Financial Stability Report

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Executive Summary

The predominant macroeconomic conditions this year and those anticipated for the next favor solid growth in financial intermediation activities. On the domestic front, economic growth should continue to be propelled largely by household consumption and investment. Generating a credit expensive.

By October 2005, credit institutions had seen a positive degree of real growth in their major assets, loans (9.3%) and investments (13.7%). However, there has been a slowdown in commercial credit (6%), that has been offset by a substantial increase in consumer loans (28.6%). It is important to mention that asset growth (10.5%) has been backed by a rise in deposits (17.8%), especially in savings deposits (31.5%). Other sources of financing such as fixed end deposit certificates (CDT) and repo operations on the interbank market have declined as a share of liabilities. As a consequence, financing has become less costly.

Private debtors of the financial system (i.e. corporations and households) continued to show signs of better financial *health*. The private corporate sector has experienced good earnings, coupled with low indebtedness. Nevertheless, the tradables sector is not as profitable as it was, but profitability in the non-tradables sector has improved. As a result, the profitability in both of these sectors has converged, closing the gap observed in past months.

As to borrowing, the decline in corporate indebtedness is explained by fewer domestic obligations rather than by the reduction in external liabilities, as indicated in earlier reports. This is consistent with the slowdown in the commercial loans. With respect to households, there has been a major increase in consumer loans, as opposed to a slowdown in mortgage loans. Moreover, the job market indicators reflect a positive situation for household borrowing.

Good conditions in the private sector, coupled with more loan coverage, less post due loans, good profitability and intermediaries suggest that credit risk is not a problem for the financial system, at least in the short term. Yet, the performance of the consumer loan should be monitored carefully in view of its recent growth.

Finally, as indicated in the last edition of the *Financial Stability Report*, market risk is the greatest to financial system, due to the growing share of government bonds on the balance sheet of financial institutions. In this respect, Banco de la República and the Superintendency of Financial Institutions are pursuing a joint agenda to improve the way this risk is measured, regulated and monitored, by the analysis of different methodologies consistent with the spirit of Basel II.

Board of Governors
Banco de la República

Financial Stability Report

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I. Macroeconomic Environment

Domestic and external conditions favor solid growth in financial intermediation activities. Expectations remain positive in terms of how the principal macroeconomic variables for the health of the financial system and its debtors will evolve.

The predominant macroeconomic conditions this year and those anticipated for the next favor solid growth in financial intermediation activities. Growth in external demand, together with domestic absorption, should provide an important boost to credit activity in Colombia's financial system.

A. External Context

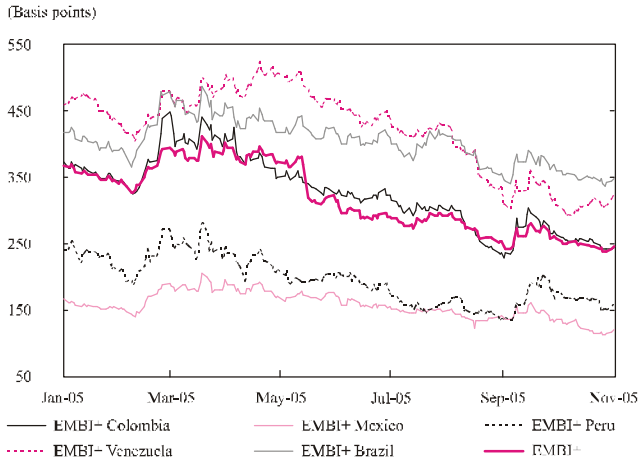
World economic growth has been favorable during the current year, although less than in 2004. The strength of the United States and Chinese economies, and to some extent of Japan and the Euro zone, has fueled this growth. Despite a temporary slowdown in the second quarter, the United States economy registered an annual growth of 4.3% in the third quarter. The expectation is that consumption, higher employment and investments will continue to foster this momentum. In fact, the forecasts[1] point to 3.3% growth in 2006. On the contrary growth remains weak in the Euro zone countries, given the limited force of domestic demand. The forecasts for the end of the year are for 1.2% annual growth, followed by 2.0% in 2006. In the case of the Japanese economy there has been an important expansion, despite a slowdown in economic activity during the second quarter of the year.

With respect to Venezuela, the forecasts for growth still reflect an upward trend. Growth in 2005 is forecasted at 8.6% and is expected to decline to 5.7% for 2006. High oil prices have helped to keep the Venezuelan economy in an

[1] The growth forecasts presented for Colombia's major trading partners come from Data Stream Consensus.

GRAPH 1

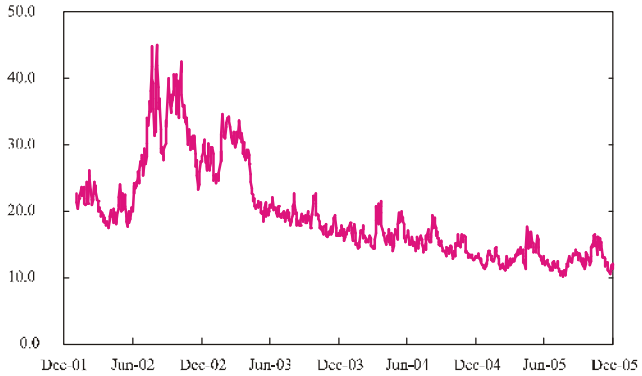
EMBI+ SPREAD SOME LATIN AMERICAN COUNTRIES



Source: Bloomberg.

GRAPH 2

RISK AVERSION INDEX (VIX)



Source: Bloomberg.

expansionary phase. However, the situation is not as favorable for Ecuador, where second-quarter growth was less than expected (2.9%) due to the oil strike and political uncertainty. The forecasts place Ecuador's economic growth at 2.9% for both 2005 and 2006.

The strength of real activity at the international level has been accompanied by a smoothes in the international financial markets, particularly debt markets for emerging economies (Graph 1). Low international interest rates, high liquidity and more of a risk appetite, as indicated in Graph 2, have favored the reduction in the country-risk premiums of these economies. Moreover, the increase in external demand and in commodity prices has been a contributing factor in this dynamic, as well as the significant progress towards structural reforms.

International real conditions in the near future are expected to evolve in a more restrictive environment with respect to monetary policy. The United States Federal Reserve Bank (the Fed) and, to a lesser extent, the European Central Bank are expected to adjust their interest rates gradually to avoid demand-driven inflationary pressures. The gradual nature of this adjustment by the Fed will depend largely on the behavior of oil prices, the rise in domestic demand and the increase in labor costs. In this sense, the main source of uncertainty is the trend in oil prices. Inflation in a number of developed economies, particularly in the United States, has begun to reflect the impact of higher fuel prices, although it has not reflected yet in the core inflation. Any additional rise in oil prices could have a considerable impact on core inflation and world economic growth. However, both the forecasts and the market for oil futures suggest a certain stability in crude prices, despite historically high levels and well above long-term expectations (Table 1 and Graph 3).

As indicated in the September 2005 edition of the Inflation Report, higher international interest rates are not expected to create a sharp rise in international liquidity. This is due to abundant world savings and because interest rate hikes have been in line with expectations. Accordingly, possible

increases in international interest rates are not expected to prompt major outflows of capital from the emerging economies —contrary to the situation on other occasions— nor increased pressure on their domestic liquidity.

Although the higher internationally interest rates —particularly those above what was anticipated— are the main risk in the international environment, there are other relevant risks. To begin with, there are the current account and fiscal deficits in the United States economy. However, a sudden correction in these imbalances appears unlikely in the current context, ample liquidity and high world savings. Secondly, the trend in housing prices in the United States remains a risk factor for growth because any adjustment in these prices could spark a major slowdown, by having a negative impact on consumption (75% of GDP). Some of the figures with respect to the demand for used-homes indicate this market may be cooling off. [2] Finally, 2006 is an election year for most Latin American countries, including Colombia. Although a significant amount of volatility on the financial markets is to be expected, better macroeconomic conditions in these economies make the region less vulnerable to shocks of this nature.

TABLE 1

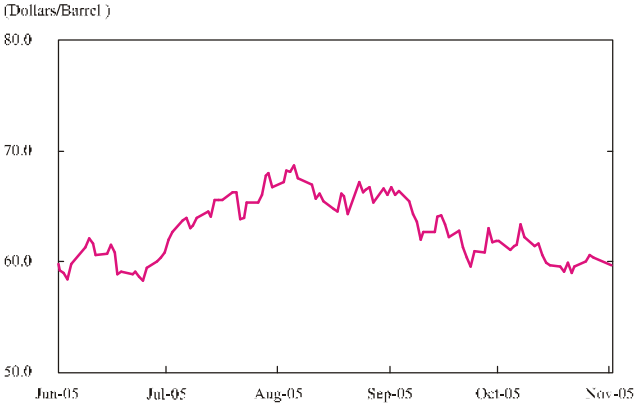
WTI OIL PRICE FORECASTS (DECEMBER)

	2005	2006	2010
Average	57.4	57.9	38.6
Maximum	62.0	74.0	49.8
Minimum	50.0	50.0	30.0
Median	57.6	57.3	38.0

Source: Reuters Survey, November 2005.

GRAPH 3

OIL FUTURES AT DECEMBER 2006 (*)



(*) Futures contracts agreed and negotiated on the New York Mercantile Exchange (NYMEX) and due to expire on December 31, 2006.
Source: Bloomberg.

B. DOMESTIC CONTEXT

Domestic economic growth remains extremely dynamic, showing more accelerated behavior during the second quarter of the year (5.3%), which exceeded the expectations and the figure for the first quarter of 2005 (3.9%).

[2] The used-home price indexes in the United States have begun to slow down and the supply months - a variable that measures the relative growth in housing supply and demand - has continued to climb in the last eight months. However, no abrupt drop in prices is expected during 2006. Instead, home prices are likely to stabilize and be accompanied by a continuous flow of mortgage credit and a growing demand for housing with easy financing.

Economic activity in the last six months has been propelled largely by domestic demand, including household consumption as well as gross fixed capital formation. On the consumption side, services and non-durable goods were the high points, while investment in machinery and equipment and transport equipment accounted for the bulk of gross capital formation. The Colombian economy is expected to continue to grow during 2006, particularly because of the trend in domestic demand and in less extend to the external conditions (Table 2).

There has been a slowdown in the tradables sector this year due to industrial manufacturing performance. Growth in industrial manufacturing was 1.9% in the first half of 2005, followed by 4.7% during the same period in 2004. In contrast, the nontradables sector experienced a good increase, particularly in commerce and government services.

High liquidity and low interest rates consistent with the inflation targets are behind this expansion in economic activity. As mentioned in the Inflation Report, the forecast for growth in 2005 is near 4.7%, while predictions for 2006 point to 4.5%, largely due to domestic demand (mainly consumption and investment), coupled with improved terms of trade and world demand, plus relatively low risk premiums. In addition, the coming year is not expected to see an outflow of capital. Exports probably will be less dynamic, because of the anticipated slowdown in economic growth during 2006 for Colombia's major trading partners and the trend in the real exchange rate.

TABLE 2

REAL GDP FORECAST BY TYPE OF EXPENDITURE
(PERCENTAGE)

	2004	2005							2006
		I Qtr.	II Qtr.	III Qtr.	IV Qtr.	I-Half	II-Half	Year	
End Consumption	**3.9**	**3.6**	**6.0**	**5.2**	**4.8**	**4.8**	**5.0**	**4.9**	**5.2**
Household	4.1	3.7	5.3	5.4	5.4	4.5	5.4	5.0	5.3
Government	3.3	3.4	8.0	4.8	2.9	5.7	3.8	4.8	5.0
Gross Capital Formation	**12.6**	**16.0**	**24.7**	**32.8**	**17.0**	**20.4**	**24.4**	**22.6**	**21.7**
Gross fixed capital formation (GFCF)	13.3	17.5	22.0	15.4	8.7	19.8	11.9	15.6	14.6
GFCF without civil works	22.5	12.8	25.3	16.3	11.7	19.0	13.9	16.3	15.8
Civil works	(19.1)	46.9	5.4	10.3	(5.8)	24.0	1.6	11.7	8.0
Domestic Demand	**5.4**	**5.8**	**9.4**	**10.5**	**7.3**	**7.6**	**8.9**	**8.2**	**8.8**
Total Exports	**9.9**	**13.0**	**7.8**	**6.2**	**4.5**	**10.3**	**5.3**	**7.7**	**0.1**
Total Imports	**17.3**	**22.7**	**28.5**	**29.5**	**18.5**	**25.7**	**23.8**	**24.6**	**18.8**
GDP	**4.0**	**3.9**	**5.3**	**5.4**	**4.1**	**4.6**	**4.8**	**4.7**	**4.5**

Source: *Inflation Report*, September 2005.

Interest rates and inflation continue to decline. There is certainty that Banco de la República will comply the inflation target for 2005. As well, the unfavorable trend in food inflation is expect to dissipate quickly at the start of 2006, and the pressure exerted on inflationary expectations by the latest price figures should abate.

Nevertheless, there are risks that might bring inflationary pressure during 2006. As mentioned in the Inflation Report, the third quarter saw a change in some of the factors that determine inflation, in relation to the first half of 2005. On the one hand, there is evidence of more demand-driven pressures, which means output could be close to its potential level. On the other, less appreciation of the Colombian peso suggests the exchange channel could cease to lower inflation.

In short, domestic conditions for economic activity and inflation favor an increase in financial activity including both credit and deposits.

II. Financial System

The expansion in financial intermediation continues, supported by favorable conditions in the sources that finance the sector. This expansion does not appear to be restricted by the quality of the portfolio, the profitability or the solvency of credit institutions.

A. Credit Institucions

The main balance-sheet items for credit institutions, their exposure to different types of debtors, debt quality, the profitability and the solvency of these institutions, and the lending rate spread are analyzed in this section. This is done to assess recent developments in the main performance indicators of credit institutions.

Owing to the consolidation of the financial system after the 1998-1999 crisis, the boundary between commercial and mortgage banks has become less clear in terms of their emphasis on different types of loans (consumer and commercial, and mortgage loans, respectively)[3]. For this reason the present section does not concentrate particularly on the distinction between these groups of establishments.

1. Recent Developments in the Main Balance-sheet Elements

a. *Asset positions*

During the period from May to October 2005, the total assets of credit establishments continued to grow keeping with the upward trend mentioned in the last Financial Stability Report. By the end of October 2005, these assets totaled COP127.3 trillion (tr), which implies a to 10.5% real annual

The consumer loan portfolio is growing rapidly.

[3] As a result, the balance sheets of institutions in each of these groups are becoming increasingly alike in structure. Furthermore, the balance series of these groups of institutions reflect recurrent changes occasioned by the shift in institutions from one group to another.

growth rate (Graph 4).[4] Real annual growth rate of total assets has stabilized at around 11% during the past year.

The evolution of the two main components of credit institutions' assets, namely, their loan and investment portfolios, has been similar. The gross loan portfolio, which came to COP74.1 tr. at the end of October 2005, has increased at a real average annual rate of 10.5% throughout the year. In October, the gross loan portfolio was up by 9.34% with respect to the same month in 2004. Although the gross loan portfolio has grown steadily in recent periods, there is a big difference in the performance of the various types of loan portfolios, as Graph 5 illustrates. The consumer loan portfolio, which accounts for almost 22% of the gross portfolio (Col$16.6 tr.), is still the fastest growing loan portfolio in real terms. With the exception of October, when growth slowed from 29.6% to 28.6%, the increase in consumer loan portfolio growth rate has been steady throughout the year.

Although nonperforming consumer loans is not large, there are two closely-related reasons why the rise in consumer loans could be source of concern. First, is because high growth can include poor-quality debtors. Secondly, consumer loans generally do not have enough collateral. Both reasons could jeopardize the system's resilience to future shocks affecting the solvency of consumer loan recipients.

The growth in the consumer loan portfolio is almost five times that of the commercial loan portfolio (6.04%). With respect to the latter, it should be noted that the momentum observed up until March 2005, when the increase was 12.5% in real terms, has subsided gradually. There has been a considerable rise in the microcredit loan portfolio, which registered 50% real annual growth at October 2005. Although this percentage is above that reported for the consumer loan portfolio, it is worth noting that the amount of microcredit is still very small (Col$1.1 tr) and, therefore, poses less risk to financial intermediaries.

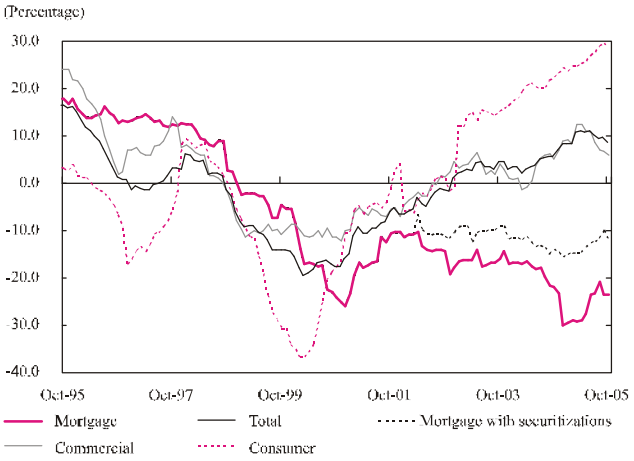
GRAPH 4

ASSETS OF CREDIT INSTITUTIONS

Source: Colombian Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 5

REAL ANNUAL GROWTH RATE IN THE GROSS PORTFOLIO OF CREDIT INSTITUTIONS

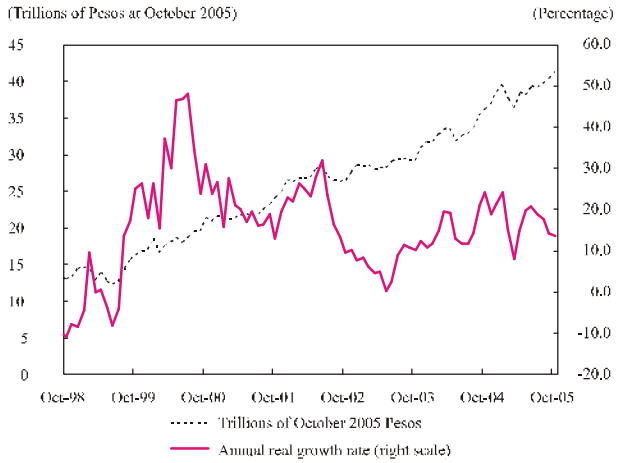


Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

[4] In October 2005, the value of the banking system's assets was close to what it was at the end of 1998.

GRAPH 6

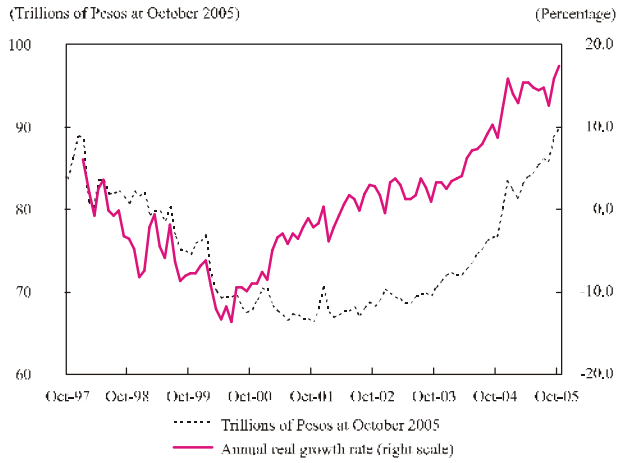
CREDIT INSTITUTIONS' INVESTMENTS



Source: Colombian Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 7

DEPOSIT-TAKING BY CREDIT INSTITUTIONS



Source: Colombian Superintendency of Financial Institutions. Calculations by Banco de la República.

The only type of loan portfolio that tell in real terms is mortgage loan portfolio. However, its negative growth rates have receded gradually. The Mortgage Portfolio, for example, with securitization saw a drop of 14.9% in real terms in January compared to 11.8% in October 2005. This could indicate a change in the trend of mortgage loan portfolio.

Investments portfolio by credit institutions came to COP41.3 tr at October (Graph 6). With the turmoil on the public debt market in March 2005 in the past, the upward trend in investments seems to have strengthened. As Graph 6 illustrates, real annual investment growth rate was up to 13.7% by October 2005. Although less than in previous months, this is rate still high.

b. Liability Positions

The recent developments in the main components of credit establishment assets were propelled by strong deposit taking, which is the financial sector's primary source of funding. Total deposits held by credit institutions had increased to COP90 tr by October 2005. This means a 17.4% real growth rate compared to the same month in 2004. In real terms, the actual amount of total deposits exceeds that registered at the start of 1998. Unlike total assets, the annual growth rate of total deposits has increased steadily (Graph 7).

The share of total deposits represented by savings deposits is on the rise. In fact, deposits of this type accounted for 41% of total deposits in October 2004 and 46% a year later. This increase is associated primarily with the decline in certificates of deposits (CDT) as a share of total deposits. In October 2005, CDTs accounted for 30% (Graph 8). In other words, credit institutions are turning towards less costly sources of financing. The proportion of demand deposits has remained relatively stable at around 15%.

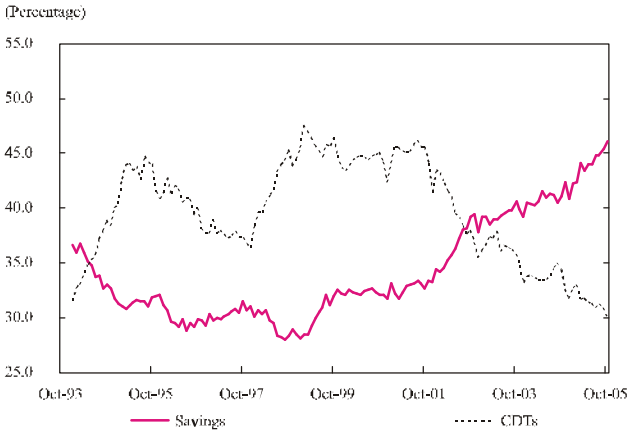
The recent momentum in different types of deposits is consistent with the trend in their share of total deposits (Graph 9). Compared with the same month of 2004, savings deposits were up by 31.5% in October 2005, which is almost

twice the increase in total deposits (17.4%) and more than three times the growth observed a year earlier (10%). The increase CDTs (3.1%) is low by comparison, but the latest figure for the sample seems to indicate a change of course. Demand deposits experienced somewhat of a slowdown: growth in April (16.4%) was seven points above the rate in October (9.4%).

In summary, current growth in credit institutions appears to be backed by the positive trend in the sources of financing the sector.

GRAPH 8

COMPOSITION OF DEPOSITS WITH CREDIT INSTITUTIONS, BY TYPE OF DEPOSIT



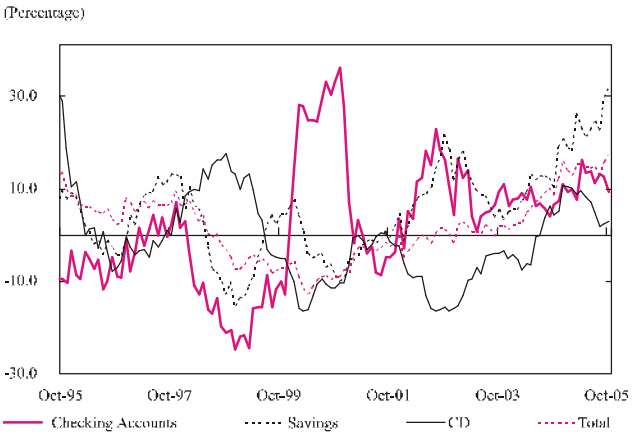
Source: Colombian Superintendency of Financial Institutions. Calculations by Banco de la República.

2. Credit Institutions' Exposure to their Debtors

By October 2005, credit institutions were exposed to debtors[5] in the amount of COP97.8 tr This means a real increase of 11.2% with respect to the same month of 2004. As a percentage of credit establishment total assets, the exposed amount was similar to the levels registered since mid-2003 and 76.8% during the month in question (Table 3).

GRAPH 9

REAL ANNUAL GROWTH RATE IN DEPOSITS WITH CREDIT INSTITUTIONS, BY TYPE OF DEPOSIT



Source: Colombian Superintendency of Financial Institutions. Calculations by Banco de la República.

On the other hand, the distribution of the exposed amount among debtors remains virtually unchanged. In contrast to what was reported in earlier editions of the Financial Stability Report, the household debt ceased reduce its share. This is primarily because of accelerated growth in the consumer loan portfolio and the reduced importance of the mortgage portfolio in the exposed amount lent to households (26.4% in October 2005). Another consequence of these trends is the concentration of household credit risk in the consumer loan portfolio, which amounted to 65% of the exposure in October. This is almost 10 percentage points (pp) above the share observed a year earlier.

The other side of this situation is growth rates displayed by the private corporate sector portfolio and by public debt instruments. Their rates of growth were

[5] Exposure is calculated as the sum of the portfolio and voluntary investments other than equity securities listed on the balance sheets of these establishments.

TABLE 3

CREDIT INSTITUTIONS' EXPOSURE TO THEIR MAJOR DEBTORS

Type	Oct-04		Oct-05		Percentage of Real Annual Growth
	Trillions of pesos (*)	Share (%)	Trillions of pesos (*)	Share (%)	
Public Sector					
Loan Portfolio	4.4	5.0	4.2	4.3	(2.9)
Securities	24.6	28.0	29.0	29.6	17.8
Total Public Sector	**28.9**	**32.9**	**33.2**	**33.9**	**14.7**
Private Corporate Sector					
Loan Portfolio	35.0	39.9	38.2	39.1	9.1
Securities	0.4	0.5	0.5	0.6	25.9
Total Private Corporate Sector	**35.5**	**40.3**	**38.7**	**39.6**	**9.3**
Household Sector					
Loan Portfolio	21.7	24.7	23.4	24.0	8.0
Consumer loans	12.8	14.6	16.6	17.0	29.6
Mortgage loans	8.9	10.1	6.8	7.0	(23.1)
Securitizations	**1.8**	2.0	2.4	2.5	34.5
Total Household Sector	**23.5**	**26.7**	**25.9**	**26.4**	**10.0**
Total Exposed Amount	**87.9**	**100.0**	**97.8**	**100.0**	**11.2**
Exposed Amount/Total Assets	**76.3**		**76.8**		

(*) Billions of October 2005 pesos.
Source: Colombian Superintendency of Financial Institutions. Calculations by Banco de la República.

below those registered during the twelve months before October 2005 (9.1% and 17.8% respectively).[6]

3. Debt Quality and Provisioning

Throughout 2005, the ratio of nonperforming loans to gross loans (NPL/GL), fluctuated between 3% and 3.5%. It was 3.2% in October. Although the downward trend noted in previous editions of the Financial Stability Report appears to have come to a halt, the levels on record are still close the historic low observed in June of this year (3.1%).

