THE DEVELOPMENT OF LATIN-AMERICAN BOND MARKETS: THE CASE OF COLOMBIA

THIRD DRAFT

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I. Introduction

At the beginning of the nineties Colombia underwent a series of major policy reforms aimed at facilitating the development of a bond market, which at the time was practically inexistent. The result two decades later is a bond market that has developed unevenly, with a thriving government bond market, and a private bond market that remains far from consolidation, concentrated on a small number of large suppliers, and exhibiting momentary growth spurs that are not sustained over time. In consequence, in Colombia, to date, bank credit remains the main source of external financing for firms.

There have been several efforts aimed at explaining the lagging performance of market-based financing in Colombia. None of them, however, has focused explicitly on the bond market, so questions regarding this specific market remain largely unanswered. Also, the empirical approach to the capital market has been mostly descriptive.

This paper focuses on the development of the corporate bond market in Colombia. We attempt to connect the growth pattern of this market to the recent history of the financial sector, and using a microeconomic analytical approach, we revise the variables that have driven the decision of firms to issue bonds, and the decision of investors to acquire them. We also, and most importantly, provide empirical evidence about the convenience of having a well-developed corporate bond market that represents a true financing alternative to the entrepreneurial sector.

We find that the corporate bond market plays a key counter-cyclical role during periods of banking crisis and -to the extent that this is central to the workings of the economy as a whole- we emphasize the importance of an adequate policy and institutional framework to facilitate the development of this market. We also find that it is not strictly the firm size that determines access to the bond market, but rather the size of the bond issues, as there is a preference in the market for the more liquid securities. Investors avoid bonds in which individual players may have market power. Finally, we find evidence that government bonds crowd out the corporate debt market.

The remaining of the paper is organized as follows. Section II briefly reviews the related literature. Section III presents an overview of the Colombian financial sector. Section IV introduces the data available and uses it to characterize the Colombian bond markets. Section V explores in an empirical setting the determinants of the corporate bonds' supply and demand. Section VI provides some empirical evidence to support the idea that of having a larger bond market is desirable, and Section VII concludes.

II. Literature review

The relatively scarce literature addressing the issue of bond market development has focused on the factors that explain the market's development in a multi-country regression setting. For example, Eichengreen and Luengnaruemitchai (2004) study the causes for the slow development of the Asian bond market, using a cross-section of developing and developed economies. They find that larger country size, stronger institutions, less volatile exchange rates, and more competitive banking sectors are positively associated with bond market capitalization. Asian countries' strong fiscal balances have not resulted in growth of the government bond markets. Their results suggest that the region's structural characteristics and macroeconomic and financial policies account fully for differences in bond market development between Asia and the rest of the world.

Zervos (2004) documents the costs of debt and equity issuance, both in the domestic and the international markets, for firms in Brazil, Chile and Mexico, collecting data on investment banking and legal fees, regulatory and exchange listing costs, taxes, rating agency fees, and expenditures for marketing and publishing. The paper suggests that Brazilian firms face similar costs in the local markets and abroad in issuing debt, but face significantly higher costs in the local markets when issuing equity. Chilean firms can issue debt more cheaply in the international markets, and while issuing equity in their local market is cheaper, transaction costs have resulted in a preference for bonds over equity as a source of financing. Finally, Mexican firms face the lowest costs when issuing debt, but the highest to issue equity. In addition, the paper underscores the role played by the investors' base in influencing the ability of firms to access the domestic capital markets.

Beck and Levine (2002) study whether market-based or bank-based financial systems are better at financing the expansion of industries that depend heavily on external finance, at facilitating the birth of new establishments, and at improving the efficiency of capital allocation across industries. They do not find evidence for either the market-based, or the bank-based hypothesis. While the efficiency of the legal system and the overall degree of financial development boost industry growth, having a bank-based or market-based system does not *per se* seem to matter for the formation of new establishments, or for an efficient capital allocation. Levine (2002) also explores the relative merits of bank-based and market-based financial systems. Using a broad cross-country database, his results indicate that although overall financial development is robustly linked with economic growth, there is no support for either the bank-based or the market-based view.

Faulkender and Petersen (2003) examine if, rather than being constrained in their access to incremental capital by the risk of their cash flows and by their characteristics, firms may be rationed by lenders. They find that firms with access to public bond markets have significantly different leverage ratios. Even after controlling for the firm characteristics previously found to determine observed capital structure and the possible endogeneity of having a bond rating, they find that firms which are able to raise debt from public markets have 40 percent more debt.

For the case of Colombia, the literature has focused on the capital markets in general, but not specifically on the bond market. Fedesarrollo (1996) led an umbrella project to examine the obstacles to the development of the capital markets from different angles, including a revision of the institutional and regulatory restrictions, of the potential suppliers and market participants, and of the structural macroeconomic variables that affect it. The result of this study, known as the Mission of the Capital Markets, is a set of policy recommendations that led the way for the development of a government bond market and proposed several regulatory and institutional reforms regarding the supply and demand of corporate debt.

More recently, ANIF-Fedesarrollo (2004) studied the determinants of the firms' capital structure, in an effort to understand their reluctance to issue debt and equity. Using the input from interviews, workshops, and a survey, this study found that only large firms participate, and that the market is still very concentrated in short term debt. The diagnosis from the point of view of both, firms and institutional investors, was not far from that provided by the Mission of the Capital Markets a decade before.

III. Overview of the Colombian financial sector

In spite of having experienced significant growth over the last 15 years, the Colombian financial sector is still small and shallow. Both, the Colombian banking and non-banking financial sectors are relatively small compared to those of the developed countries and to the Asian emerging economies, for which this is true in particular with regards to the banking sector and the stock market (see Table 1). When compared to Latin America, the banking sectors in Colombia, Mexico and Peru are of similar size, but much smaller than in Brazil and Chile. The picture is slightly different for the debt markets, in which Colombia appears as a medium size player, both in terms of the domestic public debt and the corporate bond market. In 2004, only Chile and Argentina had larger markets (relative to GDP).

The Colombian bank-based financial system is much larger than the market-based segment. Thus, the banking sector remains the main source of funding of all productive activities. Both the stock market, active since the 1960s, and the more recent private bond market, are still concentrated on a small number of issuers and issues, and relatively illiquid[2]. The performance of the public debt market has been, by contrast, very dynamic since the early 1990s. All this is reflected in Table 1.

Table 1
Bank credit, stock market capitalization and outstanding domestic debt, % of GDP, 2004

	Bank credit	Stock market capitalization	Domestic debt		
			Government	Financial	Corporate
Mature Markets					
Japan	94,4	78,5	141,0	25,6	16,3
United States	45,8	129,0	47,1	94,4	22,0
Euro Area	103,9	54,6	53,6	29,8	10,0
Emerging markets					
Asia	103,6	74,1	22,3	13,4	6,9
Europe	24,3	34,1	26,9	0,5	1,0
Latin America	20,9	40,2	28,9	5,3	2,6
Argentina	10,4	30,7	5,8	3,4	6,4
Brazil	25,2	50,0	44,7	10,8	0,6
Chile	56,8	114,8	19,6	10,2	11,3
Peru	17,6	28,3	5,6	1,3	3,1
México	14,3	25,4	22,6	0,8	2,7
Colombia*	18,0	24,3	22,8	4,3	3,9

Source: IMF (2005). Data for Colombia: Banco de la República de Colombia, Superintendencia de Valores.

In the remainder o this section we describe the main developments of both the banking and non-bank sectors since the 1990s.

A. The banking sector

Prior to the 1990s, the Colombian banking sector operated under a model of specialized banking. Commercial banks had the monopoly of checking accounts and held about 60% of the sector's total assets. The remaining 40% was held between three types of intermediaries: Investment banks, Mortgage banks, and Consumer loans companies. Investment banks appeared in the late 1950s with the purpose of facilitating long term financing to the real sector through the issue of stocks and bonds. Their role, largely unfulfilled to this date, was to aid the development of the capital markets. Mortgage banks were the result of a reform of the system of housing finance in the early

[2] Only around 100 companies are listed.

1970s, which gave these intermediaries the monopoly over the use of the UPAC –an indexation mechanism- applying both to saving deposits and mortgages.

Financial repression was pervasive between the mid 1960s and the 1980s. In the context of import substitution industrialization, credit was directed towards certain sectors while interest rates were heavily controlled and regulated. In addition, reserve deposits –monetary policy's main instrument at the time– and forced investments, represented between 35% and 40% of total deposits. Foreign ownership of banks was heavily restricted, foreign exchange controls prevented the development of a foreign exchange market, and direct Central Bank lending to the government made the development of a public debt market unnecessary. All of the above contributed to the lack of development of the financial sector at the time.

In addition, during the early 1980s, and as a result of the Latin American debt crisis, the Colombian financial sector was under severe stress. The lack of adequate prudential regulation and supervision led to the intervention and nationalization of several intermediaries. The estimated net cost of these interventions was 3% of GDP[3].

