,550)	(164,904)	(383,455)	10,22
Commercial finance companies	(1,561)	0	(1,561)	1,63
Finance corporations	(31,887)	(50,804)	(82,691)	37,10
PFM	**(1,688,313)**	**(1,075,597)**	**(2,763,911)**	**5,18**[a/]

a/ Loss as a percentage of total PFM portfolio value at June 2007,
Source: Banco de la República

Graph 81
Valuation Losses as a Percentage of Annualized Profits, with a 200 bp Shock



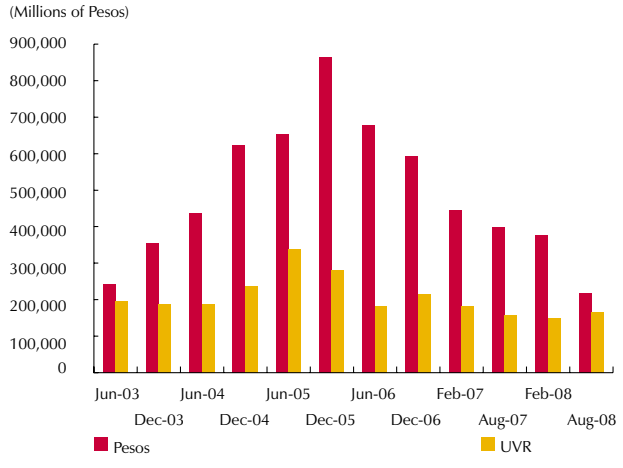
Source: Banco de la República

In Graph 81, this outcome is compared to that of previous periods.[46] The valuation losses that credit institutions and commercial banks would incur as a whole with the August portfolio are the lowest in the entire period under consideration and are very similar to those obtained with the exercise done for February 2008. This is due to the combined effect of increased annualized profits and a relatively stable portfolio, with a tendency to decline and similar percentages of securities exposed to market risk in those six months. In fact, the proportion of exposed securities was up by about 50 bp between February and June 2008, when it was at 70%.

Moreover, since most of the shift in assets has not only been from peso-denominated securities to those denominated in UVR, but also from short-term to longer-term securities, the risk posed by changes in interest rates did not decline as much as would be expected compared to the first analysis. In

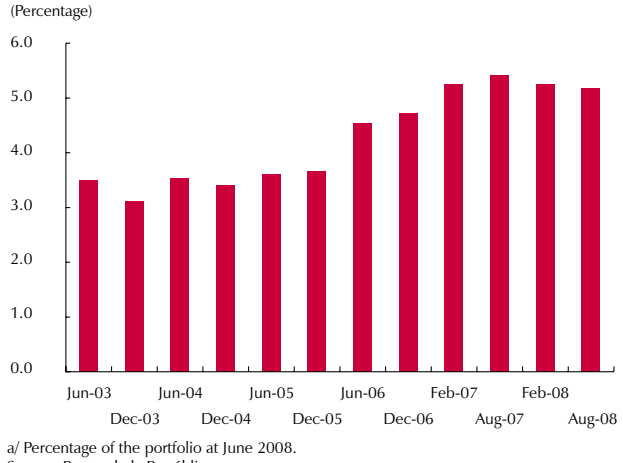
46 The exercises were done for the portfolio registered on the last working days of June and December in each year during the 2003-2006 period. The latest figures pertain to February 16 and August 31, 2007 and, lastly, to February 29 and August 22, 2008.

Graph 82
Valuation Losses for Commercial Banks



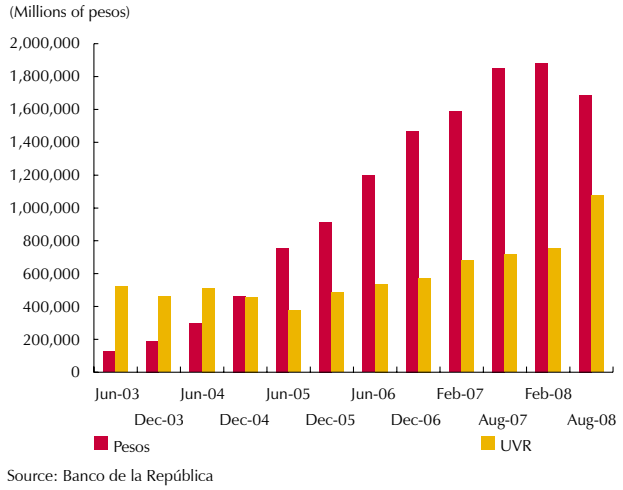
Source: Banco de la República

Graph 83
PFM Valuation Losses as a Percentage of Portfolio[a/]
Value, with a 200 bp Shock



a/ Percentage of the portfolio at June 2008.
Source: Banco de la República

Graph 84
PFM Valuation Losses



Source: Banco de la República

fact, the average duration of the portfolio held by commercial banks at February 29 2008 was 2.9 years, which is less than what was calculated for the portfolio at August 22, 2008 (3.2 years).

In order to isolate the effect of profit performance on the outcome of commercial banks, the valuation losses incurred by those institutions is shown in Graph 82 in billions of pesos. As illustrated, the valuation loss on securities denominated in pesos has declined steadily since December 2005 and was COP$164.9 b by August 2008. As to TES-RUV, the losses between December 2006 and February 2008 have declined as well, but increased again during the period covered by this report, having gone from COP$150.4 b to COP$164.9 b as a result of the shift in composition described earlier.

The PFM valuation losses,[47] assuming the same increase in interest rates, would come to COP$2.8 t, which would represent 5.18% of portfolio value at June 2008 (Table 12). As Graph 54 illustrates, estimated PFM losses rose gradually between December 2004 and August 2007, only to decline again in February 2008 and remain constant during the last period under study. This reduction is due to the fact that value of the PFM portfolio has increased more than the losses projected in millions (Graph 83).

The PFM valuation losses in millions of pesos are shown in Graph 84. The losses on peso-denominated holdings declined during the period in question, which was not the case for the rest of the sample. On the other hand, the losses on TES-UVR rose considerably, having gone from COP$751.4 b on February 29, 2008 to COP$1,075.6 b in June of this year, which is a variation of 43.1%.

47 Since the March 2008 edition of the *Financial Stability Report*, only mandatory pension funds have been taken into account to calculate hypothetical losses.

The rise in VaR at the end of the period under study is due to the increased volatility of securities in the bands that represent the longest stretch of the yield curve

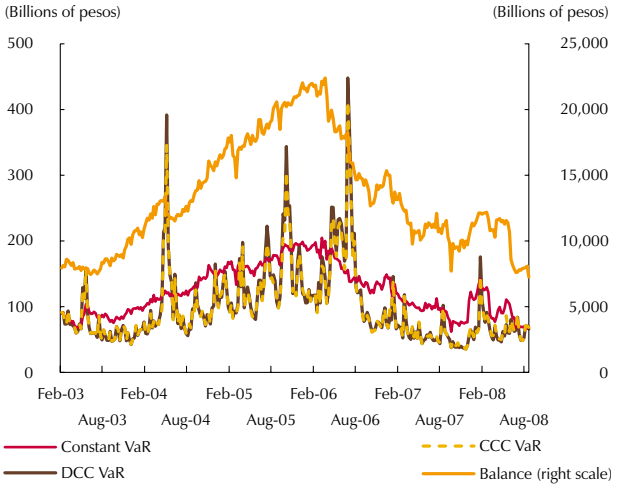
3. Value at Risk for Commercial Banks

Continuing with the aim of the March 2008 edition of the *Financial Stability Report in terms of including a more rigorous* estimate of commercial bank exposure to market risk in Colombia over time, this edition features an additional risk measurement: daily value at risk (VaR) for the system, calculated for the period between February 2003 and August 2008.

This is a more exact measure of the market risk to which commercial banks are exposed, as it estimates the maximum loss the system could incur with a particular investment portfolio at a specific point in time. The VaR has been calculated for each of the commercial banks, using the portfolios observed on each Friday of each week during the period under study. The VaR for the system is the aggregate of individual VaRs.[48]

The VaRs were calculated daily, with 99% confidence, assuming normality and using the mapping technique suggested by Risk Metrics™.[49] Three methods were employed to calculate the correlations and return variances for each of the risk factors (returns on TES in pesos, TES- UVR and an additional exchange exposure factor given by the movement in the representative market rate).

Graph 85
Total VaR of Commercial Banks and Total Exposed Balance: 2002-2008



Source: Banco de la República

The methods used to calculate the matrix of the correlations and the return variances, which are required to calculate VaR, were: historical correlations and variances, constant conditional correlations and dynamic conditional variances (CCC models), and both dynamic conditional correlations and variances (DCC models).

Graph 85 shows the changes in the calculated VaR (pursuant to each of the methods mentioned) and the exposed balance in the system's trading book during the period in question. The points in time with maximum exposure to market risk occurred on May 7, 2004,[50] October 7, 2005 and June 30, 2006. The series of static correlations and variances is not as sensitive to changes in the agents' positions, precisely because of its historical nature. However,

48 For details on the method, see Martínez and Uribe (2008), "Financial Stability Issues," *Financial Stability Report*, March 2008 <www.banrep.gov.co/publicaciones/pub_es_fin.htm>.

49 Risk Metrics, 1996, *Technical Document*, J.P. Morgan/Reuters, Fourth Edition, December 1996.

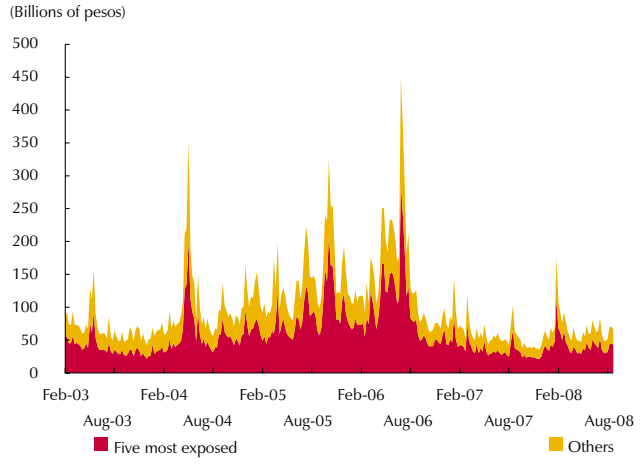
50 This constitutes a recognized extreme scenario, since the rates on TES maturing in January 2012, April 2012 and February 2009 increased by almost 250 bp between April and March 2004.

it does show a clearer tendency: first, the rise in risk exposure levels from February 2003 up to the early months of 2006(with levels near COP$200 b), followed by a decline from that period up until August 2008, when the exercise ends, and when the DCC and CCC VaR levels are around COP$70 b. The last VaR calculation is reported on August 22, 2008. The difference between what is estimated with the DCC and VaR models in terms of static variances and correlations is relatively small (COP$3.8 b).

Two factors are responsible for this reduction in market risk. One is the shift from tradable securities available for sale towards securities to maturity. The sum of tradable securities available for sale went from an average of 82% for the system as a whole in January 2006 to 66% in February 2008, with a slight increase to 69.9% in August 2008. The second is the reduction in return variance levels, which can be appreciated in an underlying way by considering the difference, at the end of the sample, between VaR calculated with static variances and correlations and VaR calculated with dynamic variances and correlations. This last fact became less evident in July and August, when the constant VaR-DCC was almost equal to the dynamic model, basically because the reduction in both was due to the decline in exposed balances and not to considerations associated with volatility or correlation. However, the increase in VaR produced at the end of the period under study; that is, between July 11 and August 22, 2008, is due to the increased volatility of securities in the bands at the longest stretch of the yield curve.

Finally, Graph 86 shows what portion of the VaR in the system is explained by the share of risk represented by the five most exposed institutions at each point in time. The percentage is highly representative and the behavior of this series closely follows that of the total. The percentage explained by the VaR of the five banks with the most exposure was 60.4% on August 22, 2008; this is quite near the average for the entire sample (60.3%). Maximum participation was on March 10, 2006 and minimum participation, on March 18, 2006 (with a highly unusual minimum share of 34.2%); however, with the exception of this last figure, all the others are between 50% and 70%.

Graph 86
Share of Total VaR for the Five Most Exposed Institutions



Source: Banco de la República

The market risk measurements presented in this section indicate that credit institutions, particularly commercial banks, are not in a particularly fragile situation at this point in time, given their relative low levels of exposure as a result of the decline in outstanding securities. Nevertheless, as will be illustrated later in a combined risk analysis, relative market risk, calculated as a percentage of the exposed portfolio, has increased during the last six months.

The slowdown in loan portfolio growth has been accompanied by a deterioration in the indicators of loan-portfolio-quality and arrears

B. CREDIT RISK

1. Credit Institutions

As noted, the slowdown in loan activity has been accompanied by a decline in the loan portfolio quality and arrears indicators. This denotes materialization of the risks assumed beforehand by the financial system.

It is important to evaluate the effect an adverse macro-economic situation could have on the performance of financial institutions. Several stress testing exercises were conducted to this end, based on a set of extreme and rather unlikely scenarios. The exercises presented analyze how changes in the principal macro-economic indicators might affect loan portfolio quality and the profitability of financial intermediaries.

The exercises presented in past editions of this report were modified for this edition.[51] Four different scenarios were considered on this occasion, and the effect of each on the arrears indicator is analyzed. The first looks at the impact of a slowdown in economic activity; namely a drop of 6.8% in GDP and a reduction of 13.7% in internal demand (similar to the figures observed in the second quarter of 1999). The second scenario examines the impact of a 450 bp hike in interest rates, such as the one registered between May and June 1998; in the case of the mortgage loan portfolio, it analyzes the impact of a reduction of 8% in housing prices, which is equivalent to the average decline during 1996-2000. The third exercise considers the effect of a 4.2 pp increase in the unemployment rate, which pertains to the average increase in 1999. The fourth scenario looks at the impact these scenarios would have if they were to occur simultaneously.

The arrears indicator for each type of portfolio analyzed is presented in Table 13, before and after each of the scenarios. The results show the consumption

Table 13
Arrears Indicator Before and After the Shock, by Type of Loan Portfolio

Type of Portfolio	Jun-08	Shock 1[a/]	Shock 2[b/]	Shock 3[c/]	Shock 4[d/]
Commercial	2.07	4.29	2.54	2.42	4.60
Consumption	6.68	10.65	6.97	8.63	12.41
Mortgage	4.00	5.18	4.67	6.07	7.33

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

51 For more information on these exercises, see "A Cointegration Analysis of Credit Risk" in the section of this report entitled "Financial Stability Issues," September 2008, <www.banrep.gov.co/publicaciones/ pub_es_fin.htm>

The consumer loan portfolio is the most vulnerable to adverse macro-economic change.

loan portfolio is the most vulnerable to changes in the macro-economic variables, followed by the mortgage loan portfolio. If the fourth scenario were to occur, the consumer loan portfolio quality index would increase by 5.73 pp. The exercise also shows that financial institutions are more vulnerable to shocks that affect economic activity and the unemployment rate than to changes in interest rates or housing prices.

The impact an increase in the non-performing loan portfolio would have on the profitability indicator for financial intermediaries is presented in Table 14. In the event of a shock in economic activity, profitability would be negative for seven banks, while four banks would be seriously affected by a shock in the unemployment rate. Moreover, assuming the macro-economic indicators deteriorate simultaneously, 15 of the 17 banks would register negative profitability, and the ROA of the banks would decline by 4.19 pp. In spite of this outcome, the indicator of profit on paid capital, plus reserves, is -20.23%, a figure that is considerably less than the liquidation level.[52]

Table 14
Stressed ROA and Number of Banks with Negative Profitability After the Shock

	Shock 1[a/]	Shock 2[b/]	Shock 3[c/]	Shock 4[d/]
ROA at June 2008 (percentage)	2.98	2.98	2.98	2.98
Commercial	2.49	2.88	2.90	2.43
Consumption	2.52	2.95	2.76	2.32
Mortgage	2.95	2.96	2.92	2.88
Total	0.31	2.55	1.40	(1.21)
Number of banks	7	2	4	15

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

A comparison between the aggregate and stressed ROA of this exercise over time shows that, in recent periods, the negative impact of the shocks on the profitability indicator has increased in each period. Moreover, in the last four semi-annual periods, the impact of the aggregate shock has regularly caused 15 banks to show negative profits. This is a major source of instability within the system.

An adverse change in macroeconomic variables would reduce the ROA for banks by 4.19 pp.

52 The regulations indicate the ratio of profits to paid capital, plus reserves, must be -50% for a company to be liquidated.

2. Analysis of Loan Portfolio Concentration and Credit Risk[53]

a. Commercial Loan Portfolio

Annual growth in the commercial loan portfolio to COP$87.5 t at June 2008 represents an increase of 16% (Table 15). However, as a portion of the total loan portfolio, its share declined from 55.49% in June 2006 to 52.83% two years later.