The fact that the indicator has stabilized is explained by the moderation in the pace at which the mortgage NPL/GL has dropped. It was 8.2% in

[6] Although the real growth in public debt instruments exceeds the increase in the total exposed amount, it is 7% less than the average registered during the twelve previous months.

October 2005, having declined by 2 pp since January 2005[7]. The NPL/GL standstill with respect to the consumer and commercial portfolios also was a factor (4.6% and 1.9%, respectively at October) (Graph 10).

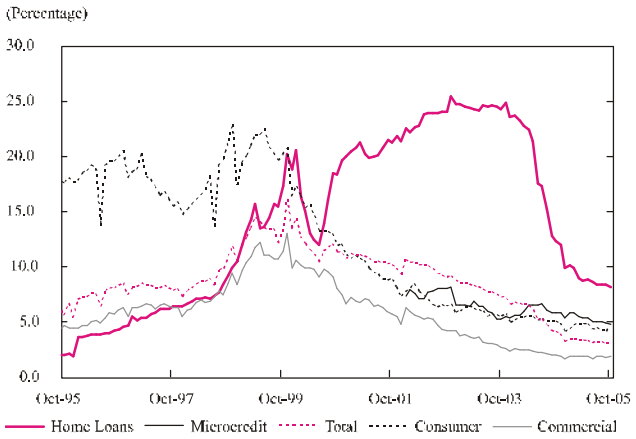
The mortgage portfolio indicator fell, even though 2005 has seen no securitizations, sales or write-offs similar to those responsible for the major NPL/GL reductions in 2004. The results summarized in this report shows that the quality of the different types of credit continues to converge. This is illustrated by less of a difference between the mortgage and commercial PCI, which was 6% in October 2005 and almost two pp less than at the beginning of the year.

The high quality of the portfolios held by credit institutions is being reinforced by an adequate level of provisions for the riskiest loans. Although the provisions of NPL ratio has stabilized in 2005, its level is near historic peaks and was up to 135% in October. As is the case with NPL/GL the indicator for the various types of intermediaries is converging. For example, the difference in provisioning between domestic and foreign lenders is 35 pp (165% and 130% respectively). This is half the difference reported in the same month of 2004. The convergence between public and private lenders is similar (Graph 11).

The accelerated increase in the consumer loan portfolio and the reduction in its provisioning, given the kind of collateral being offered, raises concerns about the credit risk it entails. Despite the healthy state of the household sector, as summarized later in this report, it is important to keep an eye on its indicators. The efforts of the Colombian Superintendency of Financial Institutions to gauge this risk should extend even further, particularly to overcome the difficulties encountered in setting up and operating the consumer credit risk management system (CRMS).

GRAPH 10

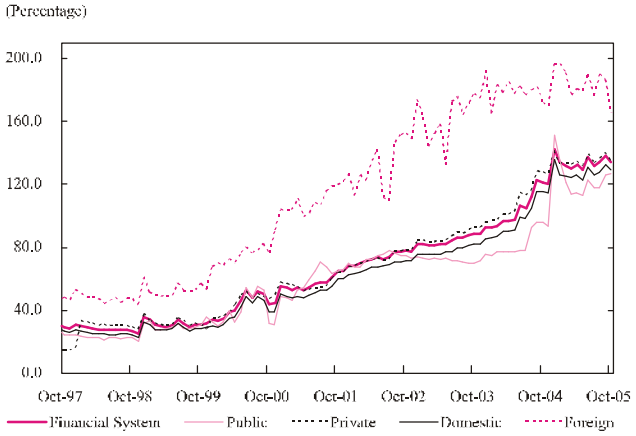
NPL/GL BY TYPE OF CREDIT



Source Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 11

COVERAGE: PROVISIONS/NPL

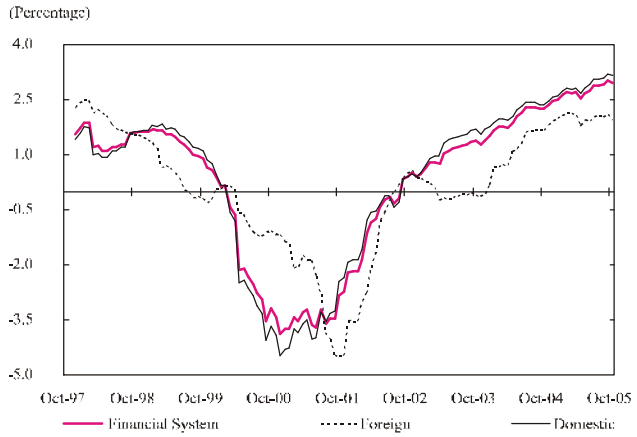


Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

[7] The drop in the NPL/GL during the same period in 2004 came to 11 pp.

GRAPH 12

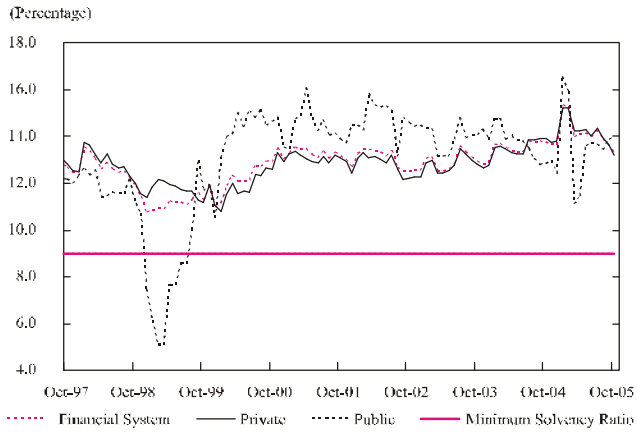
ASSET PROFITABILITY



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 13

CREDIT INSTITUTIONS' SOLVENCY RATIO



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

4. Profitability and Solvency

Following the turmoil in government securities market (TES) during February and March of this year, the return on asset (ROA) of credit institutions began to grow again, reaching 2.97% by the end of October, which is slightly below the maximum of September 2005 (3.02%). The ROA for domestic credit institutions was 3.17%, as opposed to 1.95% for foreign institutions (Graph 12).

The difference in ROA between domestic and foreign institutions, which was mentioned in the last Financial Stability Report, rose from 1% in May to 1.22% in October. Even more relevant is the fact that the profitability of domestic credit establishment has continued to grow, while foreign institutions have seen ROA to stabilize at around 2%.

The recent trend in the capital adequacy ratio (CAR) (Graph 13) also reflects the financial system's soundness. Although this ratio declined from 14.1% in May to 13.3% in October for the sector as a whole (due entirely to the fall in the capital adequacy ratio (CAR) of private credit institutions), it still exceeds the average for 1997-2005. The capital adequacy ratio (CAR) of public lenders continued to grow and was 13.97% at October.

In other words, the minimum requirements set by the Superintendency of Financial Institutions are comfortably being met by institutions in the financial system. Consequently, as mentioned in the last edition of the Financial Stability Report, this ratio is not a constraint to in the expansion financial-intermediation activities.

5. Margins

The recent trend in margins reflects the changes in the financial system's loan portfolio and its sources of financing. The vigorous growth in consumer credit has been accompanied by a reduction in interest rates on new loans, which could be an indication of enhanced competition between financial

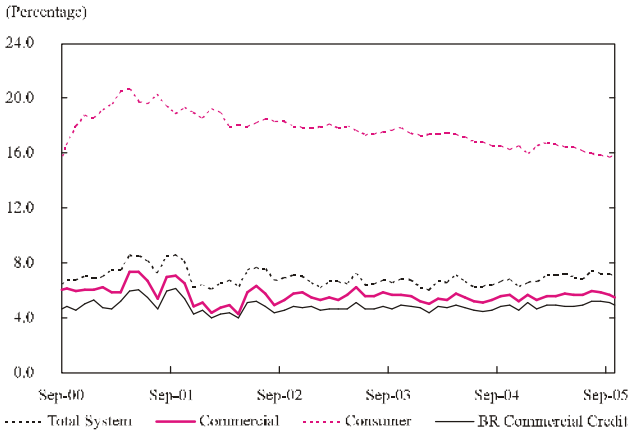
intermediaries in this market. Owing to this decline, the ex ante margin on consumer credit fell 100 basis points (bp), from 16.9% in January to 15.8% in October 2005.[8]

The ex ante margin on other types of loans remains relatively unchanged (Graph 14). Even so, the ex ante margin on the sector's disbursements as a whole has been using slightly since mid-2004. This is due to an increase in the relative share of disbursements on consumer credit, which brings the total margin close to the margin for these types of loans.

Despite recent changes in the makeup of the financial system's loan portfolio and sources of funding, the ex post margin has stayed at around 11% for the past two years[9] (Graph 15). This is because the implicit interest rates on loans and deposits also stabilized during that period (at around 17% and 6%, respectively).

GRAPH 14

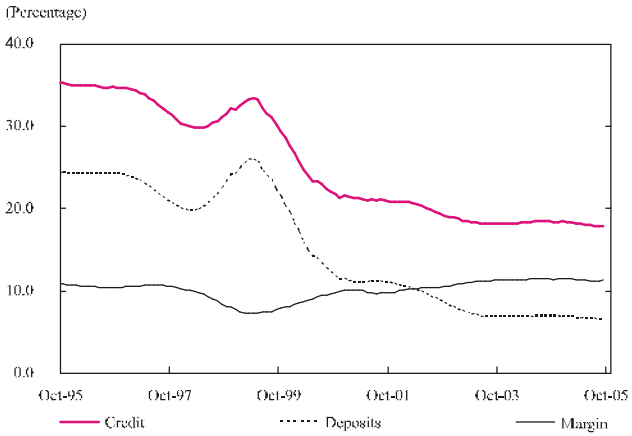
EX ANTE INTERMEDIATION MARGIN
USING THE CERTIFICATE OF DEPOSIT RATE



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 15

EX POST INTERMEDIATION MARGIN



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

B. NON-BANK FINANCIAL INSTITUTIONS

The major non-bank financial institutions in Colombia are analyzed in this section of the Financial Stability Report. They include pension-fund managers (PFM), life and general insurance corporations, ordinary common funds (OCF) and special common funds (SCF) managed by trust corporations. As illustrated in Table 4, the size of these institutions' investment portfolio and their importance within the financial system have grown considerably in recent years.

[8] The ex ante margin is the difference between the lending rates intermediaries charge for each of these types of credit and the deposit rate paid on CDTs.

[9] The ex post margin is calculated with the inflows and outflows for interest, commissions and indexation, as a respective share of deposits and the loan portfolio.

TABLE 4

FINANCIAL INSTITUTIONS' INVESTMENT PORTFOLIO

	2003		2004		2005 (at June)	
	Trillions of pesos	GDP Percentage	Trillions of pesos	GDP Percentage	Trillions of pesos	GDP Percentage
Credit Institutions						
Investments	28.81	12.5	36.93	14.4	39.07	14.6
Portfolio	53.21	23.1	58.94	23.0	63.53	23.7
Total-Credit Institutions	**82.02**	**35.6**	**95.87**	**37.5**	**102.60**	**38.3**
Non-bank Financial Institutions						
Mandatory Pension Funds	20.34	8.8	26.45	10.3	30.28	11.3
Voluntary pension Funds	3.77	1.6	4.49	1.8	5.39	2.0
Severance pay	2.74	1.2	3.13	1.2	3.75	1.4
General insurance	2.47	1.1	2.84	1.1	2.92	1.1
Life insurance	3.55	1.5	4.38	1.7	5.04	1.9
OCF	3.98	1.7	4.52	1.8	4.95	1.8
SCF	1.83	0.8	1.93	0.8	2.36	0.9
Stockbrokers' agents (*)	1.30	0.6	1.72	0.7	2.40	0.9
Total- Non-bank Financial Institutions	**39.99**	**17.4**	**49.46**	**19.3**	**57.08**	**21.3**
Total	**122.01**	**53.0**	**145.33**	**56.8**	**159.68**	**59.6**

(*) Managed funds.
Source: Superintendencia Financiera de Colombia y DANE. cálculos del Banco de la República,

1. Pension-fund Managers (AFP's)

a. Portfolio Growth

There continues to be a significant increase in the value of the AFP's portfolio, which had risen to COP$39.5 tr. by June 2005. This implies a 32.2% real annual growth.[10] As a share of the total, mandatory pension funds comprise 76.6% of this portfolio, having risen 28.5% in real annual terms. Most of this momentum is backed by the steady rise in membership in the individual savings system. In fact, by June 2005, more than three million people were active affiliates of a mandatory pension fund. This represents an annual increase of 12.7%. Furthermore, these funds have made some very profitable investments. Real annual average accumulated profitability was 17.5% over the last three years, which is the base period for calculating the minimum required profitability. This is 5.06 pp above the required minimum. At the individual level, all the AFP's were at least 3.2 pp above that requirement.[11]

AFP's portfolio growth has remained high and most of its exposure is concentrated in public-debt securities.

[10] In July 2005, the PFM-managed portfolio came to $40.8 tr.

[11] In the case of severance-pay funds, average effective annual profitability in the last two years was 13%. This is 4.32 pp above the required minimum.

b. Portfolio Composition

1) Classification by Type of Asset and Counterpart

The government is still the main counterpart for the AFP's-managed portfolio (Graph 16). In addition, the portfolio's exposure to the productive sector has increased slightly, boosted largely by a major rise in stock holdings.[12] Although there is less exposure to the financial sector, there has been a substantial increase in holdings with this counterpart as well. [13]

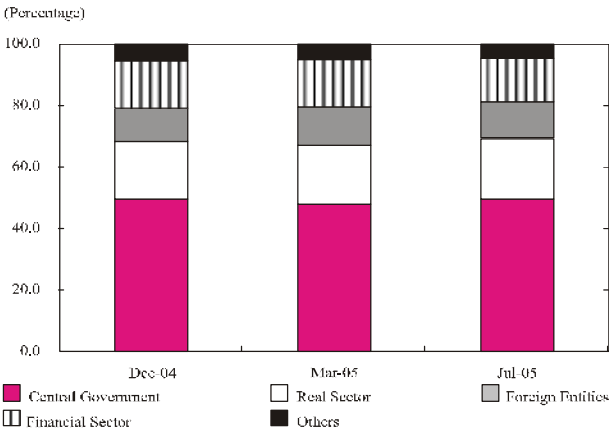
2) Breakdown by Type of Currency

A breakdown of the AFP's portfolio by type of currency (Graph 17) shows a clear shift towards COP denomination, which accounted for 48.16% in July 2005 as opposed to 41.96% of the portfolio in December 2004. This is associated with an important increase in fixed-rate assets and those with a variable return, the result being that less of the total portfolio is denominated in real-value units (UVR). The decline in exposure to foreign-currency denominated securities continues, both in USD as well as euros and other currencies.

Besides reducing the share of securities denominated in foreign currency, the voluntary pension and severance-pay funds have increased the coverage of their foreign-currency-denominated assets (Graph 18). In the case of mandatory pension funds, the uncovered portion of the portfolio has been relatively unchanged, at around 9%. By July 2005. all the fund managers had more than met the 20% limit for the uncovered portion of the portfolio denominated in foreign currency.

GRAPH 16

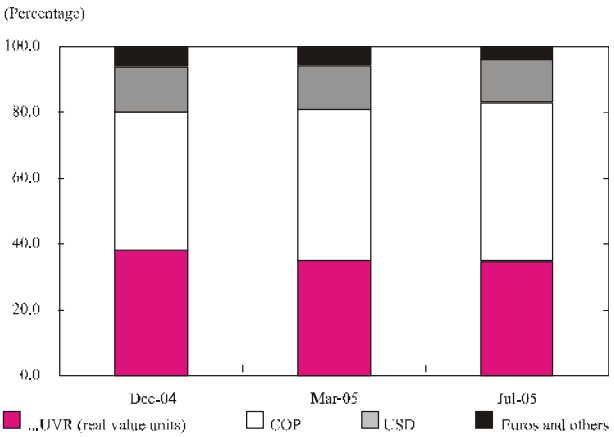
AFP'S PORTFOLIO COMPOSITION BY EXPOSED COUNTERPART



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 17

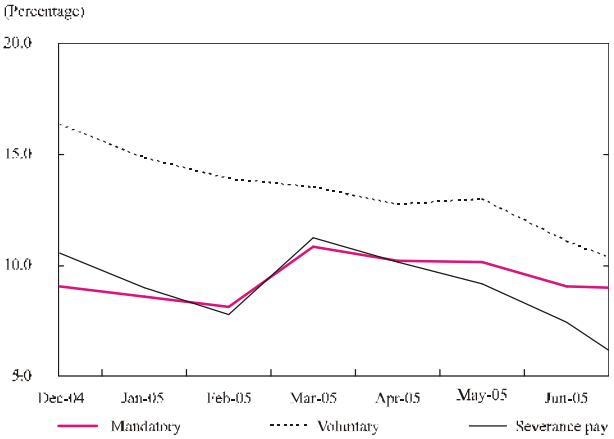
AFP'S PORTFOLIO COMPOSITION BY CURRENCY



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 18

PERCENTAGE OF PORTFOLIO VALUE DENOMINATED IN FOREIGN CURRENCY AND WITHOUT COVERAGE



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

[12] The AFP's increased their stock investments in the productive sector by 63.3% between December 2004 and July 2005. Corporate equities as a share of the AFP's portfolio were up from 5.2% to 7.4% during the same period.

[13] AFP's stock investments in the financial sector were up by 84.5% during the same period.

Most of the portfolio managed by trust funds is exposed to the financial sector.

2. Life and General Insurance

The life insurance corporations reported $6.8 tr. in assets at September 2005. The general insurance corporations reported $5.8 tr. Respectively, this is equivalent to 29.6% and 11.8% real annual growth. The investment portfolio of the life insurance corporations amounted to $5.74 tr. or 1.37 times the technical reserve. The general insurance corporations' investment portfolio came to $3.3 tr, or 1.21 times the technical reserve. With the exception of one company in the general insurance sector, all the insurance corporations (general and life) had no trouble complying in September with the requirement stipulating a ratio of no less than 0.8 times by December 2005.

The portfolios of the general and life insurance corporations registered important real annual growth: 32.0% and 14.4%, respectively. These corporations also issued $1.8 tr and $2.6 tr. in premiums.

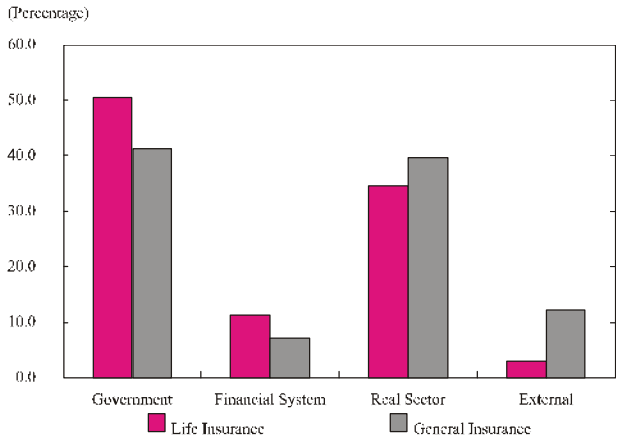
Subsequent to last edition of the Financial Stability Report, there have been some changes in the insurance sector's portfolio exposure to debtors in the financial system (Graph 19). Although the government is still the main counterpart, the proportion of government securities in the portfolio of life and general insurance corporations was down by 3 pp between March and September 2005. During the same period, the share of the portfolio exposed to the real sector rose from 30% to 35% in the case of life insurance corporations and from 37% to 40% for general insurers. A good portion of the exposure to the real sector (70%) in the case of general insurers was concentrated in corporate shares as opposed to 55% for the life insurance corporations. There was almost no change in exposure to the financial and external sectors.

There are, however, significant differences in portfolio exposure at the individual level. For example, more than 80% of the portfolio of some insurance corporations is concentrated in public-debt securities, while more than 50% of others is concentrated in corporate equities.

The insurance industry in Colombia has seen an important rise in profits during 2005. Nevertheless, they are largely the result of good investment performance and not the outcome of insurance activities as such. This is illustrated by the

GRAPH 19

INVESTMENT PORTFOLIO OF GENERAL AND LIFE INSURANCE CORPORATIONS AT SEPTEMBER 2005 ($9.0 TR.)



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

technical margin (defined as the outcome of the insurance business over premiums issued) (Graph 20). It showed a return to negative values in the first half of 2005, due to an aggregate loss for the sector in the first half of the year equivalent to $52.1 billion (bn). However, the net margin (net profit/premiums issued) during the same period was very positive. An important change in conditions on the government-bond and stock markets could affect the strength of insurance corporations, since most of the sector's portfolio is exposed to these markets.

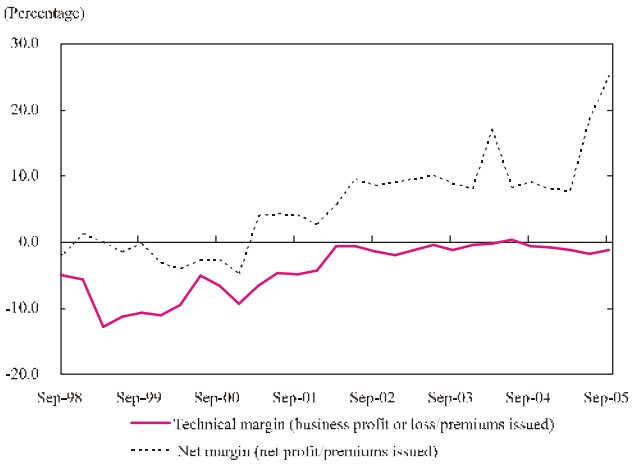
3. Ordinary (OMF) and Special Mutual Funds (SMF)

The trust-company managed OMF portfolio totaled $5.2 tr. at October 2005. This is a real increase of 2.6%. The SMF portfolio amounted to $2.8 tr., having grown significantly at a real annual rate of 36.4%.

Unlike other non-bank financial institutions, this portfolio is exposed largely to the financial sector, which accounts for 68.2% of OMF investments and 54.4% of those in the case of SMF (Graph 21). This high exposure to the financial system comes mainly in the form of time certificates of deposit, which have increased slightly as a share of these institutions' portfolio. Currently, they constitute 56.6% of the OMF portfolio and 36.4% of the SMF portfolio.

GRAPH 20

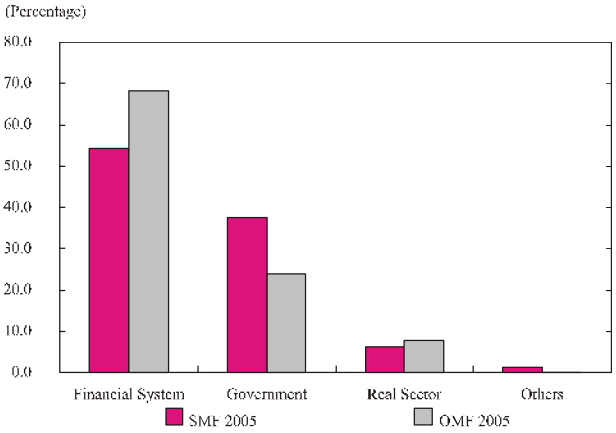
MARGINS IN THE INSURANCE SECTOR



Source: Fasecolda.

GRAPH 21

OMF AND SMF INVESTMENTPORTFOLIOS
OCTOBER 2005
($7.99 TR)



Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

III. Financial System's Debtors, Current Situation

The financial health of financial system is debtor continues to improve. On the one hand, the private non financial corporate sector has seen good profits accompanied by less borrowing. On the other, households have benefited from improvements on the job market.

A. Private Non Financial Corporate Sector

Company health and performance in the private corporate sector was analyzed with information on firms that report to the Securities Superintendency[14]. This group of corporations, however, is not a representative sample of the private corporate sector as a whole, as it included only 117 firms registered on the Colombian stock market. They and classify an average as large business[15].

1. Profitability

Asset profitability was up from 4% to 4.8% between September 2004 and the same month in 2005. This last figure is half a percentage point lower than the rate in March (5.2%) and June (5.3%) of 2005 [16](Graph 22). As

[14] In September 2005, 117 corporations filed information to the Securities Superintendency. This corporate sample was divided between producers of tradables and nontradables, based on the economic sector where they operate. Goods from the agriculture, livestock, hunting, forestry, mining, quarying and industrial manufacturing sectors are in the tradables category. Construction, commerce, transport and services are classified as nontradables. Comparisons at levels were done with a sample of 110 corporations that reported information in September 2004 and September 2005, hereinafter a homogenous sample.

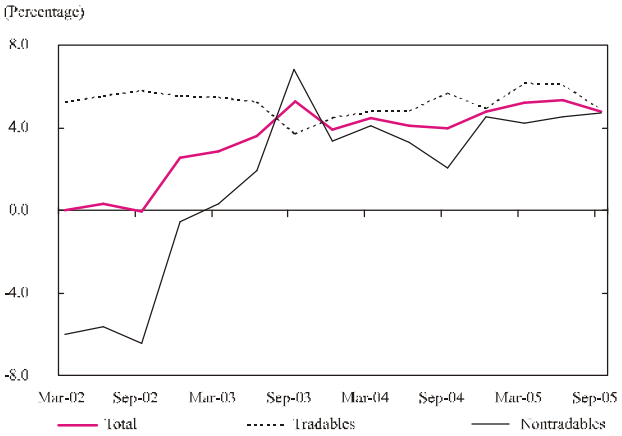
[15] In addition to the information provided by the Securities Superintendency, official figures compiled by the National Bureau of Statistics (DANE) on GDP growth by sector were reviewed, as were the monthly manufacturing and the monthly retail trade samples. In the Securities Superintendency's sample, which includes large corporations, one can find changes in the aggregate caused by a company or a small group of corporations that bias the outcome and modify the conclusions about the state of the private corporate sector.

[16] Asset profitability is calculated as profit after taxes in the last twelve months over total assets.

to sectors, tradables saw a decline in profitability from 5.7% to 4.9% between September 2004 and September 2005, while profitability in the nontradables sector doubled, going from 2.1% to 4.7% during the same period.

GRAPH 22

PROFITABILITY INDICATOR: PROFIT BEFORE TAXES/ASSETS



Source: Securities Superintendency. Calculations by Banco de la República.

The income statement may hold an explanation for this pattern, which is contrary to what was observed in March 2005. Despite different results in terms of the costs and expenses reported by these two groups of corporations, the main distinction was the increase in sales [17](Table 5). Sales growth slowed in the tradables sector between September 2004 and the same month in 2005, causing gross profits to drop. Coupled with a moderate increase in administrative expenses, this also resulted in less operating profits. And, although net non-operating expenses were down, profits before taxes declined, causing a drop in profitability for this group of corporations, as indicated earlier.

Corporations in the nontradables sector saw an increase in profits (from gross to final gain), because of substantial sales growth. The increase before taxes was significant and, as a result, profitability was up by more than two pp.

