

FINANCIAL STRUCTURE IN CHILE: MACROECONOMIC DEVELOPMENTS AND MICROECONOMIC EFFECTS*

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Abstract

The objectives of this paper are, first, to describe the developments in Chilean financial markets at the macroeconomic level and, then, to examine their effects at the level of firms. After reviewing the main government policies towards financial markets in the last three decades, the paper describes the remarkable changes and progress in the banking sector and in various types of capital markets (bond, stock, pension and insurance markets) during the same period. This is done by evaluating changes in financial markets size, activity, and efficiency. Second, the paper analyzes the changes in both the access to financial markets and the financing (balance-sheet) decisions in a sample of Chilean firms. The sample consists of 79 firms that are quoted in the stock market and for which annual balance sheet data for the period 1985-1995 are available and complete. The paper estimates and tests econometrically three issues. The first is whether the firms' reliance on internal funds for investment has decreased in the more financially open period of the 1990s relative to the 1980s and, thus, whether investment has been more responsive to changes in the q -value of the firm. The second examines whether financial liberalization and the development of the banking, stock and bond markets at the aggregate level have affected the importance of debt relative to equity and the maturity of debt in the balance sheet of firms. The third studies the extent to which firm-specific and aggregate financial market developments have impacted on firm growth, measured by the percentage increase in operational revenues. In general, we conclude that financial developments at the macro level have indeed had an impact on the firms' access to capital markets, their financial structure, and their rate of growth.

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1. INTRODUCTION

The outstanding macroeconomic performance of Chile in the late 1980s and 1990s has been portrayed as an example of successful market-oriented policies and, as such, has been the subject of numerous studies (see Bosworth, Dornbusch, and Labán 1994; and Perry and Leipziger 1999). Recently, one of the areas receiving the largest attention is financial development (see Eyzaguirre and Lefort 1999). This emphasis is well justified given the remarkable growth in banking intermediation and stock market capitalization since the mid-1980s, which placed Chile as the financial leader in Latin America a decade later. By 1995, the ratio of credit allocated by deposit money banks to GDP in Chile was 49%, almost fifty percent larger than Brazil's, the second country in the region in this respect. By the same year, stock market capitalization as a ratio to GDP reached 105% in Chile, at least three times bigger than in any other country in Latin America (see Loayza and Palacios 1997).

The objective of this paper is to describe the developments in Chilean financial markets at the macroeconomic level and then examine their effects at the level of firms. At the macroeconomic level, we pay special attention to the evolution of financial structure, that is, the relative development of the banking sector vis-a-vis the stock, bond, and other capital markets. Analogously, at the level of firms we study not only their general access to financial markets but also how their financing (balance-sheet) decisions have evolved in the last decade.

The paper is organized as follows. The second section reviews the macroeconomic development of financial markets in Chile in the last three decades. First, we describe the government policies towards financial markets. These have followed a rather pendulous process. They have transited from heavily interventionist (pre-1973) to radically market oriented (1974-81) and, after a serious banking crisis, to prudentially regulated (1985-1990s). More recently, the 1990s can be considered the second wave of deregulation, as the access to and from *international* financial markets was gradually eased during this period. In the second part of this section, we characterize the developments in the banking

sector as well as in various types of capital markets (bond, stock, pension and insurance markets.) We conduct this assessment following the criteria proposed by Demirguc-Kunt and Levine (1999), that is evaluating, in turn, the size, activity, and efficiency of the most important financial markets.

In the third section of the paper, we analyze the changes in both the access to financial markets and the financing (balance-sheet) decisions that have occurred in the last decade in a sample of Chilean firms. The sample consists of 79 firms that are quoted in the stock market and for which annual balance sheet data for the period 1985-1995 are available and complete. The purpose of this section is to estimate and test econometrically three issues. The first concerns the access to financial markets. In particular, we would like to test whether the reliance on internal funds for investment has decreased in the 1990s relative to the 1980s and, thus, whether investment has been more responsive to changes in the q -value of the firm. The second issue relates to the balance-sheet situation of the firms. Specifically, we would like to examine whether the financial liberalization of the 1990s and the development of the banking, stock and bond markets at the aggregate level have affected the importance of debt relative to equity and long-term debt relative to total debt in the balance sheet of firms. The third microeconomic issue concerns the growth rate of the firm, measured by the proportional increase in the firm's operational revenue. We would like to study the extent to which firm-specific and aggregate financial market developments have impacted on the growth of our sample of firms.

