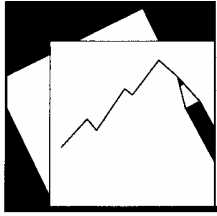


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IMF Working Paper

Sectoral Balance Sheet Mismatches and Macroeconomic Vulnerabilities in Colombia, 1996-2003

*Juan Manuel Lima, Enrique Montes,
Carlos Varela, and Johannes Wiegand*

IMF Working Paper

Research Department

Sectoral Balance Sheet Mismatches and Macroeconomic Vulnerabilities in Colombia, 1996-2003

Prepared by Juan Manuel Lima, Enrique Montes, Carlos Varela, and Johannes Wiegand¹

Authorized for distribution by G.A. (Sandy) Mackenzie

January 2006

Abstract

This Working Paper should not be reported as representing the views of the IMF.

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

We employ an extended version of the Allen et al. (2002) Balance Sheet Approach to examine macroeconomic vulnerabilities in Colombia between 1996 and 2003, based on an unusually rich data set. We find that vulnerabilities existing prior to Colombia's 1999 recession—high levels of private debt, a large negative foreign currency position of the corporate sector, and banks' exposure to stretched households and companies—receded subsequently. New vulnerabilities emerged, however, especially the high level of public debt accumulated until end-2003, and growing exposure of the financial sector to the sovereign.

JEL Classification Numbers: E00, F32, F33, F34, G15, O54

Keywords: Sectoral Balance Sheet Analysis, Macroeconomic Vulnerabilities, Colombia

Author(s) E-Mail Address: jlimaort@banrep.gov.co; emonteur@banrep.gov.co;
cvarelba@banrep.gov.co; jwiegand@imf.org

¹ Lima, Montes, and Varela are an Economist, Division Chief, and Department Head respectively in the Research Subdirectoriate of Banco de la Republica (BdR), Bogotá, Colombia. Wiegand is an Economist in the Research Department of the IMF (he was in the IMF's Policy Development and Review Department when the research for this paper was conducted). Many colleagues at BdR helped to prepare the data; we want to mention especially: Jorge Martinez Torres; Pedro Rojas and Nestor Espinoza of the public sector division; and all members of the financial accounts division. We are also grateful to Roberto Garcia Saltos, Mikis Hadjimichael, Sandy Mackenzie, Jorge Martinez Torres, Robert Rennhack, Christoph Rosenberg, Calvin Schnure, and seminar participants at the IMF for helpful comments. A Spanish version is planned for the "Borradores de Economia" series of Banco de la Republica.

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I. INTRODUCTION AND OVERVIEW

Several recent emerging market crises have originated in the build-up of balance sheet mismatches in subsectors of the economy, such as the banking system, the corporate sector, or the public sector. Prior to the crisis, the size of these mismatches were often hard to assess, as traditional macroeconomic flow indicators—such as fiscal and current account balances—provided only incomplete guidance. Once the imbalances unwound, other parts of the economy were affected by their exposure to the troubled sector. Recent examples include Mexico (1995), East Asia (1997/98), Russia (1998), Argentina (2001/02), and the Dominican Republic (2002/03).

This crisis pattern has furthered the interest in the systematic analysis of sectoral balance sheets, to identify (i) currency, maturity and/or capital structure mismatches within sectors, and (ii) balance sheet interlinkages, i.e. the exposure of sectors to one another. A general framework, the so-called Balance Sheet Approach, has been proposed by Allen et al. (2002) and applied to a number of country cases.²

This paper applies the Balance Sheet Approach to Colombia, a medium-sized emerging market economy. It covers the period from 1996 until 2003, when Colombia went through severe economic turbulences—especially between late 1998 and early 2000—while avoiding a full-blown crisis. We examine (i) the build-up of vulnerabilities in the final years of the boom phase until end-1998, (ii) the unwinding of balance sheet mismatches in 1999 and 2000, when Colombia experienced a severe recession; and (iii) the evolvement of vulnerabilities in the recovery period after 2000. While our study builds on a rich literature examining the vulnerabilities of individual sectors,³ it is the first that analyzes all sectors simultaneously, including their exposure to one another.

The paper also carries the Balance Sheet Approach further in several ways.

- First, our data cover a period of eight years, rather than one or two years as has thus far been the norm. This permits to study the development of vulnerabilities over time.
- Second, we disaggregate the economy into nine subsectors, compared to three or four as is the case in most other studies. This permits us to obtain unusually detailed insights into the economy's financial structure.
- Third, we use exceptionally clean and complete data. The sector balance sheets on which this study is based were assembled by specialists at Banco de la Republica—Colombia's Central Bank—which aggregated the balance sheets of thousands of individual institutions, both public and private.

² A survey of recent applications as well as an in-depth discussion of the Balance Sheet Approach is given in Rosenberg et al. (2005).

³ Relevant studies include Cepeda and Varela (2002), Echeverry et. al. (2002), and Martinez Torres (2003) for Colombia's corporate sector; Uribe and Vargas (2002), Villar et al. (2005), and IMF (2005) for the financial sector; and Cepeda and Varela (2002) and Arbelaez et al. (2004) for the public sector.

The remainder of the paper is organized as follows. Section II provides some background by briefly reviewing macroeconomic developments in Colombia since the early 1990s. Section III describes the data. Section IV contains the analysis of sector balance sheets, with a focus on identifying potential vulnerabilities whose knowledge could be useful for devising policy responses. Section V concludes with a summary of our findings.

II. A BRIEF REVIEW OF MACROECONOMIC DEVELOPMENTS SINCE THE EARLY 1990s

In the 1970s and 1980s Colombia's economy grew by almost 5 percent per year, making it one of the best performing economies in Latin America. Inflation, anchored by a crawling peg with the US dollar, hovered between 20 and 30 percent. In the early 1990s growth accelerated further, supported by a surge in private capital inflows (Figure 1). These flows reflected *inter alia* foreign direct investment in the oil sector, large scale privatizations, and financial inflows in the wake of measures to liberalize the capital account (for a detailed analysis see Alonso et al., 2003).

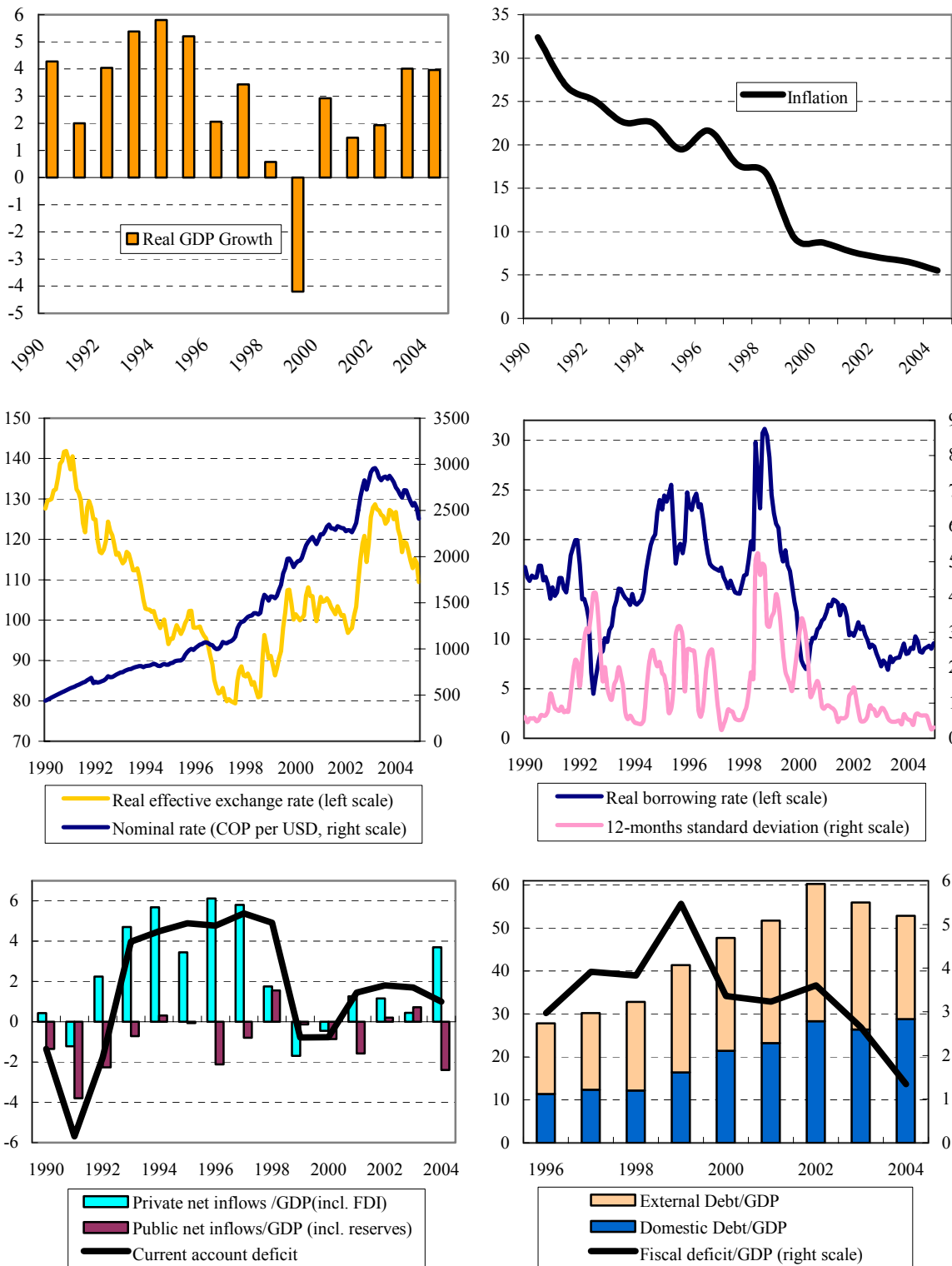
The Asian, Russian and Brazilian crises in 1997/98 triggered a sharp deterioration in financing conditions. Capital flows to Colombia reversed, forcing a sharp adjustment of the current account. Reacting to the capital outflows, Banco de Republica loosened the peso's exchange rate band with the U.S. dollar in late 1998, and abandoned it altogether in September 1999. The economy plunged into recession, reinforced by a banking crisis. In 1999, real GDP contracted for the first time in 70 years.