Between September 2004 and September 2005, profitability increased in almost every sector of the economy. The only exceptions were commerce, where profitability remained unchanged (2.3%), and industry, where it declined (from 4.1% to 2.8%). There was a significant difference in the profitability indicator between one sector and another. The increase in the agricultural sector was two pp, while the transport sector continued to report negative profitability. The decline in industrial profits was largely due to the food, cement, beverage and textile sectors. The last two saw negative profits (Table 6).

Broadly speaking, asset profitability increased for all corporations between September 2004 and September 2005. The point to underscore in this edition is the convergence in this indicator between the tradables and nontradables sectors. The former saw their profitability decline, while the latter increased theirs considerably. This difference was due to unequal sales growth.

[17] In real terms, tradables producers saw their sales increased by 3% between September 2004 and September 2005, as opposed to a 29% rise in sales of nontradables during the same period.

TABLE 5

COMPOSITION OF THE TOTAL PROFIT AND LOSS STATEMENT, BY TRADABLES AND NONTRADABLES SECTORS

	Trillions of pesos October 2005			Percentage of Sales		
	Sep-04	Dec-04	Sep-05	Sep-04	Dec-04	Sep-05
Total						
Operating income	33.6	35.3	38.3	100.0	100.0	100.0
Domestic	27.6	28.7	31.1	82.1	81.3	81.2
Foreign	4.6	4.8	4.5	13.7	13.6	11.8
Other	1.4	1.8	2.7	4.2	5.1	7.0
Less sales costs	21.7	23.0	25.2	64.5	65.2	65.8
Gross profit	11.9	12.3	13.1	35.5	34.8	34.2
Less operating expenses	7.1	7.4	8.1	21.1	21.0	21.1
Administrative expenses	3.3	3.4	3.6	9.7	9.7	9.5
Sales expenses	3.8	4.0	4.4	11.4	11.2	11.6
Operating profit	4.8	4.9	5.0	14.4	13.8	13.1
Plus non-operating income	2.6	5.1	3.6	7.8	14.3	9.3
Financial income	0.8	3.6	1.9	2.3	10.3	4.9
Less non-operating expenses	4.5	6.2	4.5	13.5	17.7	11.7
Financial outlays	2.6	5.2	3.5	7.7	14.9	9.2
Profit before taxes	2.9	3.7	4.1	8.7	10.5	10.7
Plus inflation adjustments	0.6	0.6	0.6	1.8	1.8	1.5
Less income and related taxes	0.9	0.8	0.8	2.7	2.4	2.0
Profit and loss	2.7	3.5	3.9	7.9	9.9	10.2
Tradables						
Operating income	19.1	19.6	19.6	100.0	100.0	100.0
Domestic	13.5	14.0	13.6	70.9	71.1	69.5
Foreign	4.5	4.7	4.5	23.7	24.0	22.8
Other	1.0	1.0	1.5	5.4	4.9	7.7
Less sales costs	13.0	13.5	13.8	68.3	68.8	70.2
Gross profit	6.1	6.1	5.8	31.7	31.2	29.8
Less operating expenses	3.2	3.2	3.3	16.9	16.3	17.0
Administrative expenses	1.3	1.2	1.2	6.6	6.3	6.2
Sales expenses	2.0	2.0	2.1	10.2	9.9	10.8
Operating profit	2.8	2.9	2.5	14.9	14.9	12.7
Plus non-operating income	1.5	2.0	2.4	7.9	10.1	12.3
Financial income	0.3	0.9	1.0	1.6	4.6	5.1
Less non-operating expenses	2.1	2.9	2.9	11.2	14.6	14.7
Financial outlays	1.4	2.2	2.2	7.4	11.0	11.4
Profit before taxes	2.2	2.0	2.0	11.6	10.4	10.3
Plus inflation adjustments	0.3	0.3	0.2	1.5	1.4	1.2
Less income and related taxes	0.7	0.6	0.5	3.5	3.1	2.6
Profit and loss	1.8	1.7	1.7	9.5	8.7	8.9
Nontradables						
Operating income	14.5	15.6	18.7	100.0	100.0	100.0
Domestic	14.0	14.7	17.5	97.0	94.1	93.3
Foreign	0.1	0.1	0.1	0.5	0.4	0.3
Other	0.4	0.8	1.2	2.5	5.4	6.4
Less sales costs	8.6	9.5	11.4	59.6	60.7	61.2
Gross profit	5.8	6.1	7.3	40.4	39.3	38.8
Less operating expenses	3.9	4.2	4.7	26.7	26.8	25.3
Administrative expenses	2.0	2.2	2.4	13.8	14.0	13.0
Sales expenses	1.9	2.0	2.3	12.9	12.8	12.4
Operating profit	2.0	2.0	2.5	13.7	12.5	13.5
Plus non-operating income	1.1	3.1	1.2	7.7	19.7	6.2
Financial income	0.5	2.7	0.9	3.2	17.4	4.7
Less non-operating expenses	2.4	3.4	1.6	16.4	21.6	8.6
Financial outlays	1.2	3.1	1.3	8.1	19.7	6.9
Profit before taxes	0.7	1.6	2.1	5.0	10.5	11.1
Plus inflation adjustments	0.3	0.4	0.3	2.3	2.4	1.8
Less income and related taxes	0.2	0.2	0.3	1.5	1.4	1.4
Profit and loss	0.8	1.8	2.2	5.7	11.5	11.5

Source: Securities Superintendency. Calculations by Banco de la República.

PROFITABILITY AND INDEBTEDNESS, BY SECTORS

	Profitability		Total Debt		Financial Debt	
	Sep-04	Sep-05	Sep-04	Sep-05	Sep-04	Sep-05
Tradables	**5.7**	**4.9**	**40.3**	**35.1**	**13.7**	**8.9**
Agriculture 1/	2.9	4.9	18.9	19.9	4.1	9.8
Mining 2/	57.4	78.0	68.5	72.3	1.4	1.3
Industry	4.1	2.8	39.6	34.2	14.2	9.0
Food	3.3	2.9	31.0	30.5	14.6	14.2
Beverages	1.1	(0.7)	57.3	52.6	19.1	8.7
Textiles 3/	(0.5)	(0.7)	54.7	54.0	23.3	22.3
Paper 4/	3.2	3.3	25.5	28.8	6.6	9.1
Chemicals 5/	4.8	7.3	56.3	51.3	29.5	24.6
Rubber 6/	4.5	9.7	26.9	31.8	6.1	11.8
Cement	8.1	4.3	10.0	6.7	4.0	2.7
Others	7.7	7.1	46.5	46.5	10.5	8.0
Nontradables	**2.1**	**4.7**	**25.6**	**24.3**	**10.1**	**6.9**
Construction	8.2	13.1	47.1	42.5	6.5	5.4
Commerce	2.3	2.3	42.5	43.4	8.1	6.7
Transport and communications	(8.2)	(0.6)	38.3	46.8	22.0	16.6
Services	5.7	6.6	16.9	15.3	13.3	5.6
Total	**4.0**	**4.8**	**33.4**	**29.5**	**12.0**	**7.8**

(*) In 2005, the distribution by sectors was as follows: agriculture 12%, mining 3%, industry 42%, construction 4%, commerce 3%, transport 5% and services 31%. In the manufacturing industry, it was food 12%, beverages 6%, textiles 10%, paper 8%, chemicals 14%, rubber 6%, cement 14% and others 29%.
1/ Agriculture, livestock, hunting and forestry.
2/ Extraction of petroleum, natural gas and coal, iron and ferrous metals, gold and other non-ferrous minerals.
3/ Textiles and wearing apparel.
4/ Paper and paper pulp.
5/ Chemical and petrochemical products.
6/ Rubber and plastic.
Source: Securities Superintendency. Calculations by Banco de la República.

Profitability increased in every sector of the economy, with the exception of commerce (unchanged) and industry. A review of the statistics published by DANE tells a similar story. It shows growth in the tradables sectors slowed the during the first half of the year, leading to results well below **those in the nontradables sectors, as indicated earlier of this Report the macroeconomic environment. Real growth during the first half of the year was 2.8% in tradables**[18] and 5.5% in nontradables. A year earlier, real growth was 4.2% and 4.5% for tradables and nontradables.

[18] This growth pertains to the percentile difference between GDP in the first half of 2005 and in the first half of 2004.

The slowdown in growth in the tradables sector is explained basically by the manufacturing industry, which saw only 1.9% real annual growth during the first six months of 2005. The commercial sector was the high point in terms of nontradables, going from a negative rate (-27.7% real annual growth) in the first half of 2004 to a high positive rate in the first six months of 2005 (24.2% real annual growth).

Because the figures used earlier are available only up to the second quarter of 2005, the monthly manufacturing sample was analyzed as well. It showed a real increase of only 3.4% in industrial production in September 2005[19]. This is explained by a weak growth in the consumer and intermediate goods sectors. Although the last three months saw sustained growth in the sectors that produce goods for the construction industry, their contribution to total growth was of little significance.

The monthly retail sales sample was reviewed in September 2005 for a more detailed analysis of the commerce sector. It showed a real annual accumulated change of 8,.2% in September of this year, basically due to the automotive sector, which expanded by 26.7% during the same period[20]. The other sectors that saw a sizeable increase in sales include electrical home appliances (13.3%), household cleaning products (11.8%) and footwear and leather goods (11.5%). The growth in food and beverages, which is the most important branch of the commercial sector, came to only 2.9% at September 2005.

The outcome in the industrial sector is consistent with what was found in the company data published by the Securities Superintendency, which showed a major reduction in asset profitability for this group of businesses. Although the high growth rate reported by DANE for the commerce sector contradicts the limited increase in its profitability found in the data provided by the Securities Superintendency, it is in line with the increase in the consumer loan portfolio mentioned in the financial system section of this report[21].

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[19] These figures from the monthly manufacturing sample show growth between September 2004 and September 2005.

[20] Growth in the the commercial sector, without vehicles, was 5.8%.

[21] The difference could be due to the fact that commercial corporations filing information with the Securities Superintendency accounted for only 3% of the total sample at September 2005. See Table 2.

2. Indebtedness

During the period between September 2004 and the same month in 2005, the total debt indicator, which is the ratio of total liabilities over total assets, declined from 33.4% to 29.5% for the corporations as a whole. It decreased from 40.3% to 35.1% for those producing tradable goods, and from 25.6% to 24.3% for nontradables producers. A drop in total liabilities was responsible for the reduction in this indicator for corporations producing tradable goods, as opposed to increased asset growth for the producers of nontradables (Graph 23).

GRAPH 23

TOTAL INDEBTEDNESS: TOTAL LIABILITIES/ASSETS

Source: Securities Superintendency. Calculations by Banco de la República.

Both groups of corporations continued to see a decline in long-term liabilities, mainly due to fewer financial obligations. Total liabilities marked the difference between tradables and nontradables; they were down by 6% for the former, also because of fewer short-term liabilities, and up by 20% for the latter, due to high growth in short-term liabilities.

The past year has seen a 10% rise in bonds and commercial paper. Those for the short-term were up by 9%, but did not increase their share of current liabilities. Although the rise in long-term bonds and commercial paper was similar (10%), their share of non-current liabilities went from 37% to 45%. In fact, 89% of this paper is long-term and issued primarily by corporations that produce tradables (Table 7).

The short-term suppliers, who account for most of this item, experienced a good deal of growth, prompting a 31% rise in their share of the total. The nontradables corporations were responsible for this outcome.

The increase in total assets for all the corporations also helped to lower the total indebtedness indicator. More investments and long-term revaluation, plus revaluation in property, plant and equipment, sparked this growth in assets.

One of the consequences derived from the trend in assets and liabilities is the reduction in current liquidity witnessed[22] between September 2004 and the same month in 2005 (from 126.8% to 96.9%). Also, because sales keep growing and financial borrowing continues to decline, corporations have enough sales income to cover their financial obligations more than five times over[23].

[22] Liquid assets over liquid liabilities.

[23] A year ago, sales were 3.8 times the financial obligations.

TABLE 7

COMPOSITION OF THE BALANCE SHEET
HOMOGENOUS SAMPLE (110 CORPORATIONS)

	Trillions of COP (*)		% Share		% Growth
	2004	2005	2004	2005	
Assets					
Current Assets					
Cash Holdings	0.7	0.6	5.0	4.9	(6.2)
Investments	2.9	1.8	22.0	14.3	(37.1)
Debtors	5.9	6.5	44.7	50.9	10.1
Inventory	3.3	3.5	25.1	27.7	6.8
Deferred	0.3	0.3	2.2	2.1	(7.9)
Other assets	0.1	0.0	1.0	0.1	(91.5)
Total Liquid Assets	13.2	12.7	100.0	100.0	(3.4)
Non-liquid Assets					
Investments	19.9	26.9	36.2	38.6	34.8
Debtors	1.2	1.2	2.2	1.7	(6.4)
Property, plant and equipment	9.8	11.9	17.7	17.1	21.7
Intangibles	6.8	6.8	12.4	9.8	(0.5)
Deferred	1.3	1.2	2.3	1.7	(8.2)
Other assets	0.1	0.4	0.3	0.6	177.0
Revaluation	15.9	21.3	28.9	30.6	33.8
Total Non-current Assets	55.1	69.6	100.0	100.0	26.2
Total Assets	**68.3**	**82.3**			**20.5**
Liabilities					
Liquid Liabilities					
Financial obligations	3.0	3.4	27.4	25.9	13.3
Suppliers	2.3	3.0	20.7	23.0	33.5
Accounts payable	2.7	3.3	24.8	25.5	23.2
Taxes	0.4	0.4	3.7	3.1	0.2
Labor liabilities	0.2	0.2	1.9	1.7	9.8
Bonds and commercial paper	0.6	0.7	5.6	5.1	8.7
Others	1.7	2.1	15.8	15.7	19.3
Total Liquid Liabilities	10.9	13.1	100.0	100.0	20.1
Non-liquid Liabilities					
Financial obligations	5.4	3.0	42.7	26.6	(44.0)
Suppliers	0.1	0.1	0.9	0.8	(20.9)
Accounts payable	0.4	1.1	2.8	9.7	210.1
Taxes	0.1	0.1	0.9	0.8	(18.7)
Labor liabilities	0.1	0.0	0.4	0.3	(39.7)
Bonds and commercial paper	4.7	5.2	37.0	45.3	10.1
Others	1.9	1.9	15.4	16.6	(3.0)
Total Non-liquid Liabilities	12.7	11.4	100.0	100.0	(10.1)
Total Liabilities	**23.5**	**24.5**			**3.9**
Net Worth	**44.7**	**57.9**			**29.3**

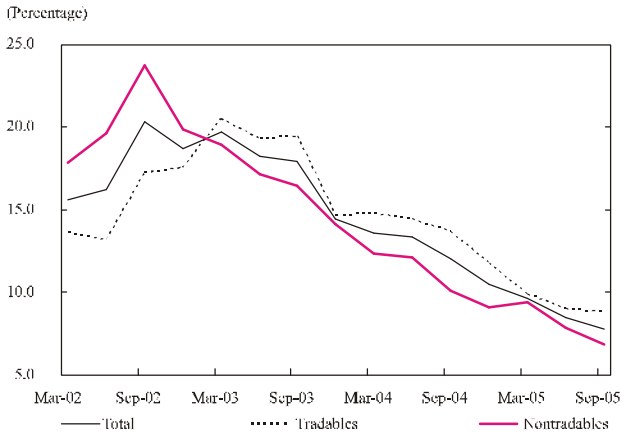
(*) Trillions of October 2005 pesos. Amounts outstanding each year at September.
Source: Securities Superintendency. Calculations by Banco de la República.

The financial debt indicator[24] dropped from 12% to 7.8% between September 2004 and the same month in 2005. This includes a reduction of more than four pp for tradables producers and three pp for nontradables producers. The latter are holding 44% of total financial obligations; the rest pertain to tradables corporations (Graph 24). Financial indebtedness declined in every sector of the economy, with the exception of agriculture. The major reductions were in industry, the transport sector and services (See Table 6).

Financial obligations to external credit entities were down by 22% for the total non-financial corporate sector. However, the results differ, depending on the group. These obligations declined by 48% among the tradables corporations and were up 32% among those in the nontradables sector. Consequently, the latter accounted for the bulk of the debt to external entities, which was not the case earlier. Yet, all the corporations had fewer internal obligations, basically because of less debt to credit entities (Graph 24 and Table 8).

GRAPH 24

TOTAL INDEBTEDNESS:
FINANCIAL OBLIGATIONS/ASSETS



Source: Securities Superintendency. Calculations by Banco de la República.

[24] Financial obligations over assets.

TABLE 8

COMPOSITION OF FINANCIAL OBLIGATIONS
HOMOGENEOUS SAMPLE (110 CORPORATIONS)

	Trillions of October 2005 COP (*)					% Share			
	Total	External	Internal			External	Internal		
			Total	Credit Entities	Others		Total	Credit Entities	Others
Total									
2004	8.4	3.4	5.0	4.1	0.8	40.9	59.1	83.3	16.7
2005	6.4	2.7	3.7	2.8	1.0	41.8	58.2	73.7	26.3
Tradables									
2004	5.0	2.3	2.7	2.3	0.4	46.2	53.8	85.7	14.3
2005	3.6	1.2	2.4	1.8	0.6	34.0	66.0	76.4	23.6
Nontradables									
2004	3.4	1.1	2.3	1.8	0.4	33.0	67.0	80.4	19.6
2005	2.8	1.5	1.4	0.9	0.4	51.6	48.4	69.0	31.0

(*) Amounts outstanding each year at September.
Source: Securities Superintendency. Calculations by Banco de la República.

The composition between obligations to external entities and internal obligations has not varied much. However, with respect to internal obligations, the share with credit entities has declined. Tradables producers have modified the composition of their obligations in favor of external ones; nontradables producers did just the opposite.

Although producers of tradables and nontradables were classified according to the economic sectors where they operate, this is a good approximation of the coverage of their liabilities in dollars by external sales. Since producers of nontradables now account for more of the debt to external entities, an increase in these obligations is a warning, as they are precisely the corporations that lack the coverage provided by an income in dollars from exports.

With respect to the composition of financial obligations to credit entities, by economic sector, most of the financing was with commercial banks. This is to be expected. The manufacturing corporations accounted for the largest portion of the debt in this sample. In the agricultural sector, there is very little indebtedness to credit entities. However, unlike other branches, the service corporations in the sample obtained loans from investment banks and commercial finance corporations as well (Table 9).

In short, substitution on the liability side is still evident, as was indicated in earlier editions of the Financial Stability Report. Financial obligations continue to be replaced by other liability items, such as suppliers, accounts payable and, to some extent, bonds. Yet, despite this decline, financial obligations still account for the biggest share of total liabilities and, for this reason, total indebtedness is

TABLE 9

COMPOSITION OF FINANCIAL OBLIGATIONS BY ECONOMIC SECTORS (*)
HOMOGENEOUS SAMPLE (110 CORPORATIONS)
(TRILLIONS OF OCTOBER 2005 COP)

	Banks		FC.		CFC		Mortgage Bankcs		Total system	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
Agriculture	7.1	36.5	4.7	1.0	0.1	0.1	0.0	0.0	11.9	37.6
Manufacturing	1,619.2	1,291.4	373.6	196.4	26.7	22.0	17.1	0.0	2,036.6	1,509.8
Commerce	349.0	233.7	6.3	1.5	0.0	0.0	0.0	0.0	355.3	235.2
Transport	450.7	226.7	73.9	7.8	0.0	0.0	0.0	0.0	524.6	234.5
Various services	417.2	349.9	108.7	42.7	369.6	55.7	0.0	0.0	895.5	448.3
Construction	25.1	23.9	9.8	7.2	5.1	4.6	1.0	0.9	41.0	36.6
Others	191.1	197.0	62.9	24.9	13.7	27.8	0.0	0.0	267.6	249.6
Total	3,059.4	2,359.1	639.8	281.5	415.3	110.1	18.1	0.9	4,132.5	2,751.6

(*) Amounts outstanding each year at September.
Source: Securities Superintendency. Calculations by Banco de la República.

decreasing. The reduction in internal and external obligations has produced this drop, although not equally for tradables producers and corporations producing nontradables.

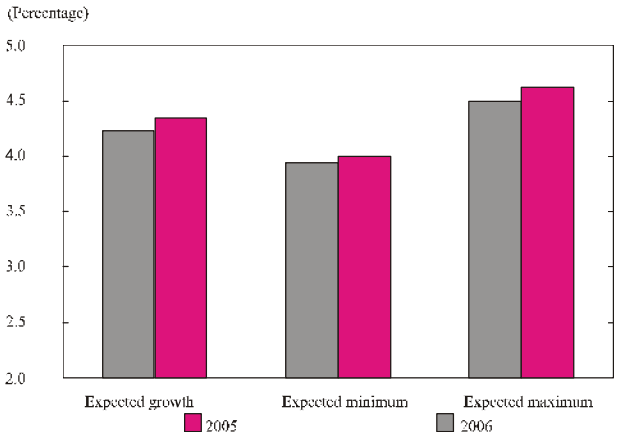
The pace of growth in net worth remains high (29%). This fact, coupled with the limited increase in liabilities, is evidence of the substitution between internal and external sources of credit for corporations.

3. Expectations

According to Banco de la República's October 2005 expectations survey, businessmen anticipate 4.2% economic growth this year and 4.4% in 2006. One year ago, the expectation for 2005 was also 4.2%. It was 3.9% in the April survey. These expectations for GDP growth in 2005 are consistent with actual growth during the first two quarters of the year (Graph 25).

GRAPH 25

EXPECTED GDP GROWTH IN 2005 AND 2006



Source: Banco de la República.

In line with this perception, the businessmen who answered to the joint industrial opinion survey (EOIC) conducted by the National Association of Industrialists (ANDI) said sales are growing by 8%, use of installed capacity is high, orders are at a good level, and there are no inventory problems. In September, when asked specifically about their investments, 59% said they have investment plans for next year. The same survey also shows that the beverage, leather, petroleum refining, chemical, glass, ceramic, non-metallic minerals and metal manufacturing sectors have the largest number of corporations with investment plans for 2006.

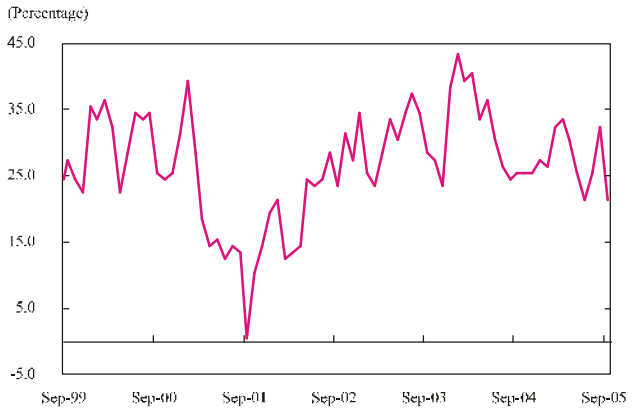
Besides these positive expectations, 61.5% of those surveyed feel that the present situation for corporations is good and 39.8% think it will improve in the near future. Demand, the trend in the exchange rate and competition are seen as the main constraints.

The outcome of Fedesarrollo's business opinion survey was not as encouraging. Expectations about the economic situation declined between August and September 2005, as did those concerning production. With respect to size, the large corporations did not change their outlook on the economic situation during the same months of 2005, but the small and medium sized corporations reduced theirs considerably (Graph 26).

Although the exchange rate continues to decline, expectations remain high. Those who answered to Banco de la República's October 2005 survey of expectations said they anticipate an exchange rate of $2,310 in December 2005 and $2,383 within a year. The minimum exchange rate anticipated this year is

GRAPH 26

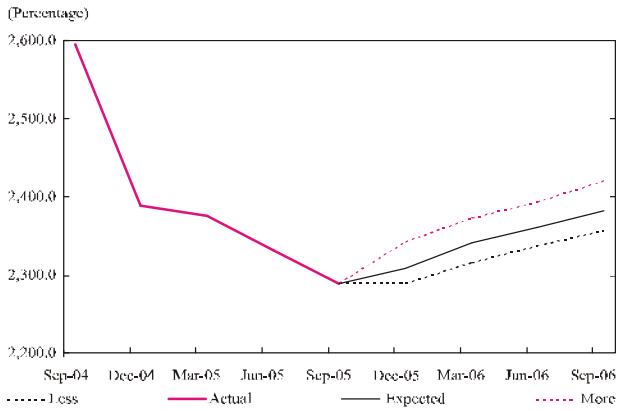
BUSINESS EXPECTATIONS (BE)



Source: Fedesarrollo Business Opinion Survey, September 2005.

GRAPH 27

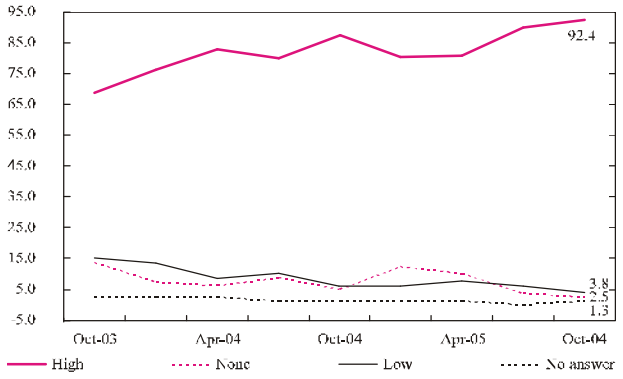
ACTUAL AND EXPECTED OFICIAL EXCHANGE RATE



Source: Expectation Survey, Banco de la República.

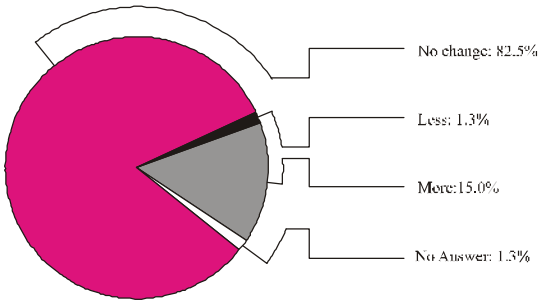
GRAPH 28

CURRENT PERCEPTION OF CREDIT AVAILABILITY



Source: Expectation Survey, Banco de la República.

TREND IN CREDIT AVAILABILITY DURING IN THE NEXT SIX MONTHS



$2,289 per dollar; the maximum is $2,343 per dollar (Graph 27).

According to the same survey, credit is high for 92.4% and low for only 3.8%. These proportions exceeded those reported in the April 2005 survey, when the response was positive for 81% of those interviewed and negative for 7.6%. As to credit availability within the next six months, 82.5% expect no change, 15% think it will increase and 1.3% anticipate less availability. In the April 2005 survey, 76.3% felt there would be no change in credit availability and 12.5% said it would increase (Graph 28).

Expectations in the private corporate sector are positive. Economic growth anticipated by the business community for 2005 is consistent with what has been observed throughout the year. A high percentage of corporations have ongoing investment projects for 2006 and, with respect to the exchange rate, those interviewed expect to see an increase at the end of the year and in 2006.