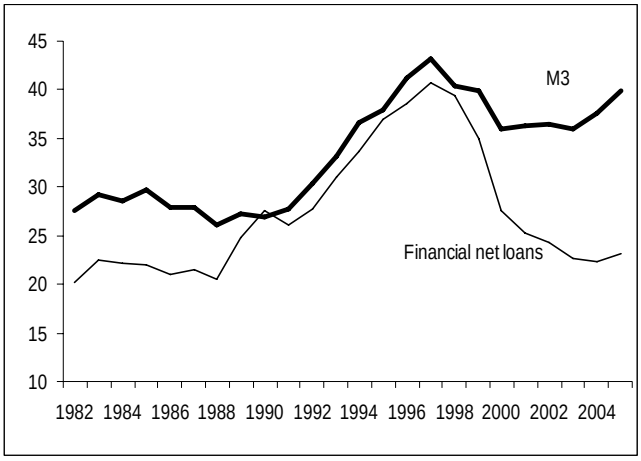
As a result of the crisis, financial regulation and supervision were strengthened in line with the Basel standards, and a deposit insurance scheme was created. Simultaneously, the predominant instrument of monetary policy shifted from reserve deposits to open market operations.

An intense process of financial reform took place in the early 1990s. Laws 45 of 1990, 9 of 1991, and 35 of 1993 substantially changed the structure and operation of the financial sector. Reserve deposits were lowered, most forced investments were eliminated, and subsidized direct Central Bank lending to the government was made unconstitutional. Although interest rate controls had been lifted before, reforms restricted their use even more by limiting their potential application to 90 days only. In addition, restrictions to the foreign ownership of banks were dismantled, while intermediaries were authorized to a wider range of activities. At the same time, exchange rate controls were removed, allowing intermediaries to participate in a growing foreign exchange market.

As a result of the reforms, as well as of large capital inflows, financial intermediation grew rapidly. M3/GDP rose to 43.2% of GDP in 1997 from 28% in 1990 (see Figure 1). The number of financial intermediaries increased, several public banks were privatized, and foreign ownership in the banking sector went from 10.2% in 1992 to 29% in 1998.

[3] Echeverry (1999).

Figure 1
M3 and net loans outstanding, as % of GDP



Source: Banco de la República de Colombia.

As a result of unsustainable rates of growth in public and private expenditures, both fiscal and external deficits were close to 4.5% of GDP in 1997, making the economy vulnerable to the effects of the Asian and Russian crises. In response to the attacks on the currency resulting from the sudden stop in capital inflows, the central bank raised interest rates at the beginning of 1998. The economic consequences of the reversal in capital flows, the increase in interest rates, the reduction in expenditures, as well as the balance sheet effects of the depreciation of the currency, resulted in a severe contraction of the economy in 1999 (-4.2%).

The repercussions on the financial sector were far reaching. The share of non-performing loans over total loans rose to 16% in 1999 from 6% in 1997. Progress in terms of size and depth of the financial intermediation suffered a major reversal. The stock of loans, which had risen from 28% to 40% of GDP between 1990 and 1997, fell to 23% in 2005. While commercial credit and consumer loans started recovering in 2002, the stock of mortgage loans fell to 4% of GDP in 2005 from over 13% before the crisis (1997).

As a result of the crisis, financial regulation and supervision was elevated to new levels, where risk is more adequately evaluated and provisions are stricter, and this is apparently proving fruitful.

B. The non-bank sector

Some important developments have taken place in this market since the early 1990s. In particular, the liberalization of foreign portfolio investment, the appearance of new institutional

investors, the development of mortgage securitization and the progress made towards an improved market infrastructure (credit ratings, the unification of stock exchange markets, the modernization of transactional systems, among others) imply more progress in recent years that in the preceding decades.

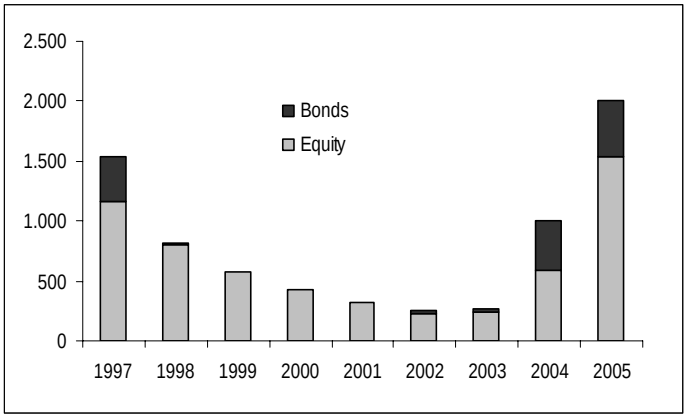
In Colombia, the firms' preference for bank loans over market-based instruments is, to a large extent, the result of policy choices. In 1951, for instance, the Central Bank became a development bank by providing subsidized loans to specific sectors, creating a bias against bonds or equity financing. Tax measures were also a determining factor in this direction. Perhaps the most important was the 1953 reform that introduced a system that taxed simultaneously corporate profits and shareholders' dividends. This measure, which proved detrimental for the development of the stock market, was eliminated in 1986. During the inflation acceleration of the 1970s, the stock market growth was also negatively affected by the non-tax deducibility of the inflationary component of interest payments.

Later measures were headed in the direction of correcting these and other policies to facilitate the development of the capital markets. Decree 1321 of 1989, for example, eliminated taxes on capital gains in the stock market. Law 49 of 1990 established that profits from the transfer of shares through the stock market would not constitute income nor occasional gain, and that investment funds, value funds, and mutual funds that administrated trusts would be exempt from income taxes.

Only in the 1990s would significant progress be observed in the non-banking sector. Law 9 of 1991 allowed inflows of portfolio foreign investment, which in 1997 reached USD$1.5 billion dollars. After drastically falling as a result of Asian and Russian crises, these flows have recovered in recent years (see Figure 2). However, these funds continue to be low (0.4% of GDP).

Labour and pension reforms (Law 50 of 1990 and Law 100 of 1993, respectively) created new institutional investors that have played a key role in the development of the capital markets. In Colombia, employers are obliged to make a yearly payment. Law 50 of 1990 created the Severance Pay Funds, where employers are required to deposit the equivalent of one monthly salary per year to an individual account own by each employee (employees are allowed to withdraw money from their accounts for education and housing, otherwise works as an unemployment insurance scheme). The assets of these funds represented about 1.3% of GDP in 2005.

Figure 2
Foreign capital portfolio investments (in million dollars)



Source: Superintendencia Bancaria

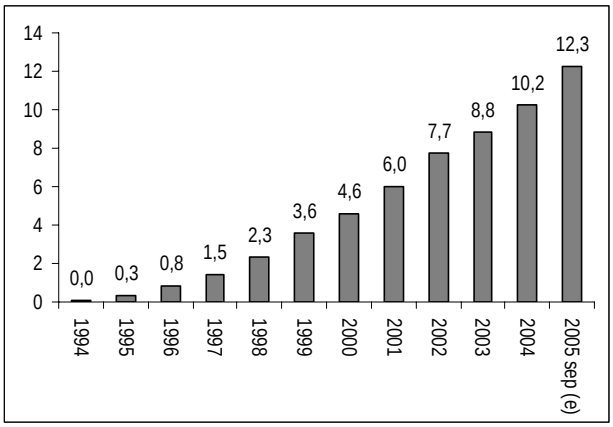
As for Law 100 of 1993, the pension reform created the private Mandatory Pension Funds to administer the defined-contribution pension regime[4]. As in the case of the severance pay funds, pension contributions deposited in the individual accounts are invested in the capital markets. Since their creation, the pension funds have grown to become the most important player in the market. Their portfolio went from 1% of GDP in 1994 to almost 12% of GDP in 2005 (see Figure 3). Law 100 also created the Voluntary Pension Funds that are not as large (0.2% of GDP in 2005), but have grown dynamically in the recent years thanks to a tax benefit that applies to the contribution of high salary individuals. The pension reform also created new business opportunities for the life insurance companies (pension funds' insurance and life annuities) providing them with additional resources to invest in the capital markets.

Other elements have also been key for the capital markets' recent development: (1) the creation of custody service entities, in the early 1990s, to reduce operating risks and add safety to financial transactions; (2) the development of mortgage securitization as an alternative long-term investment opportunity, introduced by Law 35 of 1993 and pushed further by Law 546 of 1999, to provide mortgage banks with longer term financing. By the end of 2005, mortgage securitizations amounted to 1.5% of GDP; (3) the merger of three local stock exchanges (Bogotá, Medellín and Occidente) into one national stock exchange in 2001, to avoid the inefficiencies resulting from the market segmentation; and (4) the development of electronic transaction systems for fixed and

[4] The pay-as-you-go regime continues to be administered by a public entity, the Instituto de Seguro Social (ISS).

variable income operations, that took place in the 1990s[5], enabling the provision of more information on real time on the bonds and stocks traded, and speeding transactions.