Table 15
Commercial Loan Portfolio [a/]

Date	Balance	Share of the Total Loan Portfolio	Number of Borrowers	Average Amount per Borrower
Jun-06	63,877,854	55,49	339,978	187.89
Sept-06	66,788,750	54.17	349,855	190.90
Dec-06	71,333,452	54.15	362,989	196.52
Mar-07	72,134,509	53.17	378,223	190.72
Jun-07	75,552,048	53.11	396,011	190.78
Sept-07	80,512,964	53.16	406,545	198.04
Dec-07	83,968,643	52.43	432,636	194.09
Mar-08	86,754,644	52.19	447,110	194.03
Jun-08	87,594,982	52.83	431,602	202,95

a/ Balances in millions of June 2008 pesos
Source: Banco de la República

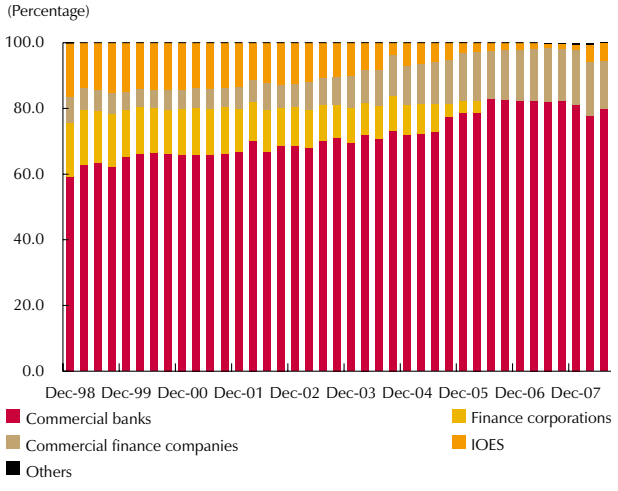
This expansion is explained primary by an increase in the number of borrowers from the system, which rose by 26.95% between June 2006 and June 2008, while the average amount was up by 8.02%. Nevertheless, the number of borrowers from the system declined by more than 15,000 during June 2008

1) Commercial Loan Portfolio Concentration by Institutions

A look at the make-up of the commercial loan portfolio by type of institution shows banks continue to be responsible for the largest number of commercial loans. They accounted for 79.7% by June 2008, with a slight reduction of 2.53 pp compared to the same period the year before (Graph 87). This decline in share is due to the increase in loans extended by special and official institutions, which went from COP$1.3 t in loans allocated by December 2007 to COP$4.7 t by June 2008.

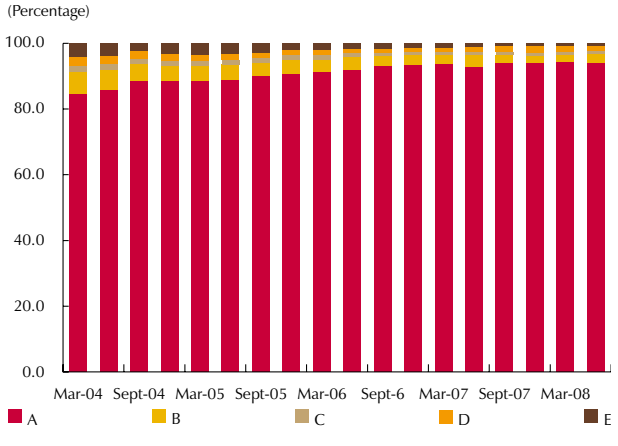
53 The information on individual loans in each of the portfolios comes from FSC Form 341 of the Superintendencia Financiera de Colombia. It includes loans from special and official institutions (IOES in Spanish), other than rediscount loans, which are not considered in the section on the financial system.

Graph 87
Commercial Loan Portfolio Concentration by Type of Institution



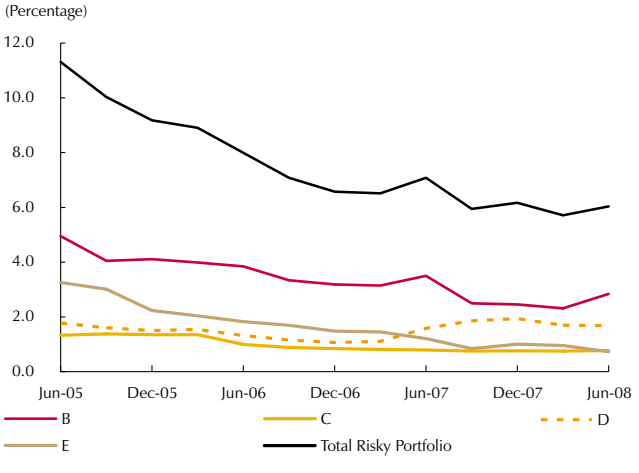
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

Graph 88
Commercial Loan Portfolio, by Ratings



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

Graph 89
Share of the Risky Portfolio, by Ratings



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

As to concentration of the loan portfolio by financial institution, the largest lenders have slightly less of a share of the total portfolio. At December 2007, the five largest accounted for 58.7% and the ten largest, 76.45%. However, by June 2008, these proportions were 57.1% and 75.13%, respectively. Although this is a slight reduction, the importance of reduced concentration warrants emphasis as one way to diminish possible systemic risk.

2) Credit Risk

A look at the commercial loan portfolio in terms of credit-risk rating shows the risky portfolio has declined as a share of the total portfolio since March 2002, having gone from 27.2% to 6% in June of this year (Graph 88).

A detailed analysis of the risky portfolio shows it increased slightly during the second quarter of 2008, primarily due to the performance of B-rated loans (Graph 89), which amounted to COP$631.3 b in March 2008 and COP$679.5 b the following quarter. However, this increase as a share of the total commercial loan portfolio is not significant.

Credit risk also can be analyzed by estimating the transition matrices, which can be used to identity the conditional probability of a change in loan standing.[54] The transition matrices for commercial loans were calculated with quarterly data from June 2002 to June 2008 and the results are presented in this section.

The average transition matrix between June 2002 and June 2008 is shown in Table 16.[55] As was expected for most states of origin, the highest probabilities

54 These standings pertain to the portfolio rating at each point in time (A, B, C, D and E).

55 Because this average matrix was constructed with data from recent periods, which do not include crisis events, its usefulness as an early warning sign may be somewhat less in adverse scenarios.

Table 16
Average Commercial Loan Portfolio Matrix: June 2002-June 2008
(Percentage)

	A	B	C	D	E
A	**95.61**	3.33	0.74	0.16	0.16
B	35.60	**42.16**	18.21	3.36	0.67
C	14.02	7.85	**29.16**	45.75	3.22
D	6.97	2.22	1.88	**61.63**	27.30
E	3.79	1.04	0.63	3.15	**91.39**

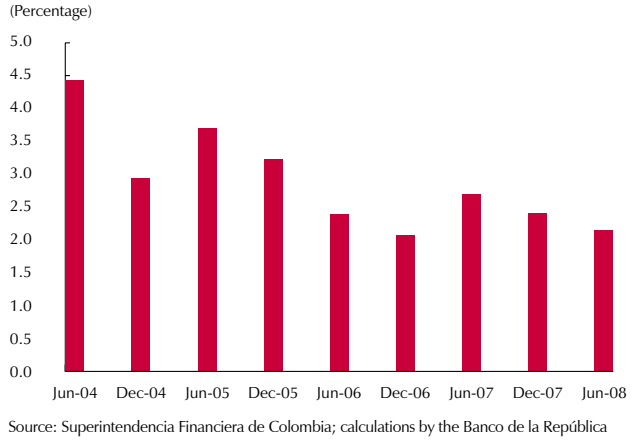
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

Table 17
Consumer Loan Portfolio Matrix at June 2008
(Percentage)

	A	B	C	D	E
A	**95.46**	3.35	0.93	0.18	0.08
B	27.06	**38.26**	12.13	21.19	1.35
C	11.87	7.73	**23.67**	48.63	8.09
D	3.49	1.13	1.55	**84.67**	9.15
E	2.62	0.74	0.32	5.62	**90.71**

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

Graph 90
Commercial Loan Portfolio Quality per "Crop" for the First Six Months of Life



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

are situated on the diagonal, which indicates a significant degree of persistence, particularly for ratings A (95.6%) and E (91.4%). However, in terms of rating C, the likelihood that it will deteriorate and change to D is higher than the likelihood it will remain at C.

The transition matrix estimated for June 2008 (Table 17) shows behavior similar to that of the average matrix. In other words, a loan in any category other than C will tend to stay in that category during the following period. However, the likelihood of the loans in category B deteriorating this quarter is worth pointing out. While the probability of going from B to D was 3.4% in the average matrix, it is now 21.2%, which is high compared to the probability of transition from B to C (12,1%).

It is interesting to analyze the quality of new loans during the semi-annual period when they are granted; that is, the quality of each "harvest". The loan portfolio quality indicator was not homogeneous between January 2004 and June 2008, and showed no clear trend (Graph 90). Another important fact is the slight 2% increase in the three latest harvest compared to December 2006. Because these loans were allocated during a credit growth period, one could expect them to be associated with borrowers who pose more of a risk.

b. Consumption Loan Portfolio

There are three types of consumption loans: credit cards, automobile loans and "other" consumption loans.[56] Each has different characteristics in terms of average amount, collateral, number of operations per type of loan and quality. The purpose of this section is to describe the characteristics of consumption loans and the risk profile of each type of consumer loan. The database used for this purpose has 140 million entries registered during the period from March 2002 to June 2008. It includes every consumption loan transaction and is constructed on the basis of quarterly

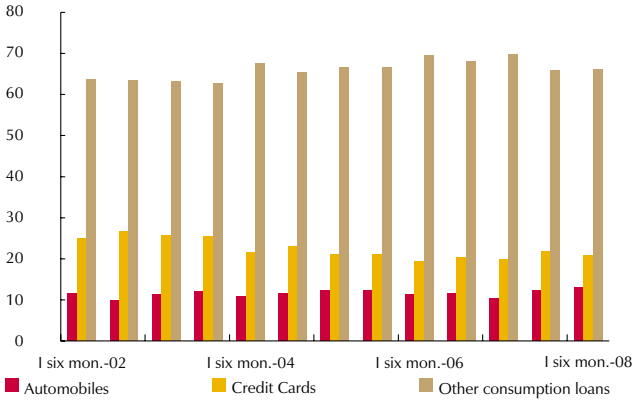
56 The "others" include free investment, revolving credit, overdrafts, loan portfolio purchase and school loans.

reports submitted to the Superintendencia Financiera de Colombia (FSC) by credit institutions.[57]

1) Amount and Number of Loans by Issuer and Type

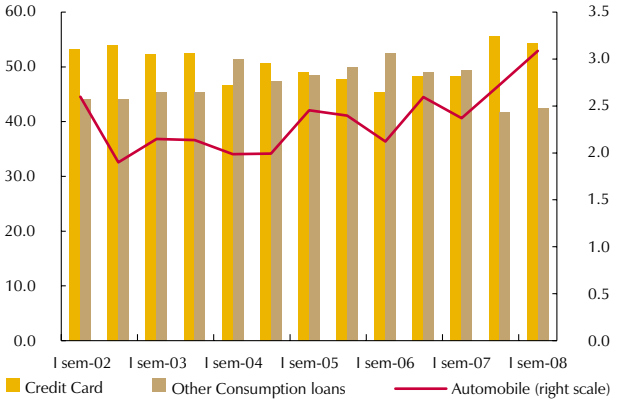
Commercial banks are the major consumer lenders in the financial system and accounted for nearly 86% of the consumption loan portfolio at June 2008, followed by commercial finance companies (CFC) with 9.9%. Compared to the situation one year earlier, commercial banks reduced their share of the consumption loan portfolio by 3.1 pp, while the largest increase was among financial cooperatives (4.1% at June 2008), which means an additional 2.1 pp in their share. The CFC expanded their share of the segment by 0.9 pp. The five and ten banks that carry the most weight in the consumption loan portfolio registered a stable level of concentration during the year under study, accounting for 51% and 77% of the total consumption portfolio, respectively.

Graph 91
Percentage of the Amount of the Consumer Loan Portfolio by Type of Loan



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

Graph 92
Percentage of the Number of Consumption Loan Portfolio Transactions, by Type



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

Graph 91 shows the share of the total pertaining to the different types of consumption lending. By June of this year, credit cards accounted for 20.8% of the consumption loan portfolio, automobile loans, 13% and "others", 66.2%; the respective amounts were COP$8.05 t, COP$5.01 t and COP$25.58 t. of the total consumption loan portfolio (COP$38.64 t). These proportions have remained relatively stable over time, although, in the most recent year, the share of "other" consumption loans decline by 3.6 pp, while the share of automobile and credit card loans increased by 2.6 pp and 1 pp, respectively.

The number of consumption loans totaled 11.6 million active operations reported in June 2008, of which 42.5% are credit card loans, 54.4% are "other" consumption loans and the remaining 3.1% are loans to purchase an automobile (Graph 92). Given their different characteristics and purposes of these loans,

57 As with the commercial loan portfolio, the data used in these exercises come from FSC Form 341. Several institutions did not report figures for 2002 and 2003. This creates a discrepancy between the real total consumer loan portfolio and the database. For example, the database shows 10% fewer consumption loans for 2002 and 2003, compared to the total consumption loan portfolio observed during that period. As of 2004, the discrepancy is under 7% in each quarter, except the third quarter of 2007, when the difference was close to 10%.

the average amount differs from one type to another. For example, in June 2008, the average debt to purchase an automobile was COP$14 m, the average credit card loan was COP$1.28 m and the average "other" loan was COP$5.19 m (Table 18). The respective real annual increases in average amounts, per type of loan, came to 4.9%, 2.16% and 21.34%; that is, for automobiles, credit cards and other consumption borrowing.

Table 18
Average Amount Borrowed per Type of Loan
(Millions of June Pesos)

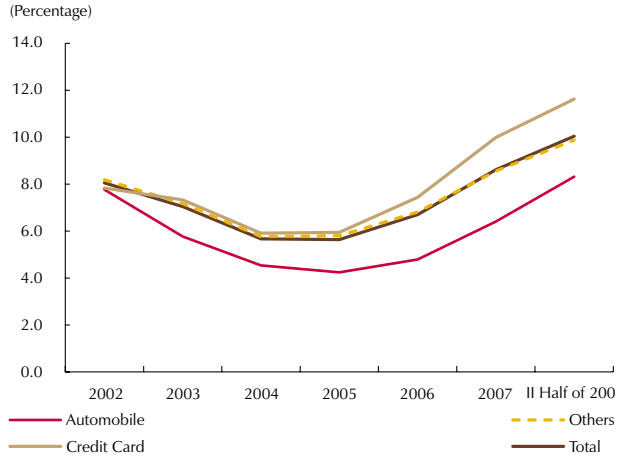
Date	Automobile	Credit Card	Other Consumption loans	Total Consumption loans
2002	8,25	0,87	2,68	1,86
2003	10,01	0,93	2,63	1,89
2004	11,57	0,98	2,79	2,12
2005	11,87	1,03	3,29	2,39
2006	13,72	1,10	3,43	2,59
2007	12,49	1,17	4,03	2,85
2008	14,00	1,28	5,19	3,33

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

By June 2008, the number of borrowers (4.79 million) had increased by 7.5%, which is 16 pp less than the figure reported a year earlier. This is consistent with the reduced momentum in consumption lending and with the more stringent policies credit institutions have adopted for the allocation of new loans, as indicated by the Central Bank in its July 2008 report on lending in Colombia.

Distribution of the consumption loan portfolio at June 2008, by debtor, is contrary in some ways to the results presented in the last edition of this report. The median of these borrowers increased by 8.1% in real terms with respect to June 2007 and was COP$1.4 m. Ninety percent of the consumption loan portfolio falls within a range of COP$0.04 m to COP$18 m. The width of that range increased at a real annual rate of 4.5%. In addition, 50% of the consumption loan portfolio was concentrated between the lower and upper quartiles in a range of COP$0.5 m to COP$4.1 m. The increase in range was 5.8%.

Graph 93
Loan Portfolio Quality Indicator by Type of Consumption Loan (Risky/Gross Portfolio)



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

2) Credit Risk and Loan Portfolio Quality

As reported in the section on the financial sector, the quality indicator for the consumption loan portfolio has declined this year. The deterioration in the risky/total portfolio ratio is shown in Graph 93 and applies

to the three types of consumption loans. However, since 2006, the rise in this indicator has been especially pronounced for credit card loans. By June 2008, it was 11.63% for credit cards, which is 1.64 pp more than at the end of 2007; the index for automobile loans was 8.32%, as opposed to 9.88% for other consumption loans. Respectively, these rates are 1.92 pp and 1.32 pp more than those reported at the end of last year. This raised the indicator for the total consumer loan portfolio to 10.1% by June.