The perception of credit availability is high, particularly for the immediate future. Coupled with the good climate for demand and investment projects, this is an ample reason to expect that the commercial loan portfolio will regain the momentum it experienced prior to March 2005, the month which the slow down began.

Industrial Export Business Performance in the Past Year[1]

The information on the industrial export corporations in the Securities Superintendency's sample was used to analyze industrial export business performance during 2005. This is because the exports corporations in the industrial manufacturing sector accounted for 72% of the export corporations in the sample, on average[2].

This group sold 21% of its production on foreign markets in July 2005, and its imports accounted for 37% of its sales costs. Foreign and domestic sales grew up by more than 20%, despite slower growth with respect to December 2004. Imports did the same, at a rate of 40% (Table B1.1).

Table B1.1
Composition of the Income Statement
Total Sample

	Sales			Exports/ Sales	Imports	Sales Costs	Imports/ Costs	Adminis. Expenses ,	Non-net Expenses	Profit Before Taxes
	Foreign	Domestic	Total	(%)			(%)			
December 2003	2,208,596	9,210,913	11,419,509	19.34	2,593,464	8,003,888	32.40	2,016,184	534,363	865,074
June 2004	2,470,203	9,953,317	12,423,520	19.88	2,882,776	8,672,129	33.24	2,139,740	515,341	1,096,311
December 2004	2,951,689	11,321,282	14,272,971	20.68	3,723,917	10,084,625	36.93	2,499,509	889,641	799,196
June 2005	3,188,936	12,003,765	15,192,701	20.99	4,049,120	10,963,958	36.93	2,657,719	692,134	878,890
Δ December 2004 (%)	33.65	22.91	24.99		43.59	26.00		23.97	66.49	(7.62)
Δ June 2005 (%)	29.10	20.60	22.29		40.46	26.43		24.21	34.31	(19.83)

Source: Securities Superintendency, DIAN and DANE. Calculations by Banco de la República.

Producers of non-durables saw a 27% decline in their foreign sales between June 2004 and the same month in 2005. On the other hand, their total sales were up by 13% during the same period. Imports by food and beverage producers increased 23% in the past year, which is well below the growth registered in December 2004.

1 The information used in this section pertains to June 2005. The findings may vary with respect to the analysis of the private corporate sector at September 2005.

2 The corporations in the final sample analysed were classified according to what they produce. For example, producers of non-durable goods (food and beverages) accounted for 17%., while producers of intermediate goods (rubber and plastic, cement, wood and cork, clay, ceramic and porcelain articles, other manufactured non-metallic mineral products, paper and pulp paper, tobacco, textiles and ready-to-wear apparel, printing and publishing) accounted for 53%. The other 29% was comprised of producers of durable goods (transport equipment, machinery, equipment and electrical input, metal manufactured goods, chemical and petrochemical products, iron and steel, and miscellaneous items).

In contrast, the corporations producing intermediate goods experienced more export growth, which amounted to 10% at June 2005, while their domestic sales were down by 1% during the same period.

The corporations producing durable goods showed the best results. Their total sales, foreign and domestic grew at a good pace (above an annual rate of 45%). As is to be expected, these are corporations that import quite a high percentage of their costs (55%). They also export a larger percentage of their sales than the other two groups (29%).

Despite less growth in total sales for all the groups, only the food and beverage producers have seen a decline in exports. However, this has not affected their total operating income. The strength of domestic sales has been good and all the corporations, except those producing intermediate goods, continue to import more.

There were, however, substantially fewer profits before taxes. These declined by 20% between June 2004 and the same month in 2005. This is explained by the behavior in costs and expenses which continued to increase at the same pace, while sales declined. As a result, the latter grew less that the total outlays during the past year. Corporations producing non-durable goods were the only group to report losses in December 2004 and June 2005.

The drop in asset profitability was a direct consequence of the decline in profits. While the profitability of the Securities Superintendency's total sample was equal to 5.3% in June 2005, the profitability of the corporations in this analysis was only 2.8%. A year ago, profitability was 4% for the two corporate samples and since then it has exhibit a downward trend corporations.

The foreign debt owed by corporations in the sample continues to decline, even in dollars. By June 2005, it was 41% less in pesos and 32% less in dollars, while the external debt/total debt coefficient went from 44% in December 2005 to 36% in June 2005.

In short, the industrial exporters monitored by the Securities Superintendency have seen less growth in their total income. However, this has not prevented their total income from increasing at annual rates above 20%.

Profits before taxes dropped sharply because costs and expenses rose at rates similar to or above the pace of growth in income between December 2004 and June 2005. Yet, in spite of this reduction, the corporations in the sample continued to show a profit. Food and beverage producers were the only exception; they reported losses during December 2004 and June 2005. The debt to external entities continued to decline and asset profitability reduced substantially.

B. HOUSEHOLDS

1. Households' Financial Situation

The momentum in household consumption has been good throughout 2005, having registered 4.8% real annual growth in the second quarter of the year (Graph 29). This increase, the highest since late 1995, has been propelled by an important rise in spending on non-durable goods and services, which saw respective annual increases of 3.47% and 3.53% during the same period. These items, which are not as dynamic as durable goods (21.3% annual growth), make up nearly 83% of household's final consumption. This upward trend is expected to carry through the remainder of 2005, and could continue in 2006. As mentioned in the first part of this report, 4.5% GDP growth is expected for 2006, largely due to private consumption.

A healthier job market is behind the increase in household consumption. Unemployment in the country's 13 major cities continued to report the lowest levels for every month in 2005 since the continuous home survey (CHS) was started. The unemployment rate in October was 12.1%, which is less than the minimum level registered in 2004, which was 12.9% in December (Graph 30). Underemployment, which started the year with the lowest rates since the CHS began, was less favorable in the second half of 2005 and is one pp above the rate observed in October 2004.

The trend in employment has been favorable in 2005. As of March, this indicator has presented levels that exceed all monthly rates in 2004. By October, employment was 55.9%. This is the highest level ever recorded in the CHS and almost 1.7 pp above the rate for the same month in 2004. In part, this is due to zero growth in the working-age population. Also, the number of employed has increased gradually since June of this year.

So far this year, the growth in real wages has remained positive, thereby reinforcing good conditions on the job market. Nevertheless, growth in retail

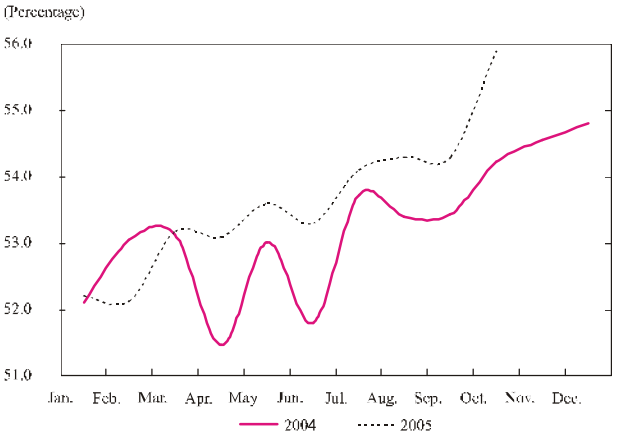
GRAPH 29

HOUSEHOLD CONSUMPTION
(SEASONALLY ADJUSTED SERIES)

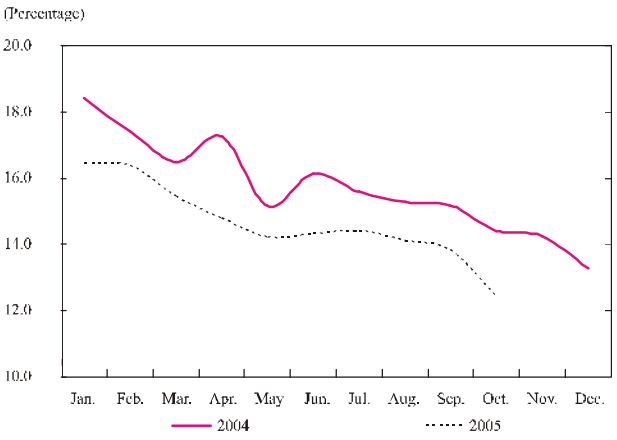
Source: DANE. Calculations by Banco de la República.

GRAPH 30

EMPLOYMENT RATE



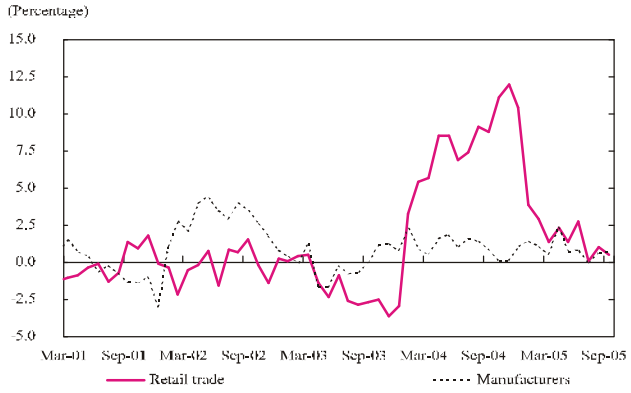
UNEMPLOYMENT RATE



Source: DANE. Calculations by Banco de la República.

GRAPH 31

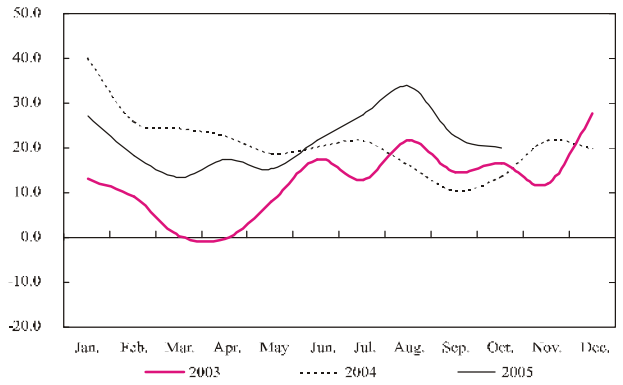
ANNUAL GROWTH IN THE REAL WAGE INDEX, BY SECTORS



Source: DANE. Calculations by Banco de la República.

GRAPH 32

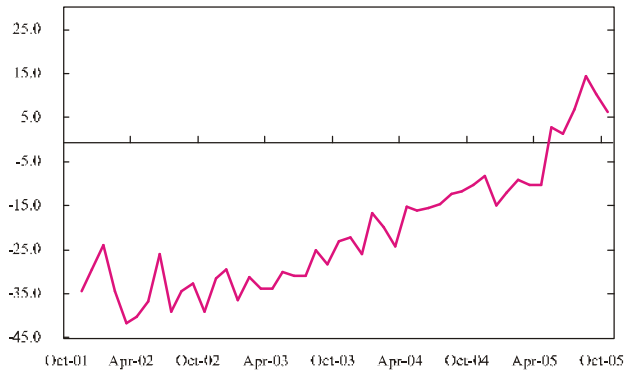
CONSUMER-EXPECTATION INDEX



Source: Fedesarrollo.

GRAPH 33

DURABLE GOODS PURCHASE PERCEPTION INDEX (*)
(BALANCE)



(*) Percentage of households that believe it is a good time to purchase an automobile and other major items (electrical appliances and furniture), minus the percentage that does not.
Source: Fedesarrollo. Calculations by Banco de la República.

wages experienced a sharp drop from 10% at the end of 2004 to around 1% during the third quarter of 2005. On the other hand, the increase in manufacturing wages has been steady. While not at the levels seen in 2002, growth rates have been positive and remain around 1% during the third quarter of the year (Graph 31).

Generally speaking, conditions on the job market bode well for household finances, due to more employment and lower unemployment since the start of the year. Together with a moderate real increase in wages, these factors are apparently fueling the growth in household consumption, backed by a more solid creditworthiness.

2. Prospects

According to the Fedesarrollo index, household expectations concerning local economic performance exceed those observed in the second half of 2004, despite having begun the year below the expectations registered in the early months of such year (Graph 32). After a substantial increase in May 2005, the durable goods purchase perception index turned around and dropped almost nine points at the end of October (Graph 33). This was due to a setback in the vehicle purchase index during the third quarter of the year, following an increase throughout most of the first six months. In contrast, the upward trend in the furniture purchase index, as highlighted in the last Financial Stability Report, continued and was more than 40 points above the figure registered for the same month in 2004. Nevertheless, it is important to emphasize that the durable goods purchase perceptions index has remained positive, which has been the case only in 2005.

The home purchase perception index as of October of this year was eight points above its level during

the same month of 2004. In spite of historically high levels for this month, the indicator was still 19 point below the maximum, registered in August 2005, sharpening the downward trend observed since September of this year (Graph 34).

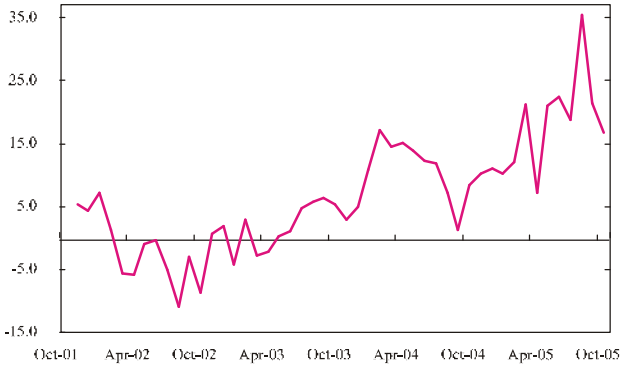
The fact that the durable goods purchase perception index has been positive throughout 2005 explains much of the growth in the consumer loan portfolio. Other factors in this respect include the growth in household consumption during the year and the increase in vehicle and electrical appliance and furniture sales (34% and 24% respective real annual growth in September). If current conditions continue and the economic growth forecasts for 2006 prove to be true, this favorable momentum should continue.

As in the past, disbursements on mortgage loans have increased in real terms, with 43.3% annual growth as of October 2005. However, the amount disbursed remains well below the levels seen in the years prior to the crisis, and was no more than 20% of the amount reported for the same month in 1997 (Graph 35).

Home building permits approved for the year at September were down by an annual rate of 12%. However, given the area approved for construction during the past 12 months to September 2005 in contrast with the year to September 2004, the decline in these permits was only 2.1%. This is because building permits have stabilized as of June 2005, breaking the downward trend observed since September 2004.

GRAPH 34

HOUSING PURCHASE PERCEPTION INDEX (*)
(BALANCE)

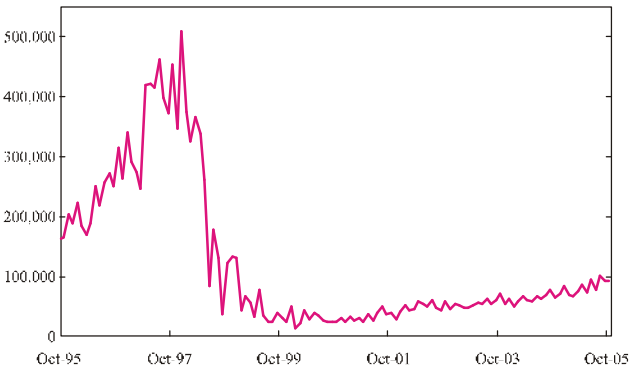


(*) Percentage of households that believe it is a good time to buy, minus the percentage that does not.
Source: Fedesarrollo. Calculations by Banco de la República.

GRAPH 35

MONTHLY DISBURSEMENTS FOR HOME PURCHASE

(Millions of October 2005 pesos)

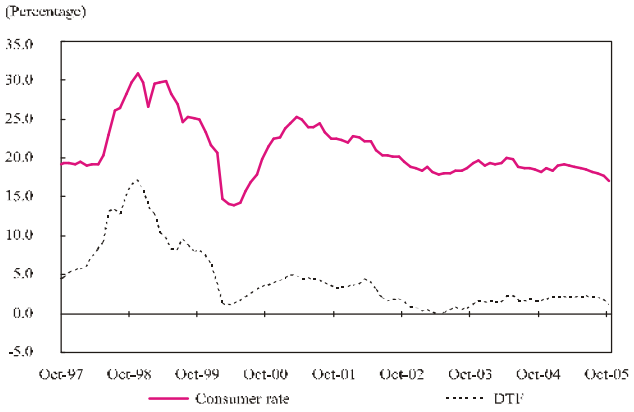


Source: Instituto Colombiano de Ahorro y Vivienda (ICAV).

Therefore, the outlook for the mortgage portfolio seems to coincide with what was noted in the last Financial Stability Report. Households apparently are replacing mortgages with other means of financing, as reflected in the share of the financial system's balance sheet pertaining to the mortgage portfolio. In real terms, it is a fourth of what it was before the crisis. A study on Bogota, Cali and Medellín done in 2004 by the Colombian Institute of Savings and mortgage Loans (IGAV)-Galería Inmobiliaria, found that 66% of those interviewed used their own resources to purchase new housing. Moreover, this proportion

GRAPH 36

CONSUMER CREDIT REAL MARGINAL INTEREST RATE (*) + DTF



(*) The marginal rate is the agreed credit rate.
Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

GRAPH 37

NEW HOME PRICE INDEX (NHPI) IN REAL TERMS (JANUARY 1994 = 100)

Source: Departmento Nacional de Planeación (DNP). Calculations by Banco de la República.

increased with the price of housing. In terms of own resources, the most important were sale of the previous home and savings in the form of CDTs and savings accounts.

Eventually, the accelerated rise in the consumer portfolio could pose a threat to households' financial health, since an increase in leverage makes them more sensitive to changes in macroeconomic variables. However, the decline in the real interest rates at which new loans are being extended has reduced some of the debt burden in recent months (Graph 36). In addition, home value, which is an important component of household equity, has been steady for the last few months, reflecting the good health of household finances (Graph 37). Nevertheless, a reversal in this situation could jeopardize the ability of these agents to pay and become a possible threat to financial stability, given deterioration in the consumer portfolio.

BOX 2

ASSET PRICE BUBBLE

The evidence of an asset price bubble in Colombia is reviewed in this section. As in previous editions of the *Financial Stability Report*, the focus will be on the new-housing and securities markets. A price-to-equity index is constructed for both markets. This methodology compares the price index of asset to an indicator of the returns offered. The resulting ratio is then compared with the asset's long term value.

In order to find evidence of a bubble in the mortgage market, we calculated the ratio of the DNP's new housing price index (IPVN) to Banco de la República's rental index, then plotted its deviations from the average indicator for 1994-2005. As shown in Graph B2.1, the indicator has been near the long-term level since March 2004, following overvaluations at around 27% between 1994 and 1995.

GRAPH B2.1
HOUSING PRICE/RENTAL RATIO
(1994 - 2005 AVERAGE = 100)

Source: DNP and Banco de la República.

Although the results contain no evidence of a mortgage bubble, caution is advised, since both the numerator and the denominator of the ratio are based on aggregate information. An analysis by income brackets could show just the opposite, especially in the upper-priced brackets. This is where most of the construction activity has been concentrated in recent years[1]. The previous *Financial Stability Report* highlighted the rise in the bubble indicator for the medium-priced brackets during the first half of 2004, a trend that may have continued during the remainder of that year[2].

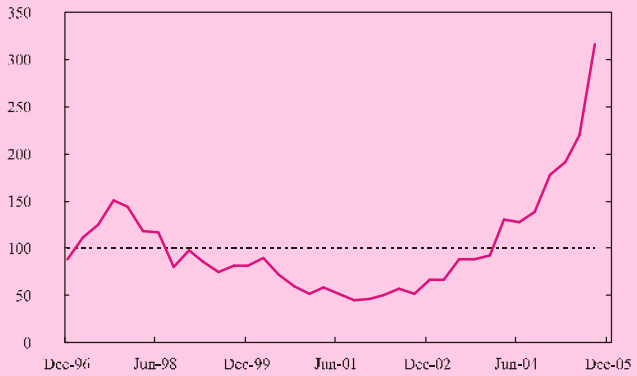
The stock market, on the other hand, has seen unprecedented growth since mid-2003. Except for the slump in March 2005, caused by an investor-confidence crisis over the possibility of a reversal in capital flows, 2005 has been a year of growth for the stock market. However, this performance, which may be somewhat of a response to macroeconomic fundamentals, also could reflect a speculative bubble in the market. To verify this possibility, we calculated the

[1] These are the same brackets where most of the housing value in Colombia is concentrated.

[2] The last Financial Stability Report included several graphs showing a breakdown of the bubble indicator by brackets. These graphs were not included in this edition, as the series - constructed by Jaramillo (2004) - has not been updated.

ratio of the Colombian Stock Exchange's General Index (IGBC) to an indicator of return on assets for the corporations quoted on the market [3] Graph B2.2 shows the value of this ratio.

Graph B2.2
IGBC/Capital Return Index Ratio
(1997 - 2005 Average = 100)



Source. Bolsa de Valores de Colombia. Calculations by Banco de la República.

As indicated in recent editions of the *Financial Stability Report*, the stock market shows signs of a bubble. Although the extent of overvaluation seems excessive (near 200%), the calculated long-term average includes the entire crisis period, but only part of the growth phase prior to it. In other words, it could be biased towards a lower level than would be obtained with a sample that captures the complete economic cycle[4].

However, developments on the stock market cannot be ignored, having registered an important measure of growth in the last few years. In fact, both the volume traded and the number of shares negotiated on a daily basis have increased substantially during the last three years (Graph B2.3). The rise in stock market activity, driven in part by the growing demand among institutional investors (e.g. pension funds) and foreign funds, coupled with the sale of corporations such as Bavaria and Coltabaco, among others, has had a positive impact on the value of stocks. As a

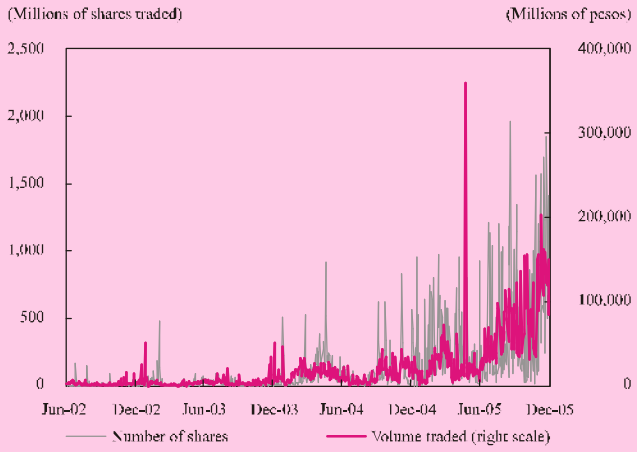
[3] The indicator is calculated as follows. 1) Information from the Superintendencia de Valores is used to construct the ratio of operating profits to property, plant and equipment. 2) The moving average of the ratio calculated as such for the last eight quarters is weighted against the company's fixed capital, as a portion of the total capital stock in the sample. 3) The information is added and the negative observations are eliminated, as these corporations, being the least given to stock market activity, are not involved in construction of the IGBC.

[4] The extent of the indicator may be biased, as it includes only the corporations in the Superintendencia de Valores's data base that are most quoted on the stock market.

result, the stock index is at a historic high and the market grew by more than 70% between March and September 2005.

In short, the Colombian stock market shows signs of being overvalued. This could be due to the influx of significant amounts of foreign capital and greater confidence among domestic investors. The influx of capital might mean the indicator, as constructed, reflects a generalized phenomenon, since much of this capital is seeking a return from corporations not listed on the stock exchange. On the other hand, the market simply might be recovering naturally, as it now has more liquidity because of low interest rates.

GRAPH B2.3
DEVELOPMENT OF THE STOCK MARKET IN COLOMBIA



Source: Bolsa de Valores de Colombia.

C. THE NON-FINANCIAL PUBLIC SECTOR (NFPS)

1. Aggregate Debt in the NFPS

Since the end of 2004, the NFPS's gross debt has declined as a percentage of GDP. Despite a slight increase in September 2005 with respect to July of the same year, this percentage is much less compared to September 2004, having declined by five pp to 54.1%. (Table 10). The drop in the external debt - both in pesos and dollars - is the main reason, since the domestic debt continues to exhibit a significant rate of growth.

TABLE 10

GROSS NFPS DEBT 1/

	(Billions of Pesos)			(Percentage of GDP) 3/			(Share)		(Nominal Growth) 4/		
	Domestic 2/	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Domestic	Foreign	Total
Dec-97	18,774.3	17,608.6	36,382.9	15.4	14.5	29.9	51.6	48.4	48.1	36.2	42.1
Dec-98	23,946.4	24,448.4	48,394.8	17.0	17.4	34.4	49.5	50.5	27.5	38.8	33.0
Dec-99	32,928.0	32,879.2	65,807.2	21.7	21.7	43.4	50.0	50.0	37.5	34.5	36.0
Dec-00	46,653.2	41,965.2	88,618.4	26.7	24.0	50.7	52.6	47.4	41.7	27.6	34.7
Dec-01	54,905.1	50,795.7	105,700.9	29.1	27.0	56.1	51.9	48.1	17.7	21.0	19.3
Dec-02	67,838.4	61,974.8	129,813.2	33.2	30.5	63.7	52.3	47.7	23.6	22.0	22.8
Dec-03	75,078.0	65,883.0	140,961.0	33.0	28.9	61.9	53.3	46.7	10.7	6.3	8.6
Dec-04	84,263.7	59,778.7	144,042.4	33.4	24.0	57.4	58.5	41.5	12.2	(9.3)	2.2
Mar-05	88,735.4	59,149.0	147,884.4	34.3	22.9	57.2	60.0	40.0	15.8	(6.0)	6.0
Jun-05	91,709.6	53,225.3	144,934.9	34.2	19.8	54.0	63.3	36.7	18.4	(16.5)	2.6
Sep-05	95,678.3	53,830.7	147,771.3	35.0	19.1	54.1	64.7	35.3	20.8	(13.5)	4.5

1/ Does not include IFI.
2/ The national government's domestic debt includes public-bank capitalization bonds.
3/ GDP in the last 12 months was used for the quarterly figures.
4/ For March, June and September, the variation is at 12 months.
Source: Banco de la República.

The domestic debt as a share of the NFPS's total gross debt continues to grow. This restructuring of the NFPS debt implies more exposure to market risk for the financial system.

In real terms, the domestic debt rose 15.02%, while the foreign debt was down by 17.6% in pesos and 5.1% in dollars by September 2005. This means revaluation of the exchange rate is not exclusively responsible for the drop. The total debt was half a percentage point less in real terms by September of this year.

The domestic debt as a share of the NFPS's total gross debt continues to grow and was 64.7% at September 2005. There are two factors behind this increase. One is the lower external debt as a result of exchange revaluation and the decline in the amount owed. The second is added growth in the domestic debt as such. As noted in the July 2005 edition of the Financial Stability Report, this restructuring of the NFPS debt implies more exposure to market risk for the financial system.

2. The Central Government's Debt (CG)

The real CG debt growth rate eased during September 2005 and was 1.45%. The decline in the CG external debt , both in dollar and pesos, was responsible for this slowdown, since the domestic debt was up by 17.5%.