Between 1998 and 2002 public debt increased sharply, reflecting *inter alia* (i) the impact of the 1999 recession, including costs of recapitalizing the banking system, (ii) repeated upward revaluations of external debt due to depreciations of the—now floating—peso, and (iii) recurrent difficulties in maintaining fiscal discipline. In 1999, sovereign foreign currency debt lost its investment grade rating. In 2002, following contagion from neighboring Brazil, the government was temporarily excluded from domestic and international capital markets.

A sustained recovery began in 2003, supported by an increasingly favorable external environment characterized by falling external financing costs and rising oil prices. Growth returned to 4 percent in both 2003 and 2004. At the same time—and in contrast to earlier expansionary periods—the current account deficit remained modest, supported by high oil export receipts and strong manufacturing exports. Anchored by an inflation targeting regime, inflation rates fell to single-digit levels, and both domestic real interest rates and interest rate volatility came down. At end-2003 public debt started to fall, caused in part by an appreciation of the peso. In 2004 Colombia received substantial private capital inflows for the first time in seven years.

Section IV will examine how sector balance sheets were affected by these developments until end-2003. Before we turn to this, some words on the data used in this study are in order.

Figure 1. Colombia: Macroeconomic Developments, 1990-2004



Sources: Banco de la Republica, IMF, and authors' calculations.

III. THE DATA⁴

Colombia's economy is disaggregated into nine sectors:

1. the *non-financial public sector*, which includes the central government, local and regional governments, the public social security system, and public companies;
2. the *Central Bank* (Banco de la Republica);
3. *private banking entities*—this sector includes both private banks and other private deposit-taking institutions;
4. *public banking entities* (the definition of “banking entity” is as in 3.);
5. *private non-bank financial intermediaries*, such as private pension funds, trust funds, and insurance companies;
6. *public non-bank financial intermediaries*, which include the bank restructuring agency Fogafin, the second-tier asset management institutions Finagro and Findeter, and public pension funds and insurance companies;
7. *large and medium-sized companies*, which consists of about 8500 private corporations that report balance sheets to the superintendence of companies or the superintendence of securities (for the sake of brevity, we sometimes call this sector “companies” or “corporate sector”);
8. *households and small (non-reporting) companies*—this sector is computed as residual (for convenience referred to as “households”);
9. the *external sector*, which is derived from Colombia's external investment position.

A sector balance sheet displays the sector's financial assets and liabilities with each other sector. Intra-sector assets and liabilities—such as liabilities of companies with other companies—are netted out. Financial assets and liabilities are broken down by currency—domestic and foreign—and by maturity—short-term and long-term. Short-term assets are debt instruments with original maturity of up to one year, including checking and savings deposits, certificates of deposits, fiduciary deposits, short-term securities, and trade credit. Long-term assets are equity and debt instruments with maturity of more than one year. For corporate equity we computed an approximate measure of market value using prices from the Colombian stock exchange. Equity of financial institutions corresponds to book value. Traded debt is evaluated at face value, most other assets and liabilities at historical costs.⁵

Importantly, the sectoral balances include only *financial* assets and liabilities. They do not include real assets, such as real estate or real corporate investments, and neither implicit asset or liabilities, such the government's implicit uncovered payment obligations in a pay-as-you-go pension systems. As a consequence, a sector's net position must not be interpreted as its

⁴ A detailed note in Spanish on data compilation is available from the authors on request.

⁵ An exception are banks that were intervened after 1998, where the value of assets incorporates losses realized prior to the recapitalization.

net worth or implied capital. Such an interpretation would be especially misleading for households and companies, which hold substantial real assets.

The information used to compile sector balance sheets comes from various sources, including Banco de la Republica; the superintendences of banks, companies, and securities; the national comptroller's office; and the national statistics office. Ultimately, sector sheets are based on the individual balance sheets and administrative registries of those institutions that were aggregated into sectors. All data were checked meticulously for consistency by sector experts at Banco de la Republica, and revised several times in the process.

Sector balance sheets were assembled for every other year since 1996. We also added the crisis year 1999, and 2003, the year with the latest available information.⁶ Full sectoral balance sheet matrices are displayed in Appendix I.

Some data shortcomings remain. Most importantly, we cannot distinguish perfectly between the (gross) assets of companies and households, as we lack exact information on household-held corporate equity. For the years 1998, 2000, and 2003, we did an estimation based on a sample of companies. See Appendix II for the resulting corporate balance sheets.⁷

At various points during the exposition we aggregate sub-sectors into larger entities. Sectors (2.), (4.) and (6.) form the financial public sector. Adding in (1.) yields the public sector. (7.) and (8.) are the non-financial private sector; (3.) and (5.) the financial private sector. (2.)-(6.) are the financial sector (public and private); (1.), (7.) and (8.) the non-financial or real sector. The other aggregates are self explanatory.

Several indicators are used to gauge a sector's vulnerability, including:

- The *net financial position*, i.e., financial assets minus financial liabilities. A large negative net position can point to solvency problems, especially if a sector's real assets are insufficient to match its open financial position. High *leverage*—i.e., a large share of debt in total liabilities (i.e., of debt plus equity)—reinforces vulnerability.
- The *net foreign currency position* (foreign currency assets minus foreign currency liabilities). A sector with a large negative (positive) foreign currency position is vulnerable to an exchange rate depreciation (appreciation). Most foreign currency assets/liabilities in Colombia are denominated in US dollars.
- The *net short-term position* (short-term assets minus short-term liabilities). A large negative short-term position indicates vulnerability to interest rate increases.

⁶ We plan to include 1997 and 2001—the missing years—as well as an update for 2004 in the Spanish version of the paper.

⁷ Incomplete knowledge of household-held equity does not prevent the computation of households' and corporates' *net* positions, as the net position of companies is known (from their balance sheets), and the households' net position can be derived as a residual. Another shortcoming is the absence of exact information on households' external assets and liabilities. We assume they are zero, which is consistent with incomplete pieces of information that we have.

IV. SECTORAL BALANCE SHEETS AND THEIR INTERACTIONS

A. Overview: Key Developments

1. Gross Financial Assets

The financial structure of Colombia's economy changed markedly between 1996 and 2003. Most sectors' (gross) financial assets grew faster than GDP (Figure 2.1); an indication of financial deepening. Especially impressive is the growth of non-bank financial institutions—pension funds, trust funds, and insurance companies—whose assets more than doubled. The non-financial private sector (households and companies) also accumulated important financial assets. In contrast, the banking system shrank during the recession, and did not regain its former importance thereafter. Thus, banking disintermediation coincided with a process of general financial deepening.

2. The Net Financial Position

Colombia's net financial position with the rest of the world followed a pronounced cyclical pattern: it deteriorated prior to the 1999 crisis (hence, Colombia accumulated net liabilities), improved during the recession; and deteriorated again after 2000 (Figure 2.2).

There are important differences between sectors, however. Net financial liabilities of the public sector rose sharply from 1999, driven by the accumulation of public debt (Figure 2.3). In 1999 and 2000, this reflects in parts the costs of the recession, notably outlays to combat the banking crisis amounting to about 4 percent of GDP—the government assumed some of the mortgage debts of households, and paid for liquidation costs of public banks, notably severance pay. After 2000, public sector debt took on a dynamic of its own, however.

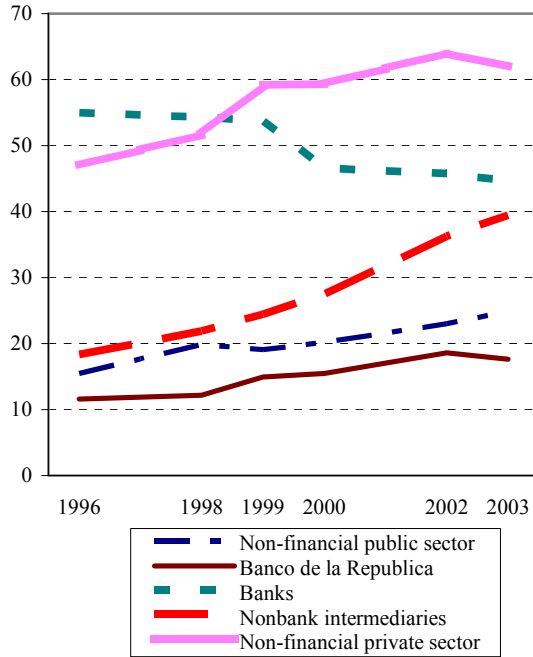
In contrast, net financial liabilities of the private sector fell by more than 20 percent of GDP between 1998 and 2000 (Figure 2.4). The adjustment was in equal parts due to households and corporations (11 percent of GDP each). After 2000, household's net financial position continued to improve, however, while the corporate sector's position fell back close to pre-crisis levels. The position of financial intermediaries—both banks and non-bank financial institutions—remained roughly balanced throughout (as one may expect).

