Impact of Capital Markets Reforms in Colombia´s Economic Development

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Executive Summary

In empirical economic literature it is widely recognized that a well-developed financial system, or in other words a well-functioning banking system and capital market, has a positive effect on a country's economic growth. However, there is a large discussion on the channels through which this impact occurs. Several studies suggest that financial development promotes growth through two main channels: capital accumulation and gains in productivity. Additionally, the impact of financial development on economic growth becomes more clear-cut when there is a sound regulation and supervision in the financial sector, and more so when the institutions that govern the financial sector are solid and stable. Empirical evidence on this matter has been crucial to promote financial reforms that have led to further deepening and higher efficiency of the financial activity all around the world.

Colombia's financial system, including both the banking system as well as the capital markets, has had an important development in the past few years, despite the severe side effects of the financial crisis of the late nineties. On the one hand, there's been a recovery in the banking system's depth and simultaneously there's been a tendency towards the deconcentration of credit. On the other hand, intermediation costs have decreased, and the system has been subject to sounder regulation and tighter supervision. Moreover, capital markets have developed significantly, particularly the corporate bonds market, which have benefited from ample liquidity, regulatory flexibility and from developments in the market's infrastructure.

However, despite its positive evolution Colombia's financial system is still relatively underdeveloped when compared to other emerging countries. The banking system's depth is still relatively low and more importantly, although Colombian firms and households are still highly dependent of bank credit, a large fraction of small businesses and low income households do not have formal access to this source of financing. Capital markets, on the other hand, are available only for a small number of firms, the number of issuances continues to be small, issuance terms are short, and costs are relatively high. Moreover, there is still sufficient room to make important reforms in order to achieve higher levels of sophistication in portfolio management, which is highly concentrated in securities that have the highest or second highest risk rating.

In order illustrate better the problem at hand, we review several indicators and analyze important data. More specifically, we have chosen four benchmark countries which we use in order to make comparisons and carry out some quantitative exercises: Chile, Mexico, Malaysia, and South Korea. These first two countries, which are located within the same region, have a more developed financial system compared to Colombia. On the other hand, Malaysia and South Korea are both Asian countries that have made significant efforts to reform their financial system, which is clearly reflected in the indicators we have chosen.

Moreover, liabilities (saving deposits) and assets (portfolio) are a good indicator of size of the financial system. For example, in Colombia financial savings, as percentage of GDP, were doubled during the period 2001-2010 (increasing from 50% to 100%). Although this increase is partly due to the considerable increase in the price of stocks, without doubt it remains significant. However, in countries such as Chile, Mexico, South Korea and Malaysia this last percentage can be twice or even three times as big. Hence, all though financial depth has increased, and despite the tendency towards the deconcentration of credit, most financial indicators still suggest that there is still a lot of work to be done in order to achieve significant progress in the matter. For instance, the ratio of bank deposits to GDP is at nearly 20%, while the ratio of credit to GDP is close to 30%, both considered low in an international context.

We have chosen the margin spread in preferential credits as an indicator of intermediation efficiency. It is worth pointing out that the margin spread cannot be attributed entirely to the administrative efficiency of financial institutions, given that a significant part is explained by the costs implied by regulation, taxes to the intermediation activity and its operational risks. However, all these extra costs are assumed by the productive sector. Our calculations suggest that the intermediation spread in Colombia has fluctuated around 7% in the last five years, compared to an average of 12% not more than a decade ago; before the financial liberalization process in the early 90s, the interest spread reached levels close to 20%. The reduction in the margin spread during the last decade is a clear indication of the continuous increase in the administrative efficiency in the financial sector, as well as a reduction in costs associated to taxes, regulation and risk.

However, in the countries chosen as benchmarks the margin spread is still lower. For instance, while Colombia's margin spread is close to 7%, Chile's and Mexico' margin are 2 and 3 percentage points lower, respectively. In Malaysia and South Korea, on the other hand, the margin spreads are below 3%. Nonetheless, despite the severe financial crisis of the late nineties, most soundness indicators suggest that the financial system is in a better situation now than it was in the post crisis period.

With respect to the capital markets, most indicators suggest that it is still possible to make significant improvements. In the last few years, the bonds market has showed to be more dynamic than the stock market, although both of them still remain without enough depth and access continue to be costly to the firms. In fact, only a small number of firms in the real sector have access to the capital markets; for 2010, the list of companies that issue bonds increased to 158 (including public utilities providers). Hence, there are very few issuances in the Colombian capital market. For instance, in 2009 only 32 issuances were authorized.

The entire bonds market represents nearly 32% of GDP. More specifically, the public bonds market (26.8% of GDP) is larger and more dynamic than the corporate bonds markets (4.7% of GDP). Given the latter, it is worth noting that in countries such as Malaysia and South Korea, the corporate bonds market represents somewhere in between 50% to 60% of GDP.

According to the level of market capitalization, Colombia and Mexico have the smallest stock market. The stock markets in Brazil, Chile and Peru, in turn, have a similar size to stock market in South Korea, although they are still smaller than the stock market in Malaysia (where it represents 164% of GDP).[1] For instance, the stock market in Colombia is one of the most concentrated markets in the region, based on the fact that nearly 75% of the market capitalization is concentrated amongst the 10 largest issuing firms. Two other facts that call for attention are that nearly 80% of fixed-income securities issued corresponds to securities with terms no longer than 10 years. Moreover, 81% of these securities have the highest market rating.

The lag in the financial sector's development is explained partly because of the low productivity of the Colombian economy, and partly because of the low long-term growth rates. According to data from the WDI, during the last 15 years the Colombian economy grew at an average rate of 3.15%, while income per capita grew at an average rate of 3%. During this same period, Asian economies grew at an average rate of 8.31%, with an average income per capita growth rate of 5.3%, while Latin American economies grew at an average rate of 3.45% with an average income per capita growth rate of 3.7%.

Thus, the purpose of this paper is to estimate, using two different quantitative exercises, the benefits for the Colombian economy that would result from an integral reform to the financial system, including both the banking sector as well as the capital markets, that would enhance its efficiency, drive its development and increase the overall productivity of the economy.

[1] In general, the stock market size is measured based on the indicator of market capitalization. This indicator, nonetheless, is not entirely adequate since it is affected by changes in prices. However, we consider the comparison between the countries in our sample is possible given the fact that stock prices have risen in most emerging countries in recent years.

In order to closely analyze the benefits that would result from a reform a reform to the financial system in Colombia, we recur to two different quantitative approaches. The first approach is a simple simulation that allows us to quantify how much the economy could save if it had a more efficient financial system, i.e., if firms could access cheaper financing in the banking sector as well as in the capital markets, mainly because of: i) a reduction of costs in both markets, ii) a shift in the composition of financing schemes towards cheaper sources. In particular, the purpose of this exercise is to quantify the impact of driving these two aspects of the financial system up to the standards of the two chosen benchmarks. More specifically, we will use Mexico's and Chile's averages as the "moderate benchmark" and then take Malaysia's and South Korea's averages as the more "aggressive benchmark".

The idea behind the simulation exercise to analyze what would happen in terms of savings if we take Colombia's banking system and capital markets efficiency, as well as firms' current financing structure, and equal it to those of the two chosen benchmarks. The efficiency of the banking sector is measured through the intermediation margin, which includes not only the administrative efficiency of banks, but also the higher costs of financial intermediation related to regulation, common taxes and payroll taxes, and credit risk, all of which are costs that are paid by the productive sector, although only the first one is directly controlled by financial institutions. On the other hand, the efficiency of the capital markets, on the other hand, is measured through access costs and through the premium that investors demand in order to leverage against risk of default (in the case of the bonds market). An important caveat is that the savings obtained from the increase in efficiency wouldn't just simply be a transfer of resources from the financial sector to the productive sector, but would rather mean more savings for the economy. However, note that increasing the efficiency of banks, decreasing the costs of regulation and promoting the existence of sound institutions that allow a less costly management of risk, would also imply savings for these sectors. We also quantify how much would small firms save if instead of using informal sources of credit, with high interest rates, they used the formal banking system where they would face the highest legally allowed rate applied to microcredit.

If Colombia's financial system could achieve the same financial efficiency and structure as that of Chile and Mexico, the economy could save resources equivalent to nearly 1.6% of GDP. Moreover, if efficiency could be driven up to the standards of the more aggressive benchmark (Malaysia and South Korea), savings would be as high as 2% of GDP. Given the methodology applied in this study, the amount of savings that the economy could generate from reducing access costs to the stock market and the bond market, are still rather small given that firms make very little use of these sources of financing. Hence, the biggest savings

would come from increasing the overall efficiency of the banking sector and from inducing a large share of firms to shift from informal sources of financing to formal banking credit. Moreover, a change in the composition of the productive sector's financing structure also provides a significant amount of savings, basically because firms tend to focus more on acquiring financing from the stock and the bond market, and in turn use less banking credit which is a more expensive financing option.

Albeit this exercise is useful to evaluate the impact derived from a shift in the composition of firms' financing schemes, we cannot quantify the effect of achieving greater financial depth on the productivity of firms.[2] Gains in productivity benefit all economic sectors given these allow a more efficient allocation of resources and it increases economic activity both in the financial sector as well as in the productive sector of the economy. Thus, in order to assess the impact of achieving a greater financial depth on the productivity of businesses, we carried out an econometric estimation of the productivity of Colombian firms following the standard models found in economic literature. The novelty of our exercise is basically the inclusion of independent variables associated to financial development, regarding both the banking sector as well as the capital markets. It is worth mentioning that although these estimates are only carried out form firms in the manufacturing sector, they are a valid illustration of the impact of a greater development of the financial sector on the productivity of firms.

In the specification used in our regressions, Total Factor Productivity (TFP) of the firms depends on the cash flow derived from operating the business, the share of intangible assets within total assets, and the level of leverage of the firms. Moreover, some dummy variables that characterize the firms, such as size, are also considered. Variables regarding the depth of the financial system such as the ratio of credit to GDP and the ratio of market capitalization to GDP are also included. Finally, macroeconomic variables such as economic growth are included as control variables.

The results in columns show that there is a negative relationship between leverage and productivity. Hence, companies with lower levels of leverage are, on average, more productive. According to Nucci et al. (2004), the leverage variable is a good proxy for the cost of capital. Specifically, firms with higher levels of productivity (LTFP) generate larger profits and cash flows, and therefore use less debt (either via financial credit or issuance of shares). The results also suggest that when a firm has a greater capacity to generate internal resources, or a greater cash flow, these firms tend to be more productive given the possibility of avoiding the financing costs associated to the use of external financial sources. Intangible assets, such as

[2] Changing the composition of firms' financing schemes generally implies depending less on financial credit and instead recurring more to the issuance of stocks and bonds.

patents and trademarks, have a positive effect on firm´s productivity, although it is not necessarily significant. A plausible explanation for the latter is the low level of innovation that exists in Colombia.

With regard to macro financial variables, the results suggest that both size and depth of the banking sector (private credit / GDP) and the capital market (stock market capitalization /GDP) have a positive impact on the productivity of firms. This, in turn, might be related to the fact that larger banking systems usually lead to lower, more attractive, interest rates which implies lower financing costs for firms. As to the depth of the capital market, the results suggest that an increase in the ratio of capitalization to GDP (depth) has a positive effect on the productivity of firms. The larger the capital market is the easier and the cheaper it is for firms to access the resources they require. Finally, econometric results indicates that an increase of a percentage point in the amount of private credit (as a % of GDP), generates an increase of 0.11% in productivity (TFP). Moreover, a percentage point increase in the stock market´s capitalization (as a % GDP), increases firms´ productivity in 0.2%. Finally, a 1% increase in the total value traded in the stock market (as a % of GDP), generates gains in productivity of 0.4%.

Introduction

The Colombian economy has sustained comparatively low growth rates. According to data from the WDI, during the last 15 years the Colombian economy grew at an average rate of 3.15%, while income per capita grew at an average rate of 3%. During this same period, Asian economies grew at an average rate of 8.31%, with an average income per capita growth rate of 5.3%, while Latin American economies grew at an average rate of 3.45% with an average income per capita growth rate of 3.7%.

Both the low levels of investment and productivity sustained during several decades explain these low growth rates. Among many others, some of the determinants that undermine factor accumulation and productivity, studied prominently in economic literature, are the insufficient depth of the financial system, and the poor development of the capital market.

The latter are both characteristics of the Colombian economy and might well be an explanation of the reduced levels of investment and productivity. The purpose of this paper is to estimate, using two different quantitative exercises, the benefits for the Colombian economy that would result from a reform to the financial system that would enhance its efficiency and drive its development.

Before discussing our results, we analyze a series of indicators of financial depth and financial efficiency, and compare them to those of some benchmark countries. To this end, the benchmark countries chosen for our exercises are Chile, Mexico, Malaysia and South Korea. The idea behind the first exercise is to estimate the potential increase in savings for the economy that would result from achieving a more developed financial system, which, in turn, would derive from an increase in the efficiency of the banking system, a reduction of the access costs to the stock and bond markets, an increase in the depth of the formal financial sector, an increase in financing via the capital market (issuance of stocks and bonds), and by a lower dependence of Colombian companies on financial credit to finance their operation and their investments. Two different scenarios are considered for this exercise: i) the first drives the financial system, in terms of depth and efficiency, to the levels of Chile and Mexico, and ii) a more aggressive scenario, simulates what would happen if the Colombian financial system would achieve indicators similar to those of Malaysia and South Korea.

The purpose behind the second exercise, in turn, is to measure the effect of the development of the financial system, especially the development of the stock market, on the level of factor productivity of the industrial Colombian firms. For the latter we use data at the firm level and standard econometric models.