Quarterly transition matrices were calculated in discrete time for a more detailed look at how credit risk in the consumption loan portfolio has evolved. Table 19 shows the average transition matrices between 2002 and 2008 (Panel A), and the average for the first half of 2008 (Panel B).[58] The average for 2008 indicates a higher persistence in every category, especially A and E, with 93.3% and 83.9% respective probability of remaining in those categories. The probability of migrating from categories B to A (46.8%) and from C to D (49.4%) was high.

Table 19
Total Consumption Loan Portfolio Transition Matrices
(Percentage)

	A. Average 2002-2008					B. Average I and II Quarters-2008					
	A	B	C	D	E		A	B	C	D	E
A	**95.4**	2.8	1.1	0.6	0.1	A	**93.3**	4.1	1.7	0.9	0.0
B	49.5	**23.8**	7.8	18.2	0.7	B	46.8	**21.4**	9.1	22.0	0.7
C	28.6	10.9	**12.4**	46.6	1.5	C	25.2	10.5	**11.8**	49.4	3.1
D	16.1	5.3	4.3	**23.4**	50.9	D	16.1	6.2	4.3	**25.7**	47.6
E	6.5	1.5	1.0	2.2	**88.8**	E	9.3	2.1	1.2	3.4	**83.9**

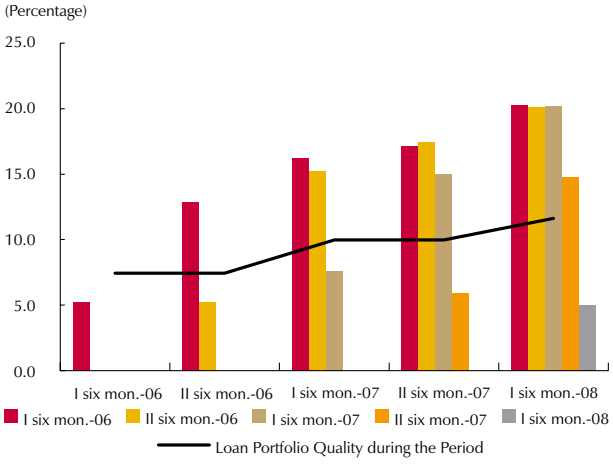
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

The higher probabilities under the diagonal are associated with the increase in ratings, while the numbers located on the diagonal refer to the probability of migrating to an inferior category. A comparison of the average matrix for 2008 to the one observed from 2002 to 2008 shows the average for the years in the sample increased with respect to migrations as opposed to what has been observed so far this year, due to the records in 2004 and 2005. However, a comparison between the 2008 matrix and the average for 2007 shown in the March 2008 edition of the *Financial Stability Report denotes improvements in terms of credit risk. So far this year, the probability of moving to a better rating is more than the average for 2007, particularly with respect to the drift in migrations from category D.*

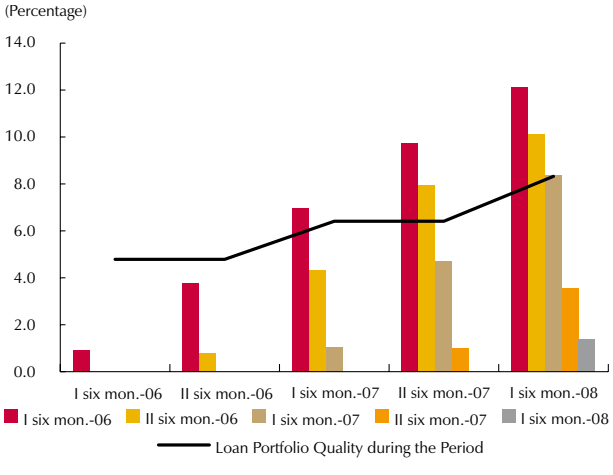
58 A transition matrix shows the probability of a loan migrating from one category to another during a quarter. The entry (i ,j) of each matrix refers to the probability of change from category i to category j.

Graph 94
Consumption Loan Portfolio Quality Analysis, by Harvest

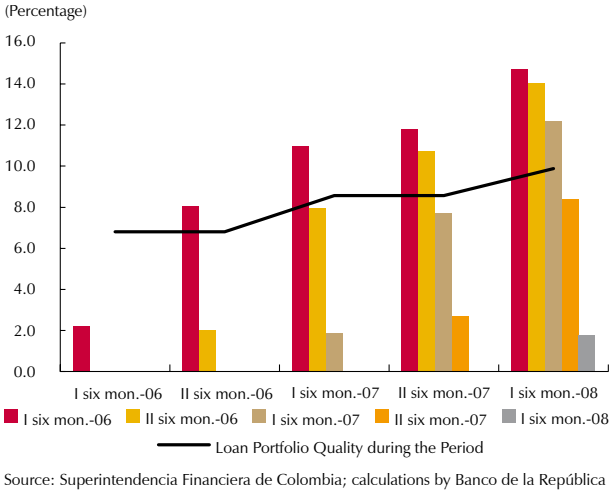
A. Credit Cards (Risky/Total Portfolio, by Crops)



B. Automobiles (Risky/Total Portfolio, by Crops)



C. Other Consumption loans (Risky/Total Portfolio, by Crops)



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

In addition to examining the probability of quality transition (reflected in the matrices), it is important to know how it has evolved, based on the "harvest" of borrowers. This analysis identifies, over time, the quality of the loans allocated to borrowers associated with the financial system during a particular semi-annual period (the "harvest"), which makes it possible to differentiate the risk profiles of new clients compared to previous borrowers. This scrutiny is fundamental to determining if the actual momentum in the portfolio is based on a more flexible process or a more stringent selection of borrowers for new loans.

Loan portfolio quality per "harvest" of credit card borrowers is shown in Graph 94 (Panel A). The half-year "harvest" evaluation period is found on the horizontal scale, while the colors of the bars are associated with each "harvest". The line indicates the quality of the total credit-card portfolio for each period. Portfolio quality analysis done several semesters after a "harvest" has been issued should take into account the fact that the outstanding debt contains a larger share of the riskiest loans. However, this bias is common to all the "harvest", which is why a comparison can be drawn among them. A detailed analysis shows each "harvest" registers a better quality index compared to the total in the half-year period when it appears. Nevertheless, one semester later, the individuals in this group come to be regarded as riskier; this can be expected, given the characteristics of credit card lending. A comparison among "harvest" shows that new borrowers in the first six months of 2007 were the riskiest when the "harvest" was created. Moreover, their deterioration one period after another is faster than the average for the groups analyzed. On the other hand, the "harvest" in the first half of 2008 is the one with the best portfolio-quality indicator at the time it appears. This is consistent with the improvement in policies on the assessment and selection of new customers during the course of the year.

The same harvest analysis was done for automobile loans (Graph 94, Panel B). Contrary to the situation

The harvest in the first half of 2008 has the best quality indicator in the credit card group, which is consistent with the improvement in policies on assessing and "selecting new customers"

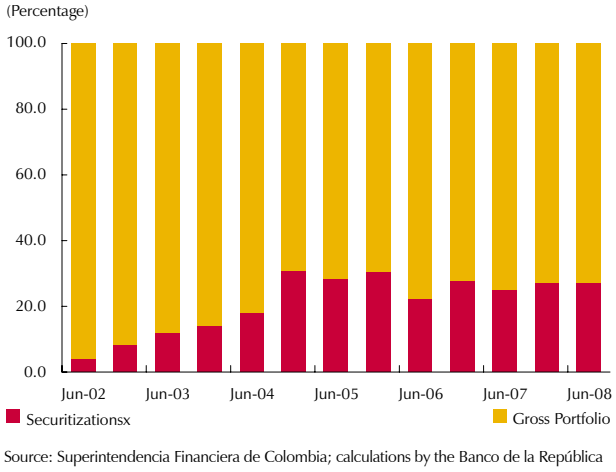
with credit card loans, there appears to be no significant difference in crop performance. Automobile loans have a common pattern of deterioration of 2 pp per six –month period; that is, the QI of the borrowers in one particular crop is 2 pp higher than in the previous six-month period, provided that segment existed. However, in June 2008, the new recipients of auto loans registered a portfolio-quality indicator of 1.3%, which is 37 bp more than the QI for the crop of new borrowers a year earlier. This can be explained by the current situation in the automotive sector, which has felt the effect of the reduction in exports to Venezuela. A recomposition of its exportable base towards the local market may have resulted in a more flexible approach to the allocation of new auto loans.

The group of "other" consumption loans behaved in the same as the credit card harvest. The new borrowers in the first six months of 2008 had a better QI than the new borrowers in other harvest during the periods in which they appeared. In general, the group of "other" consumption loans has better quality indicators than the credit card group, given the nature such groups.

b. Mortgage Loan Portfolio

Mortgage loans have characteristics that make them less vulnerable to monetary policy measures. On average, they have a longer life than other loans and current regulations limit their interest rate. Therefore, despite less growth in the mortgage loan portfolio growth, as mentioned earlier,[59] it may continue to expand. This is why it is important to examine the components that affect its credit risk.

Graph 95
Mortgage Loan Portfolio Composition, by Gross Portfolio and Securitizations



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

The last few years have seen an increase in mortgage portfolio securitization, which accounted for 3.9% of all home loans in 2002 and 27.0% in June 2008 (Graph 95). Because banks do not list mortgage securitizations on their balance sheets, the larger the percentage of the securitized portfolio, the less the credit risk exposure for financial intermediaries.

Most non-securitized loans in the mortgage portfolio are made by banks. In fact, during the period from January 2001 to September 2007, commercial banks supplied 99.95% of all mortgage loans. This proportion did not change until October 2007, when a cooperative began to

59 In June 2008, this loan portfolio registered a real annual increase of 7.7% and amounted to Col$11.8 t.

extend a significant amount of home financing. Since then, cooperatives have accounted for 3.40%, on average.

The evolution in mortgage lending during the period from December 2001 to June 2008 is shown in Table 20. The real outstanding mortgage debt reflects the delayed effect of the financial crisis at the end of the nineties on decisions with respect to the supply and demand for new home loans. Consequently, the total amount on loan, which represents the fifth percentile, displayed a tendency similar to that of the total outstanding portfolio. It is worth noting that the mortgage loan portfolio has been relatively stable; the portion between the upper and lower quartiles remained steady during the period under study. On average, the upper quartile has been 3.4 times the lower quartile, a figure that is considerably less than those observed with respect to distribution of the commercial and consumer loan portfolios.[60]

Table 20
Principal Amount in the Mortgage Loan Portfolio

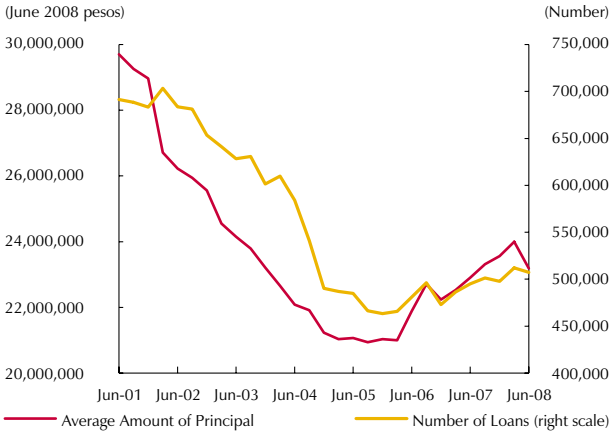
Date	Amount Outstanding a/	Distribution of Amounts by User b/				
		5th Percentile	Lower Quartile	Median	Upper Quartile	95th Percentile
Dec-01	19,794,264	2,055,626	11,563,518	22,220,234	34,926,411	78,729,360
Dec-02	16,700,988	366,150	9,243,330	19,527,789	32,031,689	70,887,604
Dec-03	13,957,680	511,023	8,359,524	17,717,209	29,470,314	63,325,021
Dec-04	10,408,349	85,392	7,018,898	16,442,111	27,232,587	56,170,821
Dec-05	9,744,733	464,406	7,590,875	16,388,841	26,539,066	55,701,610
Dec-06	10,520,089	534,567	8,370,784	16,760,934	26,896,647	59,755,181
Dec-07	11,729,008	495,775	8,735,455	17,218,775	27,463,777	66,482,259
Jun-08	11,765,548	560,896	8,952,933	17,338,302	27,439,973	66,033,708

a/ Figures in millions of real June 2008 pesos
b/ Figures in real June 2008 pesos
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

The evolution in the amount of the portfolio that is outstanding can be explained by the increase in the number of loans from approximately 460,000 in the last quarter of 2005 to slightly more than 500,000 in the second quarter of this year. Moreover, the amount outstanding has behaved similarly to the average amount on loan (Graph 96), having gone from COP$21.0 m, on average, in December 2005 to COP$23.2 m in June 2008, possibly due to higher home prices in recent years. It is important to point out that the increase in the number of loans and in the average amount per loan raises credit risk by broadening the extent to which financial intermediaries are exposed. However, in the case of the mortgage loan portfolio, this has not been prominent, since the changes have not been significant.

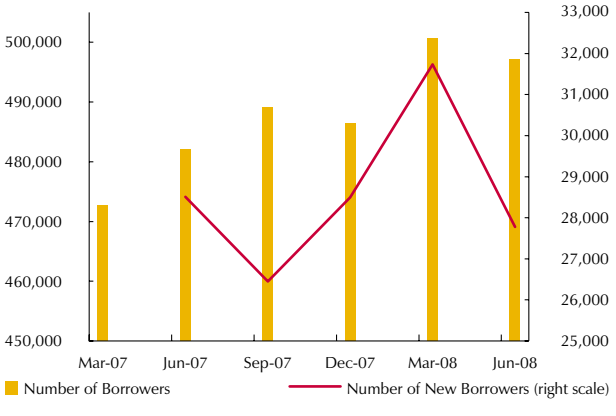
60 Since 2001, lending situated in the upper quartile of the commercial loan portfolio has been 10.3 times the lending in the lower quartile, on average. This figure has been 7.0 for the consumer loan portfolio.

Graph 96
Average Amount and Number of Loans in the Mortgage Portfolio



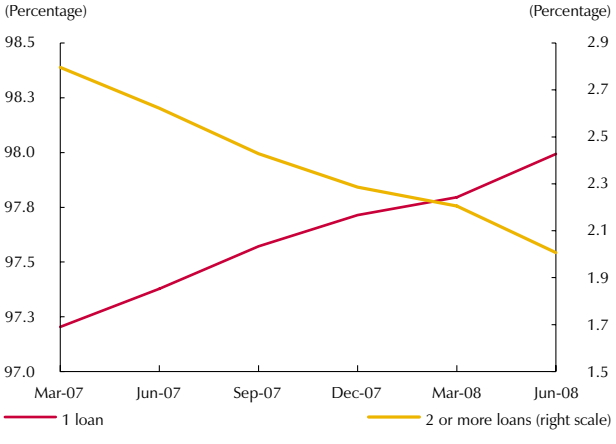
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

Graph 97
Number of Total and New Borrowers per Quarter in the Mortgage Loan Portfolio



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

Graph 98
Percentage of Borrowers Per Number of Loans in the Mortgage Portfolio



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

The average number of borrowers per quarter, since the first quarter of 2007, is 488,000, including approximately 28,600 new borrowers.[61] As illustrated in Graph 97, the total number of borrowers and the number of new borrowers declined during the second quarter of 2008 compared to the first quarter of this year and the fourth quarter in 2007. This momentum is consistent with the slight setback in the number of loans during the second quarter of 2008 and the reduced rate of growth in the mortgage loan portfolio during those periods.

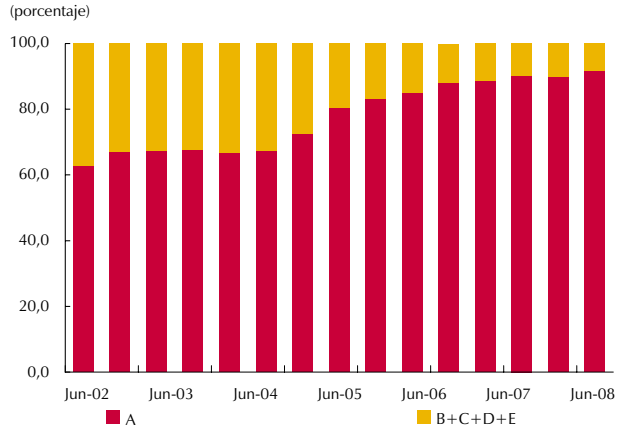
Contrary to the performance of the consumer and commercial loan portfolios, a high percentage of borrowers have only one home loan. This ratio has grown since the first quarter of 2007, when only 2.8% had more than one loan. In fact, in the second quarter of 2008, this figure was around 2.0% (Graph 98). These findings, coupled with the distribution of amounts per user (Table 20), show the mortgage loan portfolio poses no credit risk due to concentration of the debt among very few borrowers.