Figure 3
Mandatory pension funds' portfolio as % of GDP



Source: Superintendencia Financiera and calculations by authors.

In 2005, the banking and securities superintendencies were merged with the goal of improving supervision and eliminating the "regulatory arbitrage" between the two segments of the market. Also in 2005, legal changes improved corporate governance requiring independent board members in entities that issue securities, with the purpose of protecting small investors. While these developments are still too recent to show any results, they are steps in the right direction.

IV. The bond markets

Table 2 shows the evolution over time of the Colombian private and public bond market. In 2004, the total outstanding debt in the Colombian bond market was close to US$33 billion. About 70% was public debt, while the remaining 30% was equally split between corporate bonds and bonds issued by financial institutions.

The market size doubled between 1997 and 2004. The public debt component more than tripled over the same period, while the corporate debt market, although much smaller in size, also increased significantly. Debt issued by the financial sector appears to have lost participation in the market. In fact, as shown in Table 2, the share of Treasury bonds rose to 20% of GDP in 2004 from

[5] Before having a single stock exchange, each of the three stock exchanges had developed its own electronic transaction systems for fixed income operations and variable income operations. These systems were integrated with the creation of the Stock Exchange of Colombia.

8% of GDP in 1997.During the same period, debt issued by the financial sector fell from a similar starting point (7.8%) to about half (4.3%) as percent of GDP. Corporate bonds, on the contrary, started in 1997 at near to 1%, and finished the period weighting almost as much as the financial debt component of the market (3.9%).

Table 2
Bonds outstanding by type, 1997-2004

Year		Corporate bonds outstanding	Financial sector bonds outstanding	Public bonds outstanding	Total bonds outstanding
1997	in 2004 million dollars	983	7.119	7.216	15.319
	as share of total debt	6,4%	46,5%	47,1%	100,0%
	as share of GDP	1,1%	7,8%	7,9%	16,8%
1998	in 2004 million dollars	1.608	6.316	8.912	16.836
	as share of total debt	9,5%	37,5%	52,9%	100,0%
	as share of GDP	1,8%	7,0%	9,9%	18,6%
1999	in 2004 million dollars	2.269	6.344	11.835	20.448
	as share of total debt	11,1%	31,0%	57,9%	100,0%
	as share of GDP	2,5%	7,1%	13,3%	22,9%
2000	in 2004 million dollars	2.576	6.073	14.495	23.144
	as share of total debt	11,1%	26,2%	62,6%	100,0%
	as share of GDP	2,7%	6,4%	15,3%	24,4%
2001	in 2004 million dollars	2.637	5.393	16.782	24.812
	as share of total debt	10,6%	21,7%	67,6%	100,0%
	as share of GDP	2,8%	5,7%	17,7%	26,2%
2002	in 2004 million dollars	2.959	4.934	20.047	27.940
	as share of total debt	10,6%	17,7%	71,8%	100,0%
	as share of GDP	3,1%	5,2%	21,0%	29,2%
2003	in 2004 million dollars	4.246	4.490	22.123	30.859
	as share of total debt	13,8%	14,5%	71,7%	100,0%
	as share of GDP	4,2%	4,4%	21,9%	30,5%
2004	in 2004 million dollars	4.171	4.643	24.349	33.163
	as share of total debt	12,6%	14,0%	73,4%	100,0%
	as share of GDP	3,9%	4,3%	22,8%	31,1%

Source: Superintendencia de Sociedades, Superintendencia Bancaria, and Ministry of Finance of Colombia.

The numbers seem to say that, while the overall debt market evolution has been driven by a large and increasing public debt component, its performance has not hindered that of corporate debt in an evident way. On the contrary, the growth dynamics of the public debt market in Colombia may have facilitated the incipient development of the corporate bond market that remains small by international standards, but shows significant growth in size in the recent years. Crowding-out, however, could explain the market share lost by financial debt over the period 1997-2004. This may also be a result of the banking crisis.

A. The public bond market

The Constitution of 1991 set the way for a new model of government financing by restricting the use of primary financing (which requires the unanimous approval of the independent central bank's board of directors). Issuing treasury bonds (TES) became central to the government's finances, going from 9,6% in 1994 to 35,7% in 2003, as a share of the total public debt (see Table 3).

Not all treasury bonds are allocated through market mechanisms. A-type treasury bonds are issued with the exclusive purpose of covering the Government's liability with the Central Bank and do not reach the market. These are a minority of the total treasury bonds outstanding (see Table 3). B-type TES treasury bonds are used to raise funds in the market through three alternative mechanisms: (1) auctions; (2) agreed operations with public sector entities (at market interest rates); and (3) mandatory TES investments, to capture the excess liquidity of publicly owned companies or public entities. As can be seen in Table 3, as a share of the total public debt, B-type TES grew from 3,4% in 1994 to 35,6% ten years later. This growth occurred in a large proportion based on the market (see the increasing participation of B-type TES allocated through auction or agreed operation mechanisms).

Table 3
Public debt by source, 1990-2004

Year	Total debt in 2004 million dollars	External debt (% over total)					Internal debt (% over total)						
		Multilateral banks	Commercial banks	Suppliers	Bonds	Total external debt	A-type TES	B-type TES				Other	Total internal debt
								Auctions	Agreed trades	Other	Total		
1990	10.862	52,2%	28,2%	5,2%	1,6%	87,2%	-	-	-	-	-	-	12,8%
1991	10.545	53,8%	27,9%	5,1%	2,2%	89,0%	-	-	-	-	-	-	11,0%
1992	11.490	48,0%	25,7%	4,3%	2,5%	80,5%	-	-	-	-	-	-	19,5%
1993	11.966	39,1%	23,2%	3,4%	3,5%	69,3%	-	-	-	-	-	-	30,7%
1994	10.973	33,5%	21,5%	2,5%	6,3%	63,8%	6,2%	-	-	-	3,4%	26,6%	36,2%
1995	12.606	31,1%	18,1%	2,2%	7,3%	58,6%	4,2%	1,9%	3,4%	3,1%	8,4%	28,8%	41,4%
1996	12.835	24,4%	15,9%	1,6%	12,2%	54,1%	3,4%	1,9%	8,3%	5,0%	15,2%	27,3%	45,9%
1997	16.225	19,6%	14,9%	1,4%	14,4%	50,3%	2,3%	4,3%	9,7%	3,8%	17,8%	29,7%	49,7%
1998	19.976	19,3%	13,9%	1,4%	17,5%	52,1%	1,4%	4,0%	11,1%	3,9%	19,0%	27,6%	47,9%
1999	26.345	20,2%	11,7%	1,0%	18,1%	51,1%	0,8%	4,4%	16,7%	0,3%	21,4%	26,7%	48,9%
2000	34.946	18,8%	9,6%	0,9%	20,2%	49,5%	0,5%	0,3%	20,9%	0,2%	21,4%	28,7%	50,5%
2001	41.880	17,7%	6,2%	0,7%	25,5%	50,1%	0,3%	0,3%	23,6%	0,2%	24,1%	25,4%	49,9%
2002	48.130	18,8%	5,0%	0,6%	26,1%	50,4%	0,2%	0,2%	25,7%	0,2%	26,2%	23,3%	49,6%
2003	51.171	21,7%	3,6%	0,4%	23,8%	49,5%	0,1%	0,2%	28,3%	0,2%	28,8%	21,6%	50,5%
2004	50.080	19,0%	3,0%	0,2%	22,3%	44,6%	0,1%	-	-	-	35,6%	19,7%	55,4%

Source: Banco de la República, Boletín de Deuda Pública, September 2005.

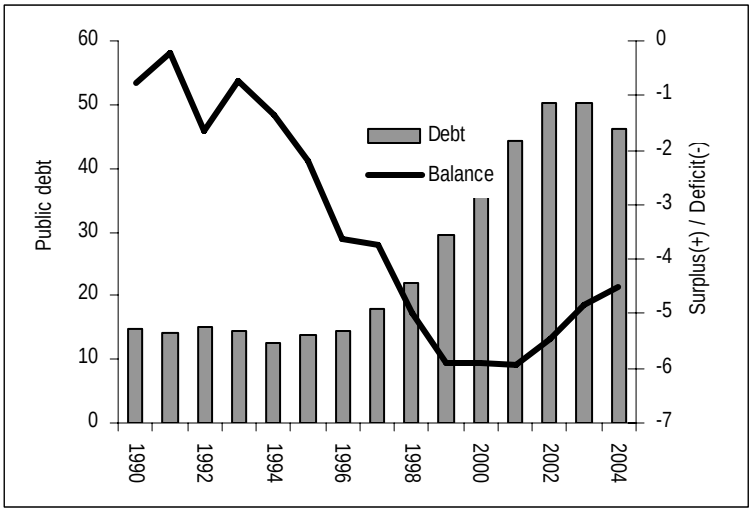
The Government's foreign debt composition also shows an increasing reliance on market-based instruments. Foreign debt bonds increased from 2,2% in 1990 to 22,3% in 2004 as a share of the total debt, gaining participation against loans from agencies, governments, multilateral

organizations and commercial banks (see Table 3). Financing through the market has represented the possibility of increased external financing without resource to multilaterals' or commercial banks' credit. While the resulting re-composition of the external debt forces the government to less flexible debt conditions that demand more fiscal discipline, the growing share of bond debt has the advantage of increasing the availability of funds not restricted in terms of destination or conditioned to policy reforms, as is often the case of credit from multilaterals.