Development of the financial system in Colombia: Analysis of the indicators of Depth and Efficiency

Colombia's financial system, which includes the banking system and the capital markets, has had a major development in recent years, despite the severe side effects of the financial crisis in the late nineties; not only has there been a recovery in the banking system's depth, but there's also been a tendency towards the deconcentration of credit. The system has been subject to sounder regulation and tighter supervision. The overall efficiency in banking intermediation has decreased. Moreover, capital markets have developed significantly, particularly the corporate bonds market which has widely benefited from ample liquidity and regulatory flexibility.

However, despite its positive evolution, Colombia's financial system is still relatively underdeveloped when compared to other emerging countries. On the hand, the banking system's depth is still relatively low and more importantly, although Colombian firms and households are still highly dependent of bank credit, a large fraction of small businesses and low income households do not have formal access to this source of financing. On the other hand, capital markets are available only for a small number of firms, and in turn the

number of issuances continues to be small, issuance terms are short, costs are relatively high, and the level of sophistication in portfolio management is clearly lagged.

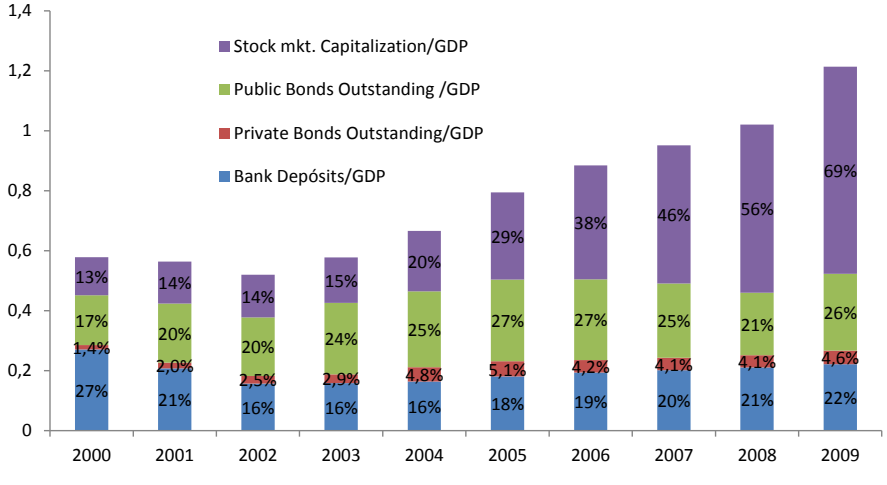
The Evolution of the Overall Financial Savings and Portfolio

In Colombia, financial savings, measured as the sum of bank deposits, the stock of government and corporate bonds, and the value of the outstanding shares (market capitalization) practically doubled in the period from 2000 to 2009 after increasing from 58% to 121% of GDP (Graph 1).

While bank deposits have remained relatively stable, averaging 23% of GDP, the public debt market has followed an inverted U pattern. Specifically, the public debt market increased from 16% of GDP in 2000 to 27% in 2006, and then declined again to 25.5% of GDP in 2009. The increase in the ratio of financial savings/GDP is basically explained by the significant increase in market capitalization in recent years, aspect in which it is difficult to isolate the effect of the increase in the stock of outstanding shares, and the effect of the increase in their prices, a behavior which has been common in several emerging economies.

In fact, market capitalization increased from 13% to 69% of GDP during the previously mentioned period. A clear cut illustration of the latter is that the General Index of the Colombian Stock Market (IGBC) increased its value in 100.5% between 2006 and 2009. On the other hand, the corporate bonds market has increased from 1.4% of GDP in 2000 to 5.1% of GDP in 2005, and 4.6% in 2009. Nonetheless, compared to the other components this last one is still relatively small.

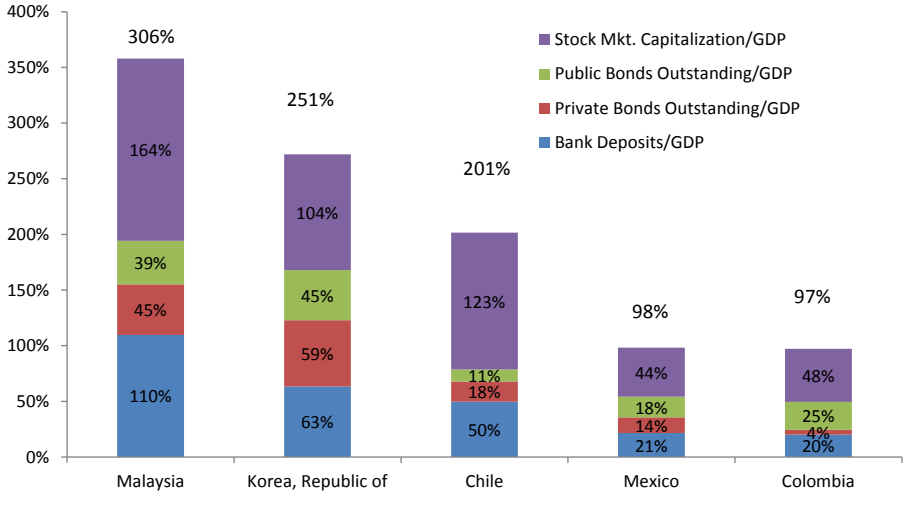
Graph 1: Financial system savings by type of instrument in Colombia (2000-2009)



Source: BIS, WB-WDI, WB-FSD, Superfinanciera and DANE

Although the Colombian financial system has gained depth in recent years, and despite its recovery from the financial crisis of the late nineties, the country's financial savings are small considered in an international context. For instance, as it can be seen in Graph 2, while in 2 the period 2005-2009 Colombia's financial savings were equivalent to 97% of GDP, in countries such as Mexico, Chile, South Korea and Malaysia that sum averaged 98%, 201%, 251% and 306% of GDP, respectively. Moreover, the Colombian corporate bonds market is relatively small (see Graph 2).

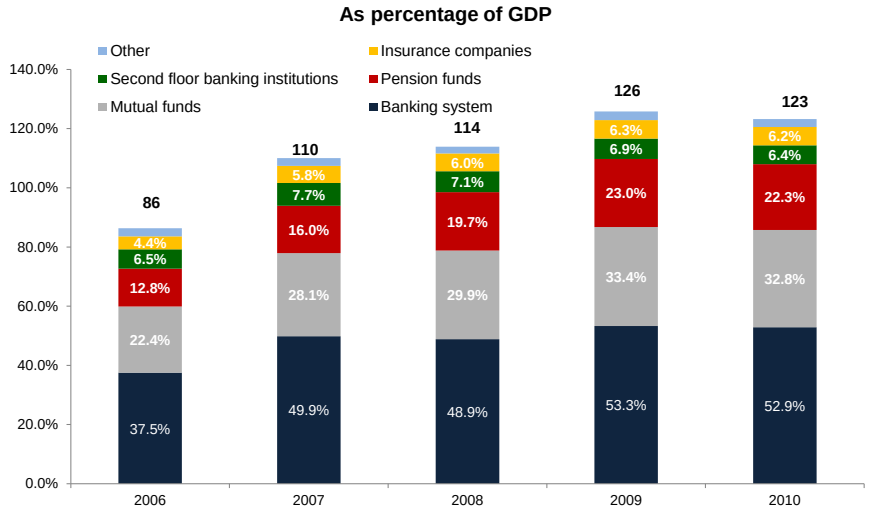
Graph 2: Financial saving (Average 2005-2009, % of GDP)



Source: BIS, WB-WDI, WB-FSD, Superfinanciera and DANE

Not surprisingly, the consolidate assets of the financial system show a similar pattern. These increased from 86% of GDP in 2006 to 123% of GDP in 2009. The first-tier banking system has the largest participation within the system's assets (52% of GDP in 2010), followed by the assets held by collective portfolios (32.8%), and pension funds administrators (22.3%) (Graph 3). The second-tier banking system and insurance companies hold assets that are worth close to 6% of GDP. The first three types of entities listed above are those that have led the behavior of the financial system's assets during the analyzed period.

Graph 3: Asset composition of the consolidated financial sector

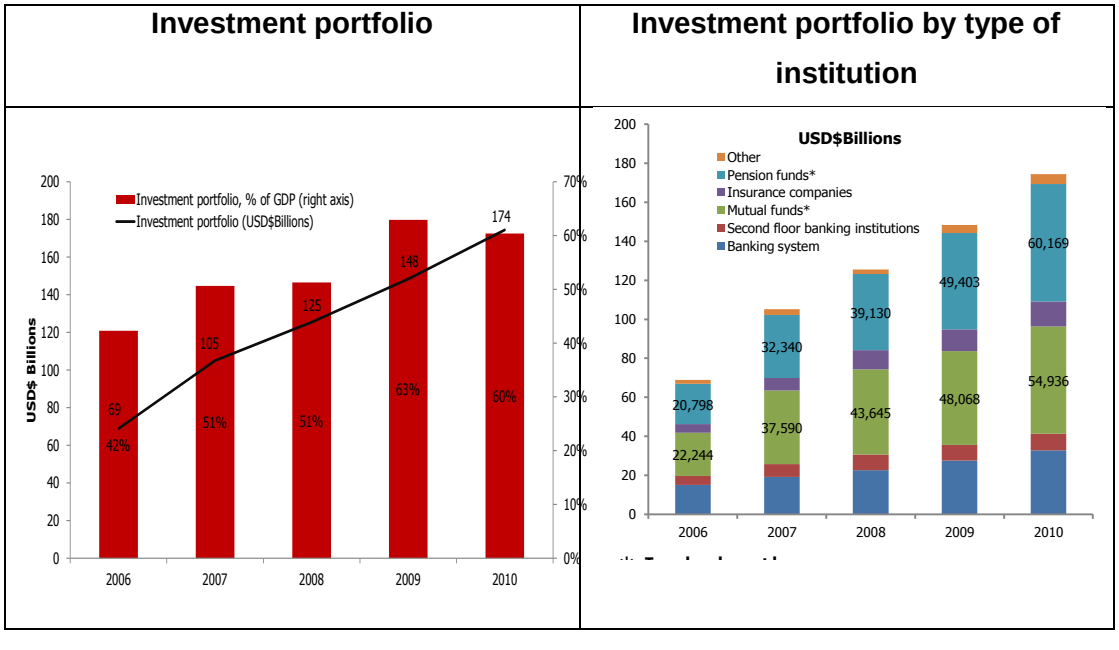


Source: Financial Superintendence and own calculations.

Nearly 60% of the assets held by the financial sector are represented in investments in securities, and the remaining 40% is represented in credits granted by the banking sector to the economy.

Clearly, investments in securities have shown significant growth as a percentage of the system's total assets. During 2006, these investments represented 42% of GDP. Moreover, the most active investors in the market are pension funds administrators and collective investors (Graph 4). It should be noted, nonetheless, that this increase in investments is partly due to higher stock prices, which as stated earlier are somewhat difficult to isolate from our calculations.

Graph 4: Assets of the consolidated financial system by type of institution

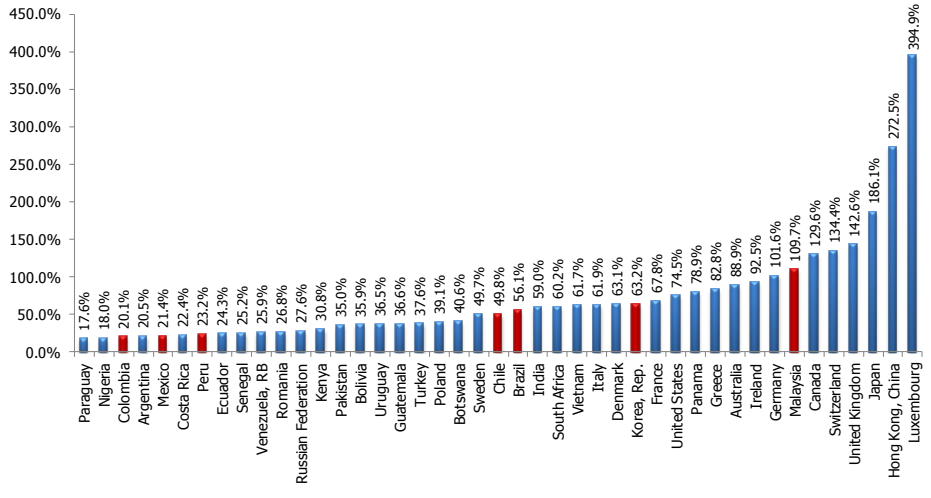


* Includes the investment portfolio of the pension fund manager. Source: Financial Superintendence and own calculations.

The Banking Sector

Despite its importance in financing businesses and households, the Colombian banking system is small when compared internationally; bank deposits are nearly 20% of GDP. The selected benchmark countries, except for Mexico which has a similar value, all have larger banking systems. For instance, bank deposits in Peru represent nearly 23%, 49.8% in Chile, 63% in South Korea, and 110% in Malaysia (Graph 5). Meanwhile, credit to the private sector is nearly 30% of GDP. In Colombia, the ratio of private credit to GDP fell sharply during the financial crisis in the late nineties, dropping to nearly 20% during those years. Despite the recovery in recent years, the ratio of private credit to GDP has not returned to the levels observed prior to the crisis (see Graph 6).