As illustrated in Graph 99, a considerable portion of the mortgage loan portfolio is low risk. Moreover, the non-risky portion of the total portfolio has increased in recent years. In the first quarter of 2001, it accounted for 62.6% of the total; by the second quarter of 2008, it represented 91.5%. The indication is that banks' perception of credit risk has declined in the last few years, especially as of 2006. This concentration of the proportion of the risky portfolio is explained primarily by the reduction in the E-rated portfolio during the crisis recovery period, when it went from 16.2% of the total portfolio in the third quarter of 2003 to less than 1.0% in the second quarter of this year (Graph 100).

The drop in the percentage of risky loans is consistent with Table 21, which contains the mortgage loan transition matrices. The matrix on the left shows the average rating changes during 2007, as a percentage

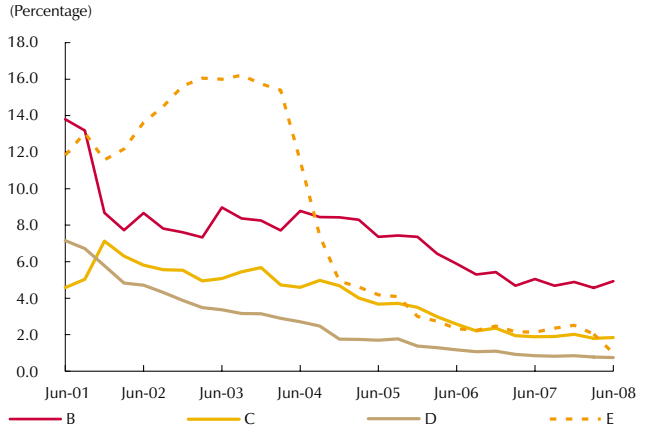
61 New borrowers are those who had no loans pending during the previous quarter.

Graph 99
Mortgage Loan Portfolio by Ratings



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

Graph 100
Percentage of Risky Loans in the Mortgage Portfolio, by Ratings



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

of the number of loans with each rating. The matrix on the right presents the same information for 2008. One can see the percentage of loans that migrated to a better rating has increased so far this year, compared to the average for 2007. The percentages below the main diagonal of the matrix for 2008 are higher than those of the average matrix for 2007. During that year, 6.7% of all E-rated loans, on average, migrated to a better rating; in 2008, the proportion was 12.1%, which reflects an increase in recovery on the non-performing portfolio. In addition, a smaller percentage of above-E-rated loans fell overdue in 2008 than in 2007.

Although the banks have improved their perception of risk with respect to the mortgage loan portfolio, average loan life has remained relatively stable since 2004, at round 164.8 months (13.7 years) (Graph 101). By the second quarter of 2008, mortgage loans had an average life of 163.4 months (13.6 years).

It also is important to analyze the performance of the new loans being allocated semi-annually (harvest). Graph 102 shows the risky/gross portfolio ratio for the harvest that appeared in the second half of 2007 and the first six months of 2008. The quality indicator improved with the latest harvest, inasmuch as the QI is less for the new loans in the first half of 2008 (0.9%) than for those in the second half of 2007 (2.5%).

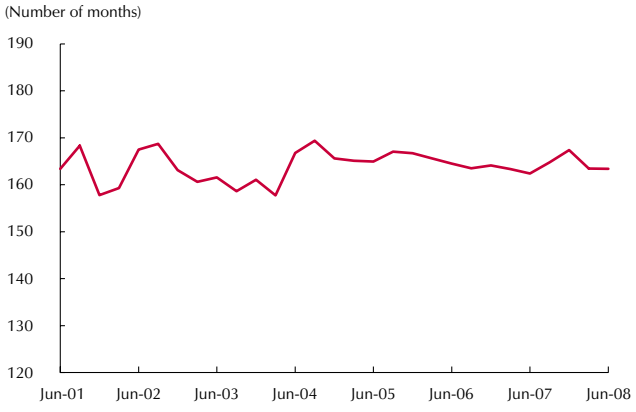
Broadly speaking, the mortgage loan portfolio is far more uniform than the consumption or commercial

Table 21
Mortgage Loan Portfolio Transition Matrices
(Percentage)

	Average: 2007						2008				
	A	B	C	D	E		A	B	C	D	E
A	**96.28**	3.50	0.13	0.05	0.04	A	**96.23**	3.57	0.12	0.04	0.05
B	31.28	**50.81**	16.82	0.25	0.84	B	33.48	**49.91**	15.78	0.17	0.68
C	14.32	7.34	**60.11**	15.99	2.24	C	17.77	8.91	**58.81**	13.63	0.90
D	7.66	2.34	5.87	**55.30**	28.83	D	9.00	2.51	8.32	**56.63**	23.53
E	3.06	0.87	1.08	1.72	**93.27**	E	6.07	1.21	1.54	3.33	**87.87**

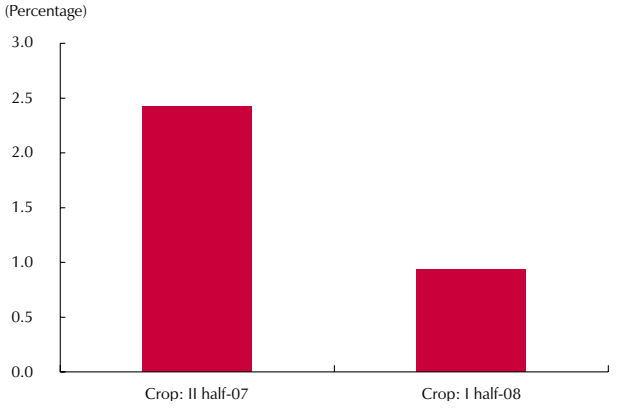
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

Graph 101
Average Life of Mortgage Loans



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

Graph 102
Mortgage Loan Portfolio Quality at the Onset of Credit
Crops (Risky / Gross Portfolio)



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

loan portfolios, since the difference between the largest and the smallest loans in terms of amount is not as pronounced. Moreover, this uniformity is relatively constant throughout the sample in question, which could be a consequence of the special features described earlier. This uniformity, in turn, is also evident in the average life of mortgage loans, which has been more or less stable since 2004.

As to credit risk, the mortgage loan portfolio does not pose a greater risk due to the concentration of loans among a few borrowers, since a high percentage have only one loan and the share of borrowers in that situation has tended to increase. On the other hand, growth in the non-risky portion of the portfolio and the improvement in migration among credit ratings in the past year are a demonstration of how this portfolio has recovered since the financial crisis at the end of the nineties.

PROBABLE FINANCIAL STABILITY SCENARIOS IN 2008: SIMULATIONS BASED ON A GENERAL EQUILIMBRIUM MODEL OF THE FINANCIAL SYSTEM

The results of simulation exercises based on a general equilibrium model of the financial system are presented in this section. The general characteristics of the model were outlined in the March 2006 edition of the *Financial Stability Report*. The simulations are quarterly and use the situation of the banking system in June 2008 as a starting point. The model scenario can be used to simulate probable patterns for different financial-system variables in 2008 and 2009, such as the loan portfolio, deposits, loan- portfolio quality and interest rates.

It is important to point out that the tendencies outlined in this section should not be interpreted strictly as forecasts for financial variables, or as an official opinion of the Financial Stability Department at the Banco de la República in terms of what the near future holds for the financial system. They are merely simulation exercises based on hypothetical monetary-policy scenarios.

See Saade, Osorio and Estrada (2007)[1] for the details on calibration, implementation, solution strategies, objective functions and the markets where the agents in this model interact.

Scenario 1: An Intervention Interest Held Steady at 10%

The Banco de la República raised its intervention interest rates from 9.75% to 10% at a Board of Directors meeting on July 25, 2008. The assumption in this scenario is that there will be no further intervention interest hikes during the remainder of 2008 and next year. Based on that assumption, the model simulates a sharp slowdown in the loan portfolio,[2] which would be valued at COP$99.5 t by December 2008, with a real decline of 8.57% in a semester. This slowdown would be accompanied by higher interest rates on lending. As to deposit accounts, the model simulates constant paths, but with higher interest rates. According to the simulation, during the first half of 2009, the slowdown in the loan portfolio would come to a halt and deposits would increase.

However, in this scenario, the momentum in the loan portfolio is accompanied by a pronounced improvement in the quality indicators, which are understood as the non-performing portfolio as a percentage of the total portfolio. According to the model, by December 2008, this portion would be 2.8 pp less than what it was in the initial simulation period.

Finally, in this scenario, the national banks and the BECH would more than meet the minimum capital adequacy ratio (9%); the foreign banks would barely do so.

Scenario 2: Slow Decline in the Intervention Interest in the Period of a Year

This context assumes there will be three successive intervention interest rate cuts of 25 bp each as of the fourth quarter of 2008. Given that assumption, the slowdown in the loan portfolio would be less than what was simulated in the first scenario; namely, a real semi-annual decline of 0.23% by December and a fairly constant path for the portfolio throughout the year. Contrary to what was observed in the first case, no pronounced hikes in interest rates on lending are envisioned with this assumption; in fact, they would stabilize during 2009 at levels similar to those registered at the start of the simulation. As for deposits, this scenario implies lower interest rates than those in the aforementioned context, accompanied by deposit stability but less growth during 2009.

As with the first scenario, the slowdown in loans would be accompanied by delayed improvements in the loan portfolio quality indicator. Although the quality of the loan portfolio is unchanged during the first two quarters of the simulation, the indicators for the three groups improve during 2009, with the risky/total portfolio ratio dropping by 2.07 pp compared to the initial half-year period of the simulation.

Finally, in this scenario, all the banks would more than comply with the required minimum capital adequacy ratio.

1 Saade, Osorio & Estrada, 2007, "An Equilibrium Approach to Financial Stability Analysis: The Colombian Case," in *Annals of Finance*, Vol. 3, No. 1, pp. 75-106. For the purpose of simulation, the optimizing agents are three and they pertain to groups of banks: mortgage loan banks (BECH), non-BECH national banks and non-BECH foreign banks.

2 The model only includes commercial banks.

C. LIQUIDITY RISK

There are two dimensions or notions of liquidity risk widely discussed in academic literature. The first, which is the risk associated with the capacity of an institution to honor its liquid liabilities on time, is known as funding liquidity risk. On the other hand, given a potential need for resources, there is a liquidity risk associated with the capacity to liquidate assets at a sufficient price and at the right time. This is known as market liquidity risk.

The liquidity risk associated with each of these dimensions is measured in this section. Stress exercises are also included to analyze how sensitive the system is to extreme, but probable scenarios involving low liquidity. Finally, because these findings can be correlated, the exposure of credit institutions to liquidity risk as a whole is analyzed in the final section.

1. Uncovered Liabilities Ratio (ULR): Funding Risk Liquidity Indicator

The uncovered liabilities ratio (ULR) is calculated to evaluate liquidity risk. In doing so, the idea is to measure the liquidity shortage financial institutions could face as a result of their activity related to change in terms. The following ratio is constructed for that purpose:

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

where LL are the liquid liabilities,[62] TrL is the temporary component of all other liabilities,[63] INV are tradable investments available for sale, LA are liquid assets,[64] and TA are total assets.[65]

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62 These include the following accounts: Banco de la República: negotiated repo agreements with others, time certificates and liability positions in money market and related transactions

63 These include regular assets, real-value savings accounts , special savings accounts, real-value savings certificates, documents payable, the centralized account, funds in trust and special accounts, banks and correspondents, bank collection services, affiliate establishments, current account bank deposits, time certificates of deposit, 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.

64 Includes the following accounts: other available cash, active positions in money market and related transactions, investments held to maturity, non-tradable-fixed income investments, hedging operations, fixed-income investments to maturity, rights to repurchase tradable investments, rights to repurchase non-tradable investments, rights to repurchase hedging operations, and rights to repurchase investments to maturity.

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

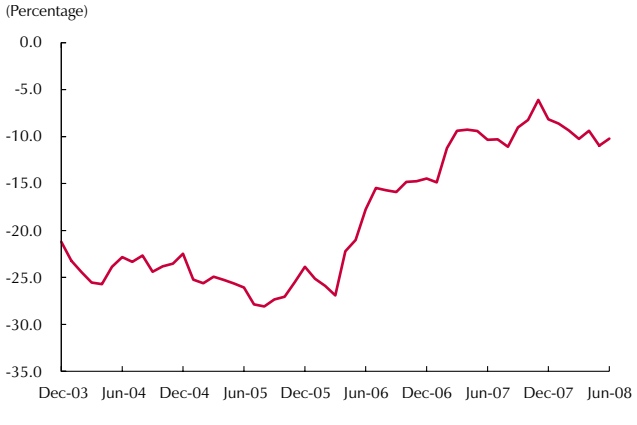
In this expression, the liabilities susceptible to redemption are the sum of *LL* and *TrL*. The support institutions have (in square brackets) is given by: i) liquid assets other than tradable investments available for sale (*LA – INV*), and ii) tradable investments available for sale multiplied by a discount (λ). This discounts means the value *INV have* —in terms of liquidity risk— is somewhat less than their market value (λ<1).[66]

The ULR is interpreted according to the following ratios:

ULR	Motive	Liquidity Risk
Positive	$(TrL + LL) > [\lambda\ INV+(LA - INV)]$	High
Zero	$(TrL + LL) = [\lambda\ INV+(LA - INV)]$	Medium
Negative	$(TrL + LL) < [\lambda\ INV+(LA - INV)]$	Low

This indicator does not take into account the reserve commercial banks are required to deposit with the Banco de la República, as it cannot be considered an additional source of funding to cover current liabilities. Although banks could use surplus reserves, above and beyond what is required on deposit, as a source of liquid resources to deal with an eventual liquidity shock; and, in the case of a bank run or systemic risk problems, the legal reserve could act as a source of support for financial intermediaries.

Graph 103
ULR of Credit Institutions



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

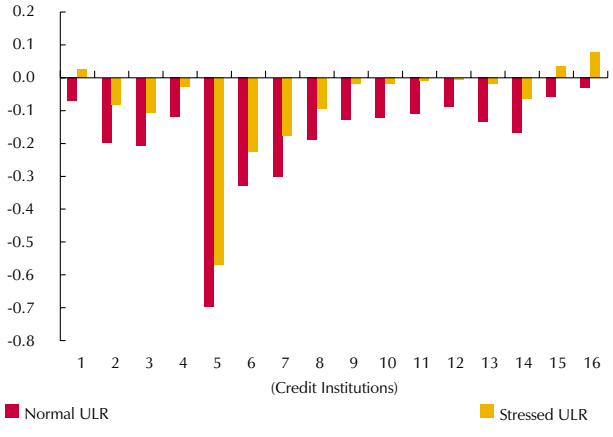
a. Evolution

The recent changes in the ULR for the financial system are shown in Graph 103. There was a marginal increase in exposure to funding liquidity risk between June 2007 and June of this year; the ratio was -10.22% in June 2008, compared to -10.35% a year earlier. However, the ULR did not evolve evenly during the period in question. The system's exposure increased ostensible between August and November 2007 (the ULR was -6.10% in November); it declined between December and March, then stabilized at rates similar to those observed in June of this year.

66 λ is calculated as (*1-haircut*), where the haircut is the discount the Banco de la República applies to the value of credit institutions' portfolio in their repo operations. Therefore, the information on haircuts can be used to calculate the value of the tradable investment portfolio discounted for such operations. This element incorporates some of the considerations on market liquidity mentioned earlier, although in an exogenous way (since the haircut is exogenous from the standpoint of these institutions).

Liquidity risk remains low, but has increased steadily during the last two years. This underscores the importance of the Liquidity Risk Management System (SARL in Spanish) designed by the Banco de la República, in conjunction with the Superintendencia Financiera de Colombia. As stipulated in External Circular 016 issued by the Superintendencia Financiera de Colombia in 2008, SARL will take effect as of April 2009.

Graph 104
Sensitivity Analysis:
ULR of Credit Institutions – June 2008



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

b. Stress Testing

The uncovered liabilities ratio (ULR) can be used to assess extreme but probable scenarios with respect to liquidity, as well as the system's capacity to adjust to them. Graph 104 shows a stress testing exercise that simulates how the ULR of institutions in the banking system would be affected by a mass withdrawal equivalent to 12% of all their deposits.[67]

It is important to point out that no institution had a positive ULR at June 2008, contrary to the situation a year earlier, when one institution was near zero. Compared to the results published in March 2008 edition of the *Financial Stability Report,* six institutions increased their funding liquidity risk exposure during the first six months of the year, although at low levels. These six account for 40.2% of bank assets.