Without doubt, the increasing fiscal deficit has contributed to the dynamism to the internal public debt market (see Figure 4). Public debt increased from 15% of GDP in 1999 to near 50% of GDP in the recent years. As can be seen in Table 3, the internal public debt market has allowed the government to substitute domestic debt for foreign debt: while in the early 1990s more than 80% of the public debt was external, since 1996 this share has fluctuated around 50%, subject to the conditions of both the internal and external markets.

The growth of the internal public debt market has been possible because the growing supply of treasury bonds has found demand for it in the market. The credit stagnation during the financial crisis of 1998-2000 contributed to boost this demand. The difficult situation facing the financial intermediaries and their risk perceptions, led them to substitute loans for investments in treasury bonds during that period. In the recent years, particularly since mid-2002, demand has continued to thrive in response to an expansive monetary policy in a context of reduced alternative investments. The financing needs of the Government, in addition, have resulted in attractive returns to the investment in treasury bonds, relative to returns on alternative investments.

Figure 4
Government balance and debt as % of GDP



Source: Ministry of Finance of Colombia and Banco de la República.

As is apparent from Table 4, the public debt market has not only grown in size, but also has progressed both towards alternative denominations and towards longer average maturities. In addition to the peso denomination (68.4% of the total outstanding in 2004), B-type TES are also denominated in indexed units (36.4% of the total outstanding in 2004), and in U.S. dollars (6.4% of the total outstanding in 2004). With respect to maturities, the share of B-type TES with maturities of less than five years has dropped significantly (bonds with maturities less than one year are now inexistent) while the share of B-type TES with maturities between 6 to 10 years has grown from nil to 52.7% over the same time period. These numbers evidence a significant success in replacing short-term debt by longer-term debt -which has been a goal of the government- and also reflect an effort to move towards a more complete reference yield curve, contributing to the development of the debt market. The behavior of the share of B-type TES of maturities longer than ten years is, however, more random, and reflects the difficulties faced by the government in allocating long-term bonds in the local market. As mentioned above, returns on public debt have often been higher than those of alternative investments in the recent years. Driven by its fiscal need, the government has committed to high interest costs. This has been particularly true when allocating the longer-term debt in the market and may explain why the longer maturity bond categories don't display an increasing trend over time.

Table 4
B-type TES by bond characteristics (% over total)

Year	By denomination			By maturity structure				By holder		
	In pesos	In dollars	Indexed	1 year	2 - 5 years	6 - 10 years	11 - 15 years	Public sector	Private sector	Financial sector
1995	100,0	0,0	0,0	38,2	43,3	0,0	18,5	53,5	11,0	35,5
1996	100,0	0,0	0,0	33,5	57,9	4,2	4,4	59,7	9,6	30,7
1997	100,0	0,0	0,0	32,9	53,2	11,5	2,5	55,2	20,3	24,5
1998	100,0	0,0	0,0	37,5	25,0	20,5	17,0	64,2	14,1	21,8
1999	100,0	0,0	0,0	15,7	51,4	21,2	11,6	54,3	12,0	33,7
2000	97,7	2,3	0,0	12,2	52,5	26,7	8,6	43,6	14,6	41,8
2001	83,3	7,8	10,8	8,5	44,6	38,8	6,9	41,8	15,2	43,0
2002	72,7	7,1	27,8	8,2	39,2	47,0	5,6	33,4	15,5	51,1
2003	67,4	10,4	33,0	7,1	39,6	46,6	6,7	32,6	16,9	50,6
2004	68,4	6,7	36,4	0,0	39,5	52,7	7,8	28,9	18,5	52,6
2005	69,8	3,9	37,6	0,0	38,8	52,2	9,0	29,6	16,7	53,7

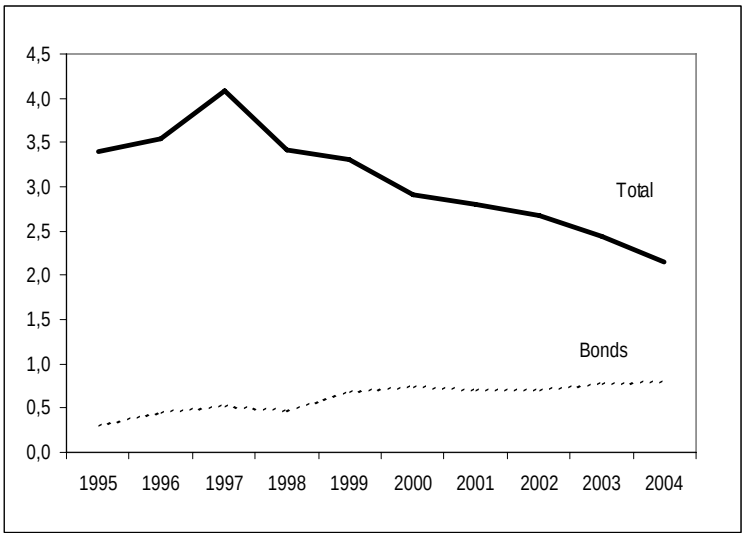
Source: Banco de la República. Information is for December of each year except for 2005 in which it is for September.

Table 4 also shows the progress of the government in placing an increasing share of bonds through the market. The share held by the financial sector increased from 35,5% in 1995 to near 53%

in 2004, and the participation of other private sector investors also increased over these ten years (from 11% to near 19%). This has allowed the weight of the public sector as bondholder to fall to 29.6%, from a starting point of 53.5%.

Finally, as Figure 5 shows, bonds have been also gaining importance in the finances of the sub national governments. While the total sub national governments' debt increased from a 3.4% of GDP in 1995 to 4% GDP in 1997, but fell since that year to reach 2.1% of GDP in 2004[6], debt through bond issues increased overtime to reach almost 1% of GDP in 2004.

Figure 5
Sub national governments' debt (as % of GDP)



Source: Banco de la República (2005).

B. The corporate bond market[7]

The first thing that calls the attention is that only a small share of Colombian firms finance their activity through the bond market. Table 5 shows that between 1997 and 2004 there were on average only 39 issuers, defined as the firms reporting bonds outstanding in their balance sheets,

[6] The decrease in sub national government's debt partially responds to the excess debt incurred by the regions at the beginning of the 1990s that directly affected the National government finances: the bad loan performances resulted in reduced access to banking credit.

[7] Information about the workings of the corporate bond market is not available directly from a unique source. Firm-level data are available at the Superintendencia de Sociedades and at the Superintendencia de Valores of Colombia. The first of these databases contains detailed annual accounting data for the period 1995-2004 for all firms subject to the Superintendencia de Sociedades' control (7,317 medium size and large firms, on average, per year). The second one also contains accounting data, but only for the firms that issue bonds. It also contains information about the amounts issued by each of these firms at each point in time. It is available for the period 1997-2004. Both databases have been combined and matched, when necessary, for the purposes of this research. Finally, detailed accounting statements are available at the firm level for all institutional investors for the period 1995-2004 from Superintendencia Bancaria. This section and the sections that follow are based on these sources.

each year. Using the same definition, the median number of issuers was 46. Table 5 also shows that bond issues have tended to be concentrated in the manufacturing and services sectors[8].

Table 5
Firms by participation in the corporate bond market, 1997-2004

	Issuers	Non issuers
Number of firms in agriculture and mining		
Mean	2	716
Standard deviation	1	99
Median	2	735
Number of firms in manufacturing		
Mean	14	1.906
Standard deviation	7	242
Median	18	1.937
Number of firms in construction		
Mean	2	528
Standard deviation	1	123
Median	3	547
Number of firms in commerce		
Mean	4	1.763
Standard deviation	3	254
Median	4	1.765
Number of firms in services		
Mean	16	1.861
Standard deviation	9	344
Median	21	1.873
Total number of firms		
Mean	75	7.243
Standard deviation	18	383
Median	81	7.092

Source: Superintendencia de Sociedades, Superintendecia de Valores.