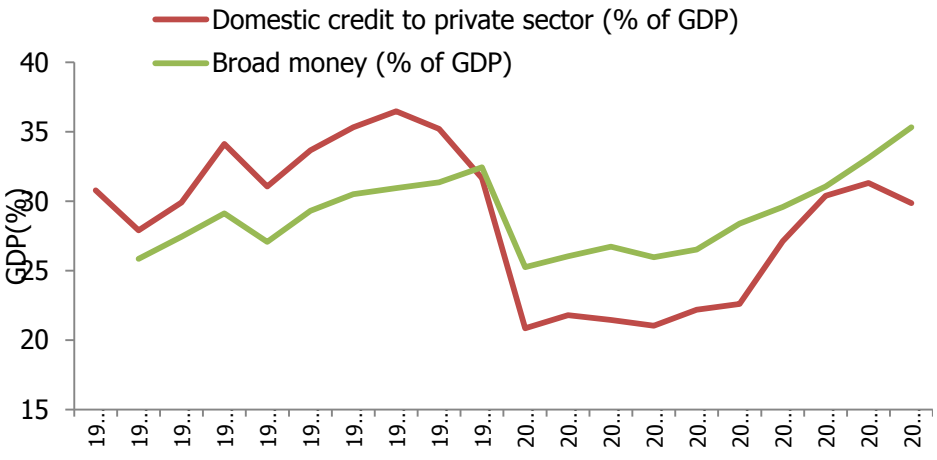
Graph 5: Bank deposits (average 2005-2009, % of GDP)



Source: WDI World Bank

On the other hand, it is worth mentioning that the financial crisis that affected the United States and the rest of the developed world in 2008 and 2009, did not affected the Colombian financial system in a significant way. Some of the reasons why the Colombian financial system avoided contagion are: i) the progress achieved on risk management by financial intermediaries, in turn, explained by the improvements in regulation and supervision, ii) the reduction in the levels of indebtedness of households and business compared to the levels seen prior to previous crisis, iii) the development of financial innovations (such as securitization, and, in general, derivative products and sophisticated financial structuring) under a strict control and monitoring from the supervisor, iv) a lower exchange rate risk exposure of the financial, the corporate, and the public sector compared to past periods, and v) a sound macroeconomic management, with a flexible exchange rate and a inflation targeting scheme that allowed the implementation of counter-cyclical fiscal and monetary policy.

Graph 6: Colombian monetary aggregates



Source: WDI World Bank

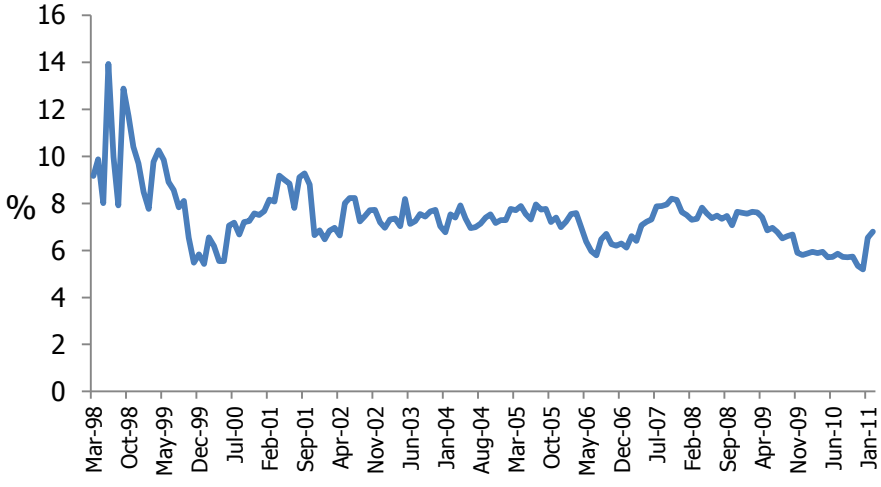
All throughout this document we use the intermediation spread (the difference between the active lending rate and the deposit rate), as an indicator of financial intermediation efficiency. It must be noted that we recur to this indicator of efficiency in part because of the lack of information, but mainly because it suits the concept of efficiency which we wish to explore in this paper. Although in a strict sense efficiency refers to the administrative costs associated to every peso that is either in a deposit or in a loan, it is important to keep in mind that there are some other aspects that make financial intermediation more costly, i.e., regulation, taxes, credit risk, and the low levels of competition within the system.[3]

In practice, the productive sector of the economy must face all these aforementioned costs, reason why, at least in principle, an integral financial reform must contemplate all these different aspects. Thus, the intermediation spread is a good suit for the broad concept of efficiency used in this paper, given that it is a measure that not only reflects administrative efficiency of banking institutions, but it also gauges regulatory efficiency, risk management efficiency, and efficiency derived from operating in a competitive scenario.

Having said the latter, not only has intermediation deepened, but the banking system has also been gaining efficiency. An indicator that reflects these gains in overall efficiency is the interest spread, which has fluctuated around 7% in the last five years, when 20 years ago it had reached levels close to 20% (Graph 7). Comparatively, the interest spreads in Colombia are still high compared to those of our benchmark countries, except perhaps Brazil and Peru, which suggests that there is room for improvement (see Graph 8).

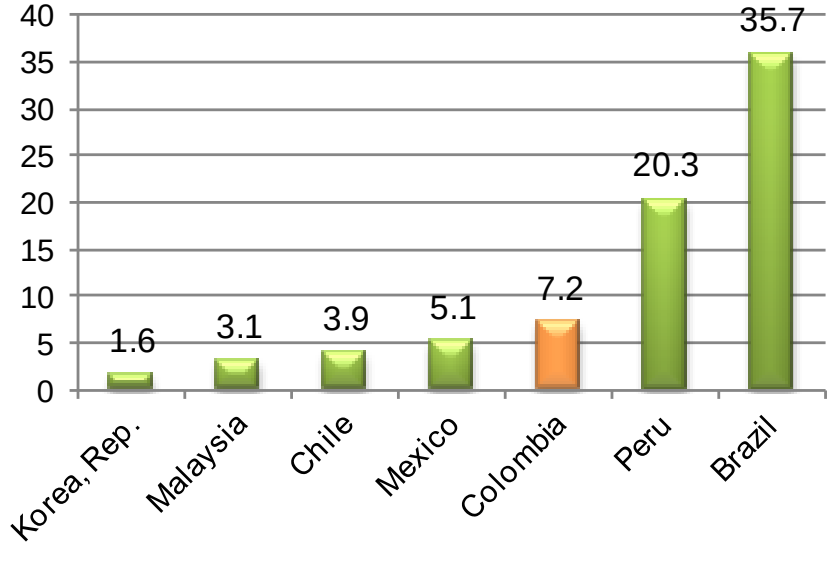
[3] In theory, the low level of competition allows the dominant agents to determine the intermediation price. These agents have enough market power to manipulate prices within the system.

Graph 7: Bank interest rate spread



Source: Central Bank of Colombia and own calculations

Graph 8: Interest rate spread (average 2005-2009, %)

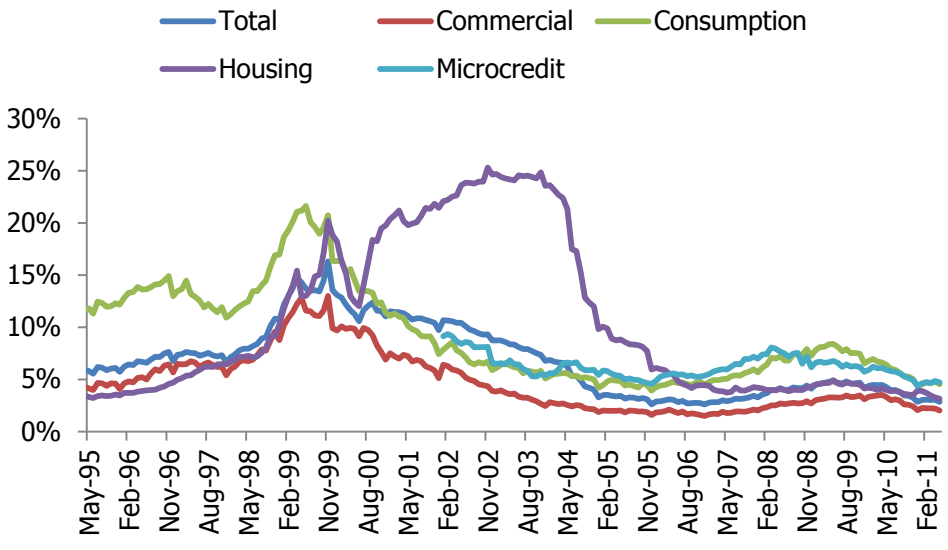


Source: World Bank

In terms of the indicators that reflect the prudential soundness of the system, one of the most illustrative is the credit quality of the loan portfolio, which is measured as non-performing loans over total loans. In 1998, this indicator climbed to 16% for the total loan portfolio, with a marked deterioration in the mortgage portfolio, segment which had an indicator of 25% in 2002, as well as the consumer portfolio which had a indicator of 21.1% in 1999. Currently, most prudential indicators are either at a similar or at more favorable levels than those seen in the period prior to the crisis in the late nineties. Nonetheless, it is

worth mentioning that during the crisis in 2007-2008, the financial system suffered a slight deterioration in its indicators, albeit consistent with the country's economic downturn. These results highlight the dramatic improvement in mortgage credit quality since 2003 (Graph 9).

Graph 9: Non-performing loans/Total loans



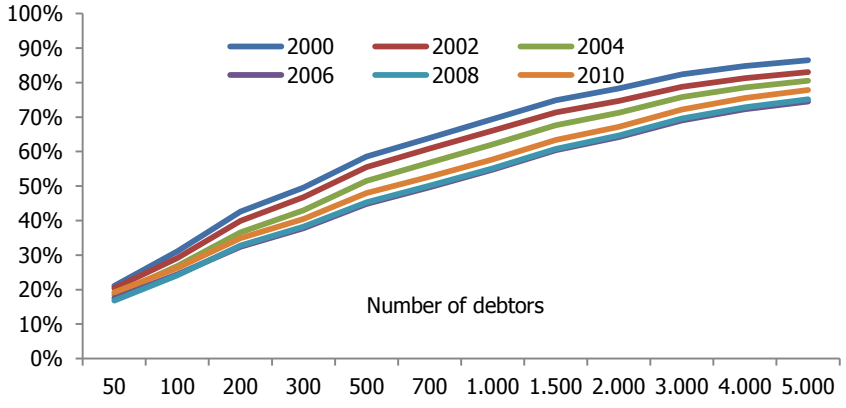
Source: Financial Superintendence and own calculations.

Colombia has made good progress in terms of increasing financial depth. Nonetheless, there is still room for improvements since access to credit and financial services is still difficult for micro, small, and medium sized businesses as well as for the low-income population.

For example, the commercial loan portfolio, that is business-oriented credit, still shows a large degree of concentration: in 2010, for instance, 78% of credit was granted to the 5,000 largest corporate debtors of the banking system. Nonetheless, this concentration has diminished, considering that in the year 2000 this rate was close to 90% (see Graph 10).

In the medium term this reflects the continuous efforts to increase penetration and depth of the financial system, but it also reflects the fact that the large companies have begun to use more actively the capital market to fund its operation and investment projects. Moreover, the slight setback in the process of deconcentration of the commercial credit portfolio between 2009 and 2010 can be explained by the effects of the international financial crisis: i) the economic deceleration could have led many companies to reduce their demand for credit, and ii) banks probably tightened their credit allocation policy.

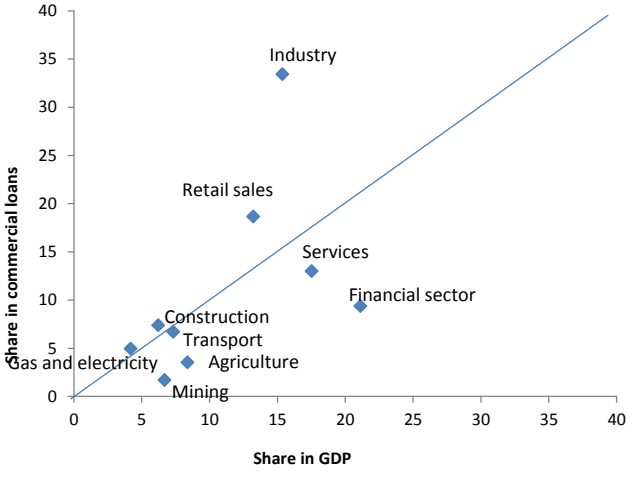
Graph 10: Participation of the major debtors of commercial loans (Debt capital)



Source: Financial Superintendence and own calculations.

In the past decade, industry, commerce, services, and the financial sector itself have accounted for a little less than 75% of commercial credit (see Graph 11). When the share of commercial credit of each sector is compared to its contribution to GDP, we find that credit is concentrated mainly in industry, commerce and construction, while other sectors such as agriculture, mining, and services, account for very little credit compared to their contribution to GDP.

Graph 11: Distribution of commercial loans by economic sector

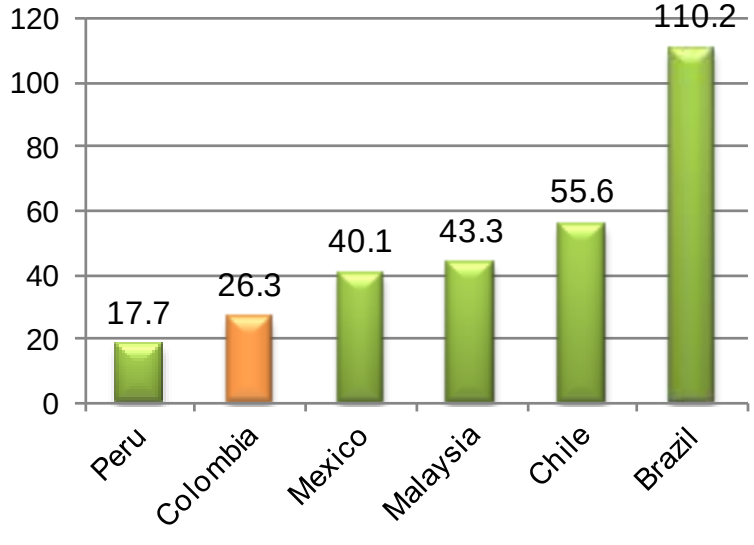


Source: Financial Superintendence and own calculations.