In a stressed situation with mass withdrawals, such as the one suggested earlier, three institutions would register a positive indicator, which is indicative of high funding liquidity risk exposure. This is less than the number reported in June 2007 (eight banks) and in December of that same year (five banks). The three institutions would have a ULR of 4.59%, on average, which is the percentage of their illiquid portfolio assets that would have to be sold off to deal with a mass withdrawal of deposits. These institutions account for 21.7% of the assets in the system. Therefore, a situation such as the one suggested has the potential of exerting a substantial impact on the stability of the financial system. The system's resistance to such a shock has increased during the past year. In June 2007, the sensitive institutions accounted for 53% of all bank assets; by December of that year, they represented 39.15%.

67 The simulated withdrawal is equal in size to the simple average of the largest monthly decline in deposit volume experienced by financial intermediaries during the period from the first quarter of 1994 to the second quarter of 2007.

2. Liquidity-adjusted Value at Risk (VaR-L): Market Liquidity Risk Indicador[68]

The VaR-L calculates the percentage by which the traditional VaR would have to increase to take market liquidity risk into account. Clearly, the larger the percentage, the greater the market liquidity risk, since the necessary VaR correction is greater.[69]

Table 22
Correction Percentage - August 22, 2008
(Percentage)

Institutions	Without Volatility	Volatility Scenario
1	10.08	55.69
2	13.42	50.59
3	12.10	30.04
4	4.57	26.28
5	15.51	26.20
6	8.17	28.65
7	9.63	53.37
8	16.03	31.76
9	11.40	59.46
10	11.64	10.72
11	11.67	25.42
12	13.91	36.06
13	3.19	21.90
14	7.21	20.71
15	16.52	32.27
16	14.12	10.43
Total	**11.44**	**46.45**

a/ Volatility in the second quarter of 2006
Source: Calculations by the Banco de la República

Table 22 shows the percentage of correction for each of the credit institutions at August 22 of this year, calculated exclusively for their TES portfolio. The market liquidity risk implies the VaR for these institutions as a whole would be 11.44% greater. This is slightly above the percent observed in March 2008 (9.73%), which indicates an increase in market liquidity risk levels. Although the adjustment ratios for each institution oscillate between 3.19% and 16.52%, the dispersion is now much less. In the March 2008 edition of this report, the standard deviation of the corrections was 13.44%; it is now 3.81%. In others words, the increased liquidity risk associated with market conditions is distributed more evenly among the institutions.

To assess how sensitive this percentage is to an extreme but probable financial market liquidity situation, a stress testing exercise is done on the assumption that the markets behave as they did during the second quarter of 2006, which was an extremely volatile period. As illustrated in Table 22, in this stressed scenario, the percentage of correction in VaR would be 46.45%, which is 4.1 times higher than the correction estimated for August 22. Compared to the correction observed in March 2008 (37.58%), not only has market liquidity risk increased, so has the system's sensitivity to an extreme situation such as the one in 2006. Therefore, it is essential to continue to carefully monitor the tendencies that might unleash a sudden drop in market liquidity.

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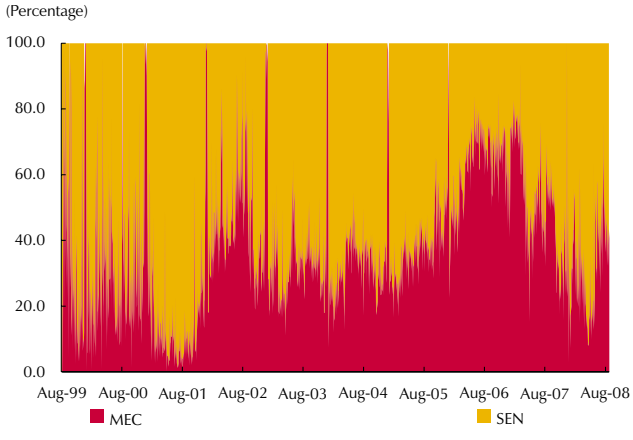
68 The details on the basic idea and the method used to calculate VaR-L are contained in the March 2007 edition of the *Financial Stability Report*. For a detailed explanation of the method used to calculate the VaR-L, see Juanita González and Daniel Osorio (2007), "Liquidity Adjusted Value-at-Risk (L-VaR) in Colombia," *Financial Stability Report*, Banco de la República, March, pp. 120-126.

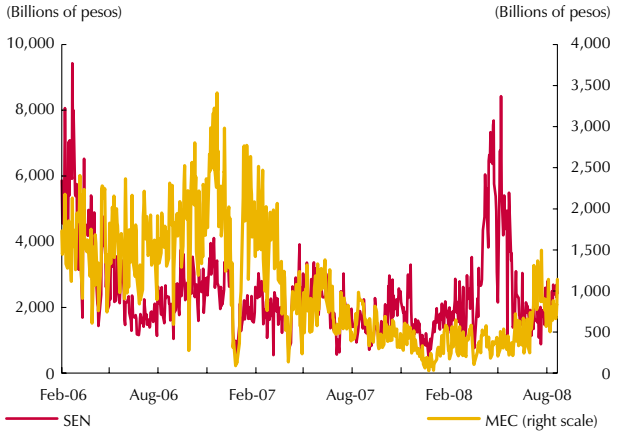
69 Due to the information restrictions on the bid-ask spreads of government bonds, it is important to point out that the VaR calculated in this exercise differs from the one presented in the section on market risk.

Graph 105
Interbank Market Transactions: Share in MEC and SEN



Source: Colombian Stock Exchange and the Banco de la República

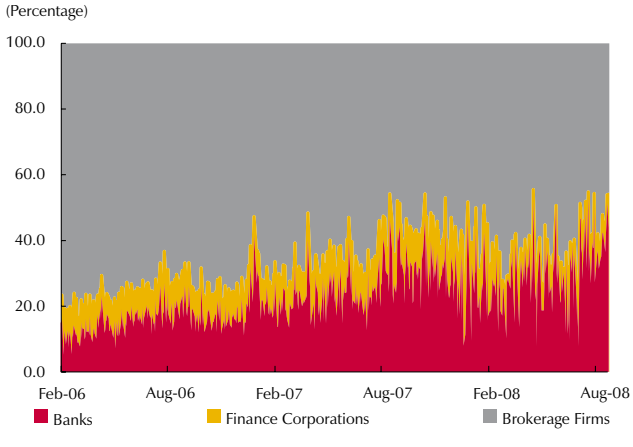
Graph 106
Amount Traded through MEC and SEN



Source: Colombian Stock Exchange and the Banco de la República

Graph 107
Share of Purchases through MEC and SEN, per Institution

A. On MEC



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

3. The Inter-bank Domestic Government Bond Market

As noted in the March 2008 edition of this report, financial institutions currently manage much of their liquidity through government bond repo transactions. These can be negotiated through two trading systems: the Colombian Electronic Market (MEC in Spanish), which is managed by the Colombian Stock Exchange, and the Electronic Trading System (SEN in Spanish), which is managed by the Banco de la República.

As illustrate in Graph 105, MEC began to gain ground in early 2002 and, by February 2007, its average share was 69.8%. However, since then, its share has declined and was 38.19% in August 2008.

An analysis of the transactions conducted through both trading systems is presented below. It takes into account only the transactions in which both parties were banks, finance corporations or brokerage firms. It is important to point out that such transactions account for a high percentage of the total trading via SEN, but only a small part of the trading via MEC.[70] For example, in July 2008, they accounted for only 26.43%.

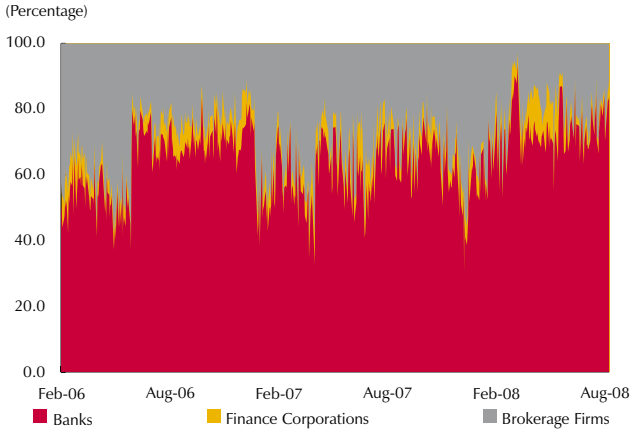
Given these considerations, one sees the amount traded through SEN is significantly higher than the amount traded through MEC (Graph 106). While the amount traded via SEN oscillated between COP$410.5 b and COP$9,429.9 b from January 2006 to July 2008, the amount traded via MEC during that period ranged from COP$28.1 b to COP$3,410 b. Moreover, these amounts appear to show a negative correlation; in other words, an increase in the amount traded through SEN is accompanied by a decline in the amount traded through MEC, which suggests the participants substitute one system for the other.

Given the importance of the liquidity in this market, it is interesting to consider what type of institutions offer

70 The transactions conducted through MEC take into account government bond transactions and those involving other securities.

Graph 107 (continue)
Share of Purchases through MEC and SEN, per Institution

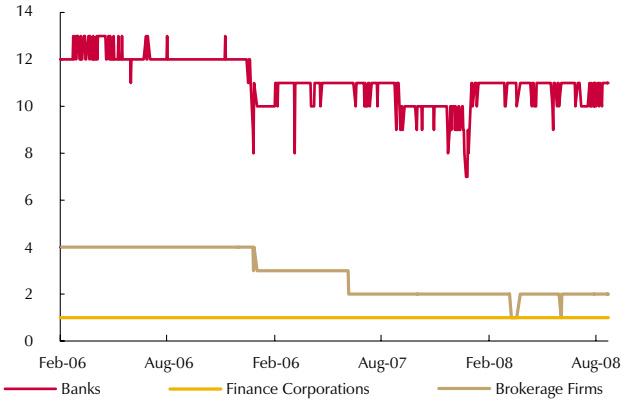
B. On SEN



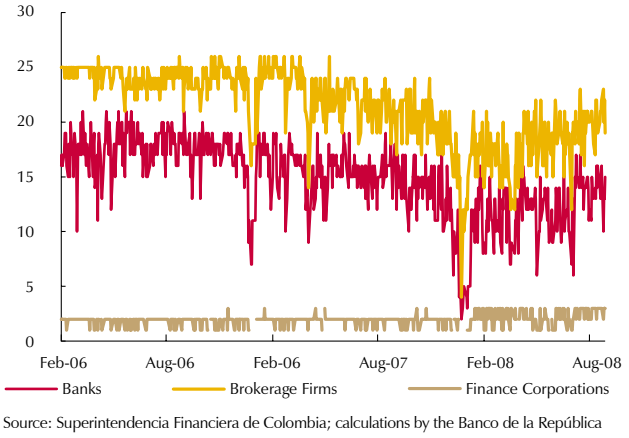
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

Graph 108
Number of Buyers by Type of Institution

A. In SEN



B. In MEC



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

liquidity; in other words, what institutions purchase TES. The share of the liquidity supplied through each trading system over time, per institution, is shown in Graph 107.

In the case of MEC, most of the liquidity is offered by brokerage firms. During July 2008, their average share was 60.3%, which is much more than the share offered by banks (37.6%). In SEN, it is banks that offer most of the liquidity; their average share during July 2008 was 73.3%.

Although the total supply of liquidity is not concentrated in one particular type of institution, it is important to emphasize that banks as well as brokerage firms play an extremely important role when it comes to ensuring liquidity in this market.

A look at the number of agents who purchased through both trading systems shows SEN has significantly fewer than MEC. This is interesting, as systems with a good many agents and a high level of connectivity tend to reduce systemic risk. However, as will be explained later, MEC seems to have a rather incomplete structure.

The number of participants in SEN fluctuated between ten and twenty during the period under study, and only one to four were brokerage firms. The number of participants in MEC was between six and 51, mostly brokerage firms. The number of bank that trade through MEC is generally higher than the number of banks that trade through el SEN (Graph 108).

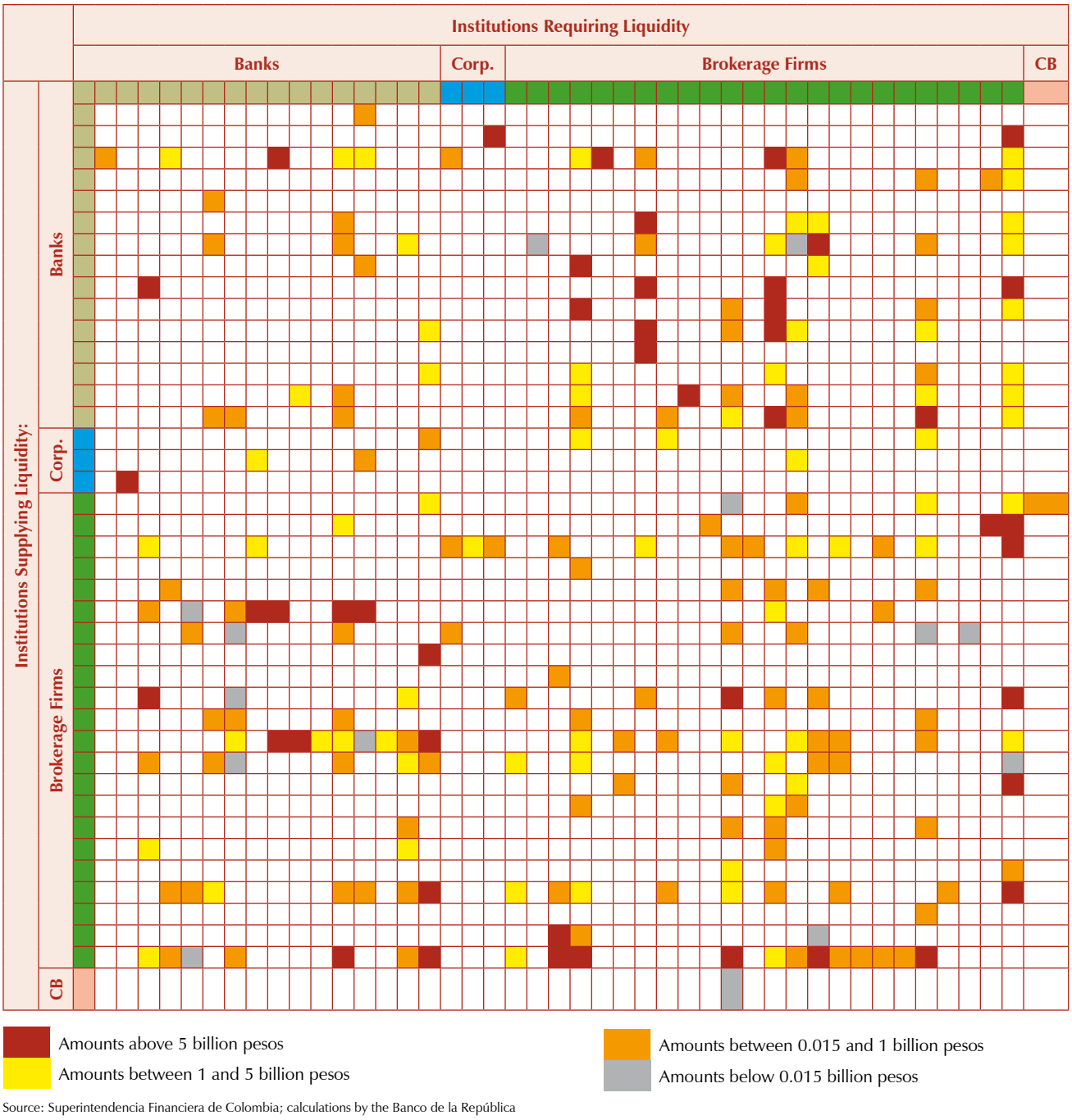
To analyze the role various institutions play in the current structure of the government bond market, the structure of that market was examined on Friday, August 22, 2008 for both SEN and MEC.

a. MEC Structure

On the day in question, banks covered 41.9% of their demand for liquidity with liquidity offered by other banks and 53.1% with liquidity offered by brokerage

firms. As to the total amount of liquidity supplied by banks, 63.5% was absorbed by brokerage firms and 33% by other banks. The matrix in Graph 109 represents the connections or supply lines that existed on Friday, August 22, 2008 among the participating institutions: the structure of the market was extremely disconnected and each institution traded with a limited number of counterparts. The graph also shows that most of the banks' demand for liquidity was met by brokerage firms.