Nevertheless, the rise in the domestic debt is now less costly than in previous year. The weighted average short, medium and long-term rates on primary TES-B offerings[25] in pesos, for 2005, are less than in previous years

The rise in the domestic debt is now less costly than in previous years.

[25] Only the bond rate was used, since borrowing of this type accounts for approximately 95% of the CG debt.

(Table 11). Consequently, even though a larger domestic debt could imply more exposure to market risk, the same debt is not as costly today. This means less financial pressure on the central government.

As to portion, the CG debt continues to grow. By September 2005, it was 90.1% of the total debt; the territorial entities and the rest of the NFPS accounted for 9% (Graph 38). By September 2005, most of the CG debt was comprised of bonds (96%). The portfolio remained unchanged at 0.6% and promissory notes increased to 3.6% of the total.

For its part, the CG external debt continued to decline, not only because of exchange revaluation but in absolute terms as well. In pesos, it fell by a real rate of 19.2%, and by 3.6% in dollars. At September 2005, the CG external debt accounted for 90.3% of the total external debt in the non-financial public sector (Graph 39).

The composition by lender of the external debt at September 2005 showed that the debt to multilateral agencies was down compared to the same month in 2004, representing 36.9% of the total, while bonds make up the majority, with 57.4% of the total. The debt to bilateral lenders, commercial banks and suppliers continues to account for 6% of the total CG external debt.

By September 2005, the central government contracted US$2,705 million (m) in credit (Table 12). The terms of these new loans provide for short grace and payback periods, coupled with higher average interest. This increase was due mainly to the higher rate on bonds issued at the beginning of the year and the renewed issue in July and September.

3. CG's Debt to Income Ratio

The central government's debt to income ratio improved by September 2005. Although this ratio

TABLE 11

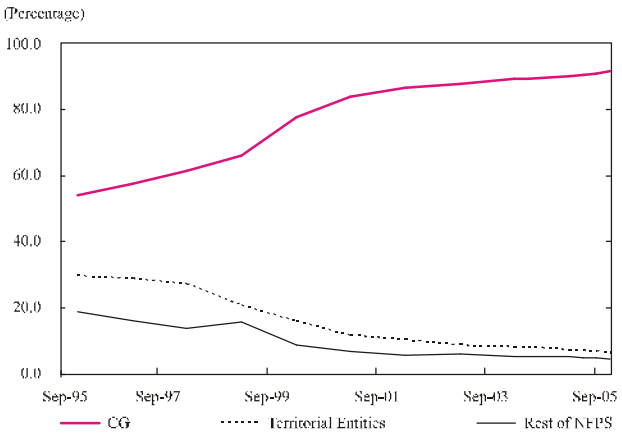
AVERAGE TES-B RATE (*)

	Short-term	Medium-term	Long-term
2002	8.89	11.89	13.72
2003	8.83	12.87	14.52
2004	8.06	11.44	12.96
2005	6.49	9.10	10.41

(*) The rate is an average weighted against the issue amount. Maturity was determined by the days to bond maturity: (1) short term: up to a year: (2) medium term: 366 days to five years; and (3) long term:_ five years and one day to 10 years.
Source: Banco de la República.

GRAPH 38

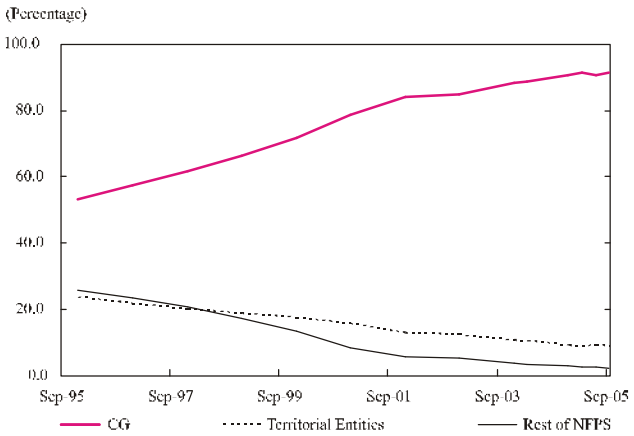
TREND IN THE GROSS NFPS DOMESTIC DEBT, BY LENDER



Source: Banco de la República.

GRAPH 39

TREND IN THE GROSS NFPS EXTERNAL DEBT, BY LENDER



Source: Banco de la República.

was up in March, the tendency is again towards a decline. The reading at September 2005 was under 300% (Table 13).

The 1.8% reduction in the CG debt/income ratio with respect to the same month last year was the result of 3.3% growth in real income, thanks to better economic performance in 2005. This is more than the moderate increase seen in the CG debt (1.45%), which is mainly due to less external borrowing. However, the central government could receive fewer tax revenues in the future, unless additional tax reforms are enacted. It is important to bear in mind that many of the temporary components of this revenue are about to expire26.

[26] "Colombia: sobrepasando las expectativas. Crecimiento, pensiones y déficit fiscal", Ministerio de Hacienda y Crédito Público, September 2005.

TABLE 12

FINANCIAL TERMS OF THE NEW LOANS CONTRACTED

Period	Amount Contracted (Millions of dollars)	Average Period		Average Interest Rate (Nominal Percentage)
		Grace (Years)	Payback (Years)	
1995	1,715	2.7	9.1	6.8
1996	3,489	1.5	8.5	7.8
1997	2,331	1.3	10.6	8.0
1998	3,104	1.2	7.1	8.2
1999	3,861	2.4	8.9	10.0
2000	3,192	1.1	9.5	11.8
2001	6,441	2.1	9.4	9.5
2002	2,042	1.5	7.8	7.8
2003	4,629	3.5	8.3	5.9
2004	3,364	3.3	10.7	6.8
Sep, 2005	2,705	2.3	10.0	8.0

Source: Banco de la República.

TABLE 13

CG CREDITWORTHINESS

Year	(Billions)		
	CG Debt	Income	Debt/Income
1997	21,778	15,238	142.9
1998	31,232	16,880	185.0
1999	47,916	20,165	237.6
2000	70,677	23,197	304.7
2001	88,689	28,942	306.4
2002	110,579	31,459	351.5
2003	123,635	35,798	345.4
2004	128,408	40,912	313.9
Mar-05	132,848	41,335	321.4
Sep-05	133,712	44,833	298.2

Source: Banco de la República.

IV. Potential Risks

Market risk is still the mayor source of financial instability. Credit and liquidity risks do not represent a source of instability for the financial sector, at least in the short term.

As illustrated in Chapter II of this report, credit institutions are in sound condition. Their loan portfolio and their investments are growing at a good pace, backed by more funding sources, low credit risk and high levels of capital. However, this positive circumstance for the financial system could change if a number of macroeconomic variables take turn for the worse. In an attempt to examine the soundness of the financial system in the face of changes in these variables, the present chapter contains the results of exercises that were done to assess market, credit and liquidity risks.

A. Market Risks

The rise in investments and, particularly, public domestic bonds (TES), continues to be one of the most significant changes financial institutions balance sheet[27]. These investments came to $41.3 tr. at October 2005 and currently account for a third of the all assets in the financial system (32.5%).

As mentioned in the last Financial Stability Report, there are two important implications to the larger share of investments on the balance sheet. To begin with, this reduces credit-risk exposure by diversifying the portfolio. Secondly, it heightens sensitivity to changes in the interest rate on investments, by raising exposure to market risk.

Yet, the rise in market-risk exposure has been accompanied by a series of preventive measures established by the Superintendency of Financial Institutions, which has set a capital requirement for market risk as of 2002. This same

[27] Real annual growth in investments was 13.7% at October 2005.

At November 4, 2005 the credit institutions were holding $24 tr. in TES-B valued at market prices. This is 19% more than at May 2005.

institution and Banco de la República are working on a revision of the market-risk model. The idea is to develop a more precise method for estimating the optimum capital requirements to address this risk effectively.

1. Financial System's Exposure to the TES-B Market

As in previous editions of the Financial Stability Report, this section presents an assessment of the TES-B holdings in the financial system. This is done to quantify the financial system's public debt stock at market prices, thereby assessing the possible valuation-loss scenario that could result from changes in interest rates relevant to the market. The market price of each security was used for this assessment. These prices were obtained as the average of the prices at which the respective issue was traded the day before, weighted against the amount of these transactions.

For securities not traded on a specific date, a price is constructed with the information implicit in the valuation curve (constructed with the securities that were traded on that date), together with the margin calculated for the same security in a past trade[28]. A discount rate in installments can be extracted from the valuation curve. When added to the margin, it is used to discount the flows that comprise the security and, thus, to arrive at its price.

Conducting this exercise with the portfolios at November 4, 2005 showed the credit institutions are holding $24 tr. in TES-B valued at market prices[29]. This is 19% more than at May 2005, when the total came to $20.1 tr. (Table 14). The non-bank financial sector is more exposed to public-debt securities and increased its holding at market prices by 18% during the same period (Table 15). For both groups, fixed-rate securities (in pesos) comprise the biggest share of the portfolio, while variable-rate securities (VR)[30] account for an increasingly smaller proportion.

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[28] The margin is calculated only if the security has a price registered on a past date. This price is used to calculate a specific rate of return on the security. The difference between this rate and the rate provided by the valuation curve is the margin. It stays the same until the security registers a different price.

[29] The valuation exercise includes all TES-B held by agents (negotiable, available for sale and up to maturity).

[30] The only variable-rate securities on the market are those indexed to the CPI. However, because the Finance and Public Credit Ministry decided not to continue issuing these bonds, it is not surprising that their share of the agents' investment portfolio is dwindling.

The concentration noted in the last Financial Stability Report, by type of intermediary, remains true. Commercial banks account for more than 90% of the securities held by credit institutions, while pension and severance-pay management funds have accumulated nearly 70% of the securities in the non-bank financial sector[31]. The higher holding, at market prices, are due to an increase in the TES-B (quantity effect), plus the valuation of the stock of these

[31] In the non-bank financial sector, as considered in this section, the trust corporations include mutual investment funds, while the insurance and investment corporations include reinsurance firms.

TABLE 14

TES-B BALANCES VALUED AT MARKET PRICES - CREDIT INSTITUTIONS
(MILLIONS OF PESOS)

	In pesos	At Variable Rates	In RVU	Total
Balances at November 4, 2005				
Commercial banks	16,843,900	953,987	4,570,177	22,368,064
Commercial finance and leasing corporations	96,500	3,479	9,533	109,511
Superior-grade financial coops	18,254	0	0	18,254
Investment banks	1,351,225	6,431	128,077	1,485,733
Credit Institutions' Total	**18,309,878**	**963,897**	**4,707,787**	**23,981,562**
Balances at May 27, 2005				
Commercial banks	13,154,458	992,987	4,796,953	18,944,398
Commercial finance and leasing corporations	48,029	1,177	6,347	55,554
Superior-grade financial coops	6,236	0	0	6,236
Investment banks	762,810	36,352	274,165	1,073,326
Credit Institutions' Total	**13,971,534**	**1,030,515**	**5,077,465**	**20,079,515**

Source: Banco de la República.

TABLE 15

TES-B BALANCES VALUED AT MARKET PRICES - NON-BANK FINANCIAL SECTOR
(MILLIONS OF PESOS)

	In pesos	At Variable Rates	In RVU	Total
Balances at November 4, 2005				
Stockbrokers	220,409	1,523	120,292	342,224
Insurance and investment corporations	1,413,627	215,309	773,639	2,402,574
Pension and severance-pay management funds	9,600,261	788,028	4,538,265	14,926,554
Trust corporations	2,556,267	743,232	1,086,154	4,385,653
Non-bank Financial Sector Total	**13,790,564**	**1,748,091**	**6,518,350**	**22,057,005**
Balances at May 27, 2005				
Stockbrokers	196,653	5,538	113,645	315,836
Insurance and investment corporations	1,284,933	211,604	554,472	2,051,009
Pension and severance-pay management funds	8,290,800	561,208	3,385,795	12,237,803
Trust corporations	2,388,682	732,558	926,266	4,047,507
Non-bank Financial Sector Total	**12,161,069**	**1,510,908**	**4,980,178**	**18,652,155**

Source: Banco de la República.

More than 40% of the change in TES-B holdings is explained by variations in the price of these bonds. This demonstrates how important these variations are to the portfolio value.

securities (price effect). During the period in question, the price effect explains nearly 40% and 50% of the total variation for credit institutions and the non-bank financial sector, respectively (Table 16). This is a reversal of what was noted in the last Financial Stability Report, when the quantity effect explained nearly 80% in both cases.

This result highlights the importance of the price component in the value of financial agents' holdings. For this reason, exercises are needed to gauge just how responsive the values of these portfolios are to interest-rate changes that affect the prices of these assets.

2. Sensitivity to TES-B Rate Increases

The valuation loss that would result from a 200 bp increase in the interest on fixed-rate and UVR TES[32] at every segment on the spot curve was estimated to gauge the financial system's exposure to interest rate changes. Only the securities in the trading book[33] were included in this exercise. The change in portfolio value was calculated using the RiskMetrics mapping methodology[34]. As part of this process, the stripped securities[35] were distributed into 13 time

[32] An increase in the real margin on the RVU reference rate is assumed for the TES RVU. In the case of an increase in inflationary expectations, the losses would occur only in the fixed-rate TES, since the real return on the security in RVU will not change.

[33] The trading book is comprised of the positions the bank maintains for the benefit to be derived from their short-term purchase and sale. In the Colombian case, it does not include positions in negotiable investments available for sale.

[34] J.P. Morgan, RiskMetrics Technical Document, 1996.

[35] This means that each coupon of a security and the principal are treated as independent zero-courpon bonds.

TABLE 16

VARIATIONS IN TES-B HOLDINGS (*)
(MILLIONS OF PESOS)

	Quantity Variation	Price Variation	Total Variation
Total Credit Entities	**2,430,339**	**1,471,708**	**3,902,048**
Commercial banks	2,023,308	1,400,358	3,423,666
Commercial finance and leasing corporations	42,582	11,375	53,957
Superior-grade financial corps.	10,493	1,524	12,017
Investment banks	353,957	58,450	412,407
Total Non-bank Financial Sector	**1,616,196**	**1,788,654**	**3,404,850**
Stockbrokers	2,638	23,750	26,388
Insurance and investment corporations	164,694	186,871	351,566
Pension and severance-pay management funds	1,372,380	1,316,371	2,688,751
Trust corporations	76,484	261,661	338,146

(*) The variations occurred between May 27 and November 4, 2005.
Source: Banco de la República.

bands, according to the residual maturity of each. Then, the shock pertaining to the change in the spot rate of the band was assigned to each. The estimated loss, which comes to $969 b, is equivalent to 27% of the financial system's profits in the last twelve months up to October 2005 (Table 17).

With a parallel shock of 200 bp, the valuation loss would represent 27% of the financial system's profits up to October.

B. Credit Risks

1. Credit Institutions

As indicated in previous editions of this report, the loan quality indicator has been at historically low levels. High levels of profitability and capital adequacy have accompanied this movement in loan quality. These facts suggest that credit risk is not an issue to the financial system at rest in the short term.

However, changes in macroeconomic conditions could affect the balance sheet of the financial system's debtors, thereby influencing their creditworthiness or ability to pay. The following are the results of several exercises[36] conducted to determine how sound commercial banks (including mortgage banks) are in the face of changes in variables (e.g. interest rate hikes, downturns in economic activity and housing price dips).

These exercises are intended to quantify what percentage of the loan portfolio would become non-performing as result of a macroeconomic shock and how this would impact the soundness of financial intermediaries[37]. The commercial,

[36] These exercises are based on Amaya (2005) "Evaluación del riesgo de crédito en el sistema financiero colombiano," which is included in this report under Topics on Financial Stability.

[37] The exercise was done for 21 entities.

Table 17

Valuation Losses in the Trading Book from a 200 bp Shock
(Millions of Pesos)

	At a Variable Rate	In RVU	Total	Percentage of Profit in Last 12 Months (Oct-05)
Commercial banks	686,282	232,506	918,788	30.46
Commercial finance and leasing corporations	4,303	335	4,639	2.33
Financial Corps.	36,423	8,995	45,418	14.88
Total for Credit Entities	**727,008**	**241,836**	**968,844**	**27.38**
Pension and Severance-pay Management Funds	566,005	348,953	914,958	

Source: Banco de la República.

consumer and mortgage loan portfolios were analyzed in this respect. In the case of a shock related to economic activity, a drop of 9% in sales and 6.8% in GDP are included, as occurred during the economic crisis. For interest rates, the shock is a 450 bp increase, as was the case during May and June 1998. A drop in housing prices equivalent to the average housing-price downturn in 1996-2000[38] was used.

The aggregate results (Table 18) suggest the financial system would be able to resist substantial price shocks (e.g. interest rates or housing prices) or output shocks. However, if another situation similar to the crisis in the late nineties were to occur, all these shocks combined the financial system would be unable to cover these obligations, at least not with its current profits.

Tables 19 and 20 show a breakdown of the results. The number of banks where the cost of the shock would exceed profits is shown in Table 19, while Table 20 illustrates the number of banks whose capital adequacy ratio (CAR) would fall below the minimum (9%). The same table also shows the total impact of the shock on the CAR of banks as a whole[39]. From these tables, one can see that very few banks would escape problems if a situation similar to the crisis were to occur. As for the system as a whole, the shocks to economic activity are particularly relevant. With respect to profits, this shock would be enough to cause losses for ten intermediaries and to place the capital adequacy ratio (CAR) at 9.77%. The combination of price shocks and a downturn in economic activity would result in losses for 15 institutions and a CAR below the mandatory minimum.

TABLE 18

COST AS A PERCENTAGE OF PROFITS
(12 MONTHS)

	Shock 1	Shock 2	Shock 3
Commercial	4	53	55
Consumer	18	24	36
Mortgage	12	11	19
Total	34	88	111

Source: Amaya (2005).

TABLE 19

NUMBER OF BANKS WHERE COSTS WOULD EXCEED PROFITS
(12 MONTHS)

	Shock 1	Shock 2	Shock 3
Commercial	1	7	7
Consumer	1	1	3
Mortgage	0	0	1
Total	2	10	15

Source: Amaya (2005).

TABLE 20

NUMBER OF BANKS WHERE THE CAPITAL ADEQUACY RATIO (CAR) WOULD FALL BELOW THE MINIMUM
(12 MONTHS)

	Shock 1	Shock 2	Shock 3
Commercial	0	4	5
Consumer	4	4	6
Mortgage	0	0	1
Total	5	8	12
Relación de solvencia	11.8	9.8	8.9

Source: Amaya (2005).

[38] The exercises assume the shocks are not correlated.

[39] The sum of the banks, by portfolio type, is not equal to the total. This is because there may be a bank where, according to the type of portfolio, the costs of the shock are moderate. However, the sum of costs per type of portfolio could exceed actual profits or be enough to lower the capital adequacy ratio (CAR) considerably.

2. A Company Account-based Analysis

The purpose of this exercise is to assess the credit risk posed to the financial system by the commercial portfolio. The idea is to calculate the domestic debt at risk in the private corporate sector, as a proxy of the possible losses the system would incur, given a likelihood of business failure and assuming that none of the portfolio is recovered.

The likelihood of corporate bankruptcy [40] is estimated with a probit model for panel data (unbalanced). The panel includes an average of 8,481 corporations during the 1995-2004 period. Specific variables for the corporations and the sectors were included in the panel, which addition to in macroeconomic variables[41].

a. Domestic Debt at Risk

After estimating the likelihood of bankruptcy, the domestic debt at risk (DDR) was calculated for each year, by sector, for all the corporations. The ex ante DDR[42] is calculated as:

$$DDR_t = \sum_{i=1}^{N} pp_i * domestic\ debt_i ,$$

Here, *ppi* is the likelihood of bankruptcy predicted by the estimate for each company. The $domestic\ debt_i$ is each company's domestic debt.

The ex post DDR[43] is calculated in a similar way.

$$DDR\ ex\ post_t = \sum_{i=1}^{N} bankruptcy_i * domestic\ debt_i ,$$

Here $bankruptcy_i$ is equal to 1 if company *i* fails during period *t.*

Our analysis includes only the domestic debt at risk, not the external debt. This is because the domestic debt represents more of a danger to the financial system.

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40 Information on the corporations monitored by the Securities Superintendency was used for this purpose.

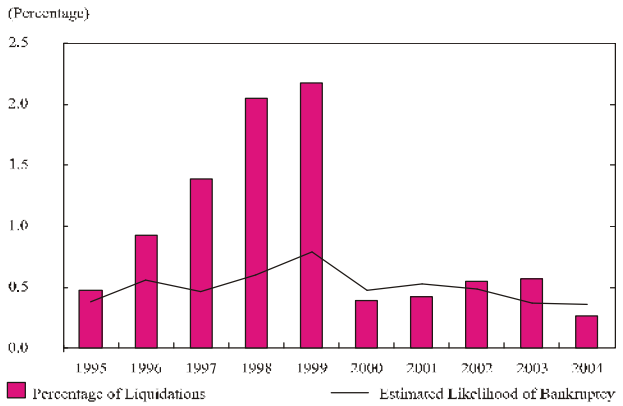
41 For further technical details, see the article by Arango, Zamudio and Orozco (2005) at the end of this edition of the Financial Stability Report.

42 The ex ante debt at risk is the potential loss to the financial system, given a likelihood of company bankruptcy and assuming the system recovers none of the portfolio.

43 The ex post debt at risk is the loss actually incurred by the financial system if none of the portfolio is recovered.

GRAPH 40

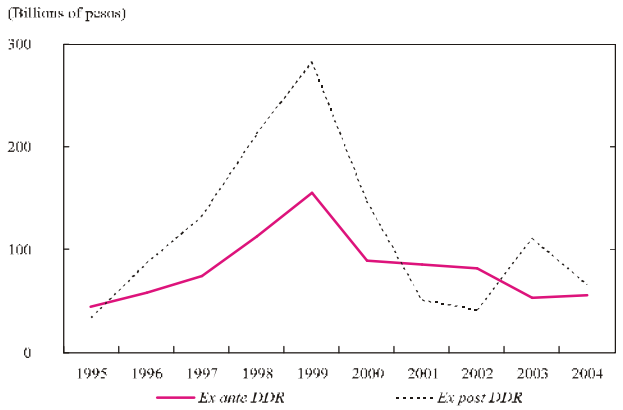
PERCENTAGE OF LIQUIDATED CORPORATIONS AND ESTIMATED LIKELIHOOD OF BANKRUPTCY



Source: Superintendency of Corporations. Calculations by Arango, Zamudio and Orozco (2005).

GRAPH 41

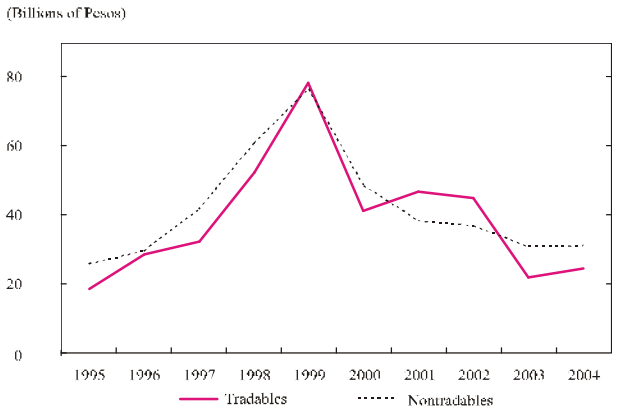
EX ANTE AND EX POST DDR



Source: Calculations by Arango, Zamudio and Orozco (2005).

GRAPH 42

EX ANTE AND EX POST DDR FOR TRADABLES AND NONTRADABLES



Source: Calculations by Arango, Zamudio and Orozco (2005).

b. Results

A review of the corporations that actually went bankrupt during 1995-2004 shows that the least number of liquidations occurred during the final year of that period. The most occurred during the crisis period. Interestingly, the rise in these liquidations began in 1997, two years before the recession (Graph 40).

The exercise shows that the estimated likelihood of bankruptcy was the lowest in 2004 (0.36%) and the highest in 1999 (0.78%). At present, the sectors with the least average likelihood of bankruptcy are transport and communications (0.25%) and services (0.33%). Those with the highest likelihood are construction (0.48%) and mining (0.41%). In fact, despite a reduction in the likelihood of bankruptcy, the construction sector still had the highest indicator during the period analyzed.

Accordingly, the trend in the ex ante DDR was similar to the trend in the likelihood of bankruptcy. Although, contrary to the likelihood of bankruptcy, in 2004, it was not the lowest. (Graph 41). The ex ante DDR for the entire corporate sample in 2004 was approximately 0.2%of[44] the commercial portfolio reported by the 5,000 largest private debtors[45].

A breakdown of the sample between producers of tradables and nontradables goods[46], showed the pattern in the ex ante DDR of both groups was similar to what is was for the corporations as a whole (Graph 42). Throughout most of the period the ex ante DDR of the nontradables producers exceeds that of the tradables producers, except in 2001-2002. This is explained by the fact that producers of tradable goods had a much larger domestic debt

44 This figure is low compared to the percentage of commercial portfolio reserves, which was 3.8% at December 2004.

45 At December 2004, the commercial portfolio of the 5,000 largest debtors accounted for 72% of the entire commercial portfolio.

46 This is the same classification used in the present edition of the Financial Stability Report, specifically the section on the private corporate sector.

during those years. In the other years, the domestic debt is similar, but the likelihood of bankruptcy among the nontradables producers is much greater.

The trend in the ex ante DDR was similar to the trend in the likelihood of bankruptcy. Although, contrary to the likelihood of bankruptcy, in 2004, it was not the lowest.

As indicated in Table 21, the ex ante DDR of the construction sector accounted for the largest share of its portfolio in 2004; in the transport sector, it accounted for the least. However, the ex post DDR, which represents the actual loss to the financial system assuming that none of the portfolio is recovered when a company goes bankrupt, is less than 1% of the total commercial portfolio for all the sectors. In this case, the commercial sector had the highest ex post DDR, followed by the agricultural sector. The mining sector accounted for the smallest proportion, which was equal to zero.

In short, the likelihood of business failure in the private corporate sector is now near the levels observed in 1995 (the lowest in the cycle). Coupled with a better-quality commercial loan portfolio and less corporate borrowing from the financial system, this means the credit risk posed by the commercial portfolio is not a latent threat to the stability of the financial system.