3. The Net Foreign Currency Position

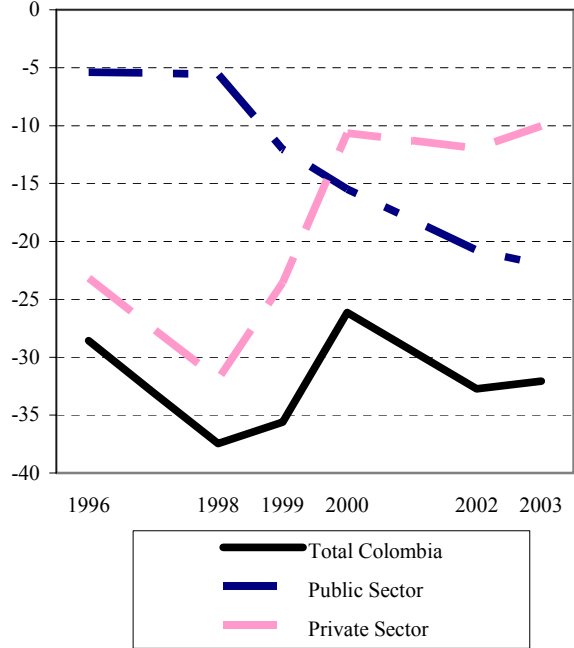
Colombia's net foreign currency position improved after 1999, thus reducing the economy's vulnerability to currency fluctuations (Figure 3.1). Again, there are important differences between sectors. The foreign currency position of the non-financial public sector worsened (Figure 3.2), as the increase in foreign currency debt outweighed both the accumulation of foreign currency deposits by the non-financial public sector—notably by the oil stabilization fund FAEP—and the build-up of reserves by the central bank.

Figure 2. Gross Financial Assets and the Net Financial Position
(in Percent of GDP)

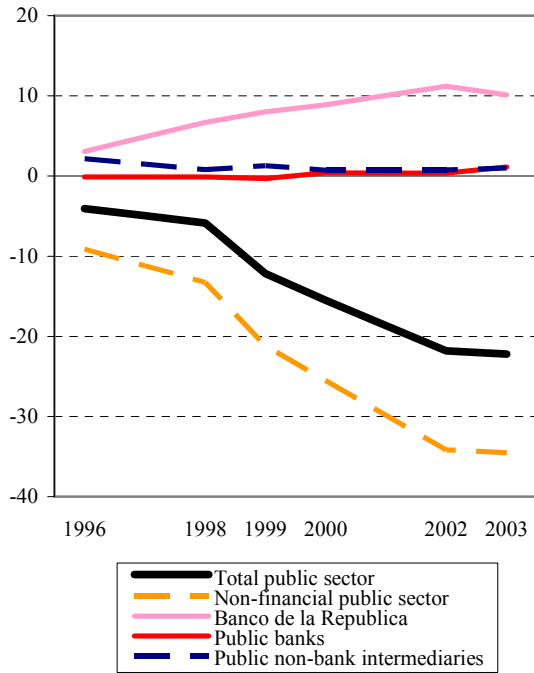
2.1 Gross Financial Assets by Sector



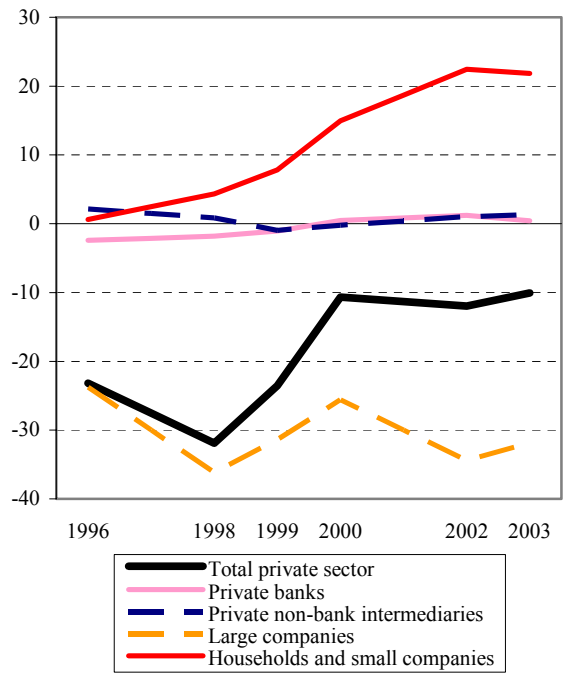
2.2 Net Financial Position: Colombia



2.3 Net Financial Position: Public Sector



2.4 Net Financial Position: Private Sector



Source: authors' calculations.

In contrast, the private sector's position strengthened (Figure 3.3). Companies halved net foreign currency liabilities during the recession and preserved these gains thereafter. The improvement coincides with the move to a floating exchange rate in 1998/99, and suggests that the fixed exchange rate regime may have induced some companies to take only incompletely account of foreign currency risk, thus accumulating excess dollar liabilities.

Private non-bank financial institutions—especially pension and trust funds—built up a substantial long dollar position after 1999, amounting to 5 percent of GDP at end-2003. The foreign currency assets consisted largely of Yankee bonds of the Colombian government (Figure 3.4). As a consequence, at end-2003 non-bank financial institutions were vulnerable to a peso appreciation, while the public sector and companies were vulnerable to a depreciation. Given the lack of hedging instruments, in particular at longer maturities (see Garcia Saltos and Ong, 2005), these positions ought to be largely open. Private banks also held a small long dollar position, as required by financial regulation.

Dollarization—i.e., the extent to which financial transactions between residents are carried out in foreign currency—has remained low in Colombia, owing to regulations that prevent households from having foreign currency accounts with domestic banks. Nonetheless, until 1998 private banks played some role in foreign currency intermediation and provided more than a fifth of companies' dollar financing needs (Figure 3.4). By 2003, banks had largely withdrawn from this business.

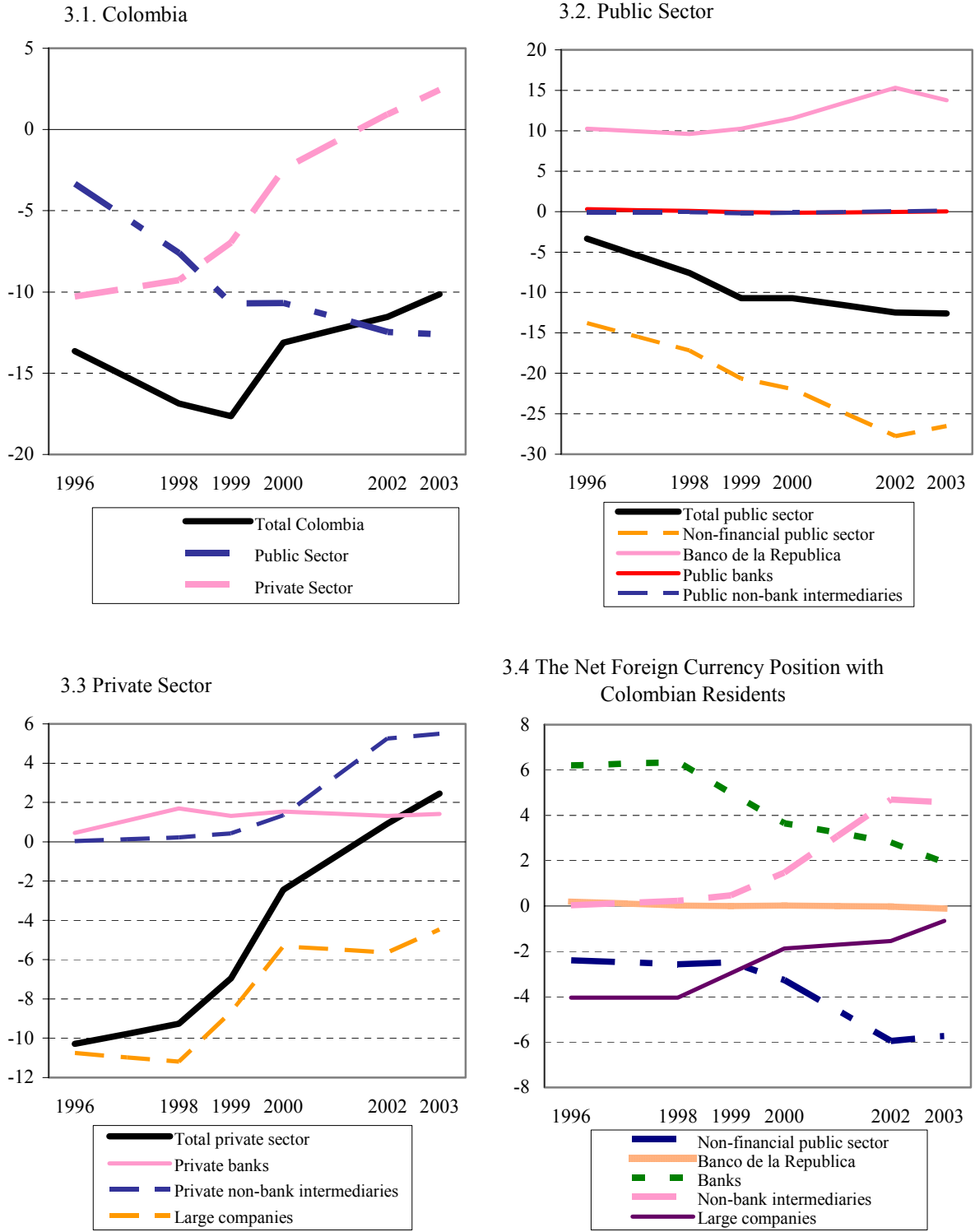
4. The Short-Term Position and Sectors' Exposure to the Sovereign

In spite of the deterioration of the public sector's overall financial balance, its short-term position strengthened markedly (Figure 4.1). Until 1999, the improvement owed partly to the accumulation of foreign currency deposits (see above). After 2000, however, it reflected primarily efforts to lengthen maturities of domestic public debt, so as to reduce the government's exposure to rollover risk (Figure 4.2).