Graph 109
Government Bond Market Matrix for MEC Trading on August 22, 2008

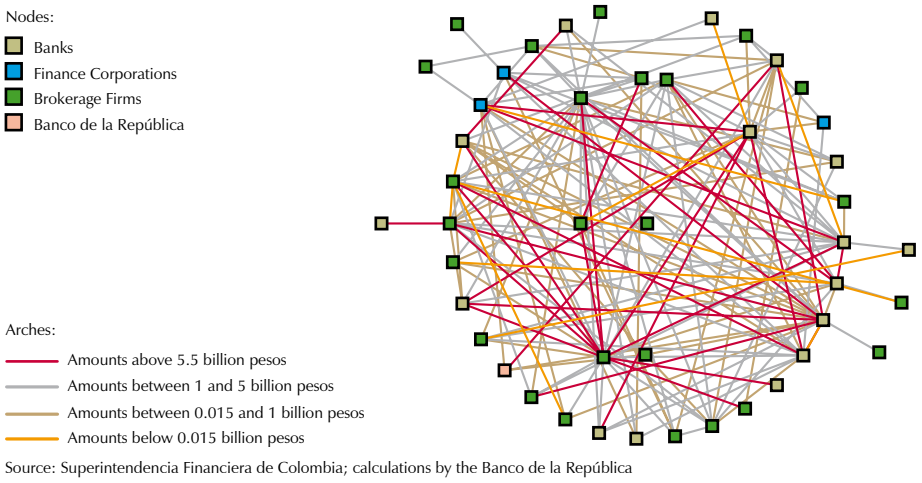


Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

A comparison between the number of transactions conducted and the number of possible connections that could have been generated showed that only 13.3% were carried out. This is a relatively low proportion and reflects a limited level of connectivity.

When the structure of the inter-bank market is portrayed as a network of nodes (banks) and arches (transactions among institutions), it becomes clear that there were several peripheral agents on that particularly day who traded with a reduced number of counterparts. This representation is useful in that it allows us to take advantage of the results of empirical studies, such as the one by Allen and Gale (2000),[71] who say the interbank market's resistance to liquidity shocks depends on its structure. In other words, complete inter-bank markets[72] are more robust and allow risk to be distributed more effectively among depositors and banks than markets with an incomplete structure. Graph 110 shows the structure of the MEC-managed government bond market on August 22, 2008. The color of the arches represents the value range within which the amounts traded by each pair of institutions are situated, while the color of the nodes differs according to the type of institution.

Graph 110
MEC Structure on August 22, 2008



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

As illustrated in Graph 110, the amount of most of the transactions conducted on that day was between COP$0.015 b and COP$1.0 b (given the prevalence of the colored arches indicative of that range).

In general, the density of red arches is low, since most of the nodes are relatively disconnected. This can be explained as follows: i) a good portion of

71 F. Allen and D. Gale, 2000, "Financial Contagion," *Journal of Political Economy*, Vol. 108, pp. 1-33.

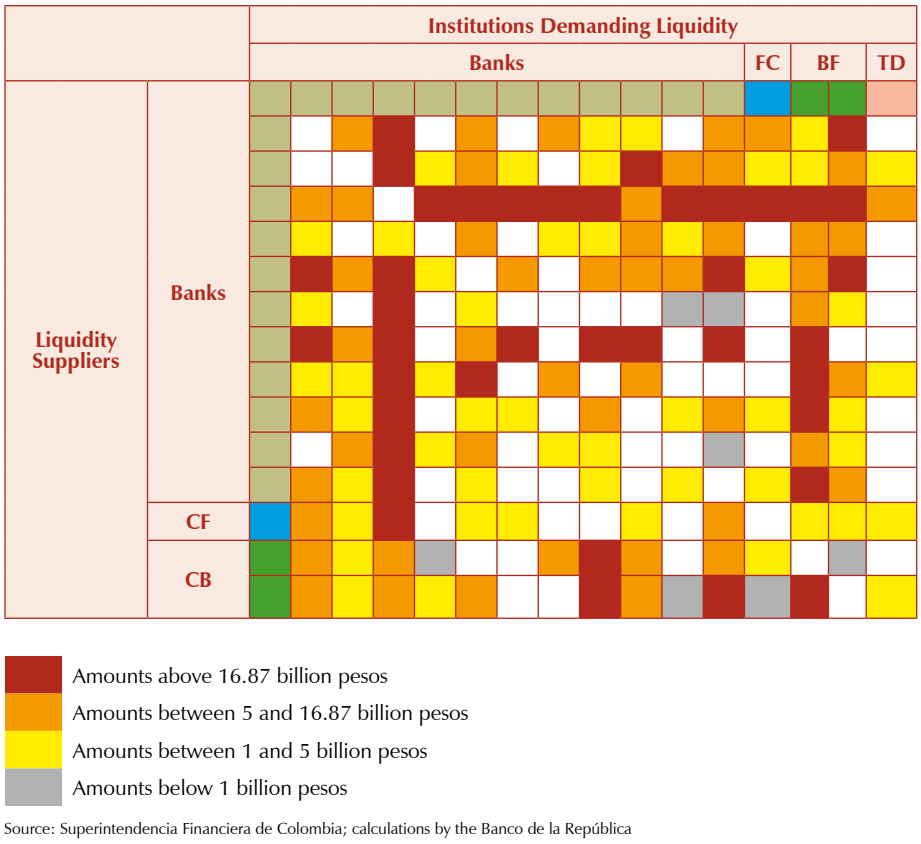
72 A complete structure is one where each bank is symmetrically connected to all the others.

the arches that potentially could cover the perimeter of the circle that is formed are disconnected, and ii) there are six completely peripheral institutions that trade only with one or two counterparts at the most. Therefore, as noted already, MEC seems to have a less complete structure.

b. SEN Structure[73]

An analysis of the structure of the market for government bonds traded through SEN on the date in question shows that banks covered 76.6% of their demand for liquidity with liquidity supplied by other banks. This is much higher than the percentage for MEC. On the supply side, we see that nearly 62% of the liquidity supplied by banks was absorbed by other banks. In the case of SEN, this suggests there were strong connections between banks on the day in question. Moreover, it is important to point out that SEN had only fifteen participants, while MEC had almost three times as many on that day (44 participants) (Graph 111).

Graph 111
Government Bond Market Matrix for SEN Trading on August 22, 2008



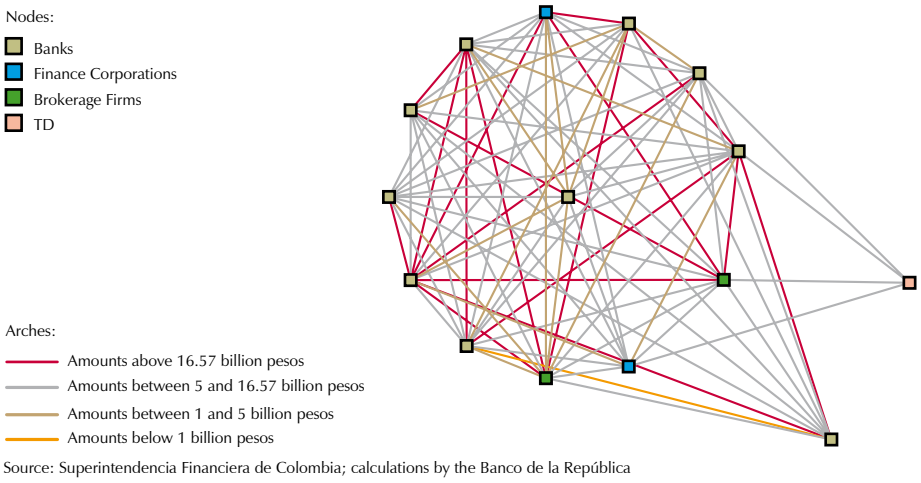
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

73 In this case, the participation of the Banco de la República is not included.

In this case, the ratio of actual connections to the number of possible connections was 74.5%. This is much higher than the figure for MEC, which suggests that SEN has greater levels of connectivity (or completeness) and, therefore, lower systemic risk levels.

Graph 112 shows the structure of the market for government bonds managed by SEN on August 22, 2008. As illustrated, there is a high degree of connectivity; in other words, most of the participants conduct transactions with virtually all the other agents and, in this case, there are only two relatively peripheral institutions.

Graph 112
SEN Structure on August 22, 2008



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

During the day in question, most of the amounts traded were within a range of COP$1.0 b to COP$5.0 b. These are much higher than the amounts traded through MEC.

The role of the interbank market as a redistributor of liquid resources is extremely important. Institutions turn to this market to sell or purchase new government debt positions (selling when they need liquidity and buying when it is offered to them). Therefore, proper operation of the interbank market is crucial to each institution in terms of liquidity risk management.

LIQUIDITY RISK MANAGEMENT SYSTEM[1]

In an effort to encourage adequate liquidity-risk management on the part of the institutions it oversees, the Financial Superintendent of Colombia established a set of regulations on the liquidity risk management system (SARL in Spanish). These regulations are outlined in External Circular 016/2008, whereby credit institutions, upper-grade financial cooperatives, trust companies and institutions that manage mutual funds or independent equity are instructed to design and apply a SARL as of April 2009. Compliance in this respect is mandatory.

Application of the circular requires that liquidity risk be regarded as a funding risk, which implies "the contingency of not being able to comply fully and in due course with the obligation to make payments on time because of a shortage of available liquid assets for that purpose and/or the need to assume unusual funding costs." Nevertheless, it does leave room to consider market liquidity risk in the assessment of liquidity risk. To this end, it adds: "This risk can affect market liquidity, which is understood as the capacity institutions have to generate or dispose of financial positions in a particularly market situation."

Credit institutions and upper-level financial cooperatives may design a SARL with their own models for risk identification and management, provided they are consistent with the guidelines specified by the Financial Superintendent and are approved for use. A standard model has been proposed as an alternative; it includes the calculation of a liquidity risk indicator (IRL in Spanish). However, in both cases, institutions are obliged to submit a weekly report on the results of risk measurement.

1. Liquidity Risk Indicator (IRL)

Regardless of the model an institution applies for the weekly report, the Financial Superintendent stipulates the LRI of credit institutions and upper-grade financial cooperatives for the first band (seven calendar days) must invariably be equal to or above zero.

The IRL formula for this first band is the sum of liquid assets adjusted for market liquidity (*ALM*) and the net liquidity requirement estimated for the first time band (*RLN*1):

$$IRL_1 = ALM + RLN_1$$

Where $RLN_1 = FNVC_1 + FNVNC_1$, with $FNVC_1$ being the net cash flow for the contractual maturity of assets, liabilities and off-balance sheet positions within the next seven calendar days, and *FNVNC*1 is the estimated net cash flow for the next seven days of deposits and liabilities payable upon demand that do not pertain to contractual maturities. The *FNVC* may be positive or negative, depending on whether cash income is greater than outlays, but the *FNVNC* has a negative sign.

$$FNVNC_1 = -frn_1 \times [\text{demand deposits}]$$

Where *frn*1 is the net withdrawal factor for a seven-day horizon. This is calculated as the maximum percentage of net reduction in the sum of demand deposits of the respective institution may have faced from December 31, 1996 up to the last day of the month immediately prior to the calculation, taking end-of-month withdrawals into account for this calculation. The *FNVNC* is, therefore, an indicator of a stressed withdrawal scenario.

On the other hand, liquid assets adjusted for market liquidity (*ALM*) are calculated according to the following formula, in which securities are entered at fair market value:

ALM=quick assets + (bonds issued by the government, the Banco de la República, Fogafin) x *(*1- *TES haircut) + (all other securities)*

*(*1-1.2 TES *haircuts)* - (Total required daily average reserve)

The institutions in question are required to apply an additional *haircut* to the foreign currency component of their liquid assets (3.7% initially) which tries to incorporate an adjustment for exchange risk, in addition to the adjustment for market liquidity.

The way the IRL is designed reflects the Central Bank's proposal to implement an indicator that replaces the current calculated liquidity GAP.[2] Moreover, with the implementation of SARL, the collection of weekly data on liquidity risk becomes mandatory. This is fundamental if the system is to be monitored properly.

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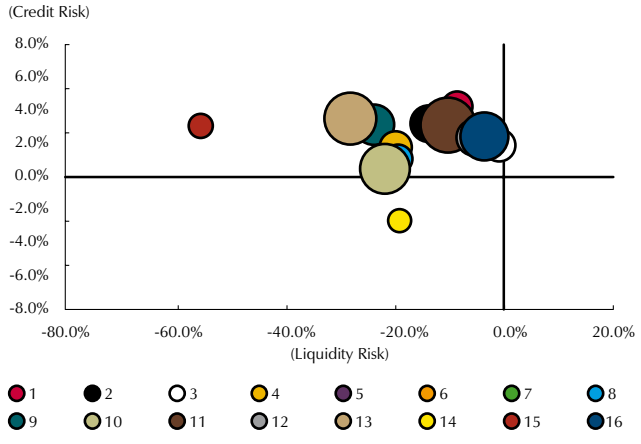
1 External Circular 016/2008 and attachments, Financial Superintendence, May 6, 2008.

2 J. González; D. Osorio (2006), "Una propuesta para la medición, monitoreo y regulación del riesgo de liquidez en Colombia," *Financial Stability Report*, Banco de la República, September, pp 103-111.

D. COMBINED DESCRIPTION OF RISKS

In this section of the report, stressed and non-stressed measurements of the three risks analyzed in earlier sections are presented all together; namely, liquidity, market and credit risk for the months of December 2007 and June 2008. Return on assets is shown on the vertical scale in Graphs 113 to 116, as a measure of credit risk,[74] while the ULR is shown on the horizontal scale to measure liquidity risk. The size of the bubbles indicates the DCC-VaR of commercial banks at thirty days, as a percentage of the outstanding balance exposed to market risk. The graphs should be interpreted carefully, since this combined description of risks is not an analysis of a measurement of systemic risk, nor does it take into account the relationships between the different risks.

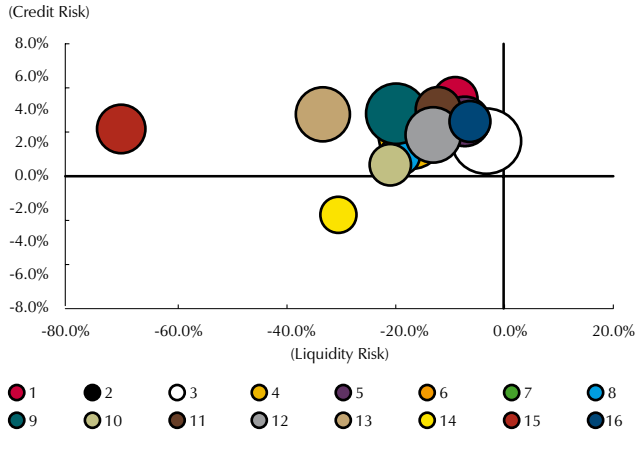
Graph 113
Set of Risks at December 2007 with Non-stressed Ratios



Note 1: The size of the bubbles is determined by the DCC-VaR at thirty days for commercial banks, as a percentage of the balance exposed to market risk.
Note 2: This graph shows both the non-stressed ULR and the ROA.
Source: Banco de la República

When comparing the two periods in question, the larger bubbles denote an increase in market risk. A shift to the right is indicative of an increase in liquidity risk, while a downward shift is equivalent to an expansion in credit risk. Therefore, in the case of a combined improvement in all three risks during the periods in question, the bubbles would be smaller and would shift upwards and to the left.

Graph 114
Set of Risks at June 2008 with Non-stressed Ratios

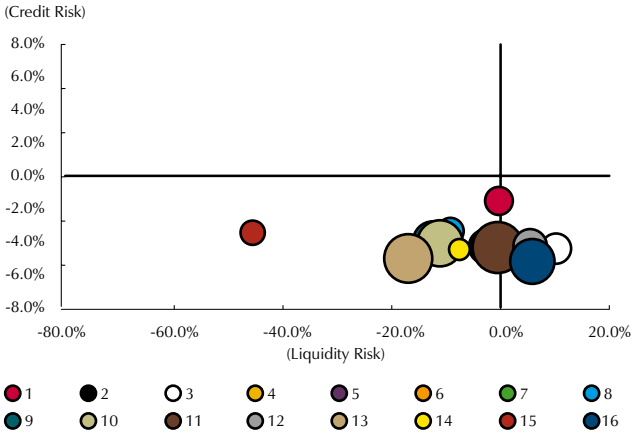


Note 1: The size of the bubbles is determined by the DCC-VaR at thirty days for commercial banks, as a percentage of the balance exposed to market risk.
Note 2: This graph shows both the non-stressed ULR and the ROA.
Source: Banco de la República

As illustrated in Graphs 113 and 114, the bubbles at December 2007 and June 2008 are larger than average and are situated towards the upper left-hand portion. In other words, one sees evidence of a general deterioration in market risk, in relative terms, but with a slight improvement in the actual levels of liquidity and credit risk at the same time. Specifically, market risk went from an average of 2.3% in December 2007 to 4.52% in June 2008; liquidity risk went from -16.1% to un -18.4% during the same period, while average ROA, using credit risk as a measurement, went from 2.3% in December 2007 to 2.6% in June 2008.