There are some marked differences between the firms that have access to the bond market and the firms that do not. Table 6 reports these differences by comparing firms with bonds outstanding in their accounting statements in 2004 with non-issuers. The first and most obvious difference is size. Bond issuers in 2004 were on average 42 times larger than non-issuers, as measured by their real assets. When measured by the median, the difference in size appears even larger, of about 91 times. There is also less dispersion in sizes among issuers. These differences are statistically significant at the 1% level. Also significant at the 1% level are the differences between issuers and non-issuers with respect to the composition of their liabilities. For issuers, the share of debt with the banking sector is on average much lower, 12.7% as opposed of 23,7% for the non-issuers, and the median issuer firm reports no debt at all with the banking sector, while for the

[8] In the database, 350 firms on average per year do not have a sector identifier.

median non-issuer loans represent about 15% of its liabilities. It seems that although debt with the banking sector is in some cases a complementary source of funding to bond issuers, this is not necessarily true in all cases in the same degree. The evidence shows that some bond issuers have completely substituted bank debt for bonds. Accounts payable as a source of funding are also on average much lower as a share of total liabilities in the case of issuers (12.6% against 27.8% for non-issuers) and the difference among median firms is also substantial (7.9% against 17.4% for non-issuers).

Table 6
Firm characteristics by participation in the corporate bond market, 2004

	Issuers	Non issuers	Difference is statistically significant
Real assets in 2004 million dollars			
Mean	564.570	13.726	Yes (1%)
Standard deviation	1.070.889	82.349	
Median	167.074	1.838	
Leverage			
Mean	41,9%	44,0%	No
Standard deviation	20,0%	25,9%	
Median	46,6%	43,7%	
Operating profit as share of total assets			
Mean	5,4%	3,7%	Yes (10%)
Standard deviation	6,8%	62,8%	
Median	4,5%	4,2%	
Debt with the banking sector as share of total liabilities			
Mean	12,7%	23,7%	Yes (1%)
Standard deviation	20,5%	25,9%	
Median	0,0%	14,5%	
Accounts payable as share of total liabilities			
Mean	13,1%	27,8%	Yes (1%)
Standard deviation	14,3%	27,3%	
Median	9,1%	17,3%	
Corporate debt as share of total liabilities			
Mean	25,0%	-	
Standard deviation	23,0%	-	
Median	22,9%	-	

Source: Superintendencia de Sociedades, Superintendecia de Valores.

Finally, issuer and non-issuer firms also differ in terms of their profitability. Issuers are not only more profitable – on average their operating profit as a share of assets is of 5.4% as opposed to 3.7% of the non-issuers– but also they show much less dispersion in profitability (compare a standard deviation of 1.25 to one of 17). This difference is statistically significant at the 10% level. There is no evidence of significant differences between issuers and non-issuers with respect to their leverage.

Firms that issue bonds had on average one quarter of their liabilities represented by bonds outstanding in 2004. The median issuer firm had a share of 22,9%, just slightly below that average. That share is higher than it was in 1997, at the beginning of the period for which the data are available, but does not show a tendency to increase over time (see Table 7).

The more careful revision of the issuers and issue characteristics between 1997 and 2004 shows at least two interesting facts. First, we observe that issuer firms, defined this time as those that are reported by the *Superintendencia Financiera* as having issued bonds each year, are much larger in 2004 than they were 7 years before. The larger issuer firm is 9,6 times larger, the median firm is 13,2 larger, and the smaller issuer firm is 11,7 times larger in 2004 than it was in 1997.

Second, the fact that the total amount issued each year has considerably increased over this period -the ratio of the market size in 2004 to the market size of 1997 is 4 if only issues by firms are considered, and of almost 7 if issues by holding companies are included- paired with the fact that the total number of issues per year is not increasing over time, has resulted in significant growth of the average issue size (compare the average issue size of $202,3 million dollars in 2004 to that of $16,1 million dollars in 1997, or the evolution of the median and the minimum issue sizes over the same period).

Table 7
Issuer and issue characteristics, 1997-2004

		1997	1998	1999	2000	2001	2002	2003	2004
Firms	Real assets in 2004 million dollars								
	max	479.036	90.067	2.750.759	515.367	494.927	3.838.823	4.297.296	4.622.397
	min	100.062	90.067	97.317	2.894	44.330	33.240	124.396	1.165.800
	median	113.784	90.067	283.188	167.685	280.742	215.507	420.410	1.497.680
	Average corporate debt as share of total liabilities	12,1%	2,9%	28,0%	17,7%	17,9%	26,4%	35,2%	22,3%
	Number of issuers	4	1	7	5	5	9	6	3
	Number of issues	9	1	11	6	5	11	6	3
	Total amount issued in 2004 million dollars	145,24	6,43	397,13	158,10	213,77	935,53	856,44	606,76
	Issue size in 2004 million dollars								
	mean	16,14	6,43	36,10	26,35	42,75	85,05	142,74	202,25
	median	22,52	6,43	23,55	16,78	30,18	18,80	50,77	125,54
	min	0,94	6,43	6,25	10,83	22,63	11,75	13,24	62,77
Total including holdings	Number of issues	13	3	13	10	11	14	8	9
	Total amount issued in 2004 million dollars	182,77	7,15	582,11	255,55	405,40	1.050,71	856,31	1.258,90
	Average issue size in 2004 million dollars	14,06	2,38	44,78	25,56	36,85	75,05	107,04	139,88

Source: Superintendecia de Valores.

Thus, the size of the Colombian corporate bond market is explained by a small number of large issues placed by very large firms. The evidence points towards a pattern of bond market development that is increasingly supported on fewer larger issues: a market growing in size but apparently not getting deeper.

Interestingly, regardless of the reduced number of firms participating in the bond market, the fact that those that participate do so at a large scale has implied that the overall share of market-based financing is not only increasing over time, but is also increasingly substituting bank credit as a source of funding (see Table 8).

Table 8
Firms' liabilities by type, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004
Total liabilities in 2004 million dollars	30.901.576	40.187.219	38.923.127	44.554.402	45.258.588	44.526.183	46.015.358	63.284.548
Bonds and commercial paper	2,5%	3,3%	4,6%	4,4%	4,6%	5,5%	7,1%	15,6%
Financial liabilities	45,9%	39,4%	36,1%	38,0%	37,8%	34,2%	32,7%	20,3%
Labor obligations	1,7%	1,8%	2,0%	1,8%	1,9%	1,8%	1,8%	1,4%
Accounts payable	16,6%	15,2%	18,0%	17,5%	16,5%	15,1%	15,2%	16,7%
Other	33,3%	40,2%	39,2%	38,2%	39,2%	43,4%	43,3%	45,9%

Source: Superintendecia de Valores.

To complete the picture of the corporate bond market we take a look at the role corporate bonds play in the investment portfolios of the institutional investors. Table 9 summarizes the findings for 2004.

Mandatory pension funds are the larger institutional investors in Colombia as measured by their portfolio size, which amounted to about 50% of the total investment portfolio in 2004. They are followed at a distance, by banks and investment banks.

Out of a total of 153 potential institutional investors in 2004, 56 do not report any participation in the corporate bond market in their financial statements. Non-participants are a majority of the consumer loan companies, investment banks, trust companies, and banks, and to a lesser extent insurance companies. Pension funds –both mandatory and voluntary- and Severance pay funds are investors in corporate bonds. On average, however, the share of their portfolios invested in corporate bonds is near 11%, way below the ceiling of 30% that the regulation permits for both Mandatory pension funds and Severance pay funds. Not withstanding, in 2004, Mandatory pension funds held 76% of the corporate debt outstanding. Severance pay funds and Voluntary pension funds followed at a distance, with 9% and 7%, respectively.

The contrast is striking when you look at the portfolio shares of all investors invested in treasury bonds that are lowest in the case of Investment banks, but still reach 31.7% at the median. Both Mandatory pension funds and Life insurance companies are invested in treasury bonds at levels close to the ceilings of 50% and 60% dictated for them by the regulation[9], and the share of the median Severance Pay Fund and the median bank portfolios invested in public debt in 2004 is of 70% and 65%, respectively.