As domestic debt is largely held by banks and non-bank intermediaries (discussed in detail in Section B.2 below), the counterpart to the lengthening in public debt maturities was a weakening of the short-term position of the financial system. This is especially the case for banks, whose liabilities—deposits—are largely short-term (Figure 4.3).

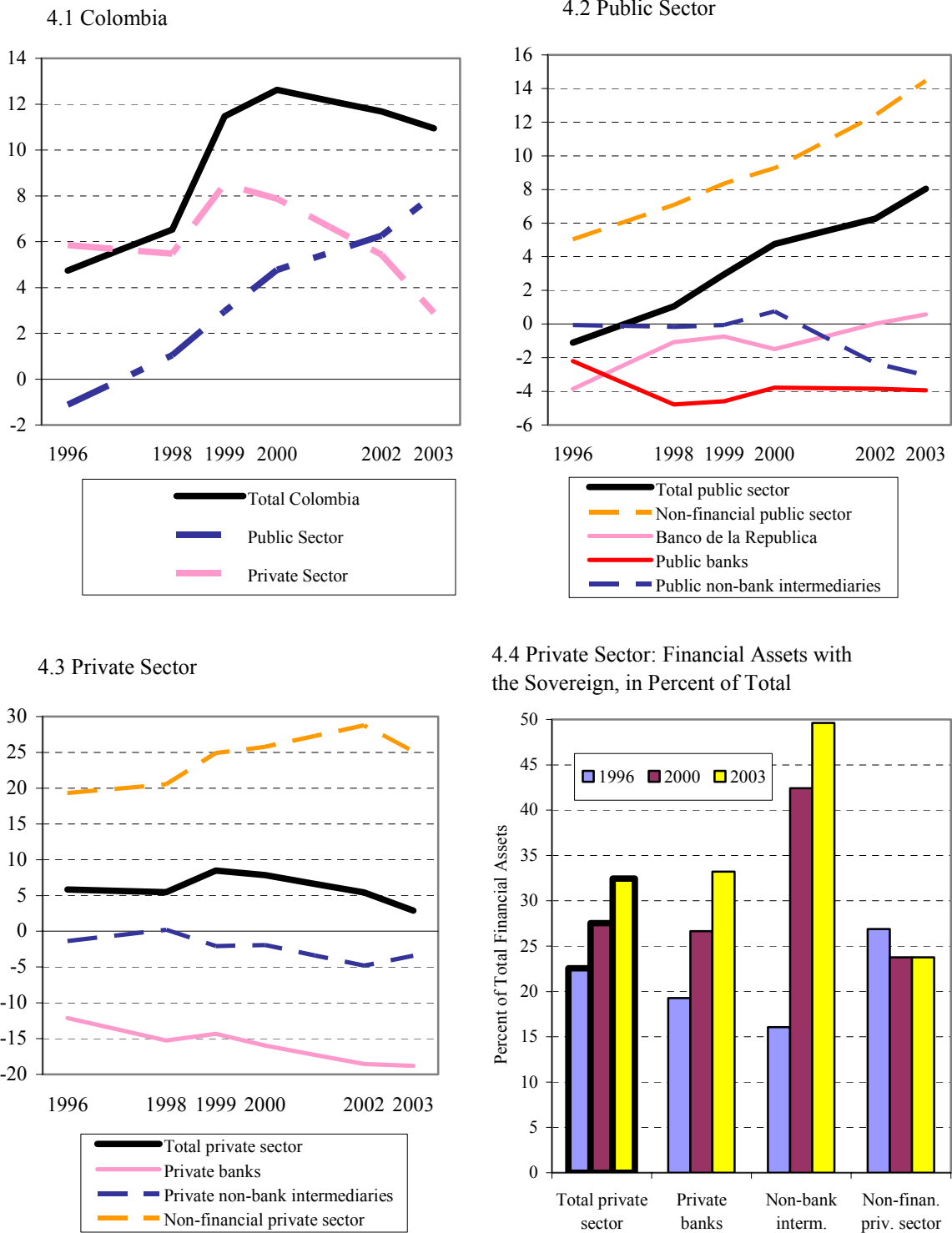
In addition, the exposure of the private financial sector to the sovereign increased sharply. While in 1996, both banks and non-bank intermediaries had invested less than 20 percent of their assets with the public sector, by 2003 this share had increased to one-third for banks and to almost one-half for other intermediaries (Figure 4.4). Hence, at end-2003 a large share of the financial system's assets was tied up in long-term government bonds, increasing the sector's vulnerability to interest rate hikes.

Figure 3. The Net Foreign Currency Position
(in Percent of GDP)



Source: authors' calculations.

Figure 4. The Net Short-Term Position and Sectors' Exposure to the Sovereign
(in Percent of GDP, Unless Indicated Otherwise)



Source: authors' calculations.

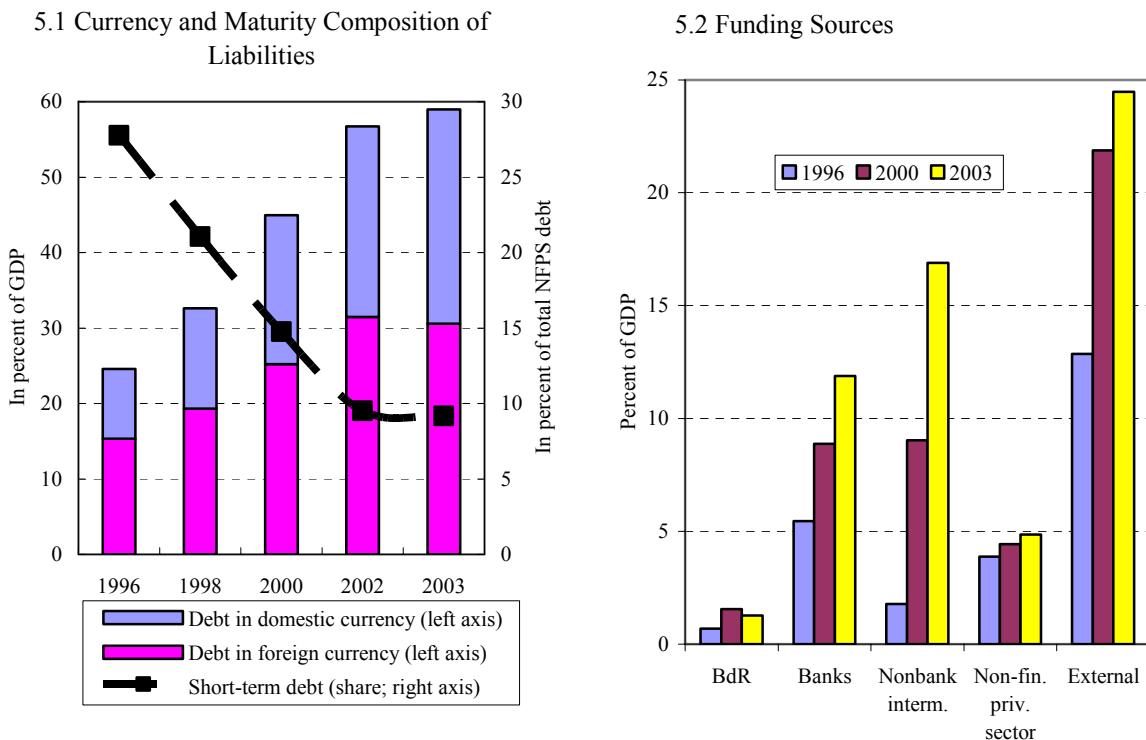
B. Sector Developments

1. The Non-Financial Public Sector

The finances of Colombia's public sector are extensively discussed elsewhere (see, e.g., Arbelaez et al. (2004)). Thus, we limit this section to a brief summary. Gross liabilities of the non-financial public sector increased sharply between 1996 and 2003, reaching almost 60 percent of GDP at end-2003 (Figure 5.1). This increase notwithstanding, the structure of public debt improved. The share of debt denominated in foreign currency fell from more than 60 percent in 1996 to little more than 50 percent in 2003, thus containing the increase in exchange rate risk. Also, the average maturity of public debt increased from 3½ to 5½ years, reducing exposure to rollover risk.

The government managed to place public debt with various sectors, but in particular with non-bank intermediaries. At end-2003, the financial sector held 27 percent of the non-financial public sector's debt (17 percent of GDP), up from 7 percent in 1996. It should be noted though that indebtedness developed very differently at distinct levels of government (not displayed in Figure 5). While central government debt grew rapidly, the share of subnational debt in total public debt fell from 40 percent in 1998 to 14 percent in 2003, owing to reforms implemented in the late 1990s and early 2000s that restrict regions' and local governments' capacity to run deficits (for details see Adenauer, 2005).

Figure 5. The Non-Financial Public Sector



Source: authors' calculations.

2. The Financial System: Banks and Non-Bank Intermediaries

Banks

Various studies analyze Colombia's banking system in-depth, including most recently IMF (2005). Thus, this section focuses on selected aspects only.