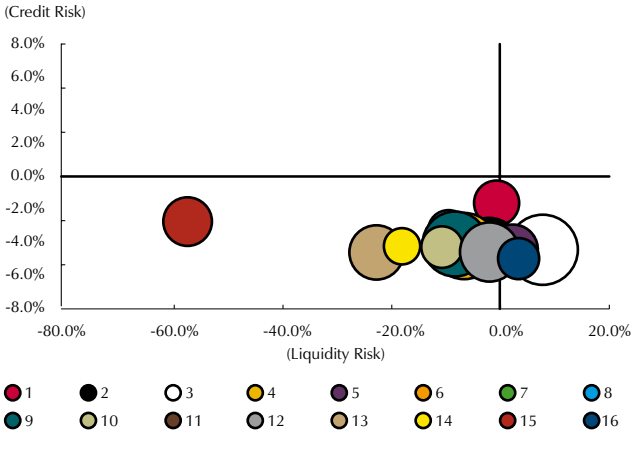
74 In the graphs showing combined risk with stressed ratios, credit risk refers to the percentage of decline in ROA.

Graph 115
Set of Risks at December 2007 with Stressed Ratios



Note 1: The size of the bubbles is determined by the DCC-VaR at thirty days for commercial banks, as a percentage of the balance exposed to market risk.
Note 2: This graph shows both the non-stressed ULR and the ROA.
Source: Banco de la República

Graph 116
Set of Risks at June 2008 with Stressed Ratios



Note 1: The size of the bubbles is determined by the DCC-VaR at thirty days for commercial banks, as a percentage of the balance exposed to market risk.
Note 2: This graph shows both the non-stressed ULR and the ROA.
Source: Banco de la República

The analysis is similar when examining the stressed risk measurements (Graphs 115 and 116). On average, market risk exposure is higher, while credit risk is stable and liquidity risk shows some improvement. Specifically, in the case of market risk, stressed exposure increased from an average level of 2.3% to 4.5% (between December 2007 and June 2008). As to the stressed measurement of liquidity risk, one sees the ULR was -5.7% in December 2007 and -8% in June 2008. Finally, in terms of credit risk, the ROA showed a 4.1 pp decline in December of last year and June of this year.

In short, the analysis of stressed measurements is similar to the observed risk indexes. The bubbles grew larger in size between December 2007 and June 2008, which indicates added market risk exposure, in relative terms. The bubbles also have shifted to the left, but with no pronounced vertical displacements. This is indicative of an improvement in liquidity risk levels and a certain amount of stability in credit risk.

Box 4
COMBINED ANALYSIS OF LIQUIDITY RISKS AND RELATIVE POSITION IN THE INTERBANK MARKET

Funding liquidity and market liquidity risks should be analyzed jointly for a better interpretation of agents' liquidity. The VaR-L and ULR measurements for the Colombian banks are shown in Table B4.1, along with the stress exercises calculated in this report.

Table B4.1
VaR-L and ULR per Bank
(Percentage)

Bank	22/08/2008		30/06/2008	
	VAR-L	VAR-L (Volatile Scenario)	ULR Normal	ULR Stressed
1	10.1	55.7	-8.8	-0.6
2	13.4	50.6	-13.4	-1.9
3	12.1	30.0	-5.9	3.4
4	4.6	26.3	-16.8	-6.4
5	15.5	26.2	-7.1	2.4
6	8.2	28.7	-12.1	-1.9
7	9.6	53.4	-11.0	-0.9
8	16.0	31.8	-19.0	-9.3
9	11.4	59.5	-19.6	-8.1
10	11.6	10.7	-20.7	-10.5
11	11.7	25.4	-11.9	-2.6
12	13.9	36.1	-12.9	-1.8
13	3.2	21.9	-3.1	7.9
14	7.2	20.7	-33.0	-22.4
15	16.5	32.3	-30.2	-17.8
16	14.1	10.4	-69.8	-56.9
System	**11.4**	**46.5**	**-10.5**	

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

As indicated, there is more market liquidity risk and less funding liquidity risk to the system. In addition, there appears to be no relationship between higher levels of VaR-L and ULR: banks with more funding liquidity risk are not those required to make more of an adjustment in their VaR because of market liquidity risk.

For example, the bank that most needs to adjust its VaR-L is among those with the best uncovered liabilities ratio (B15: 16.52% VaR-L and -30.2% ULR), while the bank with the most funding liquidity risk was, at the same time, the one with the least market liquidity risk (B13). However, some banks have low funding liquidity risk and low market liquidity risk (B4, B6 and B7), while one has poor levels for both (B3).

In fact, there seems to be no statistically significant relationship between the measurements of funding liquidity risk and market liquidity risk. As shown in Table B4.2, the Spearman rank correlations between the measurements of VaR-L and ULR are negative, but not statistically significant. Nor is there a statistical relationship between VaR-L and stressed VaR-L. This is not surprising given the type of simulated stressed scenario, which assumes markets with prices and bid-ask spreads such as those observed in the second quarter of 2006.

There are several explanations for the lack of relationship between the measurements of funding liquidity risk and market liquidity risk. Banks with a high percentage of less liquid securities, but a high level of securities overall, can have high VaR-L levels and a very negative ULR. B15 and B16 are examples. On the other hand, there are some banks in the sample with a very close relationship between liquid assets and liabilities, but their securities are highly liquid and traded on the market. B13 is an example; it has very low VaR-L, but a ULR near zero.

Although a larger haircut is applied to less liquid securities when calculating the ULR, no adjustment is made for bid-ask-spread volatility, which is included in VaR-L. The banks with a larger percentage of adjustment for VaR-L; that is, the ones with more market liquidity risk, are those with the highest

Table B4.2
Spearman Correlations between VaR-L and ULR per Bank
Spearman Rank Correlation (*P-value*)

	VAR-L		VAR-L Stressed		ULR		ULR Stressed	
VAR-L	1	-	0.169	(0.516)	-0.230	(0.3907)	-0.208	(0.4385)
VAR-L Stressed	0.169	(0.5164)	1	-	0.243	(0.3654)	0.336	(0.2038)
ULR	-0.230	(0.3907)	0.243	(0.365)	1	-	0.971	(0.0000)
ULR Stressed	-0.208	(0.4385)	0.336	(0.204)	0.971	(0.0000)	1	-

Source: Banco de la República

percentage of less liquid securities, but they also may have so many securities relative to their liquid liabilities that they pose no funding liquidity risk.

1. Relative Position in SEN and Its Relationship to Liquidity Risk

In addition to quantifying liquidity risk in every one of its dimensions, it is importance to have an idea of the relationships and patterns that can be observed in transactions on the interbank markets. Estrada and Morales (2008)[1] describe how the structure of the interbank market in Colombia appears to be complete, although its level of completeness has declined in the last two years.

Given the trading quotas per counterpart, coupled with the possibility of blocking agents, and considering the parties involved are fully identified once a transaction or deal is closed, it is possible that commercial ties may be formed in these market over the course of time. In other words, an agent can build a reputation and gain space in the market. But, more importantly, not all agents have equal relative market size, nor do they use the same criteria to manage their liquidity. Therefore, not all are likely to enter the market in the same negotiating position. In other words, some may be more *central* in the market, while others are more *peripheral* and less connected.

Because these markets are important to liquidity management, it is appropriate to look for indicators that measure the extent of each individual's connection in time, so as to answer questions about liquidity risk and to identify systemic or vulnerable agents. One of the articles in the section of this report that deals with financial stability issues[2] describes a method that can be used to quantify the centrality or peripherality of agents in markets with incomplete observable networks. It also can be used to construct times series that describe agents' relative position in the market and to organize them according to their connectivity and importance for transactions with others.

The first column in Table B4.3 shows the centrality indicator for the banks analyzed, calculated on the same day as VaR-L (August 22), according to the interbank transactions on SEN. In addition, indicators of average centrality with weekly data were calculated year to year (Column 2), and from July to August (Column 3). The interpretation is the

Table B4.3
SEN Position Analysis

Bank	22/08/2008		Year-to-Year Average: 22/08/2008		Average: July-August 2008	
1	0.012	Very central	-0.070	Peripheral	-0.037	Peripheral
2	-	-	-	-	-	-
3		-	-	-	-	-
4	-0.001	Peripheral	0.007	Central	0.009	Central
5	-	-	-0.123	Peripheral	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	0.001	Central	0.028	Central	0.002	Central
9	-0.000	Peripheral	-0.008	Peripheral	-0.006	Peripheral
10	0.007	Central	2.667	Very central	0.021	Central
11	0.002	Central	0.113	Central	0.118	Very central
12	-0.020	Very Peripheral	0.137	Central	-0.060	Very Peripheral
13	0.024	Very central	-0.009	Peripheral	0.019	Central
14	0.006	Central	0.442	Central	0.035	Central
15	-0.003	Peripheral	-0.015	Peripheral	-0.043	Peripheral
16	0.009	Central	0.056	Central	-0.048	Peripheral

Source: Banco de la República.

1 D. Estrada and P. Morales (2008), "The Interbank Market Structure and Risk of Contagion in Colombia", *Financial Stability Re-*

2 A. Saade (2008),. "A Quantitative Approach to Bank Centrality in the Interbank Market: Application of the Cooperative Game Theory," <www.banrep.gov.co/publicaciones/pub_es_fin.htm>

Table B4.4
Spearman Rank Correlation *(P-value)*

	22/08/2008		Year-to-year Average- 22/08/2008		Average: July-August 2008	
VAR-L	-0.407	(0.2143)	-0.120	(0.710)	-0.548	(0.0810)**
VAR-L Stressed	-0.448	(0.1670)*	-0.468	(0.1252)*	-0.459	(0.1556)*
ULR	0.322	(0.3341)	-0.519	(0.0839)**	0.158	(0.6430)
ULR Stressed	0.254	(0.4505)	-0.533	(0.0741)**	-0.006	(0.985)

* 80% significance
** 90% significance
Source: Banco de la República

following: positive for banks that are central and negative for peripheral banks, with those that are more central having more value.

When comparing the results of the centrality indicator for SEN with the liquidity risk calculations per bank, one sees that agents with higher market liquidity risk tend to be the most peripheral ones. As illustrated in Table B4.4, there are significant and negative Spearman correlations between average centrality in the last two months and the correction in VaR adjusted for liquidity (-0.5479, *p-value* of 0.0810). In other words, the agents with a larger proportion of less liquid securities are, in turn, identified as peripheral and not very connected in the SEN

There appears to be no relationship between how central an agent is, on average, during the last year and its market liquidity risk, but there does appear to be a relationship with its funding liquidity risk. Agents that are central, on average, since August 22, 2008 and one year before, have more negative ULR levels and the relationship is statistically significant as well (-0.5188, *p-value* of 0.0839).

Box 5
ASSET OVERVALUATION

The combined occurrence of an imbalance in the volatility of asset and loan price cycles is regarded as a primary source of economic and financial instability. In literature, this is known as the financial accelerator.[1] It is present when agents are optimistic about their future flow of income in response a favorable economic scenario, which boosts asset prices. If their expectations are borne out, the price hike will have responded to a change in the fundamentals that determined it. If not, the increase is a deviation of the value determined by those fundamentals, which is commonly known as asset overvaluation.

Therefore, it is essential to monitor the combined performance of these variables to determine if possible asset price hikes are reflected in added indebtedness (or vice versa), which could jeopardize borrowers' creditworthiness if there is a setback in the actual macroeconomic situation. The focus of this section is on finding evidence of asset overvaluation in the mortgage and securities markets[2] in Colombia, and on analyzing the growth in loans using the loan/GDP ratio.

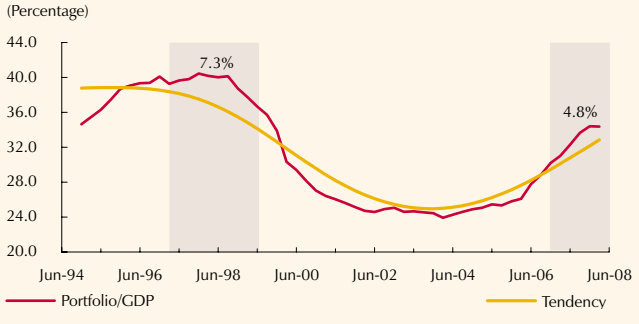
1. Loans

A Hodrick and Prescott filter is used to analyze the actual pattern of total loans, the consumption and mortgage loan portfolios, and mortgage loan disbursements. It estimates the smoothed tendency of these series.[3] That tendency is compared to the current indicator to calculate the extent to which each series deviates from its long-term tendency.

On average, the total and consumption loan portfolios, as a percentage of GDP, were 4.6% and 0.6% above their long-term tendency during the first half of 2008 (Graphs B5.1 and B5.2). This represents an increase of 0.7 pp in the indicator for the total loan portfolio and a decline of 6.4 pp in the indicator for the consumption loan portfolio, compared to the average registered in the first half of 2007. If the slowdown in these portfolios were to continue, this gap would continue to narrow for the consumer portfolio in the coming months, and there would be a certain amount of stability in the indicator analyzed for the total portfolio, given the current performance of the commercial and mortgage loan portfolios.

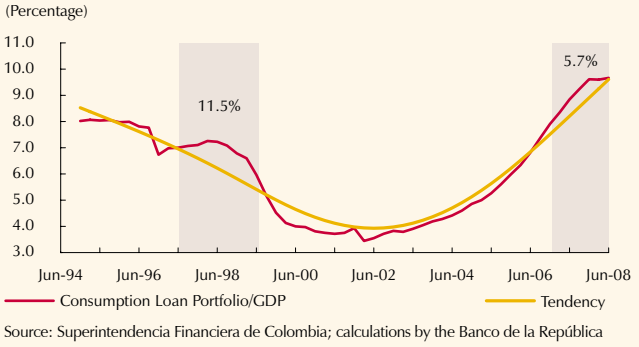
Graph B5.3 shows an average deviation of 25.5% in the tendency of the mortgage loan portfolio during the past semester, which is even more than in 1998-1999 (12%). It

Graph B5.1
Total Loan Portfolio /GDP and Its Tendency



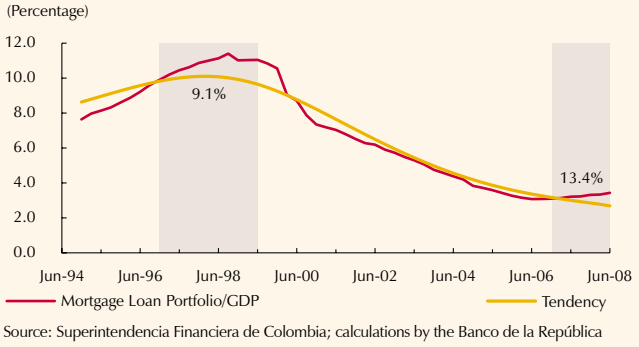
Source: Superintendencia Financiera de Colombia; calculations by the Banco de la República

Graph B5.2
Consumer Loan Portfolio /GDP and Its Tendency



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

Graph B5.3
Mortgage Loan Portfolio /GDP and Its Tendency



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

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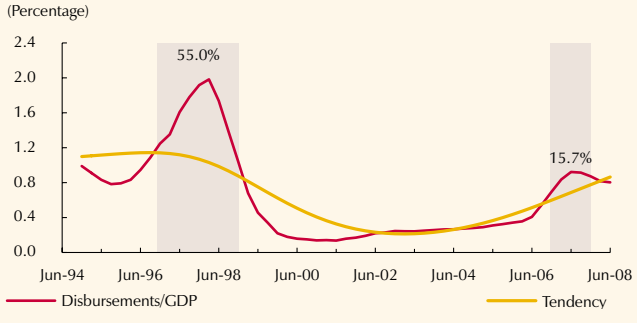
1 For more information, see the *Financial Stability Report*, March 2007, pp. 66 and 67.

2 An analysis of the price of government bonds (TES) is not included, as they account for only a small share of household and corporate wealth. This is contrary to the situation with housing and stocks.

3 The series for the total and consumer loan portfolios, as a percentage of GDP from December 1994 to June 2008, were used. Annual nominal GDP growth in the second quarter of this year was assumed to be 11.48%, calculated with the transition in the series of national accounts based on the years 1994 and 2000, pp. 61-67.

is explained by the recent recovery in that portfolio (since mid-2006), which means the estimated long-term tendency might be biased towards a lower level than was predicted for the next few months, once that recovery consolidates. Nevertheless, the growth in this indicator is not associated with the current pattern of disbursements, which were 7% below their long-term tendency at June 2008. On the contrary, the momentum in the mortgage loan portfolio indicator is more related to the delayed behavior of disbursements. On average, the latter were 8.7%, above their long-term tendency throughout 2007 (Graph B5.4).