Table 9
Institutional investors by type, 2004

	Banks	Consumer loan companies	Trust funds	Investment banks	General Insurance companies	Life insurance companies	Mandatory pension funds	Severance pay funds	Voluntary pension funds
Number of investors with corporate bonds outstanding in their portfolio	13	1	7	4	16	17	7	6	7
as share of total	28,3%	1,6%	12,7%	11%	39,0%	68,0%	100%	100%	100%
Portfolio size in 2004 million dollars									
Mean	493.357	3.899	6	391.707	52	87	1.550.366	210.614	209.392
Standard deviation	539.482	3.062	7	288.946	50	100	1.089.213	119.593	189.196
Median	290.259	3.124	3	362.023	32	41	1.689.383	218.739	122.594
Portfolio share in corporate bonds									
Mean	2,4%	0,0%	2,9%	2,1%	4,2%	8,3%	11,5%	10,7%	11,0%
Standard deviation	5,8%	0,2%	9,2%	1,5%	5,4%	8,3%	4,5%	6,9%	4,9%
Median	0,0%	0,0%	0,0%	2,0%	2,5%	7,2%	12,9%	9,3%	13,1%
Ceiling imposed by the regulation					30,0%		30%	30%	
Portfolio share in treasury bonds									
Mean	63,7%	63,6%	54,9%	29,0%	52,4%	64,8%	47,9%	68,2%	47,6%
Standard deviation	22,3%	28,9%	37,0%	13,7%	21,4%	20,3%	14,1%	10,0%	17,3%
Median	64,6%	74,7%	53,3%	31,7%	56,2%	67,1%	53,1%	69,9%	43,1%
Ceiling imposed by the regulation					60,0%		50%		

Source: Superintendencia Bancaria

The public component of the Colombian bond market is evidently getting a large share of the market liquidity. However, it is unclear whether there is indeed a liquidity restriction affecting the development of the corporate bond market or whether there are other types of restrictions that result more binding. This is further explored in the following section. The fact that the bond market, with respect to both its public and private components, is in the hands of a few large players subject to substantial regulation is an issue to revisit in gauging the long-term health of the market.

V. The Market participation choice

This section explores the decisions of the firms to issue bonds, and of the investors to acquire them in an econometric setting, using the available firm-level data.

[9] For more detail on the regulation affecting institutional investors see Appendix 1.

A. The firm's decision to issue bonds

We were able to construct a firm-level dataset for the period 1997-2004, containing firm characteristics and information about the firm activity in the corporate bond market that allows us to estimate the following probit model:

$$I_{it} = F(X_{i(t-1)}, M_t) + \varepsilon_{it}$$

where the dependent variable, I_{it}, is a dummy variable equal to 1 if firm *i* issued bonds at time *t* and equal to zero otherwise. The firm's decision to issue bonds is examined against both firm characteristics, $X_{i(t-1)}$, and market characteristics, M_t.

Firm characteristics used to explain the probability of a firm issuing bonds include size (measured by the log of the firm's assets), leverage (total liabilities/total assets), and profitability (measured by the ratio of operating utility to total assets). The coefficient on the size variable is expected to have a positive sign since the evidence in Colombia points towards a large size as a key determinant of the firm's decision to search for financing through the market. The signs on the other two firm-level variables are, however, uncertain. There is no clear-cut difference between the levels of leverage of issuers and non-issuers and, with respect to profitability we know that issuers' profitability tends to be closer to the mean and median profitability levels, and slightly higher at the mean and median than that of non-issuers, but this evidence may not be enough to guarantee a positive sign.

The firm's participation in the market as bond issuer in the previous period is controlled by the inclusion of a dummy variable equal to 1 if the firm issued bonds at time t-1. The firms' activity in the capital markets is also controlled with a dummy variable = 1 if at any previous time, before time t, the firm issued stocks. Both variables are expected to have a positive coefficient, since they capture the fact that previous activity in the market usually facilitates the decision to participate in it.

The explicit inclusion of variables identifying whether the firm was listed at the local or foreign stock exchanges, or whether it was under the supervision of the Superintendencia de Valores at the time of issue, is not possible due to the lack of variation of the dependent variable within these categories. This is also true about the inclusion fixed effects by sector of activity. Because participation in the bond market occurs only in a few sectors, the inclusion of 3-digit ISIC sector dummy variables results in lack of variation of the dependent variable within groups, rendering estimation impossible.

Market characteristics included explicitly as explanatory variables are meant to capture particularities of the Colombian markets that are common to all firms and should affect their choices with regards to financing. We have chosen to focus on the role played by financial markets' characteristics[10].

The first of these variables considered is a proxy of the cost per *peso* issued, constructed as the annual average cost per peso across all issues recorded by Superintendecia de Valores. Costs considered in this calculation include (1) the cost of inscription at the Bonds and Stocks Registry (Registro de Valores) required for each issue, and (2) the cost to obtain the issue authorization from Superintendencia de Valores. Both of these costs are calculated as a percentage over the amount issued, with rates that vary with the issue size. The expected coefficient on this variable is negative, since a large cost to enter the market should deteriorate the probability of choosing to participate in it.

Measures of the size of the stock market (value of domestic equities over GDP, also known as stock market capitalization), the depth of financial intermediaries (M3 over GDP), and the public debt market (treasury bonds outstanding over GDP) are included in the regression in order to capture the degrees of complementarity or substitutability across markets. Stocks should be a close substitute to corporate bonds, so the expected coefficient on the first of these variables is negative. With regards to the financial intermediaries market, its development aids the overall development of the financial markets, so the expected coefficient has a positive sign. Finally, the sign on the public debt market size measure is uncertain. A negative sign will indicate a crowding-out effect, while a positive sign will signal that the development of the public debt market has aided the activity of the private side of the bond market.

The last explanatory variable considered is the size of the capital market relative to the financial intermediaries market. The proxy used as a measure in this case is the ratio of the value of domestic equities over M3. A larger capital market, in relative terms, should facilitate the development of the corporate bond market, so the coefficient expected on this variable is positive. Note that this relative size measure may increase due to growth of the capital market either in volume or in prices. The expected impact on the decision to issue bonds is positive regardless of which of these prevail.

[10]Time-dummies were included as explanatory variables in an alternative model specification to control for elements of the macroeconomic environment that may affect the firm's financing decisions. The coefficients on the firm-level variables were robust to the inclusion of these controls, but the significance of the market variables was swept away by it. We considered the alternative model specification -without time dummies- much more interesting.

Table 10 presents the estimation results[11]. Standard errors are robust standard errors that correct for the clustered nature of the market-level variables, and firm characteristics that enter as explanatory variables are lagged to control for potential endogeneity problems. All estimated coefficients are significant. Although the resulting marginal effects are small, the estimation serves well the purpose of contributing to explain the firm's choice to issue bonds.

The probit model estimated underscores the importance of scale economies in a firm's decision to finance through the market in Colombia. Not only it is the large firms that show participation in the market over the years, but also the positive sign on the one-period lag of the firm size proxy indicates that the larger the firm, the higher the probability that it will issue bonds to finance its activity. There must be a threshold firm size below which the cost of obtaining financing through the corporate bond market is higher than that of obtaining banking credit.

The leverage and profitability variables both obtain positive coefficients too. The positive sign on the former indicates that more levered firms have a higher probability to finance through bond issues. This suggests that the probability of financing through bonds is higher for firms that already have a history of active participation in the financial sector. The positive sign on the profitability proxy indicates that after controlling for size, the more profitable firms are more likely to search for financing through the bond market.

The coefficients on the dummy variables controlling for state dependence -previous activity in the capital markets- are both positive as expected. While potential biases from the inclusion of the lagged dependent variable in the right hand side of the regression are not explicitly controlled for, the results obtained are robust to the exclusion of this variable.

The coefficient on the corporate debt market entry cost variable is negative. This result is evidence that the cost per peso issued is a deterrent for firms to finance their activities through the market. In combination with the coefficient obtained on firm size, it may be pointing towards the fact that larger firms are able to issue bonds because they spread the entry costs over larger size issues – recall that the entry costs are calculated over the issue value, from percentage rates that vary with the issue size.

[11] A version of the same model was estimated using a sample restricted to include only the firms that report bonds outstanding in their balance sheets each period. We found that the variables driving the decision of a firm to issue bonds are robust to whether the firm is a new or an experienced bond-issuer. The results of this exercise are available from the authors.

Table 10
Probit regression to explain the firm's decision to issue bonds
(Standard errors in parentheses)

Dependent variable: Dummy = 1 if firm issued bonds at time t	Coefficient	dF/dx
Constant	-135.27 (35.608)***	
Size (t-1)	0.47 (0.062)***	2.55e-10
Leverage (t-1)	0.44 (0.158)***	2.40e-10
Profitability (t-1)	0.45 (0.230)**	2.48e-10
Dummy=1 if firm issued bonds in $(t-1)^2$	0.57 (0.213)***	2.87e-09
Dummy=1 if firm issued stocks before $(t)^2$	0.63 (0.306)**	4.02e-09
Corporate debt market entry cost	-11.45 (3.413)***	-6.26e-09
Stock market size	-6.67 (1.947)***	-3.65e-09
Financial intermediaries market size	4.20 (1.185)***	2.30e-09
Public debt market size	-0.51 (0.175)***	-2.79e-10
Relative size stock vs. financial intermediaries markets	2.94 (0.871)***	1.61e-09
No. Obs	46.813	
Log likelihood	-107,59	

Notes:
1. Standard errors in parentheses. *** denotes significance at 1%. ** denotes significance at 5%.Standard errors are robust standard errors that correct for the clustered nature of the yearly data.
2. dF/dx is for discrete change of dummy variable from 0 to 1.