As mentioned in the overview section, the banking system contracted during the 1999 recession and did not recover thereafter (Figure 6.1). Public banks continued to shrink throughout 2003. Moreover, banks retreated from private sector lending, especially to households, and instead invested an increasing share of their assets in government debt, much of which is long-term (Figure 6.2).⁸

Several policy initiatives furthered this development. First, a series of bank recapitalization schemes implemented after the mortgage banking crisis in 1999 led to banks' acquisition of official assets. These included (i) a mechanism to compensate banks with government bonds for the write-off of mortgage loans; (ii) direct recapitalization of public banks with bonds from the bank restructuring agency Fogafin; and (iii) indirect recapitalization of private banks through Fogafin loans to the banks' shareholders. According to Fogafin, the total costs of these schemes amounted to about 4 percent of GDP. Second, revisions in banking regulation tightened lending standards and thus fostered the switch from private to official assets (see Villar et al., 2005).

Banks' large and increasing holdings of long-term government debt contributed heavily to the deterioration of their short-term position identified earlier. Moreover, short-term assets, such as consumer and commercial loans—which would provide a better match for the banks' short-term liabilities—fell sharply between 1996 and 2003 (Figure 6.3). While government bonds are “liquid” in the sense that they can be sold in secondary markets, the growing maturity mismatch renders the banks vulnerable to interest rate shocks.

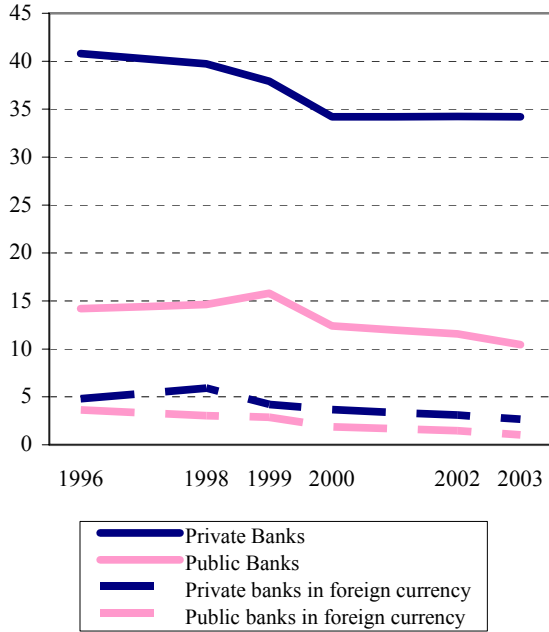
Colombia's banks have also retreated from foreign currency lending (Figures 6.1 and 6.4). In 1996, more than 15 percent of banks' assets were foreign currency loans to the domestic economy, financed by loans the banks contracted abroad. Following the 1999 recession, foreign currency lending to companies has all but ceded.

Importantly, banks always avoided a short position in dollars—i.e., their dollar assets exceeded dollar liabilities—as required by banking regulation (Figure 6.4). As a consequence, the banks' balance sheets were not directly affected by the sharp peso devaluations in 1998/99 and 2002. Their exposure to exchange rate risk was indirect and owed to the banks' exposure to the leveraged non-financial private sector.

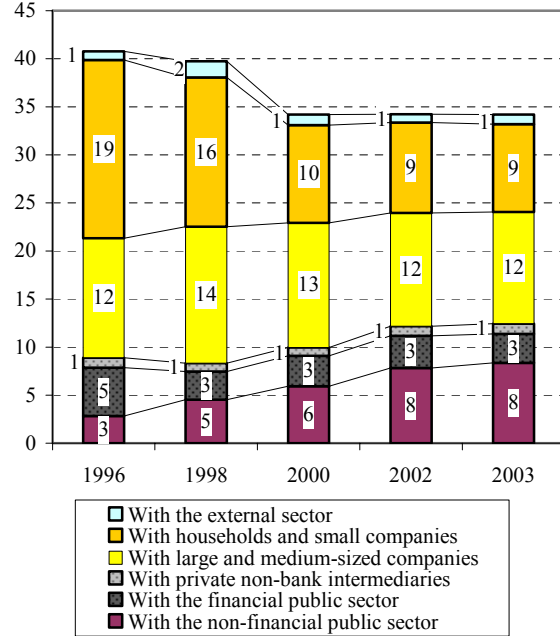
⁸ Figures 6.2-6.4 depict private banks only, which account for more than three-quarters of Colombia's banking system (as shown in Figure 6.1). Most assertions made for private banks hold for public banks as well, however. For example, the share of credit to companies and households in public banks' assets fell from almost 60 percent of total assets in 1998 to 35 percent in 2003.

Figure 6. The Banking System
(in Percent of GDP)

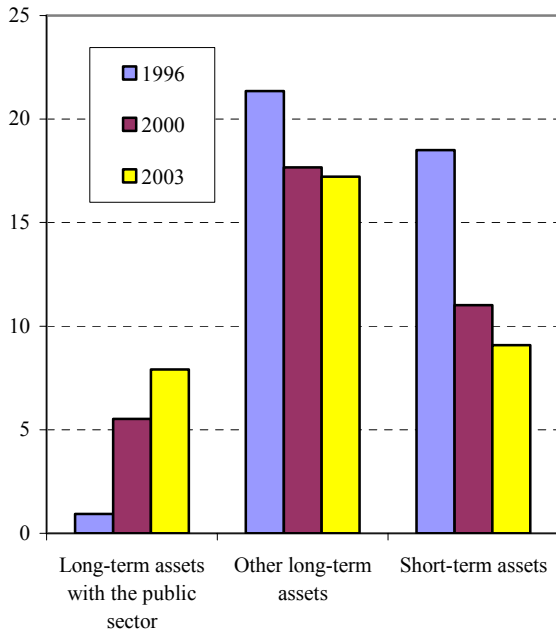
6.1 Total Assets



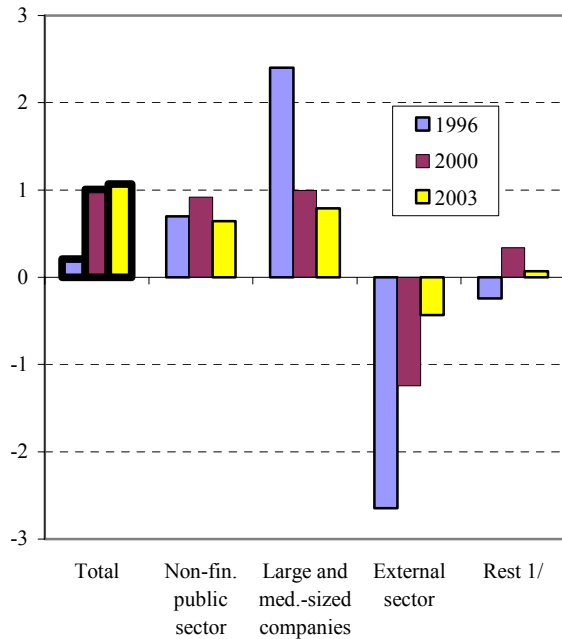
6.2 Private Banks: Sectoral Allocation of Assets



6.3 Private Banks: Term Structure of Assets



6.4 Private Banks: Net Foreign Currency Position with Other Sectors



Source: authors' calculations.

1/ Small companies, households, public banks, and non-bank financial institutions.

Non-Bank Intermediaries

In contrast to banks, private non-bank intermediaries (NBIs) have grown strongly (Figure 7.1). While in 1996 NBIs' combined assets amounted to one-third of the assets of private banks, by end-2003 both sectors were of almost identical size.

Private non-bank intermediaries consist of (i) pension and severance payment funds (with assets of 14 percent of GDP at end-2003), (ii) trust funds (10 percent), (iii) insurance companies (4 percent), and (iv) other entities (3 percent).⁹ A part of the NBIs' impressive growth reflects the rapid expansion of private pension funds after their establishment in 1993. Another part owes to the outsourcing of the management of pension liabilities by several large public companies between 1999-2001, such as by the state oil company Ecopetrol.

Non-bank intermediaries are funded by households and, to a lesser extent, the public sector (Figure 7.2). The way how NBIs invest these funds changed substantially. While in 1996, more than half of their assets consisted of deposits with the banking system, in subsequent years NBIs invested increasingly in government bonds: on a net basis, NBIs channeled almost all contributions received from households between 1996 and 2003 to the public sector (Figure 7.3).

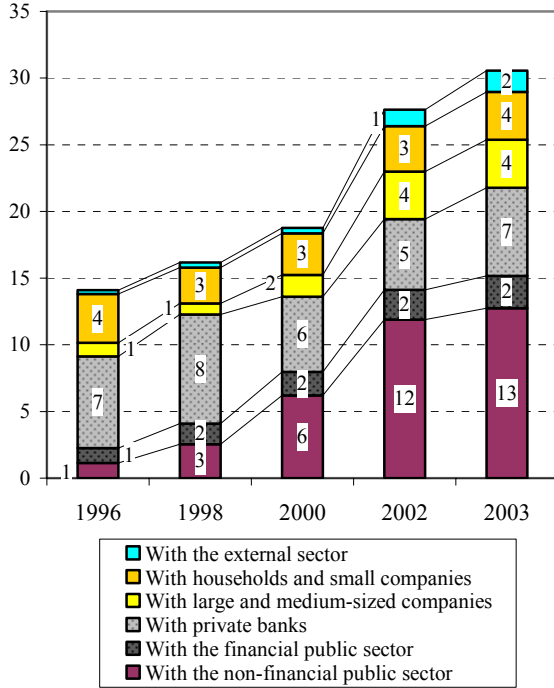
Investments of private NBIs in corporate assets—both corporate debt and equity—have remained small, and appear to be hampered by institutional obstacles, such as an underdeveloped market for corporate securities. One indication is that in 2002, the exposure of pension funds to the sovereign reached the regulatory limit of 50 percent of total assets, compelling them to look for other investment opportunities. However, most contributions paid into the funds in 2003 were deposited with banks, rather than invested with Colombian companies.