Graph B5.4
Disbursements/GDP and Its Tendency



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

2. Mortgage Loan Market

Two separate indexes: i) the new housing price index (NHPI) calculated by the National Department of Planning (DNP in Spanish), and ii) the used housing price index (UHPI)[4] calculated by the Banco de la República,[5] are used to verify the existence of possible overvaluation in the mortgage loan market. Each has its advantages and constraints, and can be used to analyze different markets.

Two overvaluation indicators are constructed with those two price indexes. The first is the ratio of the UHPI to the rental index (RI) calculated by the Banco de la República,[6] which compares housing price to he rental price. Then, a Hodrick and Prescott filter is applied to the new housing price series to evaluate the deviations from its long-term tendency. This constitutes the second indicator.

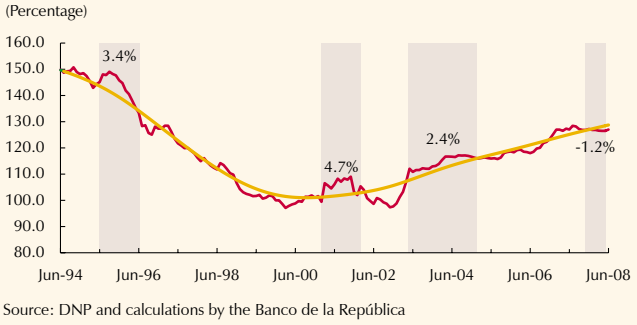
The first of these indicators shows a pattern similar to the one described in the March 2008 edition of this report, with 6.9% overvaluation at June 2008 (Graph B4.5). This level is not alarming in light of the tendency observed between 1994 and 1995 (nearly 30%). However, these findings must be analyzed carefully, since the ratio is constructed with aggregate data.

Graph B5.5
Ratio of New Housing Prices (NHPI) to Rentals
(Average 1994-2008 = 100)

Sources: DNP and the Banco de la República.

Graph B5.6 shows a comparison between the actual NHPI and its smoothed, long-term tendency. In this case, one sees the NHPI is actually lower than the long-term level (1.3% below). Interestingly, both indicators coincide in terms of high housing prices during 1995-1997, but the second reflects a perspective that is more consistent with the slowdown in the mortgage sector so far this year.

Graph B5.6
NHPI and Its Tendency
(December 1999 = 100)



Source: DNP and calculations by the Banco de la República

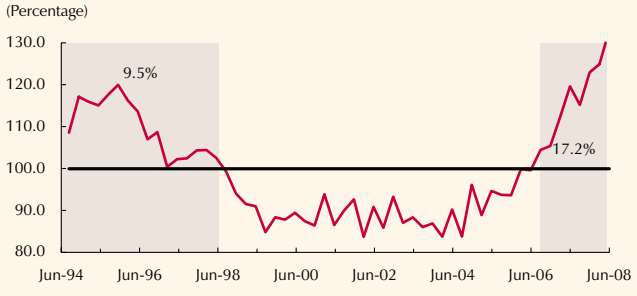
4 There is a third indicator, which is the Real Estate Registration Index (IRI in Spanish) compiled by Fedelonjas-ICAV. However, the IRI series is normalized to the average for 1998-2007, which means it cannot be analyzed the same way as the other indexes used in this report. For information on how this indicator has performed recently, see ANIF, "Comentario Económico del Día," August 28, 2007.

5 The first of these indexes concerns only the price of new housing, which creates a bias towards lower levels than those actually facing the end consumer. This is due to the problem created by end-housing-price under registration. However, it has the advantage of being a monthly indicator (the UHPI is quarterly) and has less of a lag than the other indicator. The UHPI offers the advantage of having the longest historic records (as of March 1988, while the NHPI starts in January 1994) and is a homogeneous prices index, as it measures only the same home. This is known as the repeat sales method.

6 The rental index is part of the housing component of the CPI.

The ratio of used housing prices to rentals (Graph B5.7), which does not have the under-registration problems of the NHPI and is a homogeneous price index, has increased from 15% undervaluation in 2004 to positive deviations (with respect to the long-term tendency) of nearly 33 % in June 2008.[7] These exceed the percentages observed in the pre-crisis period, which were above 15%.

Graph B5.7
UHPI/Rental Ratio and Its Tendency
(1994-2008 Average = 100)



Source: Banco de la República

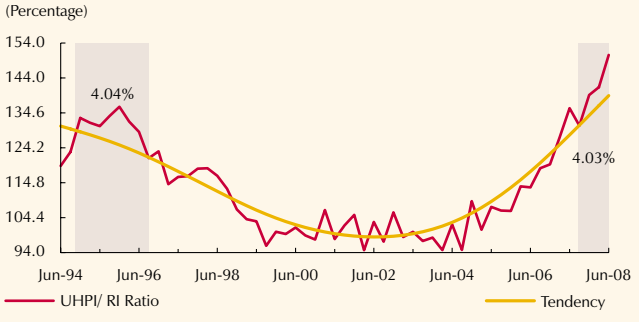
The extent of overvaluation noted during the first half of the year shows it has been more pronounced in the used housing market than in the market for new homes. This could be due to the menu costs implicit in the construction business,[8] which mean prices are not adjusted immediately. Therefore, when suppliers overestimate the price of an asset, the rigidities would imply that overvaluation will be more pronounced in that market.

A comparison between the UHPI and its long-term tendency confirms the overvaluation found in the first analysis (Graph B5.8). In this case, the levels observed are 8.3% above the long-term tendency. These exercises suggest the housing price increase registered in recent months has been more pronounced for used housing than in the market for new homes.

4. Stock Market

The ratio of the Colombian Stock Market Index (IGBC in Spanish) to an indicator of return on capital for the companies listed on that exchange[9] is used to detect possible overvaluation in the stock market.

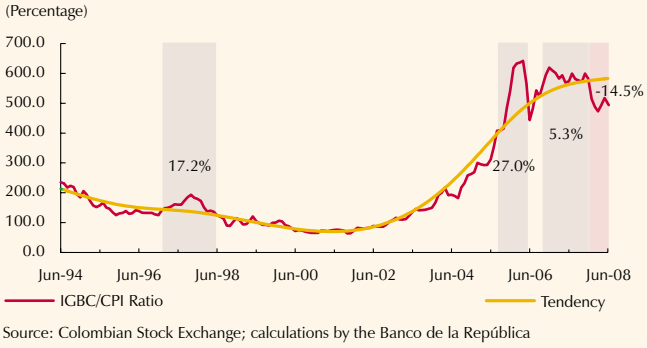
Graph B5.8
UHPI/Rental Ratio and Its Tendency



Source: Banco de la República

A Hodrick and Prescott filter was applied to analyze the possible deviations in the IGBC with respect to its long-term tendency. The results show 14.5% average undervaluation so far this year (Graph B5.9), which is consistent with the recent slowdown in the stock market. The momentum during the upward phase of the stock market responds to its deepening in a context of high liquidity. However, the recent change in the indicator was due to both external and internal factors, including the effects of the subprime crisis in the United States (felt the world over), higher local and world inflation, a weak dollar, and external and internal political circumstances, which raised uncertainty in the markets. It is worth noting that the current interpretation of the IGBC is far different from what it was a year ago. This is due to the entry of Ecopetrol into the capital market, which concentrated liquidity in a single security. If that concentration continues, the development of the stock market in Colombia will be correlated to the movement in Ecopetrol stock and to the elements that determine its price.

Graph R5.9
IGBC/CIP Ratio and Its Tendency
(Diciembre 1999 = 100)



Source: Colombian Stock Exchange; calculations by the Banco de la República

Given the current elimination of restrictions on the capital market, that indicator might reverse itself in the mid-term. However, these levels should be regarded with caution, since there are limitations in the construction of this indicator and it is calculated on the basis of strong assumptions.

7 As with the calculation of overvaluation in the NHPI, it is important to consider these results with caution, since this ratio also is constructed with aggregate data.

8 Builders have marketing expenses, which mean prices cannot be adjusted immediately.

9 See the September 2006 edition of the *Financial Stability Report* (pp. 40-43) for a description of how this indicator is calculated.

5. Conclusions

In short, the results suggest that prices in the mortgage market for used housing appear to show signs of overvaluation in recent months, contrary to the evidence for the new home market. This situation could consolidate in the case of used housing and reverse in the case of new homes, insofar as the mortgage loan portfolio shows signs of recovery. Consequently, it is imperative that the lenders embark on a detailed analysis of the potential risk in the value of the collateral on these loans.

The stock market indicators could reflect signs of undervaluation in stock prices. How this segment performs in the future will depend on international market volatility and existing regulations on the flow of capital, as well as the extent of risk aversion among investors and the evolution of internal inflation.

The indicators for the total loan and mortgage loan portfolios remain high compared to their long-term tendency. This underscores the need for careful monitoring. Evidence of the opposite was found with respect to the indicator for the consumer loan portfolio. Its levels are similar to the long-term tendency and consistent with the slowdown in household consumption. Finally, as mentioned at the beginning of this section, what is important in terms of possible financial imbalances is a joint analysis of indicators of this type. To the extent the loan portfolio indicators continue to show considerable deviation and the asset price indexes do the same, a reinforced effort to monitor these markets will be required to minimize the potential effects on the stability of the financial sector.

Financial Stability Issues

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Vulnerability of the Colombian Financial System to the Fluctuations in the Income of the Exporting Firms
Vulnerabilidad del sistema financiero colombiano ante fluctuaciones en los ingresos de las empresas exportadoras
Adriana Paola Morales
Juan Carlos Mendoza

A Cointegration Analysis for Credit Risk
Un análisis de cointegración para el riesgo de crédito
Javier Gutiérrez Rueda
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Stress Analysis on the Colombia Banking System: A Joint Risk Scenario
Análisis de estrés sobre el sistema bancario colombiano: un escenario conjunto de riesgos
Jorge Mario Uribe Gil
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A quantitative Approach to Bank Centrality in the Interbank Market: Application of Cooperative Game Theory
Aproximación cuantitativa a la centralidad de los bancos en el mercado interbancario: enfoque de juegos cooperativos
Agustín Saade Ospina

VULNERABILITY OF THE COLOMBIAN FINANCIAL SYSTEM TO THE FLUCTUATIONS IN THE INCOME OF THE EXPORTING FIRMS

ADRIANA PAOLA MORALES
JUAN CARLOS MENDOZA

This paper analyzes the vulnerability of the Colombian financial system to the fluctuations in the income of exporting firms to the principal commercial associates of Colombia (United States of America and Venezuela), in the period between 2004 and 2007. The analysis was done in three stages: in the first one, we evaluated the dependence of local firm's income to exports to these countries and we compare its performance with all those that submit balance sheet information to the *Superintendencia* de *Sociedades*. In the second stage, we assessed financial system's exposure to exporting firms and its debt. Finally, we estimated the relation between non performing loans and financial microeconomic variables of the firms and analyze its sensitivity in a stress scenario. With this analysis we find that the direct effect over solvency index of Colombian financial system of a decrease in the exporting firm´s income is not significant.

VULNERABILIDAD DEL SISTEMA FINANCIERO COLOMBIANO ANTE FLUCTUACIONES EN LOS INGRESOS DE LAS EMPRESAS EXPORTADORAS

En este documento se presenta un análisis de la vulnerabilidad del sistema financiero Colombiano ante fluctuaciones en los ingresos de las empresas exportadoras a los dos principales socios comerciales, United States y Venezuela, para el período comprendido entre 2004 y 2007. El análisis costa de tres partes: en primer lugar se evalúa la dependencia de los ingresos de las empresas nacionales frente a las exportaciones realizadas a estos países y así mismo su desempeño en comparación a la muestra de empresas que reportaron información a las superintendencias Financiera y de Sociedades. En segundo lugar, se identifica el riesgo que representa la deuda de estas empresas en el total de la cartera comercial de las entidades financieras. Finalmente, se estima un modelo de regresión para la cartera riesgosa en función de indicadores financieros propios de las empresas y a partir de los resultados se realiza un análisis de sensibilidad del sistema financiero de forma agregada. Los resultados de este análisis sugieren que el efecto directo de una caída en los ingresos de las empresas exportadoras no reduce significativamente la relación de solvencia del sistema financiero colombiano.

A COINTEGRATION ANALYSIS FOR CREDIT RISK

JAVIER GUTIÉRREZ RUEDA
DIEGO M. VÁSQUEZ E.

It is common in the literature to consider credit risk as a major source of instability of the financial system. In order to assess the sensitivity of credit risk to changes in certain macroeconomic variables and their possible impact on the profitability of financial institutions, we used multiplier analysis to carry out some stress tests. The results suggest that the credit institutions are significantly vulnerable to changes in economic activity and unemployment rates; while they are less prone to suffer significant losses as a result of changes in the interest rates. However, under extreme and unlikely scenarios, the reduction in system´s profitability does not exceed the level of bankruptcy considered by regulation.

UN ANÁLISIS DE COINTEGRACIÓN PARA EL RIESGO DE CRÉDITO

Es común en la literatura considerar el riesgo de crédito como una de las principales fuentes de inestabilidad del sistema financiero. Con el fin de evaluar su sensibilidad ante cambios en algunas variables macroeconómicas y sus posibles efectos sobre la rentabilidad de los intermediarios del sistema, se realizan pruebas de *stress* por medio de *multiplier analysis*. Los resultados sugieren que los establecimientos de crédito son significativamente vulnerables ante cambios en la actividad económica y en la tasa de desempleo, y en menor medida ante cambios en la tasa de interés. Sin embargo, con escenarios extremos y poco probables, la reducción en la rentabilidad del sistema no supera el nivel de liquidación establecido por la regulación.

STRESS ANALYSIS ON THE COLOMBIA BANKING SYSTEM: A JOINT RISK SCENARIO

JORGE MARIO URIBE GIL
MIGUEL ÁNGEL MORALES MOSQUERA
JOSÉ HERNÁN PIÑEROS

This paper develops, for the Colombian banking system, the stress testing methodology suggested by Čihák (2007). The study of different consequences generated by several economic shocks over the system includes five individual risk factors: credit risk, interest rate risk, exchange rate risk, interbank contagion risk and liquidity risk. The importance of a consolidate monitoring of the risks and the generation of stress scenarios that involve simultaneous shocks on the overall system, is highlighted. With this type of analysis it is possible to characterize the main vulnerabilities of the banking structure and to identify the banks with higher weaknesses.

ANÁLISIS DE ESTRÉS SOBRE EL SISTEMA BANCARIO COLOMBIANO: UN ESCENARIO CONJUNTO DE RIESGOS

En este documento se presenta una aplicación al sistema bancario colombiano de la metodología de prueba de estrés propuesta por Čihák (2007). El análisis de las posibles consecuencias generadas por diversos choques económicos sobre el sistema bancario se desarrolla teniendo en cuenta cinco factores de riesgo individuales: de crédito, de tasa de interés, cambiario, de contagio interbancario y de liquidez. Se resalta la importancia del monitoreo conjunto de los riesgos y la generación de escenarios de estrés que involucren choques simultáneos sobre el sistema. Con este tipo de análisis se logra caracterizar las mayores vulnerabilidades de la estructura bancaria, así como identificar las entidades que podrían presentar mayores debilidades.

A QUANTITATIVE APPROACH TO BANK CENTRALITY IN THE INTERBANK MARKET: APPLICATION OF COOPERATIVE GAME THEORY

AGUSTÍN SAADE OSPINA

This paper introduces a methodology to quantify the centrality of agents participating in the interbank market, using cooperative game theory as framework. The methodology uses the difference of Shapley values of transaction games with and without restrictions of observable networks, and allows the construction of time series of centrality measures for each agent. Finally, properties of the centrality measure and some relations with liquidity risk variables are studied. For the Colombian case, a statistically significant relation between a network dispersion index and the *bid-ask spread* of liquid government bonds is found.

APROXIMACIÓN CUANTITATIVA A LA CENTRALIDAD DE LOS BANCOS EN EL MERCADO INTERBANCARIO: ENFOQUE DE JUEGOS COOPERATIVOS

En este trabajo se propone una metodología para cuantificar la centralidad de los agentes que participan en el mercado interbancario desde un enfoque de juegos cooperativos. La metodología utiliza diferencias de valores de Shapley en juegos de transacciones con y sin restricciones de red observable, y permite construir series de tiempo para cada agente, las cuales identifican la posición relativa de cada uno frente al mercado. Por último, se analizan propiedades del indicador y su relación con variables atadas con el riesgo de liquidez. Se encuentra que para el caso del SEN hay una relación entre un indicador de dispersión de red y los *bid-ask spread* de los TES en bandas líquidas.