A brief literature review and this paper's value added. As mentioned above, quite a few papers have examined the recent experience in financial markets at the macro level in Chile. The majority of them study the policy changes concerning banking regulations and supervision and their effect on the banks' assets and portfolio (see Arellano 1983, Brock 1992, Valdés 1992, Budnevich 1997, Larraín 1995, and Ramírez and Rosende 1992.) Others address the financial and macroeconomic effects of capital account controls and liberalization (see Johnston, Darbar, and Echeverría 1997; Soto 1997; Valdés-Prieto and Soto 1997; and De Gregorio, Edwards, and Valdés 1999.) Only recently, some studies have taken a broad approach on capital markets, attempting to provide a comprehensive perspective on the joint development of the banking sector, the stock and bond markets, and insurance markets in Chile (Reinstein and Rosende 1999, Eyzaguirre and Lefort 1999, and

Lefort and Walker 1999). Mostly based on time-series correlations, these papers agree in linking the recent improvements in financial depth and activity in Chile to its high rates of GDP growth in the late 1980s and 1990s. They provide, however, dissimilar views on the causes of financial development and the relative importance of the various components of the financial system. The first part of this paper, on the assessment of the financial system at the aggregate level, is similar to the latter studies. The perspective of this paper is, however, different in that the comparisons between banking and capital markets are emphasized. This is done in an attempt to answer the question of whether the financial system in Chile has become bank-based or market-based. Moreover, the evaluation of financial markets, following the criteria of size, activity, and efficiency, is done to enlighten the second part of the paper. In this part, we study the effect of financial development at the aggregate level on the firms' financial structure and access to credit and equity markets.

For the second part of the paper, on microeconomic evidence, we follow two research traditions. The first studies how the investment behavior of the firm is determined by financial constraints apart from the profit-maximizing considerations imbedded in the firm's q -value (see Fazzari, Hubbard, and Petersen 1988; Hoshi, Kashyap, and Scharfstein 1991; Stein 1997; and Hu and Schiantarelli 1998.) To the extent that firms face constraints on or high costs of external financing, their investment depends not only on its profitability but is limited by both the availability of internal resources and the balance-sheet composition of the firm. Medina and Valdés (1998) provide an interesting application of this research line to the Chilean experience. In a sample of stock-market-traded firms in Chile, they find that firms' financial constraints do affect their investment behavior, particularly in the firms not regarded as "investment grade." In this paper, we assess the effect of financial development by analyzing whether firms are less dependent on their internal resources and balance-sheet composition and more responsive to their Tobin's q -value as result of financial development (for a similar application to Indonesia, see Harris, Schiantarelli, and Siregar 1994.)

The second research tradition we follow studies the firm-specific and aggregate factors that determine the financial structure of the firm (see Aivazian, Booth, Demirguc-Kunt, and Maksimovic 1999; Demirguc-Kunt and Maksimovic 1995; and Schmukler and Vesperoni 1999.) In this tradition, Hernández and Walker (1993) examine whether the

financial crisis of 1983-84 in Chile and the ensuing enactment of banking prudential regulations affected the debt and equity composition of domestic non-financial firms. They find that after the crisis the debt-equity ratio declined, particularly in firms in the tradable sector. This resulted from the liquidation of assets and corresponding debt reduction induced by the new prudential banking regulations. Focusing on the period 1985-95, in this paper we examine whether changes in various sectors of the Chilean financial system have had an impact on the firms' preference for and availability of equity, long-term debt, and short-term debt as alternative financing choices. Controlling for firm characteristics such as size and tangibility of assets and reported profitability, we estimate the balance-sheet effect of the size and activity of banking, stock, and bond markets.