Starting in 2000, non-bank intermediaries—especially pension funds—accumulated substantial foreign currency assets, mostly Colombian government bonds denominated in U.S. dollars. By end-2003, foreign currency assets accounted for 18 percent of the NBIs' total assets (Figure 7.4). As practically all payment obligations of NBIs are in pesos, the open dollar positions appear speculative, presumably reflecting expectations held at the time that the peso might continue to depreciate—as it had between end-1998 and mid-2003. Reflecting the turnaround in capital flows the peso started appreciating at end-2003, however, which is likely to have inflicted capital losses on the NBIs.

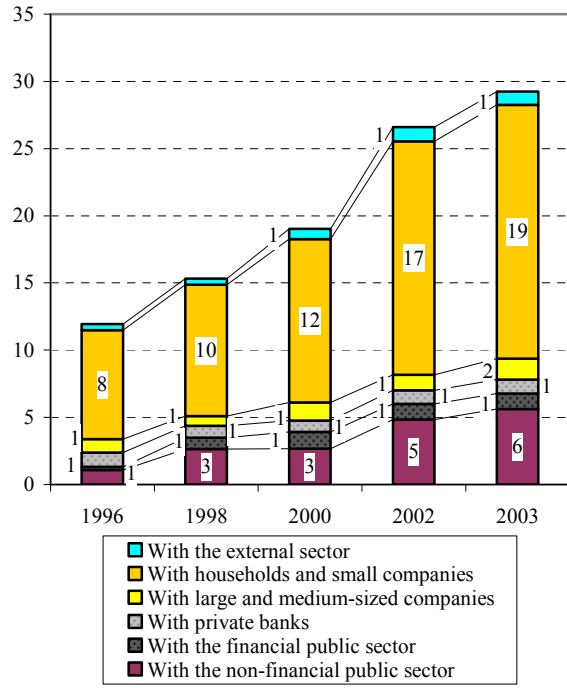
⁹ *Public* non-bank intermediaries had assets of 9 percent of GDP at end-2003 (up from 4½ percent of GDP in 1996). More than half of the sector's size was accounted for by the bank restructuring agency Fogafin, reflecting leftovers of the bank recapitalization schemes in 1999/2000. At end-2003, almost half of the assets of public non-bank intermediaries were invested in government debt, the rest in the banking system and the non-financial private sector.

Figure 7. Private Non-Bank Intermediaries
(in Percent of GDP)

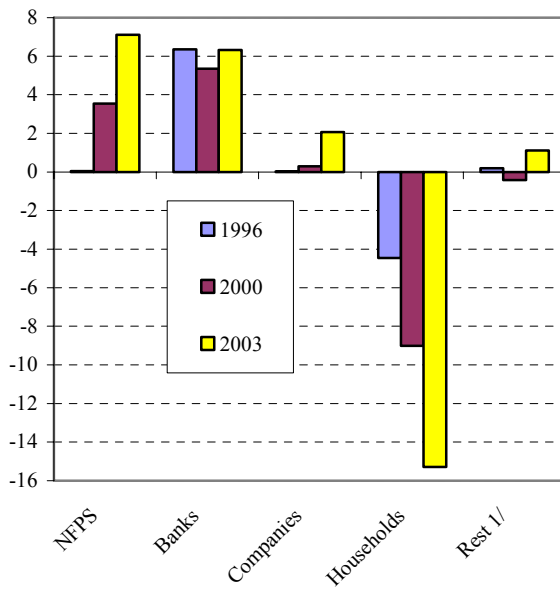
7.1 Sectoral Allocation of Assets



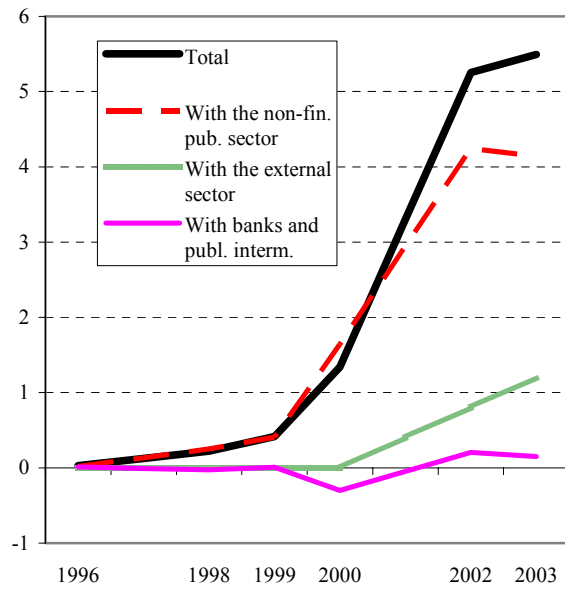
7.2 Funding Sources: Sectoral Distribution of Liabilities



7.3 Net Position with Other Sectors



7.4 Net Foreign Currency Position with Other Sectors



Source: authors' calculations.

.....1/ Public non-bank intermediaries and the external sector

3. The Non-Financial Private Sector: Non-Financial Corporations and Households

As mentioned in Section III, the data do not permit us to distinguish perfectly between financial assets and liabilities of non-financial corporations and those of households. Most importantly, there is no exact information on corporate equity held by households. To obtain an approximation, we estimated the share of equity held by households from the balance sheets of approximately 8500 companies that report to the superintendences of companies and securities. To keep the data work within limits, we performed the estimation only for 1998—the year before the recessions—2000—when the effects of the recession had largely fed through the sector balance sheets—and 2003—the most recent information.

Large and Medium-Sized Non-Financial Companies

As was shown in Section IV (see Figure 2.4), the corporate sector's net financial position in 2003 resembled the position in 1998 right before the crisis. Corporate vulnerabilities receded nonetheless, owing to improvements in the companies' financing structure.

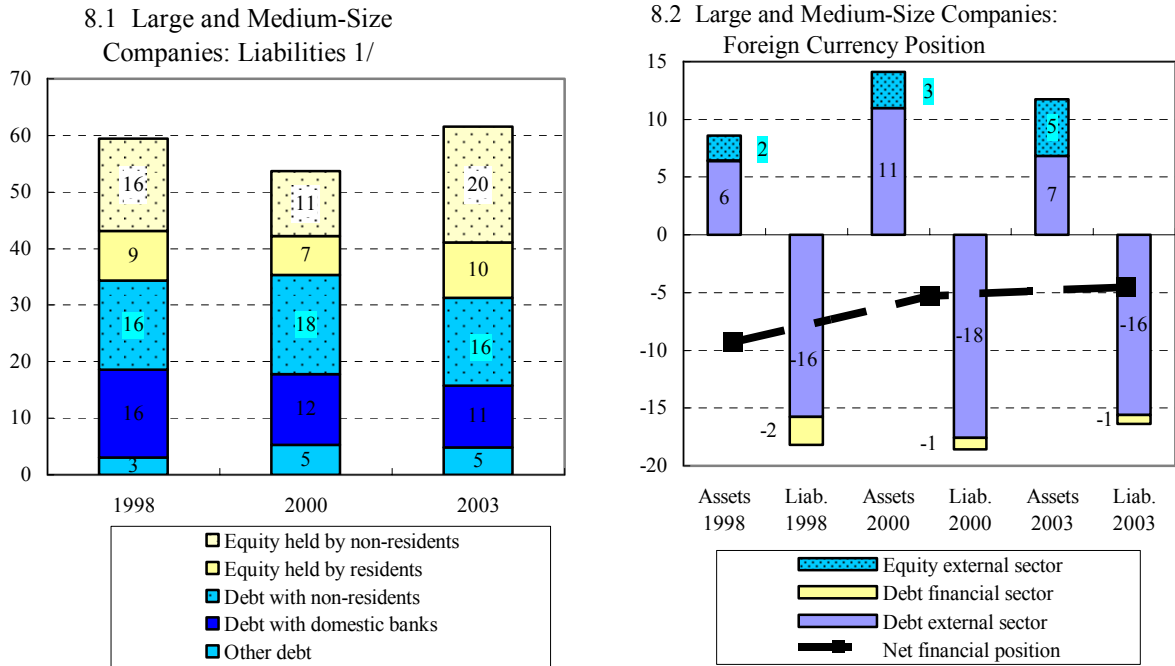
In 2003 Colombia's corporate sector was less leveraged than before the recession. While in 1998, 58 percent of the corporate sector's liabilities consisted of debt, by 2003 this share had fallen to 51 percent—after shooting up to 66 percent at the height of the crisis. This implies more risk sharing between companies and their financiers.

This change in the corporations' financing structure occurred in several steps. First, between 1998 and 2000 the valuation of corporate equity deteriorated—the corresponding improvement in the corporations' net financial position is therefore somewhat artificial (Figure 8.1). Second, companies paid off debts with domestic banks, much of which they had accumulated in the two previous years (not displayed in Figure 8). Third, after 2000 equity valuations recovered. Fourth, Colombian companies managed to attract capital injections, especially from foreign investors. These replaced to some degree the debt financing that corporations had used prior to 1998.