Additionally, it is important to note that the degree of bank usage in Colombia, measured as the number of overage people who have at least one financial product as a percentage of total adult population, was 62.4% during the first quarter of 2011, with nearly 5.5 million people that had at least one outstanding loan from the financial system. With regard to business, on the other hand, according to data from Asobancaria

(National Banking Association) in 2010 there were close to 496 thousand companies with at least one financial product, and 190 thousand of these had at least one outstanding loan from the financial system. Comparatively, Colombia has a relatively low financial penetration. An indicator that illustrates this fact is the number of Automatic Teller Machines (ATMs) per 100 thousand adults. Within the sample of countries analyzed, Colombia has the second lowest indicator (26.3), after Peru (18), while in Brazil rises to 110 (see Graph 12).

Graph 12: Number of ATMs per 100,000 adults (average 2005-2009)



Source: World Bank

The Capital Markets

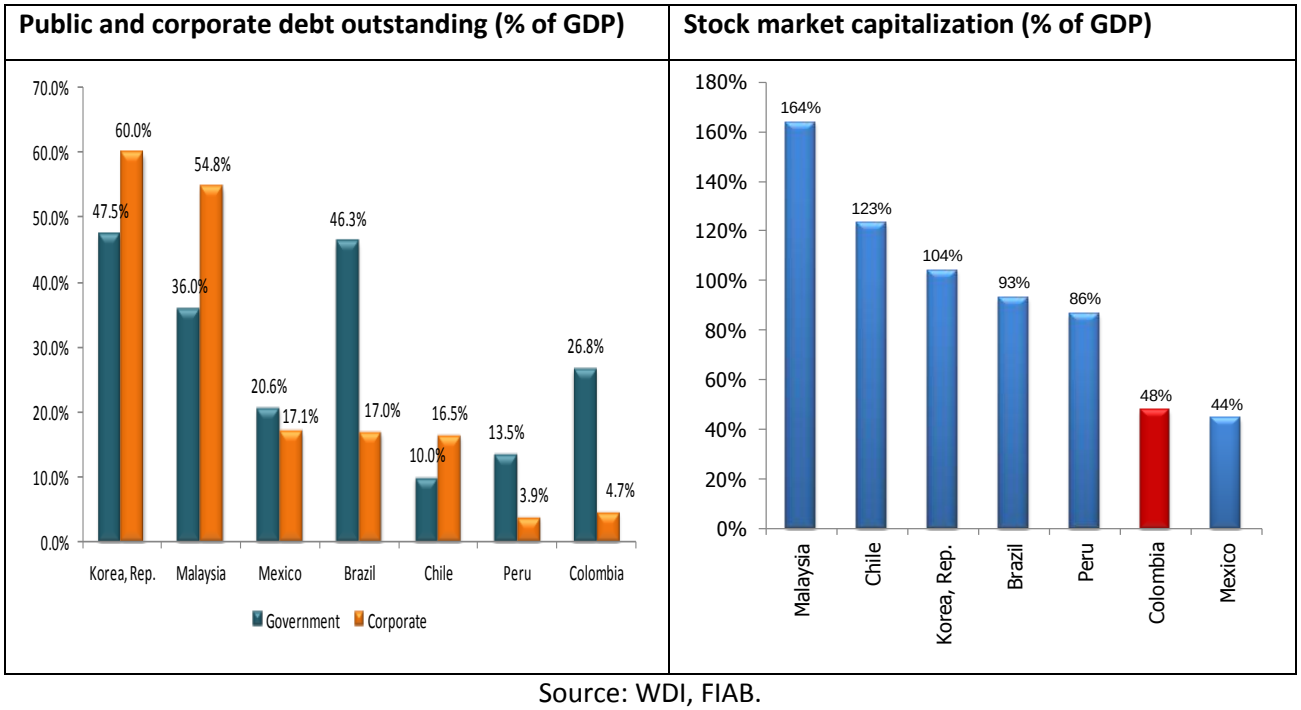
The public debt and the corporate debt markets together account for 31.5% of GDP, with a significant concentration of the public debt market (26% of GDP in 2009). The bond market in Colombia represents 4.7% of GDP but is one of the smallest one in the sample of countries mentioned previously. It is worth noting the corporate market development in Asia, where these markets weigh 50% to 60% of GDP, compared to Latin American where the corporate debt markets weigh less than 20% of GDP. Moreover, despite the favorable evolution of the Colombian corporate bonds market in recent years, it is still comparatively small compared to those of other Latin American Countries. Note also that this comparison applies the stock market.

In general, the stock market size is measured based on the indicator of market capitalization. This indicator, nonetheless, is not entirely adequate since it is affected by changes in prices. However, we consider the

comparison between the countries in our sample is possible given the fact that stock prices have risen in most emerging countries in recent years.

According to this indicator, Colombia and Mexico have the smallest stock markets. The stock markets in Brazil, Chile and Peru, in turn, have similar a similar size to stock market in South Korea, although they are still smaller than the stock market in Malaysia (where it represents 164% of GDP) (see Graph 13).

Graph 13: Comparative size of the capital market in selected emerging markets 2005-2009

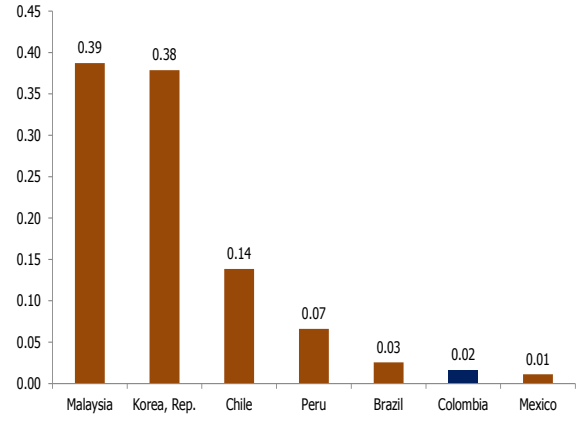
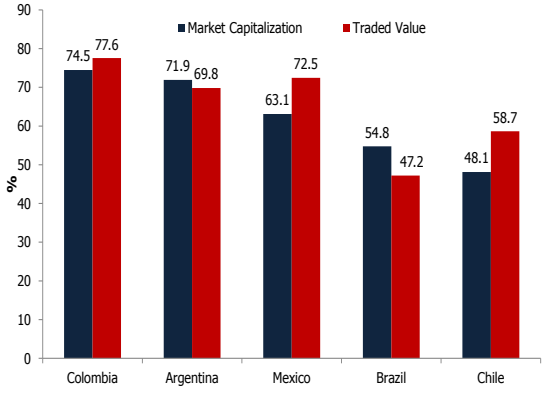


Source: WDI, FIAB.

The Colombian stock market is shallow due to both the small number of issuers and issuances. In Colombia, the number of listed companies in the stock market, for every ten thousand inhabitants, is close to 0.02, an indicator which is lightly higher than the one registered in Mexico, but smaller than those of the other sample countries notably South Korea and Malaysia where the indicator is close to 0.04 (see Graph 14). Moreover, the indicator of listed companies for every ten thousand inhabitants in Colombia is a clear reflection of the high concentration in the stock market. In fact, although all countries in the region have an elevated concentration in their stock markets, Colombia has the highest indicator of concentration. [4] More specifically, in Colombia over 75% of the total value of traded shares and market capitalization is concentrated in the 10 largest companies listed in this market.

[4] Concentration is measured as the participation of the 10 largest companies in both market capitalization and the total value of traded shares.+

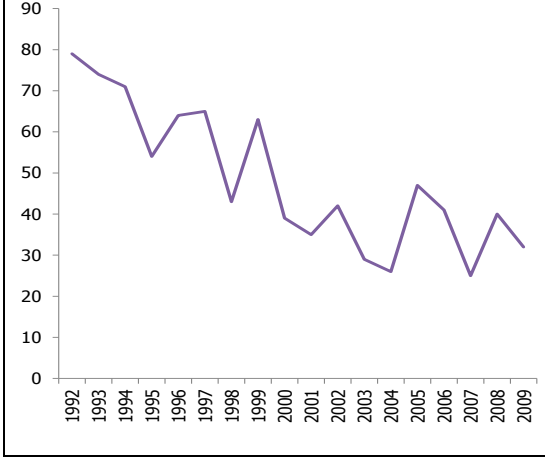
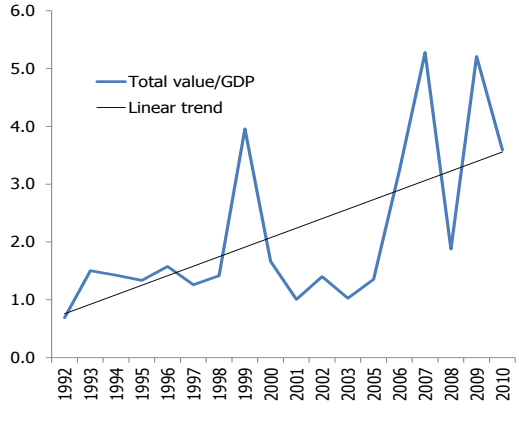
Graph 14: Some facts of stock market benchmark, 2009

Number of listed companies per 10K population	Participation of the 10 biggest companies by market capitalization and traded value, 2009
	

Source: FIAB and World Bank.

There are very few issuances of stock in the Colombian stock market. For instance, in 2009 only 32 issuances were authorized. In fact, the number of issuances has decreased substantially: for example, in 1992, close to 80 issuances were authorized, more than double of those of 2009 (Graph 15). By contrast, the value of the issuances as a percentage of GDP has risen considerably, especially in recent years. This suggests that the value of issuances is continually increasing, which in turn implies that the market has been concentrating around the larger firms.

Graph 15: Authorized public offers 1992-2010

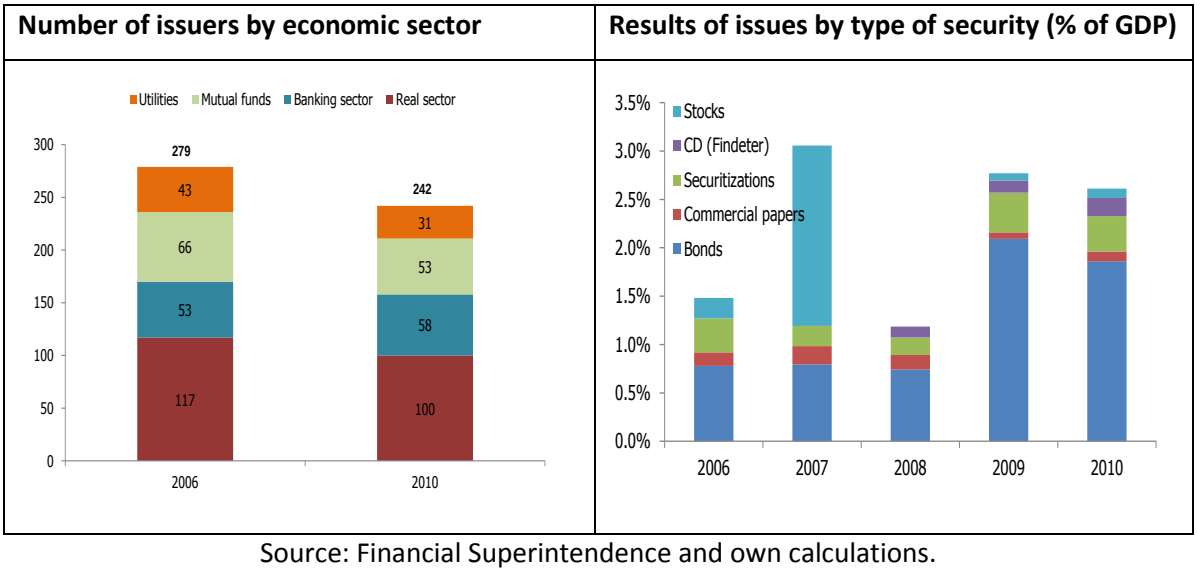
Number of authorized public offers	Value of the authorized public offers (% of GDP)
	

Source: Financial Superintendence and own calculations.

The number of issuers has also decreased from 279 in 2006 to 242 in 2010. The real sector is responsible for the greatest number of issuances in the stock market (100 in 2010), followed by the collective portfolio sector (58), financial sector entities (52), and public utilities providers (31).

Moreover, within the total number of issuances, the issuance of bonds accounted for 70% of the total value followed by securitization issuances (14%), commercial papers (3.9%), and stocks (3.7%). Hence, it is important to note how the issuance of bonds has been gaining importance, considering that they increased from 53% to 70% of the total value of issuances (see Graph 16). Thus, compared to bonds, all other instruments have lost importance (stocks, commercial papers and securitizations).

Graph 16: Results of issues by type of security



Source: Financial Superintendence and own calculations.

It is also important to note that the fixed income issuances in the capital market are still on short term basis, although recently there has been a tendency to issue on a long term basis. For instance, in between 2006 and 2008, nearly 15% of total issuances had an expiration term of one year. Nonetheless, it is important to point out that in the last two years this percentage has dropped to less than 5%. Thus, a large percentage of the total value of issuances has had an expiration term that ranges from 1 to 10 years. In fact, issuances that have expiration term equal to or greater than 10 years, are now more frequent; between 2006 and 2008, these issuances accounted only for 6% of the total value, while in the last two years this percentage increased to nearly 20% (Table 1).