The financial markets' size variables also yield interesting results. For both the stock and financial intermediaries markets the estimated coefficients have the expected signs. The coefficient on the stock market size is negative, signaling that indeed in Colombia stocks and bonds behave as substitutes. Growth of the equity market does not per se motivate bond issuance, and on its own may be detrimental for the development of the corporate bond market. And the positive coefficient on the financial intermediaries size proxy confirms that the larger the financial intermediaries sector -the more liquid the market- the larger the probability that a firm will choose to issue bonds. Perhaps the most interesting of these results is the negative sign of the coefficient obtained on the public debt

market size measure, which provides evidence that there may be a crowding out effect: the larger the treasury bond market, the lower the probability that a firm will decide to look for financing in the market. This maybe due to the difficulty to compete with the treasury bonds in terms both of risk and return –the latter having been high relative to other investment opportunities in the later years, as pointed out in Section IV.

Finally, the size of capital markets relative to financial intermediaries shows a positive coefficient. This result is in line with the idea that firms will be more likely to participate in a more developed capital market. It also says that the market relative size matters. It is not only a large capital market that is desirable from the corporate bond market development perspective but also a capital market that is large relative to the financial intermediaries sector.

B. The institutional investor's decision to buy corporate bonds

We used the firm level data available for the period 1995-2004, containing the accounting statements of each of the institutional investors and detailed information about the composition of their investment portfolios, to estimate the following probit model:

$$H_{it} = \alpha_0 + \alpha_1 S_{i(t-1)} + \alpha_2 TO_{i(t-1)} + \alpha_3 IS_t + \sum_i \alpha_i I_i + \sum_t \alpha_t T_t + \varepsilon_{it}$$

where the dependent variable, H_{it}, is a dummy = 1 when the investor's corporate bond holdings are greater than zero at time *t*, and = 0 otherwise. Investor characteristics used as explanatory variables include a measure of firm size, $S_{i(t-1)}$, (the log of the investor's investment portfolio), the share of the investors' portfolio invested in public debt, $TO_{i(t-1)}$, (the ratio of treasury bonds holdings to total portfolio investments), and a series of dummy variables, I_i, to control by investor type[12]. Firm-level variables enter the regressions lagged in order to control for potential endogeneity problems.

The probability of holding corporate bonds is expected to increase with portfolio size, as larger investment portfolios ought to be more diversified, so the coefficient on the size variable should be positive. With respect to the share of the portfolio invested in public debt, while the extent to which the firm is invested in treasury bonds can influence the investor's decision to hold corporate bonds, it is impossible to know ex ante what sign to expect on this variable's coefficient. It may be that investors holding more public debt in their portfolios tend to acquire less corporate bonds, in which

[12] A measure of firm performance -the firm's return on equity (ROE)- was included in alternative model specifications and discarded due to lack of significance. Results are available from the authors.

case there would be evidence of a crowding-out effect. Alternatively it may be that portfolios more strongly invested in public debt –with investments in treasury bonds at the ceiling imposed by the regulation- tend to be also more invested in corporate bonds.

The dummy variables by investor type are intended to control for characteristics specific to each investor type. In particular, there are regulatory restrictions that may affect the possibility of investing in corporate bonds. These regulations have no variance over time and differ only across investor types (see Appendix 1), so the inclusion of investor-type dummies should capture their impact.

The average issue size at time *t*, IS_t, (value of total bonds issued over number of issues) is included in the regression to capture the role of the corporate bond supply in inducing investors to buy corporate bonds. Since investors are concerned about the liquidity of their investments, it is reasonable to expect that their decision to buy corporate bonds will depend to some extent on the size of the bond supply available. On the one hand, if they buy a small issue of corporate bonds, their market movements may alter prices and expose them to the risk of not achieving the mandatory minimum profitability required by the law. On the other, the larger the issue, the larger the number of buyers, thus more participants may be interested in buying bonds when the investor needs cash flow and requires to sell its bond holdings. The bond supply average size is measured as the log of the average amount issued at time t -the total amount issued divided by number of issuers-. This market-level variable is constructed using the firm-level bond issue data from Superintendencia de Valores introduced above.

Finally, the regression includes time dummies to control for macroeconomic factors that may affect the investment decision.

Table 11 presents the estimation results. Standard errors are robust standard errors that correct for the clustered nature of the yearly data. The coefficient on the investor size variable is positive and significant at the 1% level indicating that the investors with larger portfolios have a higher probability of holding corporate bonds. This result may also indicate that larger portfolios tend to be more diversified. The coefficient on the portfolio share invested on public debt is negative and significant at the 5% level. Apparently a large portfolio share invested in public debt tends to decrease the investor's probability of holding corporate bonds. This result, in line with that obtained while exploring the firms' choice to issue corporate bonds, signals once again that the market for public debt may be hindering the development of the corporate bond market in Colombia

Table 11

Probit regressions to explain the investor's decision to hold corporate bonds

Dependent variable: Dummy = 1 if investor has corporate bonds outstanding in its portfolio at time t	Coefficient	dF/dx
Constant	-14.16 (1.934)***	
Investor size (t-1)	0.34 (0.032)***	0.006
Share of investor's portfolio in treasury bonds (t-1)	-0.29 (0.128)**	-0.005
Average issue size	0.82 (0.155)***	0.014
Dummies by investor type[2]		
Banks	-3.06 (0.331)***	-0.019
Investment banks	-1.99 (0.423)***	-0.008
Consumer loans companies	-2.87 (0.209)***	-0.014
Development banks	-3.16 (0.342)***	-0.008
Leasing companies	-1.74 (0.223)***	-0.010
Capitalization companies	1.15 (0.340)***	0.076
General insurance companies	0.58 (0.062)***	0.017
Life insurance companies	1.02 (0.075)***	0.049
Voluntary pension funds	1.76 (1.127)	0.204
Severance pay funds	2.02 (0.785)***	0.283
No. Obs	1.864	
Log likelihood	-264,31	

Notes:

1. Time dummies were included in the estimation.
2. Standard errors in parentheses. *** denotes significance at 1%. ** denotes significance at 5%.Standard errors in all model specifications are robust standard errors that correct for the clustered nature of the yearly data.
3. dF/dx is for discrete change of dummy variable from 0 to 1.

Perhaps the most interesting result of this exercise is the finding that the average bond issue size is a critical variable. The coefficient on this variable is positive and significant at the 1%, indicating that the probability of investment is strongly dependent on the availability of a large bond supply in the market. No matter how many firms participate in the market, or how many times they do it, as long as they participate with large placements, investors will apparently be willing to buy this debt. This result tells us that investment bankers have a key role to play in designing coordination schemes to make bond issuance a real financing alternative for the smaller players.

VI. Role of the corporate bond market

Up to this point we have explored what drives Colombian firms to use the market as a source of financing -or what limits them in their financing choices- and we have revised the demand-side elements that seem to play a role in determining the development of the corporate bond market. We have found that the market is not a cost-efficient financing alternative for the smaller firms, that while having doubtlessly contributed to create a debt market in Colombia, the public debt market does not appear to be facilitating the development of the private side of the market in the recent years, and that the probability to secure a demand for corporate bonds depends strongly on the size of the issue, leaving out of the game the firms with smaller financing needs. It remains to answer if any of this matter from the point of view of economic growth and development. This section attempts to answer this question by analyzing the impact of the existence of a corporate bond market on the performance of the banking sector in an empirical setting.

Firms that are able to obtain financing through bonds should have a better bank loan-performance during periods of crisis. This should be so because they are low-risk -having had access to financing through the market-, and because having access to long-term financing they face lower cash constraints during periods of crisis. If this is true, then the existence of a large corporate bond market aids the performance of the banking sector during periods of crisis, and its existence is desirable for purposes of macroeconomic stability.

We use loan performance data available at the ISIC 3-digit sector level from Superintendencia Bancaria for the period 1998-2004, in combination with accounting information from the firm-level databases already introduced, to examine if the sectors that issue bonds perform better in their interaction with the banking sector during periods of financial crisis.