C. Liquidity Risk

The nature of financial activity, which is distinguished by the transformation of short-term liabilities (e.g. deposits) into medium and long-term assets (e.g. loans), necessarily implies liquidity-risk exposure for financial intermediaries. This risk is associated with the possibility that a financial institution might be unable to

Table 21

Ex Ante and Ex Post DDR

2004	Ex Ante DDR		Ex Post DDR	
	Thousands of Pesos	Percentage	Thousands of Pesos	Percentage
Agriculture	3,188,553	0.28	2,468,318	0.22
Mining	988,650	0.21	0	0.00
Industry	20,197,400	0.19	7,901,758	0.08
Construction	6,776,126	0.41	1,419,801	0.08
Commerce	13,364,723	0.25	40,961,589	0.76
Services	9,340,247	0.12	10,992,908	0.14
Transport	1,722,899	0.10	2,021,282	0.12
Total	55,578,597	0.20	65,765,656	0.23

Source: Superintendency of Financial Affairs. Calculations by Arango, Zamudio and Orozco (2005).

meet its obligations in full, for lack of sufficient liquid resources to do so[47]. This situation entails costs to the extent that entities are obliged to liquidate part of their illiquid portfolio. In extreme circumstances, an inability to liquidate these assets can lead to bankruptcy and an eventual systemic crisis.

Therefore, adequately measuring and monitoring the degree of liquidity risk facing financial institutions is important. An indicator of this risk, its recent trend and a sensitivity exercise that examines the impact of a major withdrawal of deposits can have on liquidity are presented in this section.

1. The Liquidity Risk Indicator: Ratio of Uncovered Liabilities (RUL)

Measuring liquidity risk implies identifying the portion of an institution obligations that are susceptible of being redeemed in. This is done to calculate the liquidity required to satisfy these obligations[48]. An obvious approach to this calculation is to look at when the company's liabilities fall due. However, the problem with this strategy is that not all items on the balance sheet have an agreed maturity or redemption date (e.g. savings deposits)[49]. Therefore, the calculation presented in this report is based on an alternate strategy that involves determining statistically what portion of an entity's obligations is permanent in nature; in other words, what percentage is not susceptible to short-term redemption and what percentage is temporary, or susceptible to short-term redeption[50].

Based on the foregoing, the share of the entity' liabilities that are susceptible to redemption will include all liquid liabilities (LL), plus the temporary component of the remaining liabilities (Tr.L) [51]. The assumption is that all liquid liabilities are susceptible to short-term redemption. These liquidity needs are met by (LA) to satisfy, should they materialize.

Based on balance-sheet information for financial institutions, the measurement of liquidity risk presented in this section is a ratio of uncovered liabilities (RUL) expressed as[52].

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47 The concept of liquidity is different from that of solvency. The latter is associated with a situation where the net present value (PNV) of liabilities exceeds the PNV of assets.

48 For example, see Banking Superintendency Circular 100/95.

49 Furthermore, creditors can renew obligations with a contractual maturity or expiration date.

50 Banking Superintendency, op. cit.

51 The temporary component of an entity's liabilities is identified by applying the Hodrick-Prescott filter to the liability series. See Hodrick, Robert and Edward Prescott, "Postwar U.S. Business Cycles: An Empirical Investigation," in Journal of Money, Credit and Banking, Vol. 29, No. 1, Ohio State University Press, 1997, pp. 1-16.

52 The spirit of the expression comes from Dziobek, Claudia, Kim Hobbs and David Marston, Toward a Framework for Systemic Liquidity Policy, IMF, Working Paper No. 34. IMF, 2000.

$$RUL = [(Tr.P + LL) - LA] / (TA - LA)$$

Here, TA represents total assets. The numerator in the expression applies to the difference between liabilities susceptible to redemption and liquid assets; the denominator refers to illiquid assets[53]. If the RUL is positive, the institutiondoes not have enough liquid assets to cover the liabilities susceptible to redemption. In this case, the liquidity risk is high. The opposite is true if the RUL is negative. In short, the RUL is read as indicated in Table 22. It is important to point out that liquidity risk is never non-existent, as there is always the possibility that liabilities susceptible to redemption will exceed the amount calculated.

2. The Recent Trend in Liquidity Risk

Graph 43 shows the trend in the RUL for the financial sector as a whole in the months from January 1994 to October 2005. According to the graph, the liquidity risk was relatively low and stable during the period prior to 1997 (an average RUL equal to -7.43% of illiquid assets). Whit the financial crisis, the system became much more liquid and the RUL in September 1998 was near zero. Since then, the liquidity risk has declined gradually and, since April 2004, the RUL has stabilized at around -34%, it was -34.8% at October 2005. This means the financial system, as a whole, used part of its obligations with little susceptibility to redemption to purchase liquid assets. Therefore, according to the figures available at October 2005, the liquidity risk poses no potential threat to the financial system's performance.

TABLE 22

INTERPRETING THE RATIO OF UNCOVERED LIABILITIES

RUL	Motive	Liquidity Risk
Positive	*PTr + PL > AL*	High
Zero	*PTr + PL = AL*	Medium
Negative	*PTr + PL < AL*	Low

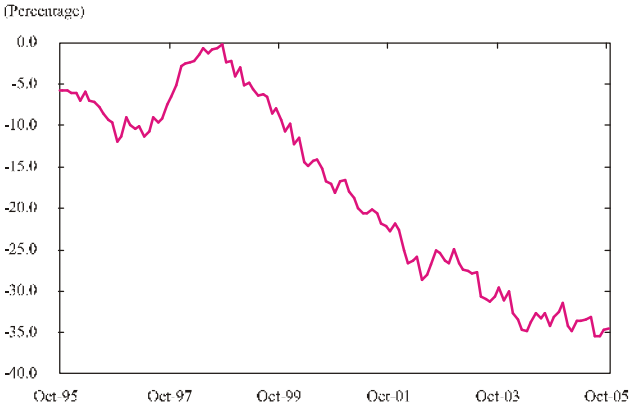
Source: Adapted from Dziobek, Hobbs and Marston (2000).

3. Sensitivity Analysis

Given the relative importance of commercial and mortgage banks within the financial system, the present section offers an individual analysis of their sensitivity or responsiveness. This exercise is intended to detect the impact an extreme reduction in deposits would have on each of these intermediaries.

GRAPH 43

RUL OF CREDIT INSTITUTIONS

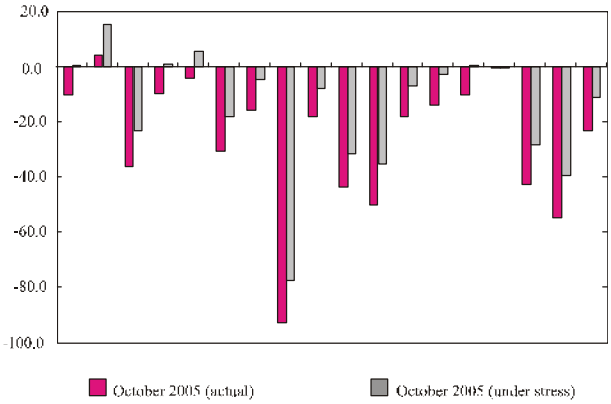


Source: Superintendency of Financial Institutions. Calculations by Banco de la República.

[53] According to Dziobek, Hobbs and Marston, the difference between liabilities susceptible to redemption and liquid assets should be scaled by the illiquid assets to prevent the indicator from favoring the larger banks, which do more business.

GRAPH 44

SENSITIVITY ANALYSIS : RUL OF COMMERCIAL AND MORTGAGE BANKS



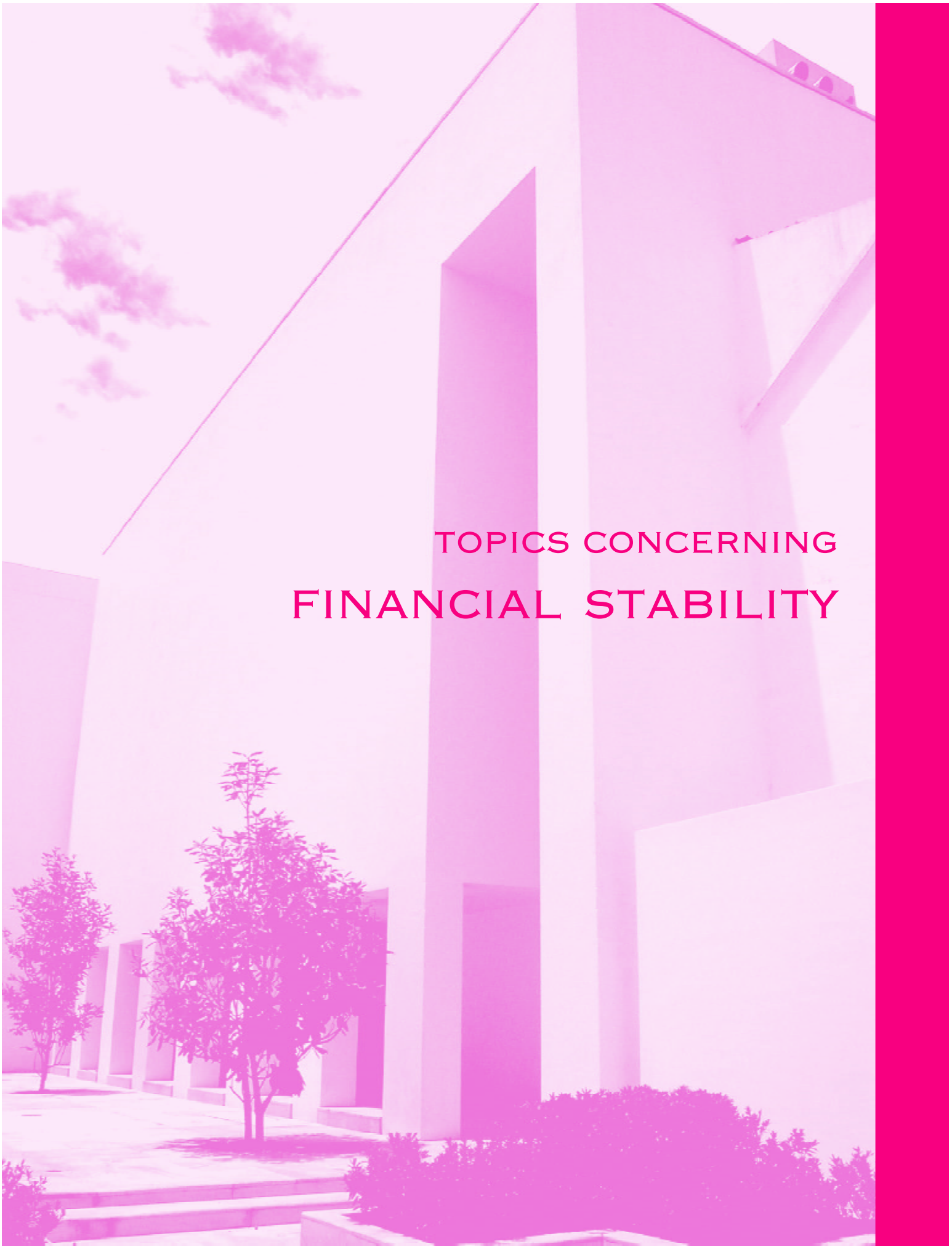
Source: Superintendency of Financial Affairs. Calculations by Banco de la República.

To examine the impact of a major deposit withdrawal, we modified the numerator of the RUL adding the drop in deposits. A breakdown of the most important monthly reductions experienced by the commercial and mortgage banks during 1998-1999 was examined to determine what constitutes an extreme withdrawal. The selected shock was a 12% reduction in deposits, which is the simple average of the worst drop experienced by each of these intermediaries during the period in question.

The results of the exercise (Graph 44) offer at least two interesting conclusions. First of all, without simulating an extreme situation, these financial intermediaries exhibit important differences in their liquidity management. Although the RUL averaged -26.5% in October 2005, one intermediary's ratio was close to -100% and other had ratios near zero. Secondly, when facing withdrawals such as those simulated, the indicator was positive for five of the 18 intermediaries in question, being no more than 4.7%, on average. In other words, in the event of withdrawals equivalent to 12% of their deposits, these intermediaries would have to liquidate an average of 4.7% of their illiquid assets.

In conclusion, at the aggregate level, the financial system is managing its liquidity adequately, well above the levels observed during the crisis. At a disaggregated level, both commercial and mortgage banks would be able to absorb sizeable deposit withdrawals. As to the intermediaries that might have to deal with illiquidity situations, the related cost would be no problem[54]. An event such as the one simulated is extremely unlikely, due to the soundness of the financial system in recent years, which means depositors are not likely to run off.

[54] As mentioned earlier, in a stress situation, this group of entities would liquidate nearly 5% of its illiquid assets, on average. This is a relatively small share of the total portfolio. If these entities were able to liquidate this portfolio at the prices registered in late October 2005, the cost clearly would be no problem. However, the cost could be larger than estimated if this 5% is liquidated only at reduced prices. Also, this liquidation may cause in imbalances in the value of the portfolio of other entities. These costs are not considered in the analysis presented herein.



TOPICS CONCERNING

FINANCIAL STABILITY

Assessing Credit Risk in the Colombian Financial System

Carlos Andrés Amaya G. *

Introduction

The recurrent financial crises in the developed and developing economies during the last two decades show how costly these events can be[1]. They also underscore the importance of financial stability as an economic policy consideration. Among the authorities responsible for overseeing financial stability, central banks play an extremely important role, one that is gaining ground among monetary authorities, since most economies have made important progress towards reducing inflation.

According to Large (2005)[2] , there are at least three things central banks must do to encourage financial stability. They first must assess the threats to the financial system. Secondly, they must monitor stability of the payment system and take actions to reduce any risk on this front. Finally, as lenders of last resort, they must be able to inject liquidity, even in times of crisis.

Stress test exercises have become a fundamental tool for evaluating the soundness of the financial system and the threats it faces. They involve a number of ways and means to assess the financial system's vulnerability to exceptional but plausible shocks. The use of these exercises is now common practice within financial institutions and in multilateral organizations, supervisory bodies, central banks and private financial institutions[3].

The purpose of this article is to determine, based on exercises of this type, how sound the Colombian financial system is in the face of credit risks that could

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* With the help of Inés P. Orozco and Nancy E. Zamudio in developing the commercial-loan exercise and the valuable assistance of Diego Vásquez with respect to all the econometric exercises. The opinions expressed herein imply no commitment on the part of Banco de la República or its Board of Directors. The suggestions made by Fernando Pineda and the comments by José M. Matus, David Salamanca, José L. Torres and Hernando Vargas are greatly appreciated. This is a work in progress and any comments and/or suggestions are welcomed. camayago@banrep.gov.co

1 For example, the fiscal cost alone for a sample of 40 countries was estimated by Honohan and Klingebiel (2000) at 12.8% of GDP, on average.

2 Large (2005) bases his discussion on the Bank of England case.

3 The financial sector assessment programs (FSAPs) of the IMF, Bank of England, Central Bank of Chile and others are an example.

materialize. Although, in the short term, the major threats to the country's financial system come from the market risks associated with the domestic public debt[4], the last crisis was generated largely by an increase in credit risk. This is the reason for examining the financial system's current stability in the event of macroeconomic changes that could affect debtors' ability to pay (i.e. households and corporations).

The present article includes three sections, in addition to this introduction. As a prelude to the stress test exercises, the second section explains the spirit behind them. The third proposes several statistical models to assess just how sound the Colombian financial system is in terms of dealing with eventual macroeconomic shocks. The last section discusses the weaknesses of the exercises and concludes.

1. What Do Stress Test Exercises Entail?

Because stress test exercises are a fundamental tool for assessing financial stability, their nature is examined in detail in this section, as well is the difficulties that arise when developing exercises of this type, with a particular emphasis on credit risk[5]. The exercises simulate hypothetical crisis scenarios in an attempt to determine if the financial system would be able to resist these events were they to occur. Unlike the so-called early warning models, these exercises do not assign a likelihood of occurrence to such events.

A. What should they involve?

Stress testing exercises have four basis phases. The scope of the exercise should be designed in the first phase and the macroeconomic scenario under stress, in the second. The impact of the stress on the system's stability should be assessed in the third phase and the possible feedback effects, in the fourth. The details of these phases are discussed below.

In an exercise of this type, the first step is to define its scope. Doing so implies defining the set of relevant financial institutions and how they will be approached. For example, some studies focus exclusively on banks, occasionally only the largest. It also is necessary to decide on the type of financial assets to be examined. Many studies concentrate solely on the banking book, particularly consumer, commercial and interbank credit.

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[4] See the July 2005 Financial Stability Report.

[5] This section closely follows Bunn et al. (2005) and Sorge (2004).

The second step is to design the stressed macroeconomic scenario, based on one or more shocks. Considering the type of risk being analyzed (credit risk in this case), it is essential to identify the risk factor(s) to be taken into account, the parameters under stress (e.g. prices, volatility, correlations) and the time horizon. A properly constructed macroeconomic scenario will take into account the correlation existing among the different variables[6]. However, many analyses include sensitivity exercises that examine the effect of an extreme change in a particular variable, without considering its impact on the others.

Selecting the size of the shock is crucial to the design of the scenario. Shocks that are too small or too large can deprive the exercise of its validity. In any case, the exercise should be extreme but plausible. Generally speaking, there are four different methods for deciding on the size of the shock. The first consists of gauging or weighing the shocks against historical observations, so the one selected replicates an event in the past. The second, which involves probability, implies selecting a shock that is found in a high percentage of the variable's distribution (e.g. in 95% of the movement in interest rates on consumer loans). The third is based on hypothetical scenarios, which do not necessarily have a parallel in reality. Another approach is to answer the question: How big a shock is required to generate losses above a particular threshold?

In the third phase, the impact of the shocks on the system's stability should be quantified. This necessitates first taking a look at how the new macroeconomic environment affects debtor's balance sheet. Deteriorating economic conditions for debtors eventually lead to portfolio problems for financial institutions. It also is important to contemplate the impact on the balance sheets of these institutions, solely as a consequence of the change in the macroeconomic scenario. Once these two effects have been quantified, the impact on the health of the financial institutions should be assessed.

Taking into account the feedback effect also can enrich the analysis. For example, it permits a look at contagion on the interbank market or added deterioration in the macroeconomic panorama, as a result of how the agents respond (decline economic activity due to less credit supply). However, this is a particularly complicated aspect, given the difficulties that emerge when trying to model interaction between financial institutions fragility households and corporations.

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[6] 6 For example, the Bank of England uses the ones established in the Inflation Report as base scenarios.

B. Difficulties

Difficulties, both methodological and data-oriented, generally arise when conducting exercises of this type. For one thing, the events under consideration are fairly unlikely; that is, they are extraordinary and difficult to design or predict. The opposite is true in the case of price stability, where the central scenarios and not the tails of the distributions are considered. For example, in terms of traditional econometric modeling, which implies linear relations, this poses a problem. At times of crisis, these models cease to be a good approximation, because the size of the shocks makes nonlinearity an important element to consider. (See Bunn et al. (2005).

On the other hand, the lack of sufficiently time series long makes it difficult to arrive at statistical estimates of relations existing during the crisis periods. Not only is this a problem in the Colombian case; it occurs regularly at the international level. As an example, for the Colombian case, monthly bank balance-sheet information is available only as of 1990. For corporations, it is available on an annual basis only as of 1995. There is no adequate regularly information on households, which means we have only one observation of a crisi: that of the late nineties.

In addition, this analysis is made even more complex by the rapid and significant changes witnessed recently on the financial markets. The development of new instruments and new practices, coupled with the advent of new participants in this market, have made it more difficult to examine.

II. Exercises

The exercises were done to assess the ability of commercial and mortgage banks to withstand macroeconomic shocks that heighten credit risk[7] . For this purpose, models to explain portfolio quality, which is understood as the post due loans/total loans portfolio ratio, were estimated for consumer, mortgage and commercial credit. The nature of the macroeconomic shocks in question is historical. We assume they are independent, even when all the variables in certain statistical models are endogenous (i.e. the multivariate error-correction models). Impairment in financial activity

[7] We examined these institutions because they are the most important intermediaries in the Colombian financial system. The sample includes 21.

because of changes in the macroeconomic situation is not taken into account, nor do the exercises have feedback effects.

In terms of consumer and mortgage credit, the household analysis is problematic because balance sheets do not exist. Hence, it difficult to trace the effect shocks to macroeconomic variables have on household finances. As a result, the impact changes in the variables have on the post due loans/ total loans portfolio ratio is analyzed directly. The contrary occurs with corporations, where balance-sheet information is available and, therefore, it is possible to analyze how changes in macroeconomic variables affect corporate balance sheets.

A. Statistical Models

1. The Household Portfolio

Due to the lack of household account balances, one must look directly at the relationship between macroeconomic variables and the portfolio quality indicator. However, in most cases, the use of macroeconomic data is characterized by probability distributions that change over time. This is known as non-stationarity, As a result, some studies, such as one by Delgado and Saurina (2004), use time series techniques to analyze these relationships. This particular work uses cointegration techniques along the lines of Johansen (1988) and Johansen and Joselius (1990). It is important to point out, as Hoggart, Soransen and Zicchino (2005), that these models imply the stress tests are conditional to the historic correlation of the variables. This approach also allows for identifying possible feedback effects, such as those mentioned in the previous section.

2. Consumer Credit

It is to be expected that a decline in economic activity and higher interest rates will bring on increase post due loans, insofar as households' income decline and assume more of a financial burden. Taking this factor into account, a VEC model was estimated for the credit quality indicator, the GDP and the reference interest rate (DTF)[8] . The exercise covers the period from January 1994 to March 2005[9] .

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[8] 8The estimated model also contains centered seasonal dummies and dummies for different episodes. In the long-term relationship, it has a constant and a tendency; there is only a constant (cdrift) in the short-term relationship. The GDP in logarithms is used.

[9] GDP was adjusted monthly, pursuant to the method proposed by Feibes and Lisman (1967) and Denton (1971). See the attachment.

TABLE 1

ADDITIONAL PAST DUE CONSUMER LOAN
(PERCENTAGE)

Period	Shock 1 1/	Shock 2 2/	Shock 3 3/
6 months	3.4	4.4	7.8
12 months	6.4	5.9	12.2

1/ 450 bp increase in the DTF.
2/ 6.8% drop in GDP.
3/ 1 and 2.
Source: The author's calculations.

In the estimated model, all the variables are part of the cointegration variable; they are not stationary and none is weak exogenous. The residues are normal and show no autocorrelation. The trace test, corrected by a small sample as suggested by to Cheung and Lai (1993), produced only one cointegration vector to corroborate the previous intuition (i.e. correct signs).

Because all the variables in the cointegration analysis are endogenous, the system's response to changes in some of them has to be examined by looking at the impulse response functions (See Lutkepohl, 1993)[10].

The following scenarios were considered to determine how the portfolio quality indicator is affected by different shocks to macroeconomic variables: 1) an increase of 450 basis points (bp) in the DTF, similar to what occurred between May and June 1998; 2) a drop of 6.8% in GDP, as observed in the second half of 1999; and 3) a combination of both these scenarios. The results are shown in Table 1.

3. Mortgage Credit

Recent changes in the mortgage market make it difficult to design econometric models for the latest trend in the mortgage portfolio. First of all, the market has shrunk considerably. At December 1998, the mortgage portfolio accounted for 10.9% of GDP, as opposed to only 2.6% at December 2004. Secondly, in the wake of the crisis, the credit indexing system no longer depends on market rates (e.g. DTF) and is now a function of inflation. Finally, mortgage-portfolio securitization processes are now regulated by law and have had a major impact on the financing system.

In spite of these problems, a VEC model was estimated for the period from January 1994 to December 2004. The following variables were used: GDP, the DNP housing price index and the quality index for the mortgage loans. Decline in economic activity and lower housing prices, which increase loan to value, should undermine the quality of the mortgage portfolio[11]. Centered seasonal dummies were included, as were control dummies for portfolio securitization.

[10] In an exercise of this type, although the shock occurs in just one time period, it lasts (with I (1) as the variable) and, because of the endogenous nature of the system, affects all the other variables in the model. This is important to bear in mind.

[11] See Amaya and Martínez (2005).

The trace test, corrected by Cheung and Lai (1993), produced two cointegration vectors; only one of which showed adequate signs. Impulse response functions were calculated to quantify growth in the post due loans as a result of the slowdown in economic activities and lower housing price. We assumed a drop equal to the decline in consumer credit use for GDP and an 8% drop for housing prices, which is equivalent to the average decline for both consumer credit and housing prices during 1996-2000. Table 2 contains the results.

TABLE 2

ADDITIONAL OVERDUE MORTGAGE PORTFOLIO
(PERCENTAGE)

Period	Shock 1 1/	Shock 2 2/	Shock 3 3/
6 months	3.27	4.27	7.53
12 months	8.58	7.26	15.84

1/ Drop in the housing prices index (8%).
2/ 6.8% drop in GDP.
3/ 1 and 2.
Source: The author's calculations.

4. *Corporate Portfolio*

The Securities, Corporate and Banking Superintendencies provided the data used in this exercise. The sample includes 14 major economic sectors during the period from 1998 to 2004. A two-stage procedure was conducted to gauge the increase in the post due loans as a result of changes in macroeconomic conditions. The effect of macroeconomic shocks on the income statement of the corporations in the sample was analyzed in the first stage to determine profits after the shocks[12]. For example, a drop in sales immediately means less operating income. This spells a change in profits, which affects corporate profitability. A panel data model was estimated at the same time, with the indicator of portfolio quality as the dependent variable and asset profitability return on asset as the independent variable. Deterioration in the commercial portfolio was calculated with the new profitability and the estimates from the model.

The statistical tests produced a random-effects model where the intercept and slopes vary by individual[13]. The following was the resulting model:

$$(1) \qquad Y_{i,t} = \sum_{k=1}^{K} b_{k,i} X_{k,i,t} + e_{k,i,t}$$

As shown in Table 3, the quality of the commercial portfolio is inversely related to corporate profitability. Agriculture, livestock, hunting/forestry and construction were the sectors most sensitive to changes in profitability (hence, their portfolio quality also would be affected the most). The least sensitive sectors were education and real estate, business and rental activities.

[12] The selected shocks include a 450 bp increase in interest rates and a 9% drop in sales, as occurred during the crisis, plus a combination of the two.

[13] The Hausman test identified the model as one of random effects. The Swamy test then determined that the slopes varied among individuals.

An additional exercise was done to consider tradables and nontradables corporations separately. In the case of the tradables producers, the statistical tests determined that a random-effects model was required, in which the intecept varied among individuals, but not the slopes. A random-effects model with an intercept and slopes that varied among individuals was estimated for the nontradables producers. Table 4 shows the 2004 values of the variables included in the panel and the coefficients estimated by group.