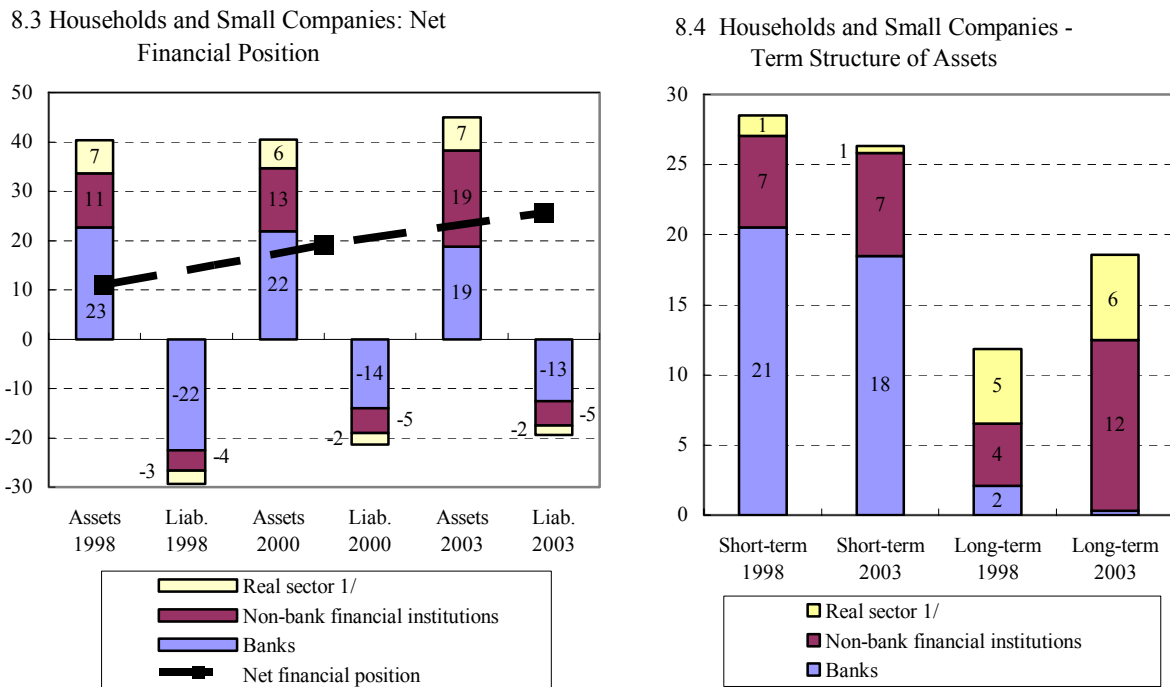
Colombia's corporate sector also reduced exposure to exchange rate risk. Again, the change occurred in several steps. The sharp peso depreciation in 1999/2000 triggered an increase in the peso value of both external liabilities and assets (Figure 8.2). On the liability side, the revaluation outweighed companies' efforts to pay down external debt. In subsequent years, Colombia's corporate sector accumulated foreign currency assets, however, especially equity participations in foreign companies (in the form of both portfolio investments and FDI). On aggregate, Colombia's corporate sector is still short in dollars, however.¹⁰

¹⁰ Echeverry et al. (2003) report that dollar debt is held almost exclusively by export companies that earn foreign currency.

Figure 8. The Non-Financial Private Sector: Non-Financial Corporations and Households
(In percent of GDP)



1/ In this and some of the following figures, the numbers inscribed in the columns denote percentage points of GDP



Source: authors' calculations.

Households and Small Companies

Households' net financial position improved sharply between 1996 and 2003, owing to two distinct developments. First, during the recession households reduced debts with the banking system. Much of this reduction reflects a contraction in mortgage loans (Figure 8.3)—in many cases, households defaulted on their mortgage debt and banks secured the collateral, resulting in a loss of *real* assets by households. Thus, while households' net financial position improved between 1998 and 2000, their net worth probably fell.

Second, households accumulated substantial assets with non-bank intermediaries, notably private pension funds, a process that accelerated after 2000. The emergence of pension funds and other non-bank intermediaries opened an important avenue for households to invest savings long-term (Figure 8.4). As non-bank intermediaries pass most of the households' savings on to the government (see Section B.2), however, households became more exposed to the public sector.¹¹

V. CONCLUSIONS

Between 1996 and 2003, the balance sheet of the *non-financial public sector* deteriorated substantially. Net indebtedness rose from less than 10 percent of GDP to 35 percent. This heightened the public sector's default risk, as reflected in the loss of the sovereign's investment grade rating in 1999. The public sector's net foreign currency position also deteriorated, *in spite of* notable success in improving the currency composition of public debt. This rendered the public sector vulnerable to a peso depreciation. In contrast, the public sector's liquidity position improved, but did so largely at the expense of domestic banks and pension funds. Experience with crisis in other emerging markets countries suggest that financial sector stress can spill over quickly into the sovereign's balance sheet.¹²

The *corporate sector* reduced vulnerabilities. Between 1998—the year before the crisis—and 2003, the sector's foreign currency position improved markedly. In fact, the large foreign currency mismatch that was found in corporate balance sheets prior to the recession—and that made the corporate sector vulnerable to the peso depreciation in 1998/99—may suggest

¹¹ It should be noted that a move from a public pay-as-you-go (PAYG) pension system to a private funded system, as it began in Colombia in 1993, renders a previously implicit household asset—the net present value (NPV) of the expected pension—explicit in the form of households' retirement savings. Conversely, the public sector, faced with loss of contributions into the PAYG system, will probably finance a part of these costs by issuing debt. Hence, a previously implicit public sector liability—the NPV of the expected pension payments—becomes explicit in the form of government debt (see Mackenzie et al. (2003) for a detailed discussion). This underscores again the importance of *not* interpreting the net financial position as a wealth indicator.

¹² As can be seen from Figure 1, public debt fell after 2003, along with improvements in other macro-indicators. As these developments fall outside the period for which we have balance sheet data, they are not discussed in this paper, however (but may be discussed in a future update).

that some companies “gambled” on the peg with the U.S. dollar. Moreover, at end-2003 companies were more equity- and less debt-financed than before the recession, implying less leverage and more risk-sharing with their financiers.

The results for households, banks, and non-bank intermediaries are mixed.

- *Banks’* main vulnerability prior to the 1999 crisis was their exposure to the stretched corporate sector. This exposure diminished during and after the recession, as banks reduced credit to the private sector and corporations’ balance sheets improved. At the same time, banks’ exposure to the sovereign increased sharply, however, and with it liquidity risk. While managing liquidity risk is a core banking activity, at end-2003 Colombia’s banks would have been less able to handle a sharp increase in interest rates than they were in the late 1990s. A foretaste of the associated dangers was experienced in late -2002, when domestic debt markets closed for several months, following a hike in interest rates due to contagion from neighboring Brazil.
- The most important fact about *non-bank intermediaries* is their impressive growth between 1996 and 2003. Similar to banks, non-bank intermediaries were heavily exposed to the sovereign at end-2003, and a stronger diversification of assets to other sectors would have appeared desirable. Also, after 2000 non-bank intermediaries built up a substantial, long foreign-currency position, which rendered them vulnerable to the peso appreciation that set in late 2003.
- *Households’* net financial position improved, owing to the accumulation of assets with pension funds and other non-bank intermediaries. However, as non-bank intermediaries passed most household savings on to cover the government’s long-term financing needs, households indirect exposure to the sovereign increased.

The absence of mark-to-market data for some assets as well as of information on how much balance sheet exposure is hedged (although indications are that most is unhedged) prevent an exact simulation of how macroeconomic shocks would feed through the Colombian economy. A rough, qualitative assessment is possible, however, and suggests the following.

- A *peso depreciation* at end-2003 would have hurt the public sector and non-financial corporations, even though corporations’ vulnerability to a depreciation was less than in the late 1990s. Non-bank intermediaries would have benefited from a depreciation. Obviously, the opposite is true for an appreciation.
- An *interest rate hike* would have hurt the financial system. In particular the liquidity position of banks appeared stretched.
- An “*autonomous*” *banking crisis* (i.e., not caused by balance sheet contagion from other sectors) would have been less harmful at end-2003 than it was in the late 1990s, as both households and corporations had sharply reduced exposure to the banking system in the meantime—even though the share of households’ assets placed in banks was still 30 percent at end-2003. Another 55 percent was invested with non-bank intermediaries, rendering the latter’s solvency critical.
- An *autonomous corporate crisis* would, obviously, have affected aggregate demand and therefore impacted on other sectors, notably households. *Direct* balance sheet

contagion would have been limited, however, as more than two-thirds of net corporate equity¹³—and almost one-half of corporate debt—was held by non-residents. In particular the exposure of banks to the corporate sector had fallen. This said, the exposure of households to the corporate sector remained non-trivial, with more than 10 percent of households' financial assets invested in corporate equity.

- Finally, a *sovereign debt crisis* would have critically affected banks, non-bank intermediaries, and Colombian households. Exposure of all these sectors to the sovereign—directly or indirectly—had increased between 1996 and 2003.

The analysis of the end-2003 data suggests the following policies to reduce macroeconomic vulnerabilities.

- *Reduce the level of public debt*, both to decrease the public sector's own vulnerability to a debt crisis, and to limit exposure of the financial system to the sovereign. Increasing debt maturities is a double-edged sword, at least to the extent that it is not accompanied by a reduction in debt levels: while it reduces the government's exposure to rollover-risk, it increases interest rate risk for banks and other financial institutions whose liabilities are largely short-term.
- *Maintain exchange rate flexibility*. The move from a quasi-peg with the US dollar to a float in 1999 did not only induce corporations to accumulate foreign currency assets and therefore improve risk management. It also reduced short-term interest rate volatility.
- *Promote the development of domestic securities markets*, to allow households and financial institutions to diversify assets away from the sovereign, and to invest more into the private sector.
- *Promote marked-based hedging mechanisms* that would allow sectors to close inverse open balance sheet positions.