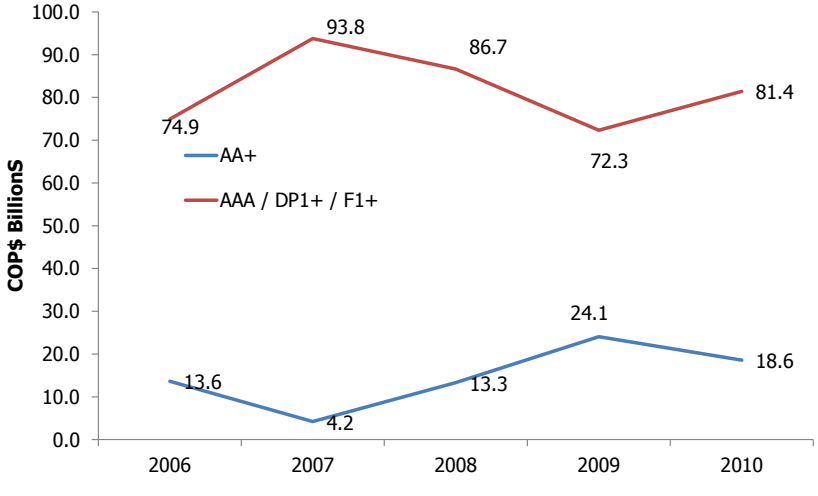
Table 1: Fixed income issues by maturity

Number of years (X)	2006	2007	2008	2009	2010
X <1	13.0%	15.7%	13.2%	2.3%	4.0%
1 < X ≤ 5	37.2%	45.9%	55.4%	36.6%	47.8%
5 < X ≤ 10	43.3%	32.1%	27.6%	42.1%	28.5%
10 < X ≤ 15	4.1%	6.3%	2.0%	16.2%	7.5%
15<X	2.4%	0.0%	1.8%	2.8%	12.2%
Total	100%	100%	100%	100%	100%

Source: Financial Superintendence.

Nearly 81% of the fixed income issuances have a triple A rating (DP+1 o F1+), which is the highest rating possible, while the remaining 18.6% have a AA+ rating. While regulation, in certain cases, requires a minimum rating for the instruments that may be part of portfolio, investors usually demand an even higher rating, which somehow suggests that the level of sophistication of handling risk in Colombia is still rather low (Graph 17).

Graph 17: Fixed income issues by rating



Source: Financial Superintendence.

Hence, both the regulation and the reduced number of issuers that participate in the market, together with a low level of sophistication of risk management, are the reasons why the portfolios of institutional investors are not too diversified.

Perhaps the best example is the evolution of the portfolio of the pension funds administrators. The first thing that should be noted is that stocks have increased their participation within the portfolio, although as it was mentioned above this participation is directly affected by the variation in prices. Moreover, as we discussed previously Colombia's stock market is rather shallow, and the number of issuers and issuances is quite reduced. In fact, both issuers and issuances have been decreasing consistently. Perhaps what is worth mentioning from the evolution in the composition of institutional investors' portfolios is the importance of public debt, which in turn signals the slow development of the market of securitizations and derivative products (see Table 2).

Table 2: Investment portfolio composition of Mandatory Pension Funds (FPO)

		2003	2004	2005	2006	2007	2008	2009	2010
Public Debt	Local	33.2%	39.1%	42.3%	44.8%	44.0%	44.6%	39.0%	38.8%
	Foreign	20.6%	13.1%	7.5%	4.2%	1.5%	4.5%	3.1%	1.9%
	Total	**53.8%**	**52.2%**	**49.9%**	**49.0%**	**45.5%**	**49.0%**	**42.2%**	**40.7%**
Fixed Income (public debt and securitization instruments not included)	Local	30.0%	26.2%	21.7%	18.6%	16.2%	16.6%	10.5%	7.3%
	Foreign	5.2%	6.7%	8.6%	8.2%	5.4%	5.5%	3.7%	1.5%
	Total	**35.2%**	**32.9%**	**30.3%**	**26.8%**	**21.6%**	**22.1%**	**14.2%**	**8.8%**
Stocks	Local	4.3%	7.8%	12.4%	15.3%	22.7%	21.5%	33.1%	35.1%
	Foreign	1.9%	2.8%	3.8%	5.8%	6.6%	3.9%	7.9%	11.4%
	Total	**6.2%**	**10.6%**	**16.2%**	**21.2%**	**29.3%**	**25.4%**	**41.0%**	**46.5%**
Securitiztion instruments	Fixed Income	2.7%	2.1%	1.5%	1.4%	1.2%	1.0%	0.6%	0.8%
	Other	0.4%	0.3%	0.4%	0.2%	0.4%	0.4%	0.4%	0.0%
	Total	**3.0%**	**2.4%**	**1.9%**	**1.6%**	**1.6%**	**1.4%**	**1.0%**	**0.8%**
Bank deposits	Banking system	1.0%	0.9%	1.1%	0.9%	1.6%	1.9%	1.7%	2.9%
	Central Bank	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.4%
	Total	**1.0%**	**0.9%**	**1.1%**	**0.9%**	**1.6%**	**2.0%**	**1.7%**	**3.3%**
Derivatives and other	Derivatives	0.8%	1.1%	0.6%	0.5%	0.4%	0.1%	0.0%	0.0%
	Total	**0.8%**	**1.1%**	**0.6%**	**0.5%**	**0.4%**	**0.1%**	**0.0%**	**0.0%**
Total Investment Portfolio (FPO)		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Financial Superintendence and own calculations.

The Benefits of a Reform to the Financial System

In empirical economic literature it is widely recognized that a well-developed financial system, or in other words a well-functioning banking system and capital market, has a positive effect on a country's economic growth. Recently there's been a large discussion on the channels through which this impact takes place. According to some economic growth theories, financial development promotes growth through two different channels: capital accumulation (traditional economic growth theories), and an increase in productivity (associated to endogenous growth theories which seem more plausible and have a higher power of prediction). However, empirical evidence shows that both these channels are present (Benhabib y

Spiegel, 2000). The roll of regulation and supervision, in terms of quality and relevance, is thus essential in order to drive financial development. Several cross-country and firm-level studies actually suggest that financial development has a more powerful effect on economic growth when there is a sound regulation and supervision in the financial sector, and even more so when institutions related to the financial sector are solid and stable (Rajan y Zingales, 1998 y Galindo, Schiantarelli, y Weiss, 2002).

The purpose of achieving greater financial development, and hence promoting productivity and economic growth, has long been the main driver behind many important financial reforms around the world. In order to assess the benefits that would result from a financial reform in Colombia, we use two different quantitative approaches. The first approach is a simple simulation that allows us to quantify how much the economy could save if it had a more efficient financial system, i.e., if firms could access cheaper financing in the banking sector as well as in the capital markets, mainly because of: i) a reduction of costs in both markets, ii) a shift in the composition of financing schemes towards cheaper sources. In this case, the efficiency of the banking sector is measured through the intermediation margin, which includes not only the administrative efficiency of banks, but also the higher costs of financial intermediation related to regulation, common taxes and payroll taxes, and credit risk, all of which are costs that are paid by the productive sector, although only the first one is directly controlled by financial institutions.

Efficiency of the capital markets, on the other hand, is measured through access costs and through the premium that investors demand in order to leverage against risk of default (in the case of the bonds market). An important caveat is that the savings obtained from the increase in efficiency wouldn't just simply be a transfer of resources from the financial sector to the productive sector, but would rather mean more savings for the economy. Actually, increasing the efficiency of banks, decreasing the costs of regulation and promoting the existence of sound institutions that allow a less costly management of risk, would also imply savings for these sectors.

In the first part of this study we conducted some international comparisons which allowed us to conclude that not only is the financial system lacking depth, but more importantly there is still room enough to make important improvements in terms of efficiency. These comparisons were based on four countries: Chile, Mexico, Malaysia and South Korea. These "benchmark" countries are useful for our simulations of different reforms and possible scenarios. More specifically, we will use Mexico's and Chile's averages as the "moderate benchmark" and then take Malaysia's and South Korea's averages as the more "aggressive benchmark". The idea behind the exercise is to simulate what would happen in terms of savings if we take

Colombia's banking system and capital markets efficiency, as well as firms' current financing structure, and equal it to those of the two chosen benchmarks.

Albeit this exercise is useful to evaluate the impact derived from a shift in the composition of firms' financing schemes, we cannot quantify the effect of achieving greater financial depth on the productivity of firms.[5]Thus, in order to assess the impact of achieving a greater financial depth on the productivity of businesses, we carried out an econometric estimation of the productivity of Colombian firms following the standard models found in economic literature. The novelty of our exercise is basically the inclusion of independent variables associated to financial development, regarding both the banking sector as well as the capital markets. It is worth mentioning that although these estimates are only carried out form firms in the manufacturing sector, they are a valid illustration of the impact of a greater development of the financial sector on the productivity of firms.

Simulation Exercises

The purpose of this section is to quantify the potential savings for the economy that would result from having a deeper, more efficient, developed financial market. [6] This exercise parts from the fact that, overall, the characteristics of the Colombian financial market consume resources unnecessarily, causing a reduction in productivity and economic growth. In particular, this exercise evaluates the potential savings derived from an increase in banking efficiency (reduction of the interest spread), the formalization of credit granted through informal means, and a reduction of costs associated to the issuance of stocks and bonds. In addition, the exercise quantifies the potential savings that would result from the improvement of the financing structure of the economy, by changing the combination of different financial resources, so that it is possible to migrate from the common financing schemes through formal credit towards schemes that have a larger component of financing via the capital market.

The methodology developed by McKinsey (2006 y 200x) yields an approximate estimate of the aggregate benefits of a potential reform, by calculating how much the economy would save if the intermediation spreads, the cost of issuing stocks and bonds in the capital market, and the available sources of financing would be similar to those found in more developed financial markets (*benchmark*). In this particular case,

[5] Changing the composition of firms' financing schemes generally implies depending less on financial credit and instead recurring more to the issuance of stocks and bonds. On the other hand, gains in productivity benefit all economic sectors given that productivity allows a more efficient allocation of resources and it increases economic activity both in the financial and the real sector.

[6] We estimate the potential increase in savings by using the same methodology applied by McKinsey to the Chinese (2006) and Indian (2006) cases.

we have chosen two possible benchmarks: i) Chile and Mexico or, a more ambitious choice, ii) Malaysia and South Korea.

Our estimates suggest that a reform to the financial system could save the economy up to 2% of GDP, in the hypothetical case where the financial system has indicators similar to those in the more moderate benchmark (Chile and Mexico), or up to up to 2.8% of GDP in the case where Malaysia and South Korea are used as the benchmark. The main drivers behind the potential savings are basically improved banking efficiency, the inclusion of non-formal sectors into the formal banking system, and the substitution of financial credit with alternative sources of financing such as the issuance of stocks and bonds.

Banking Efficiency

During 2005-2009, the prime interest spread in Colombia was, on average, 6.9%.[7] For this same period, Mexican banks registered, on average, an interest spread of 4.9%, while on average Chilean banks had an average interest spread of 3.8%. [8] Assuming that the interest spread is a good proxy for banking efficiency, this means that the Colombian economy could lower its interest spread by as much as 2.5 percentage points, if the reform to the system could manage to narrow it down to a level similar to the one seen on average in Mexico and Chile. Notice that the intermediation margin that is being considered is not the average margin, but the prime interest margin which is generally applied to the larger firms for which there is a richer set of information within the financial sector's databases. In fact, if instead of using the prime margin we would have used the average margin, then we would have possibly overestimated the effect of an increase in efficiency, given that the average margin is applied to the entire business sector and the fraction of the population that have formal access to the banking sector.[9] The reduction of the interest spread could be done either by lowering the interest rate on loans (active interest rate), by increasing the interest rate on deposits or both simultaneously. On the other hand, for the period 2005-2009, the total value of commercial loans granted by the financial sector amounted to 20.5% of GDP. [10] Taking all these figures into account, our estimates indicate that if the interest spread would have been at the average level of Mexico and Chile during this same period, the economy could have saved up to 0.5% of GDP each year (see Table 3).

[7] In this case, the intermediation margin is calculated as the difference between the prime lending rate (applied to corporate clients) and the DTF.
[8] World Bank Financial Structure Database.
[9] For a subsample of these two groups the active lending rate may be higher because of their short history or lack of information in the financial sector.
[10] World Development Indicators.

Table 3 : Driving banking efficiency to the benchmark levels

Benchmark 1: Average Mexico and Chile				Benchmark 2: Average Malaysia and South Korea			
	Commercial Banking Credit (% of GDP)	Prime interest rate spread margin (%)	Saving (% of GDP)		Commercial Banking Credit (% of GDP)	Prime interest rate spread margin (%)	Saving (% of GDP)
Colombia	20,5%	6,92%	0,53%	Colombia	20,5%	6,92%	0,94%
Benchmark 1		4,36%		Benchmark 2		2,32%	
Total			**0,53%**	**Total**			**0,94%**

Source: own calculations

Moreover, a more ambitious reform to the financial system could drive the interest spread down even further so that it matches the average interest spreads of Malaysia and South Korea. To this end, in the period 2005-2009 the average interest spread in Malaysia was equal to 2.5%, while South Korea had an average spread of 1.7%.[11] Hence, by driving banking efficiency to a level such that the interest spread matches the average interest spread of these Southeast Asian countries, the Colombian economy could lower the interest spread by as much as 4.6 percentage points. According to our estimates, achieving these higher levels of banking efficiency could bring the economy savings equivalent to 0.94% of GDP each year.[12] To sum up, compared to Latin American countries whose financial systems are more developed, Colombia's interest spread is significantly higher, even more so when compared to fast growing countries in Southeast Asia. Hence, any reform that could drive banking efficiency up to the levels of the aforementioned countries would save the economy a substantial amount of resources. As it was previously mentioned, these savings benefit the entire economy, i.e., both the financial and corporate sector, to the extent that there is an increase in administrative efficiency, at the same time that there is a reduction in taxes, credit risk, and the costs associated to regulation. This improvement could be achieved either by increasing the interest rate on deposits (i.e. a better remuneration of savings) or by lowering the active interest rate on loans (i.e. reducing the costs of credit).