B. Financial Institutions Soundness

The foregoing models determine the additional percentage of the post due loans that would result from the macroeconomic shocks. However, it also is important

TABLE 3

COMMERCIAL PORTFOLIO BY ECONOMIC SECTORS

Sector	Percentage of		Profitability	Constr.	$\hat{b}$
	Portfolio	Overdue Portfolio			
Agriculture	3.90	12.80	1.30	0.41	(9.29)
Fishing	0.10	2.80	(2.30)	0.16	0.79
Mines	1.70	3.90	31.40	0.36	(1.27)
Industry	37.30	7.20	4.80	0.27	(1.58)
Electricity	6.70	8.40	6.30	0.08	0.29
Construction	5.90	16.70	4.20	0.44	(3.25)
Commerce	19.10	5.60	6.10	0.22	(2.51)
Hotels and Restaurants	0.50	36.00	1.60	0.38	(3.19)
Transport and Communications	5.90	10.50	1.10	0.19	(1.12)
Financial Intermediation	6.20	6.80	3.70	0.14	(1.10)
Real Estate Agencies	6.40	2.10	0.70	0.21	(0.40)
Education	1.10	3.10	1.50	0.12	(0.65)
Health	1.50	12.10	8.00	0.35	(1.19)
Others	3.70	5.90	2.20	0.25	(3.80)
Total	100.00	7.70	5.10	0.25	(1.59)

Source: Orozco y Zamudio.

TABLE 4

COMMERCIAL PORTFOLIO: TRADABLES AND NONTRADABLES SECTORS

Sector	Percentage of		Rentabilidad	Const,	$\hat{b}$
	Portfolio	Overdue Portfolio			
Tradables	42.5	7.61	7.56	0.27	-0.978
Nontradables	57.5	7.72	3.16	0.25	1.593

Source: Orozco y Zamudio.

to see how these shocks affect the soundness of the financial institutions in question. To do so, the losses generated by these shocks as a portion of profits and the impact this would have on the capital adequacy ratio (CAR) were quantified in the exercises.

It is assumed the post due loans affects the balance sheets of banks in two ways. First, banks must register an additional expense for provisions on their income statement, due to deterioration in the portfolio. As done by IMF (2005), we assume 45% of the losses. Secondly, the post due loans do not generate any interest income. To determine this cost, the implicit lending rates, constructed as income from interest on the performing loan, are calculated for each type of loan, as is the income that is no longer perceived. It is assumed the loan stops earning interest (i.e. becomes non-performing) the moment it falls due. Both these effects influence profits, as well as the solvency ratio, through technical equity.

Table 5 shows how the selected macroeconomic shocks impact the financial institutions as a whole, per type of loan and shock. In this case, the cost of the shock was calculated as a portion of the profits. Both the loan portfolio and the profits of these financial institutions at October 2005, for a 12-month period, are used in the exercise. However, this leads us to underestimate the outcome, since adverse economic shocks should reduce the extent of profits.

At an aggregate level, the results suggest the financial system would be able to resist heavy price or output shocks. However, if a situation similar to the crisis in the late nineties were to occur with simultaneous shocks, the financial system as a whole could not cover these obligations, at least with profits as they now stand.

Tables 6 and 7 offer a breakdown of the results. The number of banks where the cost of the shock would exceed profits is shown in Table 6. Table 7 lists the number of banks whose CAR would fall below the minimum (9%) and the total impact of the shock on the CAR of the banks as a whole. It should be noted that the sum of the banks, per type of portfolio, is not equal to the total. This is because the cost of the shock might be moderate for an

TABLE 5

COST AS A PERCENTAGE OF PROFITS
(12 MONTHS)

	Shock 1	Shock 2	Shock 3
Commercial	4	53	55
Consumer	18	24	36
Mortgage	12	11	19
Total	34	88	111

Source: Author's calculations.

TABLE 6

NÚMERO DE BANCOS CUYOS COSTOS SERÍAN MAYORES A LAS UTILIDADES
(12 MESES)

	Shock 1	Shock 2	Shock 3
Commercial	1	7	7
Consumer	1	1	3
Mortgage	0	0	1
Total	2	10	15

Source: Author's calculations.

TABLE 7

NÚMERO DE BANCOS CUYA RELACIÓN DE SOLVENCIA CAERÍA POR DEBAJO DEL MÍNIMO
(12 MESES)

	Shock 1	Shock 2	Shock 3
Commercial	0	4	5
Consumer	4	4	6
Mortgage	0	0	1
Total	5	8	12
Relación de solvencia (%)	11.8	9.8	8.9

Source: Author's calculations.

institution, depending on the type of portfolio. However, the sum of the costs for each type of portfolio could exceed the reported profit level or be enough to lower the CAR considerably.

As the tables indicate, if the country were to face another situation similar to the crisis in the late nineties, most banks would be in trouble. Shocks to economic activity are particularly relevant, as they are for the entire system. In terms of profits, it would be enough to cause losses for 10 intermediaries and to place the CAR at 9.77%. A combination of shocks to prices (i.e. interest rates and housing prices) and economic activity would spell losses for 15 institutions and place the capital adequacy ratio (CAR) below the mandatory minimum.

It is important to remember that the exercises presented in this article examine only credit risk. None of the other risks (e.g. market and liquidity risks) are considered. These surely would increase in unstable environment as the assured above. Generally speaking, the results denote fragility among the financial institutions when it comes to dealing with historically large macroeconomic shocks. Despite record-high profit levels, a CAR well above the minimum and extremely low credit-risk levels, drastic changes in macroeconomic conditions could significantly affect the financial system's stability.

III. Constraints And Conclusions

Although these exercises are far from a complete analysis of the financial system's vulnerability to credit risk, they do offer an initial frame of reference. Despite very high profits and a comfortable capital adequacy ratio (CAR) in the financial system, these exercises show that macroeconomic shocks similar to the ones observed during the last crisis, particularly in economic activity, would create serious stability problems for the system. These findings underscore the importance of moving forward with regulations on credit risk and anti-cyclical provisions.

In terms of stress-testing techniques to help assess the soundness of financial institutions, much remains to be done, even internationally. The exercises conducted for this article have certain weaknesses that are important to point out for the sake of progress towards more sophisticated and comprehensive procedures. To begin with, the relationship between exogenous shocks to the economy and the balance for the agents in the sample needs to be improved (mapping). This implies adequately designing the channels through which movement in the macroeconomic variables affects the soundness of debtors and credit institutions alike, and the relationship between them. Part of the problem in this respect is the lack of data, particularly on households. Having this data would enable us to broaden the analysis to include other types of risk. Secondly, it is important to

understand how shocks correlate to one another. For example, we need to understand how interest rate hikes by the central bank can affect output, the interest on government bonds, the exchange rate, etc. This would help to create consistent macroeconomic scenarios. Because they assume independence among the variables, the present exercises may be somewhat biased.

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Econometric Appendix

The monthly GDP derivation based on the quarterly GDP follows the method proposed by Boot et al. (1967) and Denton (1971). The problem, as Denton illustrates, is a specific case where an attempt is made to adapt a high frequency series, from a particular source, to another that is less frequent and originates with a different source.

The problem in adjusting an original low-frequency series to one with a high-frequency can be resolved with a method that somehow minimizes the distortion of the original series and satisfies the condition which stipulates that the sum of the monthly values must be equal to the quarterly total. For example, in the case of GDP, the sum of the monthly GDP estimated during a quarter should be equal to the quarterly figure reported by DANE.

One possible consideration would be to minimize the sum of the differences between the successive months, with the restriction that, for each quarter, the sum of the months should be equal to that of the quarter.

Formally speaking, if we have n years, we want to choose the x_i that minimizes the following expression:

$$(2) \quad \min \sum_{i=2}^{12n} (x_i - x_{i-1})^2 \quad \text{s.a.}$$

$$(3) \quad \sum_{i=12k-11}^{12k} x_i = t_k \; (k = 1, 2, \ldots, n)$$

Here, x_i represents the monthly observation and tk, the total for quarter k.

As is traditional, the problem is resolved by using the lagrangian function and derivation with respect to x_i y and λ_k. The x_i are the monthly values that solve the problem and satisfy the following first-order condition:

$$(4) \quad \begin{pmatrix} B & -J' \\ J & 0 \end{pmatrix} \begin{pmatrix} x \\ \lambda \end{pmatrix} = \begin{pmatrix} 0 \\ t \end{pmatrix}$$

Here, x is the vector of $12n$ elements, λ is the vector of n lagrangians, t is the vector of n total quarters and 0 is a zero matrix of dimension $n \times n$.

The J matrix, of dimension $n \times 12n$, for $n = 2$, is provided by:

$$(5) \quad J = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{pmatrix}$$

Credit Risk: A Company Account-Based Analysis

Juan Pablo Arango
Nancy Zamudio
Inés Orozco·

Introduction

Bankruptcy is a threat to financial stability, if a company fails to meet its financial obligations. Obviously, the risk to financial stability increases with the number of liquidated corporations and the size of the debt each has acquired. Moreover, in a scenario characterized by a significant number of liquidations, other corporations might experience financial difficulties that place additional pressure on the financial system. In these circumstances, there are obvious systemic risks that can lead to financial crisis and its usual consequences.

The extent of the potential risk to financial stability that comes from business failure depends on the likelihood of bankruptcy and the size of the debt at potential risk of default. This paper pretends to assess the various aggregate risks to financial stability. It uses company account data to construct a model for gauging the risks to financial stability posed by the corporate sector in Colombia. The objective is to analyze risks at the company level and their distribution.

Although some studies have been done on the reasons for insolvency in the Colombian corporate sector (Martínez, 2003), the findings of these works are clearly limited because of the time horizon, which rules out the possibility of including the impact of macroeconomic variables.

This article overcomes the difficulties found in previous works with respect to methodology and the data used to estimate the likelihood of bankruptcy. The exercise is based on a probit model for panel data (unbalanced). The panel includes an average of 8,481 corporations during the 1995-2004 period, with

· The authors work for the Financial Stability Department of the Monetary and Reserves Division at Banco de la República. The opinions expressed herein are their own and imply no commitment on the part of Banco de la República or its Board of Governors. Diego Vásquez's comments and technical support were much appreciated.

annual intervals. Specific variables of the corporations and the sectors were included in the panel, which was controlled, in turn, by macroeconomic variables.

Our study concentrates on the determinants of business failure. However, its primary objective is to construct a model to estimate the likelihood of a company going bankrupt, as a good way to assess the risks to financial stability. The findings are not substantially different from those of other international studies concerning the reasons why businesses fail (Bunn and Redwood, 2003 and Lennox, 1999).

Profitability and size appear to have a negative effect on the likelihood of bankruptcy, while the effect of financial leverage is positive. Also, the fact that a firm has foreign capital was found to have an additional impact. Ultimately, the results showed a negative relationship between the likelihood of corporate bankruptcy and improved macroeconomic conditions, even subsequent to control for individual characteristics at the company level.

In this study, we used estimates of the likelihood of bankruptcy to understand the distribution and concentration of the debt at risk of default. The goal was to identify where the risks are greatest. According to the findings, the debt at risk of default is concentrated in a relatively small number of corporations. However, they are not necessarily those with the highest likelihood of bankruptcy. This concentration underscores the importance of carefully monitoring firms with the highest risk of default. On the other hand, businesses that are most likely to fail are generally small and, as a result, carry no large debts on their books.

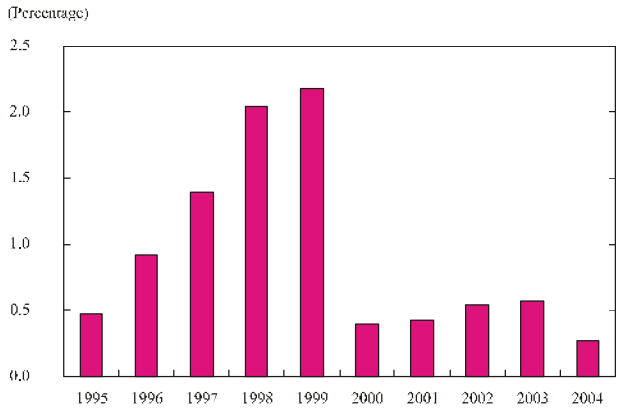
I. Stylized Facts

The crisis in Colombia at the end of the nineties was characterized, among many factors, by heavy corporate borrowing and reduced output. As a result, company balance sheets in the real sector showed a loss of income and profits. This slump during and after the crisis, coupled with the loss of access to credit markets, forced many corporations to liquidate. As illustrated in Graph 1, the number of business that failed during the period prior to the crisis rose sharply as of 1997. This may have sounded the alarm several years before the recession.

Law 550 was passed in December 1999 to respond to the crisis and to help businesses recover. It reduced

Graph 1

Liquidated Corporations



Source: Superintendency of Corporations.

the number of liquidated corporations considerably, largely because of the advantages that come with adhering to restructuring agreements of this type and to the terms that can be reached with creditors to pay off debts[1]. It should be noted that 2004, the final year of the period in question, saw the lowest percentage of liquidated corporations: just 25 (0.3%) of the 9,394 firms included in the exercises on debt at risk of default.

During each year of the 1995-2004 period, the liquidated corporations faced a very different situation than those that survived. The return on assets remained at around 3.5% for the corporations that survived, but was negative for those that did not[2] (Graph 2).

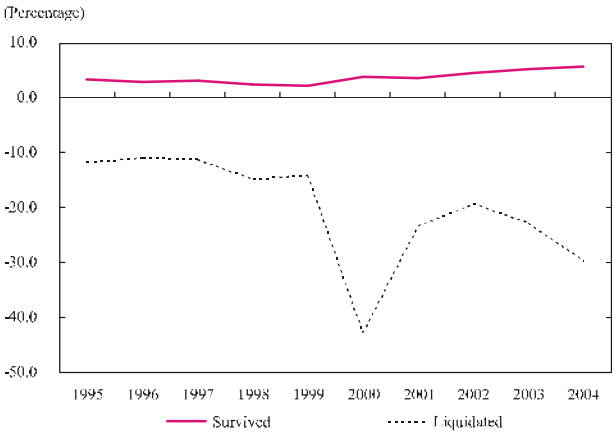
The failed businesses had less liquidity than the survivors. This is consistent with the idea that liquidated corporations experienced a major increase in liabilities, probably short-term. As a result, liquidity was reduced to 75%, on average, for the liquidated corporations, as opposed to 135% for the corporations that stayed in business.

Because of the sharp rise in corporate obligations to the financial system, coupled with a shortfall in cash flow, the failed businesses stopped paying their debts. This forced them into agreements with creditors to avoid bankruptcy and, after the crisis, into rescheduling agreements consistent with Law 550. However, many of these firms did not survive and were forced, by law, to liquidate. As shown in Graph 3, the indebtedness indicators (debt/equity ratios) of the liquidated corporations averaged 51% for the entire period; the highest ratio was in 2000 (170%).

This increase in borrowing by corporations that eventually failed can be explained by the growth in the domestic debt. When separating the domestic debt from the external debt, we found the debt to foreign lenders accounted for 7.4% of the assets of these businesses. The domestic debt accounted for a much higher proportion: over 100% in 2000 and nearly 80% in 2004.

GRAPH 2

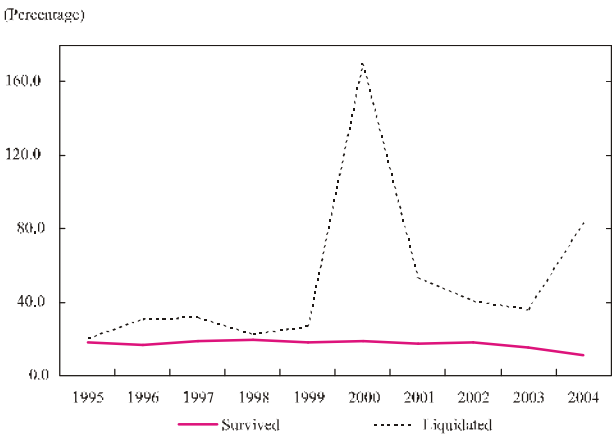
RETURN ON ASSETS



Source: The Superintendency of Corporations and Securities Superintendency.

GRAPH 3

INDEBTEDNESS



Source: The Superintendency of Corporations and the Securities Superintendency.

[1] Gómez and Zamudio (2004).

[2] The indicators for the liquidated corporations pertain to the data on corporations that went bankrupt each year.

In short, the situation facing the corporations that liquidated was one of high indebtedness and negative profitability. A look at the way the indebtedness indicator is distributed confirms this. On average, 23% of the corporations were not in debt and 39% had an indebtedness indicator somewhere between 5% and 30%. According to the distribution of return on assets, 35% of the corporations in Colombia showed a negative profit, on average, and 23% registered profitability in excess of 10%.

II. Data and Methodology

The empirical model selected for this study closely follows Bunn and Redwood (2003). The available information [3] constitutes a unbalanced panel for a ten-year period with 16,301 individuals. The information is annual. To calculate the likelihood of business failure, a probit model with random effects was estimated for the panel data. Specific variables for corporations and sectors were included, as were macroeconomic variables.

Profitability was one of the microeconomic variables monitored, assuming the lesser the profitability the greater on the likelihood of corporate bankruptcy. Indebtedness, liquidity and foreign investment indicators were included as well.[4] To capture the possible effect of belonging to a particular sector of the economy, dummy variables were constructed for each of the leading sectors, and real annual GDP growth was used as an indicator of economic activity.

The following is the estimated model:

$$Liquidation_{it} = f\,(Company\ var_{it}, dummy\ sector_{i}, \Delta GDP_{t})$$

Here, $Liquidation_{it}$ is a dummy variable equal to 1, if company *i* was liquidated during period *t*. The $Company\ var_{it}$ include the microeconomic variables described earlier, which are specific to each company during each time period. The dummy sector is a set of dummy variables equal to 1, if company *i* belongs to sector *j*, and 0 if otherwise.

III. The Results

Table 1 contains the result of the estimate. As expected, the corporations with negative profitability indicators, as opposed to indicators above 10%, have a positive coefficient. This denotes a greater likelihood of expected bankruptcy.

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[3] The data used in this study coincide with what the corporations reported to the Superintendencies of Corporations and Securities.

[4] See Attachment A for details on the variables used in this study.

The dummy profitability coefficient (between 0% and 10%) also is positive. Both coefficients are significant.

According to the indebtedness indicators (debt/equity ratios), the higher the domestic and external debt, the greater the likelihood that corporations will go bankrupt. However, the coefficient of the external borrowing variable is not significant. Also included in the estimate is an interaction variable that captures the effect of negative profitability and indebtedness over 20%. This interaction term is positive and significant.

The liquidity indicator is not statistically different from zero, nor is it significant. This is due primarily to its stability for most of the corporations during the period in question. Therefore, it is not considered a fundamental determinant in their liquidation. Although this indicator for the liquidated corporations was well below what it was for the survivors, its decline was not considerable.

The size indicator coefficient also met our expectations and is significant. It shows the largest corporations are less likely to go bankrupt than the smallest.

TABLE 1

PROBIT WITH RANDOM EFFECTS

Liquidation	Coefficient	Standard Error
D Profitability 1	**0.556** ***	0.06031
D Profitability 4	**0.137** **	0.06149
Domestic indebtedness/assets	**0.035** ***	0.01292
External indebtedness/assets	0.056	0.04407
D Profitability and indebtedness	**0.437** ***	0.03642
Liquidity	0.000	0.00000
Size	**-0.081** ***	0.00740
D Foreign investment	-0.069	0.04979
D Profitability and foreign investment	**-0.195** *	0.10736
D Agriculture	**-0.213** ***	0.06064
D Mining	0.065	0.11286
D Construction	-0.038	0.04862
D Commerce	0.004	0.04027
D Services	**-0.252** ***	0.04665
D Transport and communication	**-0.314** ***	0.08728
Δ GDP	**-0.063** ***	0.00477
Constant	**-1.472** ***	0.12837
Observations	84808	
Individuals	16301	
Log likelihood	-3829.2285	
Wald chi2(16)	1048.49	
Prob > chi2	0	
lnsig2u	-14	
Sigma_u	0.0009119	

* 90% significant
** 95% significant
*** 99% significant
Source: Calculations done by the authors.

Two variables were included to determine the effect that foreign investment has on a company. One was a dummy variable equal to 1, if more than 10% of company *i* is comprised of foreign capital[5] and 0 if not. The other was an interaction term that correlates two factors: negative profitability and being a foreign branch. The first variable shows the expected indicator, but is not significant. The interaction term is significant and shows the combination of negative profitability (which would imply greater estimated likelihood of bankruptcy) and being a branch (less estimated likelihood of bankruptcy) translates into less likelihood of bankruptcy. This suggests that head offices support their branches when they are in trouble.

Mining and commerce are the only major economic sectors where the likelihood of business failure is greater compared to corporations in the industrial sector. However, the coefficients for these variables are not statistically significant. On the other hand, the expected likelihood of bankruptcy is less for corporations in the agricultural, service and transportation, and communication sectors than for corporations in the industrial sector. The sample of corporations used in this study is biased towards the industrial sector; during the period in question, it accounted for 26% of the total corporations, on average.

Finally, the indicator of economic activity shows the likelihood of expected bankruptcy is less when economic conditions are better.

IV. Domestic Debt at Risk and Implications for Financial Stability

The purpose of this exercise is to determine the credit risk to the financial system posed by the commercial portfolio. The idea is to calculate the domestic debt at risk in the private corporate sector as a proxy for the possible losses the system could face, given the likelihood of company bankruptcy and assuming that none of the portfolio is recovered.

A. Domestic Debt at Risk of Default

After using the exercise described in the previous section to estimate the likelihood of bankruptcy, the domestic debt at risk of default (DDR) was calculated for each year, by sector and size, for the total sample. The ex ante DDR 6 is calculated as:

$$DDR_t = \sum_{i=1}^{N} pq_i^* \; domestic\; debt_i,$$

[5] This percentage was determined pursuant to the international standard on balance of payments.

[6] The ex ante debt at risk is the potential loss to the financial system, given the likelihood of corpany bankruptcy and assuming the system recovers none of the portfoio.

Here, pq_i is the likelihood of bankruptcy predicted by the estimate for each company. The *domestic debt*$_i$ is each company's domestic debt.

The ex post DDR[7] is calculated in a similar way:

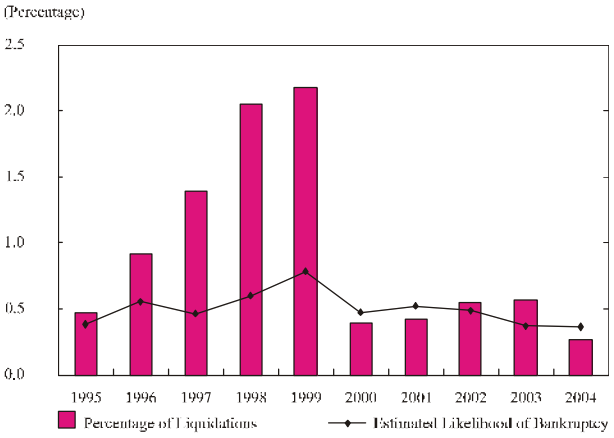
$$DDR\ ex\ post_i = \sum_{i=1}^{N} Liquidation_i^{*}\ domestic\ debt_i,$$

Here, $Liquidation_i$ is equal to 1, if company *i* went bankrupt in period *t*.

Our analysis included only the domestic debt at risk and not the external debt, as the former represents a direct danger to the financial system. Although corporations with foreign loans can pose a risk in the event of devaluation, they are not of interest to this exercise.

GRAPH 4

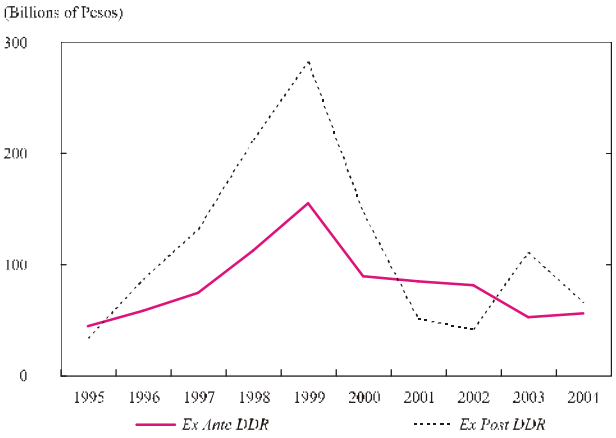
PERCENTAGE OF LIQUIDATED CORPORATIONS AND ESTIMATED LIKELIHOOD OF BANKRUPTCY



Source: Superintendency of Corporations. Calculations by Banco de la República.

GRAPH 5

EX ANTE AND EX POST DDR



Source: Calculations by Banco de la República.

B. The Results

A review of the corporations that actually went bankrupt during 1995-2004 shows the least number of liquidations occurred during the final year of that period. The most occurred during the crisis. Interestingly, the expansion in these liquidations began in 1997, two years before the recession (Graph 4).

The exercise shows the estimated likelihood of bankruptcy was lowest in 2004 and highest in 1999. The sectors with the lowest average likelihood of bankruptcy were transport/communications and services. Those with the highest likelihood were construction and mining. However, despite less likelihood of bankruptcy in the construction sector, it still had the highest indicator for the period analyzed.

Given the foregoing, the tendency in the ex ante DDR was similar to the tendency in the likelihood of bankruptcy (Graph 5). In 2004, the ex ante DDR for the corporations in total was equal to approximately 0.2%[8] of the commercial portfolio of the 5,000 largest private debtors[9].

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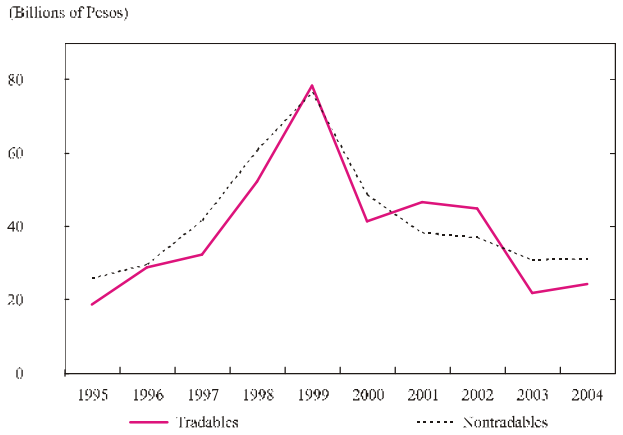
7 The ex post *debt is the loss actually incurred by the financial system if none of the portfolio is recovered.*

8 This is low compared to the percentage of commercial portfolio reserves, which was 3.8% at December 2004.

GRAPH 6

EX ANTE DDR FOR TRADABLES AND NONTRADABLES



Source: Calculations done by the authors.

TABLE 2

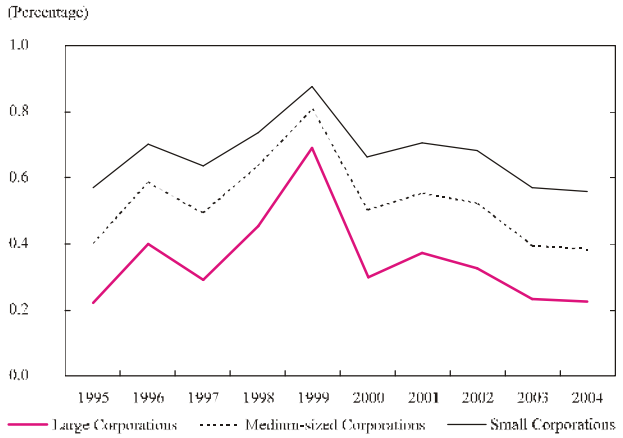
EX ANTE AND EX POST DDR AS A SHARE OF TOTAL DDR (PERCENTAGE)

2004	Ex Ante DDR	Ex Post DDR
Agriculture	5.74	3.75
Mining	1.78	0.00
Industry	36.34	12.02
Construction	12.19	2.16
Commerce	24.05	62.28
Services	16.81	16.72
Transport	3.10	3.07

Source: Calculations done by the authors.