¹³ I.e., excluding equity participations that Colombian companies hold with one another.

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Appendix I: Balance Sheet Matrices for 1996, 1998, 2000, 2002, and 2003

Colombia: *Intersectorial Assets and Liabilities Positions as of end-December 1996, in billions of colombian pesos*

Issuer of the liability (creditor)	Holder of the liability (debtor)						Financial Sector										Total
	Non Financial Public Sector		Banco de la Republica		Systema bancario depositario		Subtotal		Publico		Privado		Otros Intermedios		Non financial Private Sector		
Non Financial Public Sector	PRELIMINAR																
Total Liabilities	-	-	-	-	-	-	7,965.0	2,641.9	2,851.2	1,145.3	1,145.3	9,044.1	12,852.5	24,821.6	15,832.9	12,852.5	
Corpo plazo	2,385.0	670.2	3,804.9	2,495.0	561.5	1,933.5	1,301.7	647.3	1,933.5	571.5	730.2	2,709.8	889.8	6,894.6	8,271.1	8,271.1	
Largo plazo	-	-	584.8	1,913.5	425.5	1,301.7	1,301.7	570.6	1,301.7	0.9	0.9	2,210.8	880.8	5,426.9	3,449.7	5,426.9	
Participaciones de Capital	-	-	4,116.8	2,989.3	2,042.1	917.2	4,468.1	486.1	445.5	414.2	1,680.2	1,680.2	12,071.8	17,870.8	13,698.9	12,071.8	
(-) Banco de la Republica	2,385.0	-	4,116.8	4,116.8	734.4	3,450.2	3,450.2	20.2	3,450.2	20.2	3,450.2	3,468.9	-	8,271.1	8,271.1	8,271.1	
Systema bancario depositario	24.1	-	10.2	4,194.6	734.4	3,450.2	3,450.2	20.2	3,450.2	20.2	3,450.2	3,468.9	-	8,271.1	8,271.1	8,271.1	
Banca publica	-	-	-	-	0.4	7.0	7.0	0.9	7.0	0.9	0.9	0.3	-	34.5	34.5	34.5	
Banca privada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Participaciones de Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Otros intermedios	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Otros interm. Publicos	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Participaciones de Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Otros interm. Privados	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Participaciones de Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
External Sector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Source: Banco de la Republica-Sugeminencia de Estudios Económicos-DTE

Ti Billions = thousand of millions

Appendix II: Aggregate Balance Sheet for the Corporate Sector, 1998, 2000, and 2003

Colombia: Intersectorial ASSETS Positions-----EMPRESAS
as of end-december, in billions1/ of colombian pesos

Issuer of the ASSETS (creditor)	1998	2000	2003
Non Financial Public Sector			
Total Liabilities	5,958.0	5,696.0	9,006.8
Corto plazo	3,072.2	3,879.7	6,190.4
M/L	3,072.2	3,879.7	6,190.4
M/E	0.0	0.0	0.0
Largo plazo	2,243.6	1,505.4	2,152.8
M/L	2,243.6	1,367.8	1,626.9
M/E	0.0	137.5	525.9
Participaciones de Capital	642.2	310.9	663.6
Financical Sector			
Total Liabilities	6,186.0	10,644.6	15,832.8
1-) Banco de la Republica	570.2	764.8	825.1
Corto plazo	570.2	764.8	825.1
M/L	569.4	764.8	825.1
M/E	0.8	0.0	0.0
Largo plazo	0.0	0.0	0.0
M/L	0.0	0.0	0.0
M/E	0.0	0.0	0.0
Participaciones de Capital	0.0	0.0	0.0
2-) Sistema bancario depositario	4,548.9	7,488.5	11,335.5
Banca publica	82.9	66.2	69.4
Corto plazo	42.5	45.2	48.6
M/L	42.5	45.2	48.6
M/E	0.0	0.0	0.0
Largo plazo	36.7	15.9	20.8
M/L	36.7	15.9	20.8
M/E	0.0	0.0	0.0
Participaciones de Capital	3.7	5.0	0.0
Banca privada	4,466.0	7,422.3	11,266.1
Corto plazo	4,466.0	5,080.2	6,823.0
M/L	4,466.0	5,080.2	6,822.3
M/E	0.0	0.0	0.8
Largo plazo	0.0	0.0	0.0
M/L	0.0	0.0	0.0
M/E	0.0	0.0	0.0
Participaciones de Capital	0.0	2,342.1	4,443.1
3-) Otros intermediarios	1,066.9	2,391.3	3,672.1
Otros intern. Publicos	22.5	55.9	182.5
Corto plazo	22.5	52.0	174.0
M/L	22.5	52.0	174.0
M/E	0.0	0.0	0.0
Largo plazo	0.0	3.5	7.9
M/L	0.0	3.5	7.9
M/E	0.0	0.0	0.0
Participaciones de Capital	0.0	0.3	0.6
Otros intern. Privados	1,044.4	2,335.4	3,489.6
Corto plazo	1,044.4	1,753.1	2,828.8
M/L	1,044.4	1,753.1	2,828.8
M/E	0.0	0.0	0.0
Largo plazo	0.0	0.0	0.0
M/L	0.0	0.0	0.0
M/E	0.0	0.0	0.0
Participaciones de Capital	0.0	582.3	660.8
Resto del Sector Privado	390.2	404.6	506.2
Corto plazo	14.8	6.8	5.3
M/L	14.8	6.8	5.3
M/E	0.0	0.0	0.0
Largo plazo	375.4	397.8	500.8
M/L	375.4	397.8	500.8
M/E	0.0	0.0	0.0
Participaciones de Capital	0.0	0.0	0.0
Total Liabilities External Sector	12,122.4	24,716.2	26,626.1
Corto plazo	9,031.1	19,208.2	15,474.6
M/L	0.0	0.0	0.0
M/E	9,031.1	19,208.2	15,474.6
Largo plazo	0.0	0.6	0.7
M/L	0.0	0.0	0.0
M/E	0.0	0.6	0.7
Participaciones de Capital	3,091.3	5,507.5	11,150.8
Total	24,656.6	41,461.4	51,971.8
Corto plazo	18,263.7	30,789.9	32,369.9
M/L	9,231.8	11,581.8	16,894.6
M/E	9,031.9	19,208.2	15,475.4
Largo plazo	2,655.7	1,923.2	2,683.1
M/L	2,655.7	1,785.1	2,156.5
M/E	0.0	138.1	526.6
Participaciones de Capital	3,737.2	8,748.2	16,918.8

Colombia: Intersectorial Liabilities Positions as of end-december, in billions of Colombian pesos

	Holder of the liability (creditor) Non-Financial Public Sector	Subtotal	Banco de la Republica				Financial Sector				Resto del Sector privado	External Sector	Total
			Subtotal	Systema bancario depositario	Private	Subtotal	Other intermediaries	Private					
	Issuer of the Liabilities (creditor)												
1	Total	24,527	12	23,257	3,338	19,920	1,200	1,169	8,416	45,186	83,566		
	Corto plazo	6,641	12	6,634	1,317	5,219	77	81	1,467	3,181	13,570		
	MIL	5,017	12	4,910	1,123	3,789	77	61	1,467	0	8,765		
	ME	1,624	0	1,624	194	1,430	0	0	0	3,181	4,806		
9	Largo plazo	15,638	0	15,346	1,789	13,557	249	245	150	18,979	34,767		
9	MIL	13,886	0	13,595	1,286	12,308	249	245	150	0	14,036		
9	ME	1,752	0	1,752	503	1,249	0	0	0	18,979	20,730		
8	Participaciones de Capital	2,248	0	1,376	232	1,145	874	862	6,799	23,027	35,229		
	Total	27,558	36	24,127	1,421	22,706	3,387	2,843	8,065	50,828	83,966		
	Corto plazo	8,542	35	7,905	347	7,558	592	523	1,918	5,022	20,361		
	MIL	8,105	35	7,474	301	7,172	588	519	1,918	0	14,924		
	ME	436	0	432	46	386	4	0	0	5,022	5,458		
2	Largo plazo	15,359	0	13,830	817	13,013	1,529	331	331	25,720	41,410		
0	MIL	14,049	0	12,520	452	12,067	1,529	331	331	0	14,360		
0	ME	1,310	0	1,310	365	945	0	0	0	25,720	27,030		
0	Participaciones de Capital	3,657	0	2,392	257	2,135	1,266	1,245	5,815	20,086	26,359		
	Total	35,931	63	26,845	500	26,344	9,000	8,151	15,671	81,489	135,308		
	Corto plazo	7,590	62	7,005	110	6,895	497	358	2,405	9,042	21,976		
	MIL	7,041	62	6,465	89	6,376	488	350	2,405	0	12,365		
	ME	549	0	541	21	520	9	9	0	9,042	9,591		
2	Largo plazo	22,337	0	17,652	267	17,385	4,688	4,047	284	26,207	48,828		
0	MIL	21,088	0	16,407	117	16,290	4,684	4,043	284	0	21,372		
0	ME	1,249	0	1,245	150	1,095	4	4	0	26,207	27,456		
3	Participaciones de Capital	6,004	0	2,188	123	2,064	3,816	3,746	12,982	46,240	68,504		