Informal Credit

In Colombia a significant amount of credits granted to both households and small businesses are no intermediated by the formal financial sector. On the contrary, households and small business that lack access to the formal financial sector must rely on friends, family and neighbors to seek financing. In fact, in worst case scenarios households and small business owners often recur to private lenders and/or pawnshops to seek financing for their investment projects or needs.

[11] World Bank Financial Structure Database, 2009

[12] This estimate comes from multiplying the total value of financial credit in Colombia (equal 37% of GDP) times 4%, which is the hypothetical reduction in the interest spread.

Empirical evidence gathered by different studies suggests that these informal sources of financing usually imply interest rates that significantly exceed those charged by the formal financial sector. In the case of Colombia, according to some estimates, the usual interest rate of loans provided by friends, family members and neighbors varies around 70% to 80% effective annual interest, while pawn brokers and private lenders charge interest rates that go as high as 280% and 213% (annually effective), respectively. [13] By weighing these interest rates by the share of each informal source within the total sum of informal credit, and assuming that the interest rate on deposits is equal to the average interest rate of Fixed Term Deposits (FTD), our calculations suggest that the average interest spread in the informal sector is 164%. Hence, our estimates indicate that the total value of informal credit, granted to small business owners, represents almost 0.5% of GDP. [14]

Thus, in this case, the objective is to calculate how much could small business owners save, if the interest spread in the these informal sources of credit would be set to equal the largest spread possible charged by the formal financial sector. [15] Our estimates indicate that at small business owners could save 0.66% of GDP (see Table 4).

Table 4: The increase in savings derived from the formalization of informal sources of credit could sum up to 0.7% of GDP

	Value of informal credit (% of GDP)	Maximum interest rate spread for high risk credit (%)	Saving (% of GDP)
Informal	0,5%	164,12%	**0,66%**
Formal		26,41%	

Source: own calculations

Efficiency of Corporate Bond Markets

In Colombia, as in other countries, the issuance of corporate bonds involves paying fixed costs of registration as well as other annual costs. In particular, this issuance of bonds entails a series of costs such

[13] Marulanda & Paredes (2008).

[14] "Survey of the informal credit market in Colombia" by Econometria S.A (2007). According to the results of this survey, in 2010 total informal credit granted to households and small business amounted to up to $ 2.4 billion, a sum equivalent to 2% of the portfolio of the financial industry. According to the latter, informal sources of credit could amount up to 0.5% of GDP.

[15] We calculated the largest possible interest spread that the formal financial sector could charge as the usury rate of microcredit, plus the microcredit commission (33%) minus the Fixed Term Deposit Rate. In this case, we used the average between 2007 and 2011 for both the usury rate and the fixed deposit rate.

as: the initial registration fee that must be paid to the Colombian Stock Market (Bolsa de Valores de Colombia -BVC-), the costs associated to the allocation of the bonds, and the cost of the initial rating given by the credit rating agencies. As far as maintenance costs go, the Colombian Stock Market (BVC) and DECEVAL have specific annual rates for the maintenance of the bonds, just as the credit rating agencies charge for sustaining previous ratings. The cost derived from the risk of default is automatically transferred to the firm that is issuing the bond, which in turn makes the investment more costly. We asume that these maintenance costs are small relative to the size of the issuance and negligible compared to the default risk. [16]

Although measuring the default risk is not an easy task, we propose a method which we use in our estimates further on. According to Moody's (2009), between 1995 and 2008, 91% of corporate defaults in emerging economies occurred in years of systemic banking crises, 64% occurred during exchange rate crises, and 42% during debt crises. Hence, a large component of the default risk of corporate bonds issued in emerging economies, such as Colombia, is associated to country risk. To this end, we divided the risk of corporate bonds into two components: i) the risk of sovereign bonds (measured using the EMBI +), and ii) the premium risk paid by corporate bonds over the sovereign bond of any country. The premium is calculated as the difference between the rate of default of corporate bonds in a group of developed countries, for which we have data[17], and the average of sovereign risk (EMBI +) in these countries.

According to our estimates the average default risk of corporate bonds in Colombia is 3.5%, compared to Mexico and Chile whose average is 2.4% (see Table 5). [18] On the other hand, corporate bonds capitalization in Colombia is 4.7% of GDP for the period 2005-2009, and thus an increase in bond market efficiency would generate savings of 0.05% of GDP. [19] Thus, the estimated savings generated from an increase in efficiency in the bonds market are not really significant, given that the bonds market in Colombia is still small. As it was previously discussed, although the bonds market in Colombia has evolved significantly in the past few years, there are still only a small number of firms that have access to this market. Hence, given the methodology that is being applied here, only these firms would reap the benefits derived from the increase in efficiency in the bonds market.

[16] A company issuing bonds for US$ 100 million dollars will have to pay a sum that is somewhere in between US$ 219,000 and US$ 336,000, in other words less than 0.4% of the total value of the issuance.

[17] In the United States, Singapore, Chile, South Korea and Malaysia the average default rate of corporate bonds is 1.8% (McKinsey 2006).

[18] Bank of International Settlements.

[19] We constructed the capitalization of corporate bonds by adding the category "bonds" (260 500) of the PUC of all issuers of securities in Colombia. .

Table 5: Impact of reducing the default risk of corporate bonds to the levels of selected benchmarks

Benchmark 1: Average Mexico and Chile			
	Value of Bonds outstanding (% of GDP)	Default rate (%)	Saving (% of GDP)
Colombia	4,7%	3,51%	0,05%
Benchmark		2,45%	
Total			**0,05%**

Benchmark 2: Malaysia and South Korea			
	Value of Bonds outstanding (% of GDP)	Default rate (%)	Saving (% of GDP)
Colombia	4,7%	3,51%	0,06%
Benchmark		2,16%	
Total			**0,06%**

Source: own calculations

Moreover, an aggressive reform that drives market bond market efficiency to a level similar to those of South Korea and Malaysia would generate savings equivalent to 0.06% of GDP.

Stock Market Efficiency

In the stock market, just as in the bonds market, there are certain transaction costs implied. Arbeláez (2009) provides valuable insight by comparing the cost of issuing shares in Colombia, Chile and Peru. According to the author, in Colombia the cost of issuing shares worth US$ 100 million dollars varies between US$181 000 and US$316,000, while in Chile it's only worth US$ 18,000 (Table 6). Thus, given that for the period 2005-2010, the total value of traded shares in Colombia is equivalent to 5.4% of GDP, reducing the cost of issuing equity down to the level of Chile is relatively low (it would save 0.01% of GDP). [20] Just as in the case of the bonds market, the estimated effect of an increase in efficiency in the stock market is insignificant due to its size. Notice that we could have also used market capitalization, but in order to avoid any bias derived from the increase in the price of stocks in recent years, we preferred to use the average for the last 5 years of the value of traded shares as a percent of GDP.

Table 6: Reducing the cost of issuing shares to the level of Chile could save 0.01% of GDP

	Stock market value traded (% of GDP)	Issuing cost (%)	Saving (% of GDP)
Colombia	5,4%	0,25%	0,01%
Chile		0,02%	
Total			**0,01%**

Source: own calculations

[20] World Bank Financial Database (2009). Demirguc-Kunt and Levine (1999) propose using the value of traded shares as an indicator of stock market activity. The value of shares traded has the advantage of being a better approximation to the value of the shares that companies issue to seek financing.

Efficiency of the Aggregate Financial Structure

We have shown that the stock market and the financial market in Colombia are less efficient than those of countries like Mexico and Chile, and even less so than those of Malaysia and South Korea. We have also shown that increasing the efficiency of both these markets would produce substantial savings for the economy. Furthermore, beyond the efficiency of each of these individual markets, in Colombia the combination of these different markets is also inefficient as we show below.

Even if both the stock market and the financial market achieve a greater efficiency, there are instruments that are more efficient than others. For instance, in Mexico and Chile the interest spread of formal credit is 4.1%, while the default risk of corporate bonds is 2.45%. Thus, given that Mexican and Chilean companies finance a larger part of their debts through the issuance of corporate bonds and a smaller part through financial credit, this "mixture" of funding sources represents an additional benefit.

Table 7 shows the current value of each of the different sources of financing in Colombia (third column), and the financing structure that would be achieved if Colombia's total debt would be financed through a combination of sources similar to that of Chile and Mexico (fourth column: benchmark (% of GDP)). A change in the combination of funding sources is valued by comparing the intermediation costs after the reform. Therefore, our estimates calculate the potential benefit of changing the combination of funding resources, additional to those derived from greater market efficiency. As it was mentioned earlier, in this particular exercise we didn´t modify the level of financial depth (we only kept the average depth of the financial system of recent years), but we modified its composition so that it would be similar to that of the chosen benchmarks.

To achieve a financing structure similar to the one of Chile or Mexico, Colombia must increase the participation of corporate bonds, as a percent of the total debt, from 4.7% to 7.2% of GDP, and financing through equity from 5.4% to 9.5% of GDP. Moreover, Colombia would have to reduce the share of commercial bank loans from 20.5% to 14.4% of GDP.

As to informal credit, following McKinsey (2006), we estimate the benefits of driving this funding source down to zero, considering that it is never desirable to finance debt with informal credit. In short, our estimates suggest that by achieving a combination of financing sources similar to that of Mexico and Chile, the Colombian economy could save to 0.33% (see Table 7).

Table 7: Changing the financial structure

	Benchmark 1: Average Mexico and Chile				Benchmark 2: Average Malaysia y South Korea				
	Ahorro	Colombia (% del PIB)	Benchmark (% del PIB)	Ahorro (% del PIB)		Costo	Colombia (% del PIB)	Benchmark (% del PIB)	Ahorro (% del PIB)
Corporate Bonds	2,45%	4,7%	7,2%	-0,06%	Corporate Bonds	2,16%	4,7%	7,0%	-0,05%
Credit from banks	4,36%	20,5%	14,4%	0,27%	Credit from banks	2,32%	20,5%	6,7%	0,32%
Stocks	0,02%	5,4%	9,5%	0,00%	Stocks	0,02%	5,4%	17,4%	-0,002%
Informal loans	26,41%	0,5%	0,0%	0,13%	Informal loans	26,41%	0,5%	0,0%	0,1%
Total		**31,1%**	**31,1%**	**0,33%**	**Total**		**31,1%**	**31,1%**	**0,39%**

Source: own calculations

Furthermore, as it is expected, the combination of funding sources in Malaysia and South Korea are even more efficient than those of Mexico and Chile. Thus, by achieving a structure similar to that of the aforementioned Asian countries, the Colombia economy could save up 0.4% of GDP. Therefore, not only should a reform to the financial system seek to increase the efficiency of markets, but it should also seek to increase savings by changing the financial structure of the economy.

It is important to note that the increase in savings derived from modifying the structure of financing schemes are largely due to the substitution of financial credit with the issuance of stocks and bonds. This result, in turn, is consistent with the small size of the capital market. Moreover, an important share of the increase in savings comes from the substitution of informal credit with formal credit, which as we´ve mentioned is much cheaper.

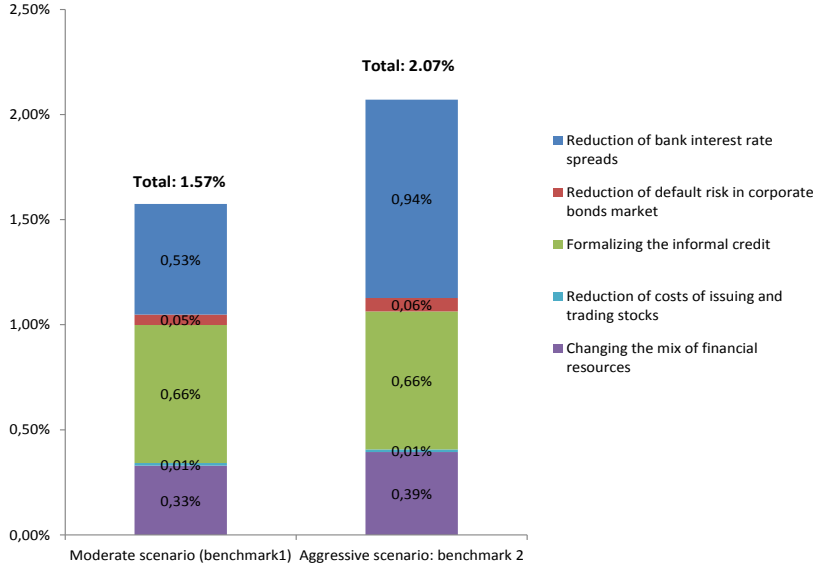
The Benefits (Value) of a Financial Reform

As we previously showed, a potential reform to the financial system would produce substantial savings for the Colombian economy. According to our estimates, by driving financial market development to the level of Mexico and Chile, the Colombian economy could increase savings in as much as 1.6% of GDP. Moreover, in a more optimistic scenario where financial market development is driven to a level similar to that of Malaysia and South Korea, the Colombian economy could save 2.1% of GDP.