GRAPH 7

ESTIMATED LIKELIHOOD ACCORDING TO SIZE



Source: Calculations done by the authors.

When dividing the sample between producers of tradables and nontradables,[10] we found the ex ante DDR of both groups behaved similarly to that of the corporations as a whole (Graph 6). Throughout most of the period in question, the ex ante DDR of the nontradables producers exceeded that of the corporations producing tradables, except in 2001-2002. This is because producers of tradables had a much larger domestic debt in those years, mainly due to increased borrowing by the mining sector. In the other years, the domestic debt is similar, but the likelihood of bankruptcy among corporations producing nontradables is greater.

Table 2 contains a breakdown of the ex ante DDR according to the major economic sectors. In 2004, the industrial sector accounted for the largest share of total DDR, while the mining and transport sectors had the smallest. As to the ex post DDR, the largest share pertained to the commercial sector, followed by the industrial sectors. The mining sector accounted for the smallest proportion, which was equal to zero.

When dividing the sample by size[11] we found the greatest likelihood of bankruptcy during the entire period was concentrated among the small corporations. It was the large corporations that showed the least likelihood of bankruptcy (Graph 7).

However, the large corporations account for 65% of the total DDR, as their indebtedness indicators (debt/equity ratios) are the highest. Because of their low indebtedness levels (debt/equity ratios), the small corporations have the least DDR, even though their estimated likelihood of bankruptcy is greater (Graph 8). This concentration underscores the importance of closely monitoring corporations that have the highest DDR levels. They pose the greatest risk to the

9 At December 2004, the commercial portfolio of the 5,000 largest debtors accounted for 72% of this portfolio as a whole.

10 This is the same classification used in the current edition of the Financial Stability Report, *specifically in the section on the private corporate sector*.

11 The sample was divided as follows: large (the 20% with the most sales), small (the 20% with the least sales) and medium (the remaining 60%).

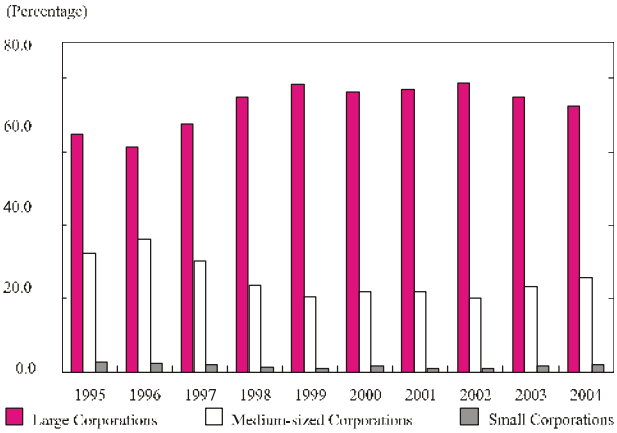
financial system in the event of shocks that could affect these firms in particular.

IV. Conclusions

Our study overcomes the difficulties encountered with previous works in terms of methodology and the set of data used to estimate the likelihood of business failure and its implications for financial stability. The large corporations account for the major share of the domestic debt at risk of default, while the small corporations, with their lower indebtedness levels (debt/equity ratios), are more likely to go bankrupt. Necessary efforts to monitor the private corporate sector can be targeted with this in mind.

Graph 8

DDR by Size as a Share of Total DDR



Source: Calculations done by the authors.

Today, the likelihood of business failure in the private corporate sector is close to the levels observed in 1995 (the lowest in the cycle). This fact, coupled with a better-quality commercial portfolio and less corporate borrowing from the financial system, means the credit risk posed by the commercial portfolio is not a latent threat to the stability of the financial system.

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Gómez, Esteban; Zamudio, Nacy (2004), "La importancia de la Ley 550 de 1999 en la reactivación de las empresas colombianas" (mimeo), Banco de la República,.

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Appendix

- Regression variable:
- *Profitability = Operational earnings/assets*
- *Size = Ln (Sales)*
- *Liquidity = Current assets/Current Liabilities*
- *Indebtedness = Financial liabilities /Assets*
- *Foreign investment = More than* 10% *foreign capital (only branches)*

Estimate of Capital Requirements According to Market Risk

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Mauricio Arias
Esteban Gómez
David Salamanca
Diego Vásquez*

Introduction

Entities and regulators alike are becoming more interested in measuring and the market risk (MR) associated with the trading book[1], given the growing share of investments comprising the financial system's assets. The Office of the Superintendencia Bancaria (Banking Superintendency)[2] in Colombia took an initial step in this direction in January 2002 when it set capital requirements based on MR. Nevertheless, this Law has come under fire lately, particularly concerning the suitability of the method used to measure and hedge exposure properly.

In this respect, the objective of the present article is to present the results of MR estimates based on alternative methods for comparing and evaluating the usefulness of current requirements. The calculations presented herein refer to the standard model proposed by the Basel Committee and to the value-at-risk (VaR) models included in both the historic simulation method and the variance and covariance-based technique (EWMA approach) proposed by RiskMetrics.

I. Methods For Calculating Value-At-Risk

The concept of value-at-risk plays a fundamental role in all the methods presented in this article, as well as in current regulation. This measure of risk is an attempt

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* Members of the Financial Stability, Operations and Market Development Departments and the Econometric Unit. The opinions expressed herein are solely those of the authors and imply no commitment on the part of Banco de la República or its Board of Directors.

1 The trading book is the portfolio of positions maintained by the bank to derive benefits from their short-term purchase and sale.

2 Now part of the Superintendencia Financiera.

to summarize, in a single number, the total exposure of an entity's portfolio to changes in market variables. Specifically, VaR is an estimate of loss that will not be exceeded, given a particular time horizon and confidence level. The main differences between the approaches outlined herein are rooted in the positions used, the market variables regarded as having an effect on portfolio value, the way shocks to these variables are calculated, and whether or not the correlations between the various risk factors are considered or omitted.

A. Data and Assumptions

For the following exercises, following the recommendations of the Basel Committee on Banking Supervision, the market risk associated with interest rate and stock holdings only take into account the trading book. On the other hand, those associated with the exchange rate include the total net position held in balance.

For the calculations in this paper, the trading book is comprised of the sum of negotiable investments, investments available for sale[3] and the repurchase rights on said investments. As to the stock positions, the aforementioned groups are taken into account only in the case of stock-market assets. Equity securities and those not listed on the stock market are not included.

Due to a lack of detailed information on the investment portfolio in securities issued by the private sector or by public entities other than the national government, the calculations presented herein only include positions in fixed-rate treasury bonds in pesos (TES) and TES UVR[4] . The same applies to interest rate options and derivatives (SWAPS and FRA). Hence, calculations do not include the capital charges applied to these positions in the trading book. The percentage of trading-book TES as a share of total TES in the financial system's portfolio is used to scale the actual capital requirement, since the information that is available does not allow for a breakdown between securities in the trading book and those in the banking book (investments to maturity).

Details on the features (residual maturity, coupon rate, etc.) of the securities comprising the financial system's portfolio were obtained from the Deposito Central de Valores (DCV). The spot curves used for their valuation are from the Bolsa de Valores de Colombia (BVC). Finally, net positions in dollars and stock come from the market-risk format currently submitted to the Banking Superintendency. In all the aforementioned cases, the positions refer to credit entities (commercial banks, commercial finance corporations and investment banks).

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[3] These positions are included because they are valued at market prices.

[4] These positions account for 66% of the total trading book.

The series used to calculate the shocks cover the period from April 19, 2003 to November 4, 2005, with a daily interval (working days only), and contemplate at least two extreme scenarios of major importance: April 2004 and March 2005[5]. The actual portfolio at November 4, 2005 is taken into account as well[6].

B. The Method Currently Used by the Superintendencia Bancaria de Colombia

As suggested in A Proposal for Modifying the SBC Method to Gauge Market Risk[7], the current method calculates this measurement on the expected maximum variation of the risk factor multiplied by its duration and by the net present value of the exposed amount.

$$VaR_i = \Delta Factor_i \, Dur_i \, PVMexposed_i$$

Where, VaR is the value-at-risk of the position exposed to factor i (individual VaR). Fifteen risk factors are used and the portfolio includes both the trading book and the banking book (even with respect to the factors related to interest rates and stock-market risk, in contrast to the Basel proposal).

Maximum variations are calculated for a period of 10 days and one year, depending on the classification of positions between negotiable investments (10 days), investments available for sale (one year) and to maturity (one year).

The VaR calculation is the sum of matrices of the individual VaR positions, taking into account the correlation matrix of the form:

$$VaR = \sqrt{V' \cdot \sum \cdot V}$$

Here, V is the vector of individual *VaR* positions and $\sum$ is the positive semi-defined correlation matrix of the risk factors. The capital requirements are shown in Table 1, based on the credit institutions' portfolio as of October 31 2005.

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5 In April 2004, the interest rates on TES maturing in January 2012, April 2012 and February 2009 rose by around 250 basis points, followed by another increase of approximately 100 bp in March 2005.

6 The foreign-currency and stock positions are those reported on October 31, 2005.

7 Superintendencia Bancaria (2005).

TABLE 1

CAPITAL REQUIREMENTS FOR MARKET RISK
CURRENT CBS METHOD
(BILLIONS OF PESOS) OCTOBER 2005

VaR by Risk Factor		Total VaR (*)	
DTF	-555	Capital Requirement	870.2
Repo	-0.3		
Interbank	0		
Real interest rate	46.6		
Libor	5.7		
Interest rate on consumer credit	289.4		
Money Market	-0.5		
TES	704.5		
RUV	339.1		
TCRM	7.2		
Euro	0.7		
Yen	-0.1		
IGBC	322.3		
FCO	14.1		
Dow Jones	-		

(*) Does not equal the sum of the individual factors, as these do not take correlations into account.
Source: Superintendencia Bancaria value-at-risk form.

C. The Standard Basel Method

The Committee on Banking Supervision included MR in the calculation of capital requirements to financial institutions with the 1996 amendment to the Capital Accord initially signed in 1988[8] . The suggested approach includes a standard model for the banking authority, as well as the possibility of institutions developing their own internal models, which would require prior approval from the banking authority.

The standard method proposes a module approach that includes four different types of MR which affect bank balance sheets: interest risk, stock market risk, exchange rate risk and commodities risk. The capital requirements calculated for the first three modules are listed in Table 2 and include only the portion pertaining to general risk[9] .

TABLE 2

CAPITAL REQUIREMENTS FOR MARKET RISK
THE BASEL METHOD
(BILLIONS OF PESOS) MAXIMUM SHOCK (100%)

04-Nov-05	Capital Requirement
Interest rate module	1,298
Exchange rate module	23
Stock market module	196
Total	1,516

Source: Calculations by the authors.

[8] Amendment to the Capital Accord to Incorporate Market Risk (1996). Several later modifications include Principles for the Management of Interest Rate Risk (1997) and Amendment to the Capital Accord to Incorporate Market Risk, Updated to April 1998 (1998), among others.

[9] The portion on specific risks was not included due to a lack of information on the securities issued by agents other than the national government. For the effects of the portfolio considered in this exercise, the specific risks are applicable only to the stock market module, as explained later. For the TES positions, the weight factor suggested by Basel is 0%.

1. *Interest Rate Module*

To calculate the MR associated with changes in the interest rate, the standard methodology suggests that positions in securities be assigned to the 13 time bands illustrated in Table 3, depending on their residual maturity. Contrary to the Basel Committee's suggestion, in this exercise, as stipulated in Chile's regulations, the principal and the coupons are assigned independently, and the registered amounts pertain to the face value of each[10].

Once the net exposure has been determined for each band, it is multiplied by a weight factor that reflects the change in the current net value of a peso payable at the mid-point in the band, given occurrence of the maximum expected shock.

The weight factor of the band with mid-point t (in number of years) is defined as:

$$weight_t = \frac{1}{2}\left[\left(\frac{1}{(1+r_t)^t} - \frac{1}{(1+r_t+\Delta r)^t}\right) + \left(\frac{1}{(1+r_t-\Delta r)^t} - \frac{1}{(1+r_t)^t}\right)\right]$$

Here, the first term represents the change in the current value of a one-peso flow midway through the band, given an increase of Δr in the spot rate for this maturity (r_t). The second represents the change in current value, given a decline of the same magnitude.

As proposed in Chile's regulation[11], the calculated shocks pertain to monthly variations (21 working days) in the spot rate for the average of the band. The maximum shock was found for each of the bands to calculate the respective requirements. The decision to use the largest of the shocks was based on the

[10] For this same reason, the zero coupon curve was used to calculate the weights and not the yield curve, as suggested by the Basel Committee.

[11] Central Bank of Chile (2002).

TABLE 3

TIME BANDS IN THE BASEL STANDARD METHOD

Months				Years								
0 - 1	1 - 3	3 - 6	6 - 9	1 - 2	2 - 3	3 - 4	4 - 5	5 - 7	7 - 10	10 - 15	15 - 20	20<

Source: BIS (1998).

constraints imposed by the sample's coverage, which considers a period of low volatility and decline in interest rates. In particular, not including the August 2002 stress scenario[12] may mean the shocks used and, therefore, the capital requirements are underestimated. This exercise gives us the respective capital requirement associated with fixed-rate TES and TES UVR.

However, because the portfolio information made available by the DCV does not allow for a breakdown between securities in the trading book and those in the banking book, capital requirements are scaled by the percentage of the former (fixed-rate TES) as a share of the total[13] (Table 4).

TABLE 4

CAPITAL REQUIREMENTS FOR MARKET RISK
BASEL STANDARD METHOD
INTEREST RISK MODULE
MAXIMUM SHOCK (100%)

04-Nov-05	Capital Requirement
Fixed-rate TES	1,050
TES UVR	247
Interest rate module	1,298

Source: Calculations by the authors.

TABLE 5

CAPITAL REQUIREMENT FOR MARKET RISK
EXCHANGE MODULE
BASEL STANDARD METHOD
(BILLIONS OF PESOS) OCTOBER 31, 2005

	Net Position Value
U.S. dollar	296.3
Japanese yen	(1.2)
Pound sterling	(23.9)
Venezuelan bolivar	0.2
Canadian dollar	1.2
Swiss franc	(0.0)
Euro	13.5
Swedish kroner	0.1
Danish kroner	0.3
Largest net position	286.4
Weight factor (percentage)	8.0
Capital requirement	22.9

Source: Value-at-risk form used by the Banking Superintendency. Calculations by the authors.

1. Exchange Rate Module

Information from the MR form filed to the Superintendencia Bancaria was used to obtain the net positions in each of the currencies analyzed. The capital requirement was then calculated by multiplying the weight factor (8%) by the greatest exposure between the sum of net asset positions and the sum of net liability positions. The resulting charge is approximately $23 billion (Table 5).

2. Stock Market Module

The information from the MR form filed with the Superintendencia Bancaria was used to obtain the net position exposed to stock market risk. However, investments classified as non-stock market shares and investments were not included, nor were equity securities. These positions were multiplied by the relevant weight factor (8%) to calculate the capital requirement. The result was $195.6 billion. This requirement includes only the charges for general risk, since specific risk is not employed in other countries where this method is used (e.g. Chile). If applied, this requirement would represent an additional 8% of regulatory capital (Table 6).

[12] The rates on TES maturing in January 2012, April 2012 and February 2009 increased by about 500 bp between the minimum and maximum rates registered in the July-August 2002 period.

[13] This information is from the MR forms filed monthly with the Superintendencia Bancaria. For October 2005, they pertain to 89% and 82% for fixed-rate TES and UVR's, respectively.

D. VaR According to Riskmetrics

For the internal models, the Basel Committee suggests a similar method to the one proposed by RiskMetrics[14]. This methodology is based on the idea that financial institutions' portfolio can be separated (mapped) through a set of simpler instruments that are exposed to a single risk factor. In the case of interest-rate-exposed positions, each of the flows associated with the security is treated independently. For example, a fixed-rate bond with one-year residual maturity and semiannual coupons is separated into three securities: one for each coupon and one for the principal. Each of these flows is assigned a position in one or more of the vertexes suggested by RiskMetrics[15] (Table 7).

TABLE 6

CAPITAL REQUIREMENTS FOR MARKET RISK
STOCK MARKET
RISK MODULE
(BILLIONS OF PESOS) OCTOBER 31, 2005

	Net Position Value
Negotiable investments	344.4
Investments available for sale	2,100.7
Weight factor	8.0
Capital requirement (%)	195.6

Source: Value-at-risk form used by the Superintendencia Bancaria. Calculations by the authors.

TABLE 7

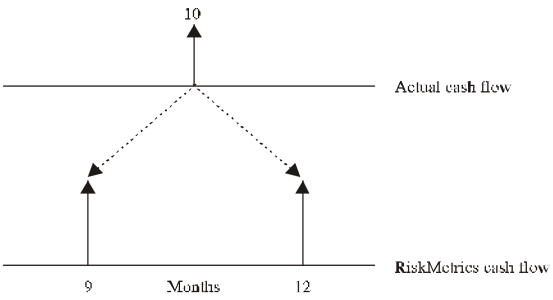
VERTEXES USED IN THE EXERCISE

Months					Years									
0	1	3	6	9	1	2	3	4	5	6	7	8	9	10

Source: RiskMetrics technical document.

FIGURE 1

RISKMETRICS CASH FLOW MAPPING



Source: RiskMetrics technical document.

Unless the residual maturity concurs exactly with one of the vertexes, assigning a cash flow implies dividing it between the two closest vertexes. For example, a TES with a residual maturity of 10 months is distributed between two positions: one with nine months residual maturity and another with twelve months residual maturity (Figure 1).

The value of a portfolio that is comprised solely of fixed-rate instruments and broken down as described earlier would be a linear function of 14 risk factors (i.e. daily percentage changes in the current value of one peso at each vertex[16]). Because the following exercise has two independent mappings, one for the fixed-rate TES positions and another for the TES UVR, there are 28 risk factors for TES positions. In addition, the implicit risk in stock and foreign-currency positions is considered by contemplating two other risk factors: the Colombian Stock Exchange General Index (IGBC) and the representative market exchange rate (TRM). In other words, 30 risk factors are used to calculate the MR of credit institutions' portfolio.

14 J. P. Morgan (1996). RiskMetrics Technical Document.

15 The vertexes for the exercise in question are different from those suggested by RiskMetrics. For example, the longest vertex is 10 years, as opposed to the maximum 30 years with the J.P. Morgan method. This selection is justified by the fact that there are no securities with a residual maturity of more than 15 years and the reduced size of the spot-rate sample for maturities beyond 10 years.

16 The spot rate for each vertex can be used to estimate a series of prices to find the percentage variations.

Since the assumption is that returns will be distributed normally and the expected change in prices is zero, the VaR of the position exposed to factor *i* (VaR_i) is calculated as the outcome between the expected maximum shock ($2.33 * s$, for a 99% confidence level) and the exposure to that factor:

$$VaR_i = 2.33 \cdot s_i \cdot Position_i$$

The model used to estimate s_i is an EWMA[17], where the assumption is that the variances follow a data generating process described by:

$$s^2_{i,n} = l\ s^2_{i,n-1} + (1 - l)\, u^2_{i,n-1}$$

Here, $s_{i,n}$ is the volatility estimated for factor i on day n, $u_{i,n-1}$ is the most recent percentage change in the price, and l is a constant between zero and one[18] (exponential run-down factor). The initial value of this recursive formula, $s_{i,0}$, is the simple average of the actual percentage changes observed in prices.

A subsequent step results in an estimate of the matrix of correlations between the returns on diverse factors ($\sum$). This is done to consider the effects of the hedging result from diversification possibilities provided by assets with different characteristics. In this case, an EWMA model also was used to calculate the respective covariances[19].

Consequently, for the total portfolio, the daily 99% VaR *is calculated as:*

$$VaR_{portfolio} = \sqrt{VaR_F \cdot \sum \cdot VaR'_F}$$

Where, VaR_F is the vector containing the VaR_i. Following the suggestion of the Basel Committee, capital requirements are calculated as:

$$RK = 3 \cdot VaR_{portfolio} \cdot \sqrt{10}.$$

The results of the exercise done for the credit institutions' trading book portfolio at November 4, 2005 can be found in Table 8.

TABLE 8

CAPITAL REQUIREMENTS FOR RISKMETRICS MARKET RISK
(BILLIONS OF PESOS)
NOV. 4, 2005

1-day 99% VaR	144
10-day 99% VaR	456
Capital requirement	1,368

Source: Calculations by the authors.

17 See Hull, J. (2000) for a more detailed explanation.

18 Higher values of mean the estimated volatility responds little to new information provided by recent daily shocks.

19 The covariances are calculated using $Cov(i, j)_n = l\ Cov(i, j)_{n-1} + (1 - l)\ u_{i,n-1}\ u_{j,n-1}$. The correlation matrix can be estimated using these along with the variances.

E. VaR by Historic Simulation

Historic simulation is another way to measure VaR. It uses data on the past to predict what could occur in the future[20]. Like the other alternatives for estimating VaR, the first step is to select the time horizon for the calculations, the confidence level, the risk factors that might affect the portfolio, and the quantity of data available on these variables. The number of scenarios that can be generated will depend on the length of the series obtained.

If, for example, there are 501 daily figures (from day 0 to 500) for each variable, 500 different scenarios (from 1 to 500) can be calculated for what can occur between today and tomorrow. Scenario 1 is where the percentage changes for all the variables (on the last day) are equal to those observed on day 1 of our historical series. In the second scenario, all the changes are equal to those on day 2, and so on until day 500. Formally speaking, what we have is the following: v is defined as the value of a market variable on day *i*, and supposing it is on day *m* (which represents the last day for which information is available, for example, day 500). The i scenario assumes that the value of the market variable tomorrow (day 501) will be:

$$v_m(v_i / v_{i-1})$$

Thus, 500 possible changes in percentage are obtained for each of the variables on day 500, which constitutes the possible scenarios for day 501. With each of these scenarios, the resulting portfolio value at the new prices is calculated and compared with the portfolio value today, so as to arrive at the expected valuation loss (gain). By this way a distribution of daily changes in portfolio value is generated. These changes in value are arranged in order, from the largest to the smallest loss, to select the first percentile, which constitutes the VaR of one day at 99%. This VaR is then scaled by $\sqrt{N}$ to obtain the VaR at N days and multiplied by a factor of 3 to determine the capital requirements.

In our specific case, we have 618 observations (617 possible price scenarios), 30 risk factors and a VaR at 10 days with a 99% confidence level. The results are presented in Table 9. They show the maximum calculated loss and the capital requirements obtained from percentile 1, after considering the fixed-rate TES and UVR positions, as well as those in foreign currency and stocks.

TABLE 9

CAPITAL REQUIREMENTS ACCORDING TO MARKET RISK HISTORICAL SIMULATION
(BILLIONS OF PESOS)
NOV. 4, 2005

Maximum loss	387
1-day VaR	146
10-day VaR	463
Capital Requirement	1,388

Source: Calculations by the authors.

[20] See Hull, J. (2000) for a more detailed explanation.

II. Verifying Goodness of Fit

A. Back Testing: the RiskMetrics Model

Regardless of the method used to estimate the VaR, an important goodness of fit test for the model is what we call back testing. It implies verifying how well the VaR estimates might have performed in the past. Let us suppose a daily VaR at 99% confidence is calculated. Back testing would imply seeing how many times the loss for one day exceeded the VaR calculated for that day. If this occurs on approximately 1% of the days, we can reasonably assume the method is adequate.

For this exercise, it is indispensable to isolate the effect of the actual price. For this purpose, a proxy of the final quantities are obtained by dividing the value of the positions by that price. The value of this portfolio is calculated with the observed prices at each point in time, and also a vector that contains, in each position, the valuation loss (gain) between two consecutive days, can be constructed.

To do the back testing exercise, the values of the parameters that minimize the mean quadratic error (k = 107, l = 0.94, tolerance = 0.0001) in the conditional variance estimate based on the EWMA method are set. A moving window with 107 observations is defined, based on the value of parameter k, and the RiskMetrics methodology is applied for each window. Once all the information is supplied for each simulation, a projection of the variance-covariance and correlation matrix is obtained. It is used to calculate the value of the shocks and, therefore, the positions at risk, in order to obtain the daily value of the VaR in each simulation. This constitutes the capital requirement for each of the 510 replications.

The capital requirements are compared to the changes in portfolio value due to price variations. Formally speaking, the occurrences of:

$$(P_{t-1} - P_t)\,(Quantities) \geq VaR_{daily}\ 99\%$$

must be recorded to determine the percentage of coverage against portfolio valuation losses, based on this method. As illustrated in Table 10, the requirements obtained with the RiskMetrics technique for VaR calculation cover nearly 98% of the occurrences.

Table 10

RiskMetrics Back Testing Model
(Billions of Pesos)

Simulation No.	Change in Portfolio Value	1-day VaR
128	187	180
130	368	183
142	481	199
143	275	208
359	246	184
434	172	145
490	138	115
491	261	117
492	156	122
494	211	127
501	165	121
Events not covered (%)		2.2

Source: Calculations by the authors.

TABLE 11

HISTORICAL SIMULATION BACK TESTING MODEL
(BILLIONS OF PESOS)

Simulation No.	Change in Portfolio Value	1-day VaR
130	373	205
142	489	194
143	278	188
359	248	210
Events not covered (%)		0.8

Source: Calculations by the authors.

B. Back Testing: Historical Simulation

An analog exercise was conducted on the historical simulation procedure. As with back testing of the RiskMetrics model, a moving window of 107observations was used. The valuation loss distribution was calculated for each of these windows, as explained in Part I, Section C herein, to select percentile 1 and to calculate the capital requirements associated with the mentioned loss[21]-

The exercise was repeated 510 times and we calculated the percentage of occurrences in which the necessary capital requirement was exceeded by the change that might have occurred in the portfolio if the quantities where the same of the actual portfolio. As illustrated in Table 11, the requirements obtained with the historical simulation method for VaR calculation cover slightly more than 99% of the occurrences.

III. CONCLUSIONS

Despite the preliminary nature of the exercises presented in this article, the results underscore the importance of continuing to develop methods for efficiently measuring and managing the risks to which credit institutions' portfolios are exposed. In this respect, the combined agenda being pursued by the Superintendency of Financial Institutions and Banco de la República is a step in the right direction, by offering alternatives for adapting the rules to scenarios where market risk is becoming more and more relevant.

[21] Basically, the exercise is identical to the one done earlier, but assumes there are only 107 pieces of historical data available each day.

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