The regression we estimate is:

$$DQ_{it} = \alpha_0 + \alpha_1 BO_{it} + \alpha_2 FC_t + \alpha_3 FC_t * BO_{it} + \alpha_4 OM_{it} + \alpha_5 L_{it} + \alpha_6 Growth_t + \alpha_7 Growth_{t-1} + \sum_i \beta_i S_i + \varepsilon_{it}$$

where the dependent variable, DQ_{it}, is the ratio at time *t* of sector *i* 's loans rated C, D, or E (low quality loans) to sector *i* 's total loans -a measure of the sector's loan performance at time *t*. A measure of the size of the corporate bond debt outstanding per sector, BO_{it}, a banking crises dummy, FC_t, and their interaction, are included as explanatory variables to capture the impact of the bond market on the credit market during crises periods. The size of corporate bond debt outstanding for each sector *I* at time *t,* BO_{it}, is measured as the ratio of bonds outstanding to total liabilities reported by the firms in their financial statements each period and aggregated to the ISIC 3-digit sector level. If it is true that a lower dependence on banking credit through access to an alternative financing source aids the firms to perform better on their loans, the coefficient on this variable should be negative. The banking crises dummy, FC_t, was built to equal 1 during the years in which FOGAFIN, the public entity in charge of deposit insurance, made large rescue payments to the banking sector. By construction, the coefficient expected on this variable is positive. The interaction term, $FC_t * BO_{it}$, captures whether sectors active in the bond market during crisis periods have a better loan performance. A negative coefficient on this variable would indicate that it is desirable, from a macroeconomic stability perspective, to have a large well-developed corporate bond market.

The regression also includes among the explanatory variables a measure of each sector's profitability, OM_{it}, constructed as the ratio of the sector's operating profits to its total assets, the sector's leverage -total liabilities to total assets- L_{it}, and sector level dummies, S_i, to control for other unobserved sector-specific characteristics. The expected coefficient on the profitability variable is negative, since better operating performance should translate into better loan performance, and the coefficient on leverage should be positive, because the more levered firms tend to default more on their obligations than the less levered.

Contemporaneous and lagged real GDP growth, $Growth_t$ and $Growth_{t-1}$, are included as macroeconomic controls. The expected signs on these variables are obviously both negative. Estimation results are presented in Table 12. All coefficients in the regression have the expected signs and are significant at, at least, the 10% significance level.

Table 12
Impact of the corporate bond market on the banking sector
(Standard errors in parentheses)

Dependent variable: Loan performance	
Constant	9.84***
	(2.28)
Bonds outstanding/ Total liabilities (BO)	-0.42**
	(0.13)
Financial crisis dummy (FC)	2.81**
	(0.94)
FC*BO	-0.68***
	(0.13)
Profitability (Operating utility/Assets)	-0.46***
	(0.08)
Leverage (Total liabilities/Total assets)	0.10*
	(0.05)
GDP growth	-0.42***
	(0.09)
Lagged GDP growth	-0.67***
	(0.09)
Number of observations	367
Adjusted R-squared	0,17

Notes: (1) Standard errors are robust standard errors that correct for the clustered nature of the yearly data. (2) The equation includes sectoral control dummies. (3) * denotes significance at the 10% level, ** at the 5% level and *** at the 1% level.

The coefficients on current and lagged real GDP growth are both negative, confirming that economic growth also contributes to a better performance of the credit market. Good average performance at the sector level contributes to a better loan performance -see the negative coefficient on the sector average profitability and the positive coefficient on the average leverage level. The coefficient on the sector's average liabilities share represented by corporate bonds has a negative sign, indicating that the alternative of financing through the corporate bond market does contribute to a better loan performance. The coefficient on the banking crises dummy is indeed positive, and, most relevant to the question posed in this section, the interaction term of these two variables obtains a negative coefficient, that can be interpreted as evidence that during periods of banking crises the existence of this alternative source of financing plays a counter-cyclical role, contributing to a better performance of banking loans.

If nothing else, the findings of this section are enough to conclude that a well-functioning corporate debt market is key for macroeconomic stability and is, hence, desirable to design policies oriented to facilitating and promoting its development.

VII. Concluding remarks and policy recommendations

Despite having experienced significant growth over the last 15 years, the Colombian financial sector is still small and shallow. Both, the Colombian banking and non-banking financial sectors are small compared to those of the developed countries and also to those of the average of the Asian emerging economies.

The development of the capital markets is recent and directly connected to a set of reforms introduced in the early 1990s that included the liberalization of foreign portfolio investment, the appearance of new institutional investors, the development of mortgage securitization and significant progress towards an improved market infrastructure. Previous to these reforms, the dependence of firms on bank loans as a source of financing was largely induced by economic policy.

The Colombian bond market doubled in size between 1997 and 2004, largely explained by the dynamics of the public debt component. The corporate debt component, although much smaller in size, also increased over time, contributing to the observed dynamics. Debt issued by the financial sector, in contrast, lost participation in the market at the expense of the other two components.

The revision of the firm-level data available confirms the findings of the previous literature that the corporate bond market in Colombia has been to date a source of financing exclusive to the larger firms. Our empirical approach allows us to go one step further in answering the questions of whether we should worry about having a better-developed corporate bond market and about what policy measures should be taken in order to facilitate its growth.

The most relevant of our conclusions is in relation to the exercise presented in Section VI. We have shown that having the market as a source of financing alternative to banking loans plays a key counter-cyclical role during periods of banking crisis. The economy as a whole holds up better when the firms in the productive sectors are not exclusively dependent on banking credit. If nothing else, this evidence should be enough to reach an agreement about the convenience of having a well-developed corporate bond market and the importance of pursuing the appropriate policies to facilitate its growth.

With regards to the variables driving the market participation decisions of both firms and investors, the most interesting of our findings is that the issue size is a key driver of this market's activity. Firm size matters but maybe only to the extent that larger firms have so far been the only ones able to place large issues in the market. This is in line with a market preference for more liquid investments and for investments in which the market price is not exposed to fluctuations induced by the movement of individual players. Evidently investment banks have a key role to play as market developers if they understand the relevance of devising schemes to package the financing needs of the smaller firms and coordinating them to reach the market with placements of the appropriate sizes. In doing this, investment bankers must overcome the reticence to work for the smaller players. The eye of the regulatory authorities must be placed on facilitating these coordination schemes. This may include a revision of the debt quality standards requirements behind the institutional investors' portfolio choices -some imposed by the regulation but others self-imposed. For instance, the asymmetries in the minimum profitability requirement currently affecting the Mandatory Pension Funds ought to be revised, since the regulation does not reward above average portfolio performances, encouraging investments only in top-rated investments. Also, it is in the hands of the regulatory authorities to make investment-banking services accessible in terms of price to the smaller players.

Another of our key empirical findings is that the entry cost to the bond market discourages firm participation. While packaging the financing needs of the smaller players, as suggested in the previous paragraph, will surely aid in spreading these fixed costs, the government should also consider directly lowering them.

Finally we do find evidence that the competition of the public-debt component for the market liquidity has in the recent years hurt the growth potential of the corporate bond market. The fact that public debt has been placed at interest rates high enough to discourage alternative investments puts a question mark on the long-term desirability of the fiscal policy put in place in Colombia in the recent years. While it is not the aim of this paper to determine the ways in which the fiscal policy of Colombia should be adjusted, it is evident that care needs to be placed on making choices that do not prioritize the short-run over the long-run when choosing financing alternatives for the fiscal deficit.

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Appendix 1
Regulation on Investment Portfolios

Due to the mandatory character of savings, and the existence of eventual state guarantees, in Colombia, pension funds, severance funds and insurance companies are subject to strict regulations on their investment portfolios. Regulation imposes individual and global limits to investment by instrument, limits by issuer and, in the first two cases, the requirement of a minimum return. In contrast, considering the voluntary character of saving, the regulation on the portfolios of voluntary pension funds and trust funds is quite flexible. Credit institutions are also allowed to invest in bonds of the real and financial sectors, and in stocks of the financial sector; they are only restricted with regards to investments in real sector stocks and convertible bonds.

Mandatory pension funds, severance funds and insurance companies face a limit of 30% of their portfolio value for investments in corporate bonds. In practice this limit is not binding. The share of these investors' portfolios invested in corporate bonds has always been below that limit. In contrast, investors are on the limit for investments in public debt bonds.

In the case of the minimum return requirement (applicable to Pension and Severance funds), the minimum return is defined as the average of three components: 1) the average return obtained by the AFP system, 2) the return on a fixed income portfolio defined periodically by Superintendencia Bancaria and 3) the return on the stock market (IGBC). Were the portfolios of the investors subject to this regulation to fall below this minimum return, they would still have to guarantee this return level to their affiliates against their patrimony. If, on the contrary, returns obtained resulted above the minimum, the investor would have to pass this profit along to the affiliate.

The regulatory requirements affecting each investor type are summarized in the table below.

Type of Instrument	Insurance companies	Mandatory pension funds	Severance funds
Domestic Public Debt	60%	50%	100%
Bonds issued by Fogafin (and Fogacoop)	30%	10%	10%
Mortgage Bonds and securitization assets	30%	40%	40%
Bonds issued by the financial sector	30%	30%	70%
Bonds issued by the non financial sector	30%	30%	30%
Stocks equity shares	30%	30%	30%
Deposit Certificates		2%	2%
Foreign bonds	30%	20%	20%
Trust funds	5%		
Minimum return requirement	No	Yes	Yes