Graph 18 summarizes the potential savings derived from the two possible scenarios considered: i) matching the market efficiency and financial structure of Chile and Mexico, or ii) matching the market efficiency and financial structure of Malaysia and South Korea. Our estimates indicate that the economy could save as

much as 1.2% to 1.6% of GDP, by increasing efficiency via the banking interest spread. Additionally, changing the combination of funding sources, and formalizing informal sources of credit, yields significant gains (about 0.3% to 0.4% of GDP).

Graph 18: A reform to the Colombian financial system could increase generate savings equivalent to 1.6% and 2.1% of GDP



Source: own calculations

Productivity and Development of the Financial and Stock Markets in Colombia

In economic literature there is a consensus that one of the major determinants of economic growth and income per capita of a country, in the long term, is the accumulation of productive factors, and the efficiency with which they are used. Moreover, in growth literature, especially since Solow's seminal contribution in 1956, total factor productivity (TFP) has been used as the primary measure of gains in efficiency in the use of productive inputs. To this end, the TFP is a residual which captures the unexplained portion of economic growth, which is usually attributed to the technical innovation process in a given economy. Several authors, such as Senhadji (1999) and De Gregorio and Lee (2001), have found that technical innovation has contributed significantly to economic growth in developed countries and a number of Asian countries, but not so for Latin American countries.

In regard to the latter, a number of empirical studies have tried to establish the possible determinants of low productivity in Colombia. Cardenas (2002), for example, found that the country's unstable growth of aggregate productivity is mostly given due to the negative effect of violence and conflict. Echavarría et al. (2006), on the other hand, argue that the gains in productivity have been mostly associated to the economic liberalization, particularly with high imports and low tariffs. Nonetheless, until now there have been no studies regarding macro-financial variables and the impact of deepening the capital market on the productivity of firms.

The development of the banking sector and the capital market is without doubt important to the development of the productive sector, considering that the primary function is to channel funds from savers to entrepreneurs who wish to invest and innovate. Hence, the absence of a consolidated financial system, or a developed capital market, are factors that play an important role within the set of barriers that affect growth in the long term, particularly preventing higher levels of private investment.

Having said the latter, in this section we make an empirical assessment, using econometric techniques, of how the financing composition of firms, and other macro financial variables, affect the productivity of Colombian companies, using the TFP as the basic measure.

Econometric Model

The specification of our econometric model builds upon the work of Nucci et al. (2004) and Gallego & Loayza (2000). Nucci et al. (2004), on the hand, analyze the empirical relationship between the financial structure of Italian companies and Total Factor Productivity (TFP). These authors find that there is a negative relationship between leverage and the productivity. On the other hand, Gallego & Loayza (2000) analyze how the development of financial markets in Chile has affected the performance of companies in that country. These authors, in turn, find that macro financial variables, such as private credit/GDP ratio and market capitalization/GDP ratio, have a positive effect on the performance Chilean companies. Building upon the work of Nucci et al. (2004) and Gallego & Loayza (2000), our econometric specification is as follows:

Where is the logarithm of Total Factor Productivity (TFP); are the firm's intangibles assets; measures the firm's cash flow; is a measure of the firm's total leverage; is a dummy variable that takes the value 1 for larger firms; is a vector of macro financial variables such as GDP growth, private credit/GDP ratio, and the capitalization of the stock market/GDP ratio; and and are fixed effects which are specific to each firm and the residual error, respectively.

In order to estimate the model given by equation (1), we used the Colombian Superintendency's database, which contains all registered companies. This database contains financial information for more than 22,000 companies, as well as data for a series of companies regarding the number of temporary and permanent workers.

On the other hand, as it is possible to see in equation (1), the model includes the lag of the dependent variable as an independent variable, which creates problems of endogeneity. This in turn, means that the estimation by OLS and fixed effects are not consistent, due to the fact that there is correlation between the independent variables and the error term. Thus, in order to resolve such a problem, we estimate equation (1) using the first differences method which eliminates the fixed effects that are inherent to each firm. More specifically, we use the Generalized Method of Moments (GMM) methodology, which uses the differences and the levels of lagged endogenous variables as instruments.

Dependent variable

With respect to the calculation of LTFP, due to the nature of the database, it's not possible to calculate the TFP for each firm, given that the database does not contain information about the intermediate inputs used by the firms. To this end, we use the coefficients of the variables capital (K) and labor (L) calculated by Eslava et al. (2004), for the manufacturing sector in Colombia and we applied them to the variables K, L and Y of our data base The value of these two coefficients can be used to calculate the TFP as follows:

It is important to note that these coefficients can only be used to calculate the LTFP for companies in the manufacturing sector. For this reason, although the database of the Superintendency of Societies has information for all sub-sectors of the real sector, we only estimate equation (1) for a subsample of firms in the manufacturing sector.

Independent variables

In this subsection we discuss how each of the independent variables could impact on productivity. As it can been seen in equation (1), these variables are those that are related with financial macro variables and firm's specific variables such firm size, cash flow, leverage, and investment in intangible assets.

Leverage

One of the topics studied extensively in economic literature is the effects of external financing (leverage), and its associated costs, on productivity. Although the effects of leverage on productivity have been widely documented, there hasn't been a clear consensus on the sign of the effect of leverage on productivity.
Hence, the effect of financial leverage on productivity is ambiguous. On the one hand, an increase in leverage can cause financial pressure which would encourage companies to be more efficient. For example, empirical work done by Jaramillo & Schiantarelli (2002) for the Ecuadorian case concludes that improvements in the access to credit have a positive effect on the productivity of firms. Specifically, credit offers companies the possibility of investing in better technology and thus become more productive. Moreover, a continuous monitoring of these credits may encourage firms to identify and eliminate inefficiencies, and hence increase their productivity.

Nonetheless, the relationship between financial leverage and productivity could also be negative, due to the fact that higher leverage decreases available collateral, and thus increases the premium required by lenders. Nucci et al. (2005), for instance, found a negative relationship between leverage and productivity. More specifically, they found that firms with less leverage are more productive on average. According to these authors, increases in debt may increase the probability of bankruptcy due to the sharp increases in the costs of borrowing, and this, in turn, could negatively affect the investment levels of companies.

Cash Flow

With regard to the cash flow, this variable is usually positively associated with productivity because, as Nucci et al. (2005) argue, companies that are more productive are likely to generate higher profits and a higher cash flow, and therefore use less debt. Thus, we expect a positive relationship between cash flow

and the log of TFP. Moreover, for those firms that have higher cash flow, compared to other firms, the capital structure could be less. In fact, the leverage of these companies, whether it is high or low, could be irrelevant because the improvements in performance can be achieved by using resources that come either from the company's revenues or the company's cash flow (Nucci et al., 2005).

Macro Financial Variables

Some theoretical and empirical studies have found a positive relationship between the depth of the banking system and the stock market, and the productivity of countries. For example, Aghion et al. (2004) found empirical evidence that suggests that the development of the banking sector and the capital market can reduce the adverse effect of macroeconomic volatility on the aggregate productivity of countries. De Gregorio (1996), in turn, shows that the development of these markets contributes to the creation of human capital. Levine (2004), on the other hand, finds that the development of banking and capital markets help generate ex ante information on profitable projects, which facilitates risk management.
Moreover, at firm level, there several studies that analyze the effects of macro financial variables on TFP. Some of the most insightful contributions on this matter can be found in the work of Gallego & Loayza (2000), and Nucci et al. (2004). These studies found that an increase in the activity of the financial sector has a positive effect on revenue growth and the productivity of companies. Gallego & Loayza (2000), for example, found that an expansion of the "real" size and activity of the stock market in Chile, contributed to the increase of sales of Chilean companies.

Others

In regard to the variable that measures the size of companies, it is worth mentioning that the empirical evidence has found that larger firms are usually more efficient and have higher profits. Moreover, the empirical evidence suggests that larger firms tend to have higher levels of investment (Echavarria, 1990; Tybout, 2000; Villamil, 1999, Echavarría et al., 2006).

On the other hand, international literature on the subject has showed that exporting firms are different from their counterparts. Evidence found by Arbeláez and Parra (2010), for example, shows that these companies spend more than non-exporters, and have higher levels of productivity. According to Echavarría *et al.* (2006), firms looking to export their product must generate relatively high profits, which in turn will allow them to have substantial cash flows, such that they can rely less on debt to finance their investment projects.

With respect to the variable of intangible assets, it is a variable that measures the level of innovation of firms. Since Schumpeter's 1942 work, technical change, achieved through innovation, has been considered as a major source for long-term economic growth. At the micro level, innovation improves the competitiveness of companies either through increases in the supply of new products or processes or by reducing production costs.

The database

As mentioned previously, for the estimation of the model given by equation (1) we used the Superintendency of Companies' database. This database has detailed information at the firm level, including balance sheets and income statements of each of registered company. Moreover, the database also has information on the number of permanent and temporary workers of each company, as well as information on the movement of fixed assets. The latter information is used to calculate the capital stock of all the companies considered in our sample.

It is important to mention that this database has a natural bias, considering that it only includes companies that are obliged by law to submit their financial statements to the Superintendency. Consequently, financial statements for smaller companies are scarce and unreliable. Additionally, it is important to mention that in 2005 there was an increase in the number of firms included in the database. Thus, due to the mentioned limitations, three criterion were used to refine the panel data: first, as mentioned previously, the TFP calculation can only be done for the manufacturing sector, and therefore the database was modified so that only companies that belong to the manufacturing sector we included. The second criterion, following Cincera (2003), consisted in deleting those firms that are not listed in the database for at least two consecutive years, and the deleting the companies that appear and disappear in the database during the period between 1998 and 2008. This last approach allows us to correct the effects of policy changes made by the Superintendency of Societies, regarding which companies must report their financial statements during the aforementioned period. The third criterion has to do with the identification of outliers, for which we followed the methodology proposed by Bond et al. (2003) and Delgado (2004). This methodology allowed us to eliminate the highest and lowest percentiles of the all variables in equation (1). Table 8 summarizes the number of manufacturing firms per year after the process.

Table 8: Number of firms in the panel after the purification process

Year	Without purifying	Purifying
1998	5074	1547
1999	5698	1694
2000	5948	1654
2001	6321	1680
2002	6789	1685
2003	5467	1571
2004	5874	1569
2005	6894	1752
2006	7556	1829
2007	7569	1894
2008	8250	1894

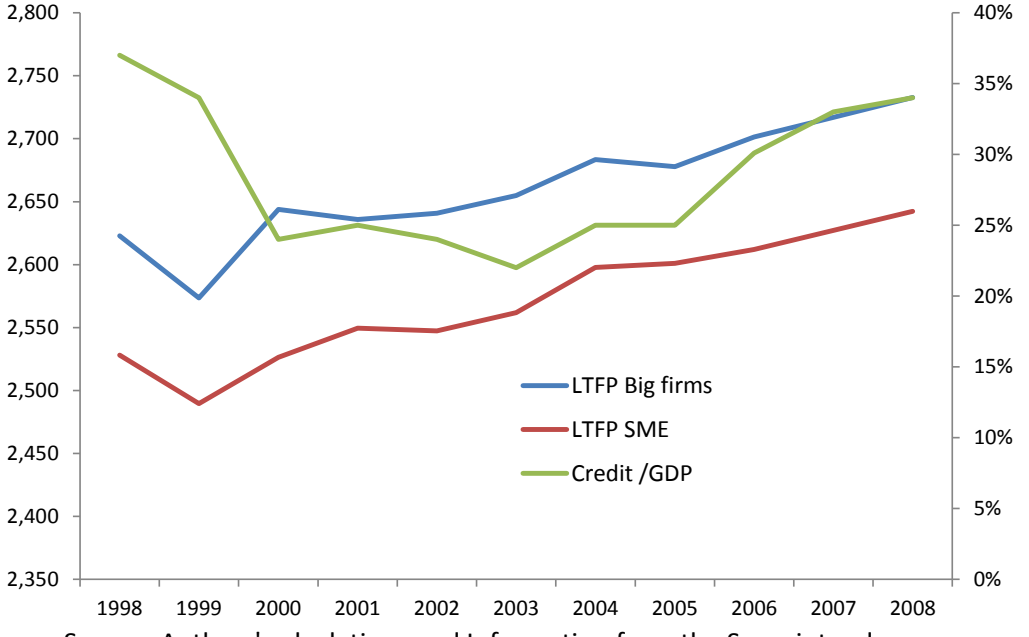
Source: Superintendency of Societies

Stylized Facts: Macro financial variables versus LTFP

Before discussing our econometric results, it is worthwhile to analyze the evolution of some of the relevant variables included in equation (1). In this case, we are particularly interested in the behavior of productivity (LTFP) during the period that's being considered for the analysis (1999-2008). First of it all, the data shows that productivity had a significant decline between 1998 and 1999, amid the crisis of the late nineties, and then began a recovery process in the year 2000 that lasted until 2008. Another interesting fact is that the depth of the banking system, which is measured by the ratio of private credit to GDP, has had a similar path to that of productivity in the manufacturing sector, with a marked recovery since 2002 onwards (see Graph 19).

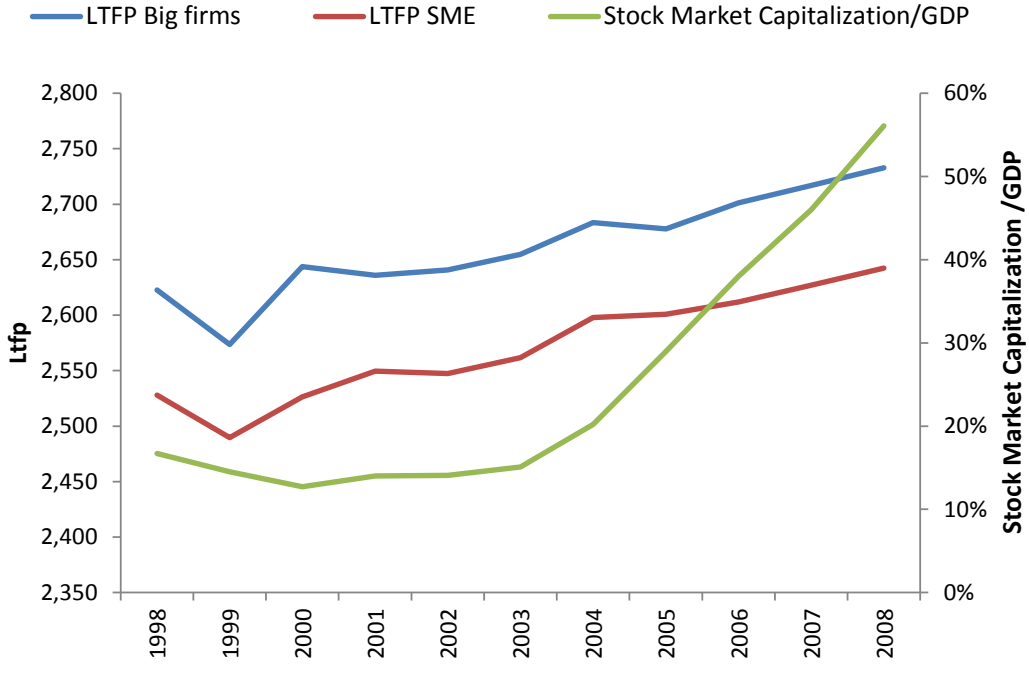
Thus, by comparing the evolution of productivity and depth of the stock market, measured by ratio of market capitalization to GDP, it is possible to see that their behavior is quite similar. In fact, prior to the year 2000, year in which the recovery began, both productivity and the depth of the stock markets had plummeted. Nonetheless, after 2000 both these productivity and depth began a steady recovery process. Hence, the data suggests that the productivity of the manufacturing industry is correlated to the macro-financial conditions of the economy.

Graph 19: LTFP vs. Private credit/GDP ratio



Source: Authors' calculations and Information from the Superintendency.

Graph 20: LTFP vs. stock market capitalization/GDP ratio



Source: Authors' calculations and Information from the Superintendency.

Results

Before we discuss our results, two minor caveats must be made. First of all, it is important to highlight that the independent variables in equation (1) are treated as endogenous, with the exception of the macro financial variables which are treated as exogenous. Moreover, it is also worth mentioning that the consistency of our estimators depends on the validity of two assumptions. On the one hand, the error term, , should not be serially correlated. On the other hand, the instruments should be jointly significant.

In order to evaluate these assumptions, Arellano and Bond (1991) developed two different tests. The first one examines the assumption of no serial correlation between the error terms, by testing whether the difference of the error term has a second-order serial correlation. The second test is the Sargan test, which is used to evaluate the validity of the instruments.[21]

Table 2 summarizes the results of our estimation of equation (1). The results in columns (1) – (8) show that there is a negative relationship between leverage and productivity. Hence, companies with lower levels of leverage are, on average, more productive. According to Nucci et al. (2004), financing costs affects firms´ productivity negatively. These authors suggest that the leverage variable is a good proxy for the value of the cost of capital. Specifically, firms with higher levels of productivity (LTFP) generate larger profits and cash flows, and therefore use less debt (either via financial credit or issuance of shares).

Thus, the results in Table 1 show that when a firm has a greater capacity to generate internal resources, or a greater cash flow, these firms tend to be more productive given the possibility of avoiding the financing costs associated to the use of external financial sources. The results of Table 9 also show that intangible assets, such as patents and trademarks, have a positive effect on firm´s productivity, although it is not necessarily significant. A plausible explanation for the latter is the low level of innovation that exists in Colombia. According to the Dane Innovation Survey, only 6% of manufacturing firms in Colombian have a registered patent.

[21] The Sargan test is based on a statistic whose distribution is with (r-k) degrees of freedom.

Table 9: : Results of the impact of macro financial variables on the productivity of industrial firms (1998-2008)

Variables	ltfp (t) (1)	ltfp (t) (2)	ltfp (t) (3)	ltfp (t) (4)	ltfp (t) (5)	ltfp (t) (6)	ltfp (t) (7)	ltfp (t) (8)
ltfp(t-1)	0.2082*** (0.042)	0.1600*** (0.041)	0.1864*** (0.043)	0.1734*** (0.039)	0.2088*** (0.042)	0.1623*** (0.041)	0.1882*** (0.044)	0.1718*** (0.040)
Large (t)	0.2974*** (0.101)	0.3679*** (0.117)	0.3449*** (0.117)	0.3613*** (0.108)	0.2842*** (0.102)	0.3575*** (0.118)	0.3372*** (0.118)	0.3228*** (0.112)
Cash Flow (t)	0.2241*** (0.065)	0.1842*** (0.059)	0.2181*** (0.065)	0.2050*** (0.045)	0.2305*** (0.067)	0.1886*** (0.060)	0.2215*** (0.067)	0.2446*** (0.065)
Leverage (t)	-0.4821** (0.222)	-0.3850* (0.217)	-0.3735* (0.219)	-0.3626* (0.203)	-0.4654** (0.223)	-0.3727* (0.219)	-0.4311* (0.243)	-0.4455* (0.266)
Inmaterials (t)					0.2642 (0.708)	0.2352 (0.619)	0.149 (0.636)	0.3326 (0.636)
GDP growth (t)		0.5880*** (0.043)	0.3729*** (0.067)	0.3035*** (0.056)		0.6177*** (0.021)	0.3613*** (0.058)	0.2559*** (0.068)
Private Credit by Banks/GDP (t)		0.1183*** (0.032)				0.1126*** (0.032)		
Stock Market Traded Value/GDP (t)			0.2057*** (0.011)				0.2048*** (0.024)	
Value stock/ GDP (t)				0.5548*** (0.044)				0.4892*** (0.046)
Constant	1.2161*** (0.155)	1.2767*** (0.188)	1.2553*** (0.183)	1.2729*** (0.157)	1.1950*** (0.155)	1.2336*** (0.188)	1.2633*** (0.186)	1.2912*** (0.155)
Number of firms	1894	1894	1894	1894	1894	1894	1894	1894
Wald test chi2	41.94	54.13	37.69	41.94	42.54	55.31	38.47	55.58
Prob>chi2	0	0	0	0	0	0	0	0
Sargan (*p-value*)	0.762	0.675	0.714	0.671	0.873	0.806	0.827	0.762
Sargan-Hansen (*p-value*)	0.202	0.197	0.283	0.247	0.241	0.211	0.214	0.275
M1	-4.773	-4.498	-4.649	-32.96	-4.780	-4.493	-4.647	-4.661
M1(*p-value*)	0	0	0	0	0	0	0	0

Variables	ltfp (t) (1)	ltfp (t) (2)	ltfp (t) (3)	ltfp (t) (4)	ltfp (t) (5)	ltfp (t) (6)	ltfp (t) (7)	ltfp (t) (8)
M2	0.448	-0.0500	0.280	1.223	0.481	-0.0425	0.285	0.119
M2(*p-value*)	0.654	0.960	0.779	0.221	0.631	0.966	0.776	0.905

Source: Authors' calculations and information from the Superintendency

With regard to macro financial variables, the results suggest that depth of the banking sector (private credit / GDP) have a positive impact on the productivity of firms. This, in turn, might be related to the fact that larger banking systems usually lead to lower, more attractive, interest rates which implies lower financing costs for firms. As to the depth of the stock market, the results suggest that an increase in the ratio of capitalization to GDP (depth) has a positive effect on the productivity of firms. The larger the stock market is the easier and the cheaper it is for firms to access the resources they require. Table 9 also shows that the valued traded on the stock exchange (as a %GDP), also has a positive effect on firm´s productivity.

With regard to macro financial variables, results suggest that an increase of a percentage point in the amount of private credit (as a % of GDP), generates an increase of 0.11% in productivity. Moreover, a percentage point increase in the stock market´s capitalization (as a % GDP), increases firms´ productivity in 0.2%. Finally, a 1% increase in the total value traded in the stock market (as a % of GDP), generates gains in productivity of 0.4%. Thus, these previous results seem to suggest that an expansion of "real" size and the activity of the Colombian stock market appear to lead to further growth of Colombian firms.

Table 10 presents the results of estimating equation (1) adding a dummy variable that takes the value of one if the company exports over 20% of its total sales. The purpose of including this variable is to test whether or not firms that export are more productive. Table 10, however, shows that our results remain unaffected after controlling for companies that export.

Similarly, the positive effects of macro financial variables are preserved, which shows the robustness of the result of deeper capital market affects the productivity of firms positively. With regard to macro financial variables, we found that one percentage point increase in private credit as percentage of GDP, generates a increase of 0.11% in productivity. On the other hand, one percentage point change in stock market capitalization (%GDP) increase 0.12% the firm´s productivity. Finally, one percentage point change in the value traded (%GDP) generates gains in the productivity of 0.27%, the latter value shows that an expansion of "real" size and the activity of the stock market in Colombia appears to lead to further growth of Colombian firms. Finally, Table 11 shows the estimation of equation (1) controlling for years, the results remain.

Table 10: Results of the impact of macro financial variables on the productivity of industrial firms (1998-2008)

	ltfp (t) (1)	ltfp (t) (2)	ltfp (t) (3)	ltfp (t) (4)
ltfp(t-1)	0.1507***	0.1711***	0.1441***	0.1909***
	(0.040)	(0.040)	(0.038)	(0.040)
Large (t)	0.3451***	0.3282***	0.3582***	0.2669***
	(0.117)	(0.120)	(0.120)	(0.103)
Cash Flow (t)	0.2105***	0.2128***	0.1781***	0.2184***
	(0.069)	(0.069)	(0.062)	(0.069)
Leverage (t)	-0.3156**	-0.2724***	-0.2083***	-0.2027***
	(0.130)	(0.101)	(0.064)	(0.070)
Inmaterials (t)	0.2204	0.2781	0.3691	0.3267
	(0.568)	(0.600)	(0.596)	(0.655)
Expo (t)	0.0267**	0.0379***	0.0345***	0.0388***
	(0.011)	(0.009)	(0.013)	(0.008)
GDP growth (t)	0.1648**	0.2517***	0.2448***	0.1706***
	(0.065)	(0.067)	(0.066)	(0.065)
Private Credit by Banks/GDP (t)		0.1141***		
		(0.011)		
Stock Market Traded Value/GDP (t)			0.1267***	
			(0.023)	
Value stock/ GDP (t)				0.2734***
				(0.080)
Constant	1.4113***	1.3622***	1.6308***	1.2253***
	(0.222)	(0.224)	(0.235)	(0.195)
Number of firms	1894	1894	1894	1894
Wald test chi2	83.89	70.51	87.72	66.50
Prob>chi2	0	0	0	0
Sargan (*p-value*)	0.837	0.872	0.723	0.596
Sargan-Hansen (*p-value*)	0.206	0.264	0.287	0.354
M1	-4.520	-4.621	-4.451	-4.730
M1(*p-value*)	0	0	0	0
M2	-0.0994	0.103	-0.253	0.299
M2(*p-value*)	0.921	0.918	0.800	0.765

Source: Authors' calculations, Super-Societies.

Table 11: Results of the impact of macro financial variables on the productivity of industrial firms (1998-2008)

	ltfp (t)	ltfp (t)	ltfp (t)
ltfp(t-1)	0.1331***	0.1326***	0.1286***
	(0.037)	(0.037)	(0.036)
Large (t)	0.2229**	0.2212**	0.2324**
	(0.110)	(0.109)	(0.108)
Cash Flow (t)	0.1555***	0.1551***	0.1969***
	(0.059)	(0.059)	(0.063)
Leverage (t)	0.2207**	0.2088**	0.2047**
	(0.100)	(0.095)	(0.092)
Inmaterials (t)	0.0800	0.0657	0.067
	(0.577)	(0.571)	(0.572)
Private Credit by Banks/GDP (t)	0.0849***		
	(0.019)		
Stock Market Traded Value/GDP (t)		0.0602***	
		(0.007)	
Value stock/ GDP (t)			0.0951***
			(0.013)
Constant	1.0804***	1.0949***	1.1675***
	(0.175)	(0.174)	(0.160)
Year	YES	YES	YES
Number of firms	1894	1894	1894
Wald test chi2	102.2	103.2	116.1
Prob>chi2	0	0	0
Sargan (*p-value*)	0.872	0.655	0.429
Sargan-Hansen (*p-value*)	0.224	0.316	0.263
M1	-4.387	-4.393	-4.419
M1(*p-value*)	0	0	0
M2	-0.348	-0.348	-0.396
M2(*p-value*)	0.728	0.728	0.692

Source: Authors' calculations, Super-Societies.

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Annex 1: Variables Definition of equation 1

Leverage is defined liabilities / assets

Cash flow is defined as operating income plus depreciation

Inmaterials: intangible assets / financial asset

Export is defined as a dummy variable (1 = firms export over 20% of total sales)

Large is a dummy variable equal to one for large companies according with law PYME.

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