Finally, we also provide estimation results regarding the macro and micro determinants of firm growth. With this we intend to replicate at the micro level the empirical work that links financial development to GDP growth (see Levine 1997; and Levine, Loayza, and Beck 1999). However, given that our sample of firms is not representative of all economic activities in Chile, we are careful both in interpreting the results regarding the growth impact of macro variables and in accounting for firm-specific factors (see Nickell, Wadhvani, and Wall 1992; and Bernstein and Nadiri 1993.) Adding this empirical exercise to those mentioned above, we intend to give a rather broad picture of how macro financial development and structure in the 1990s has affected the firms' access to financial markets, their balance-sheet structure, and their growth performance.

2. FINANCIAL DEVELOPMENTS AT THE MACRO LEVEL (1960-97)

To examine the macroeconomic developments in the Chilean financial system in the last three decades, this section first presents a brief description of related economic policies and then describes the sector's performance over the period.

A. Financial Sector Policies

This section reviews the main policies related to the Chilean financial system in the last 30 years. These policies follow a combination of historic elements (such as the country's legal tradition) and an extension of the general development model followed by

the country at each point in time. The financial policy periods identified below correspond to those of general economic policies.

a. Financial Repression, Pre-1973

Reflecting the inward-looking development model implemented in those years in Chile and most other Latin American countries, the financial sector was extremely regulated. This meant the prevalence of controlled interest rates, quantitative restrictions on credit, mandated allocation of credit to priority sectors, and large state ownership of banks and other financial institutions.¹

b. Financial Liberalization, 1974-81

The radical shift in the country's development model started in 1974 was reflected in the removal of most regulations affecting the banking sector. Consistent with the logic of market liberalization, the determination of interest rates and domestic credit was left to market forces. Thus, interest rates were completely freed by January 1976, entry barriers in the banking industry were eliminated in 1975, and liquidity requirement rates were diminished for the majority of deposit types between 1974 and 1980. Quantitative controls on credit were eliminated and banks were privatized in April 1976, while a gradual opening of the capital account took place between 1975 and 1980.

Similarly, several reforms allowed the development of other capital markets such as insurance, bond, and stock markets. In 1976, a stock register was created, and the public disclosure of information was made mandatory. In 1981, a series of laws destined to protect minority shareholders and prevent the misuse of privileged information were enacted. Also in 1981, the issuance of long-term bonds was facilitated. In 1980, insurance market rates were liberalized while prudential regulations on insurance companies' portfolios were implemented. The same year, a fully funded pension system began to operate, and private institutions started to manage the pension funds by investing them in various financial instruments.

In contrast to the prudential regulation established for capital markets, the banking sector lacked a well-developed regulatory and supervisory system. In addition, there existed an implicit state guarantee on deposits, which became evident in the rescue of

¹ It is interesting to notice that this phenomenon shows a growing trend throughout this period, since in the initial situation, prior to the 1930s crisis, the Chilean financial sector was relatively free and developed (Jeftanovic 1979).

Banco de Osorno y la Unión and other financial institutions in 1976. The implicit government guarantees together with the lack of appropriate banking regulation and the preferential tax treatment of debt obligations created moral hazard problems that deteriorated the banks' asset portfolio and prepared the grounds for a banking crisis.

c. Banking Crisis, 1982-84

In 1982, a negative terms of trade shock, a sharp increase in international interest rates, and a consequent large devaluation of the Chilean currency worsened the quality of most banks' portfolio and made some of them insolvent. In the wake of this banking crisis, the liberalization process was partially reversed given that, first, the state became the manager and main creditor of rescued banks, and second, the state reinstated financial controls such as restrictions on external capital movements and "suggested" interest rates by the Central Bank.

d. Prudential Regulation, 1985-90

The controls on interest rates were eliminated in 1985 and a new banking law was enacted. This established a modern prudential regulation, an enforced supervisory capacity by the state, and an explicit deposit insurance. Under the new law, the state helped the banks by allowing them to recapitalize and issue long-term debt (which the Central Bank bought) to replace their existing non-performing assets. Thus, the state assumed an important share of the costs of the 1982 banking crisis.

The regulatory framework for other capital markets was also improved during this period. A new bankruptcy law that clarified the extent of private sector responsibility in failing enterprises was implemented. Also, the purchase of equity in domestic firms by the private pension fund managers was allowed and regulated. Finally, the tax reform of 1984 eliminated the preferential treatment of debt liabilities by the firms (with respect to equity) and provided incentives for financial saving by all investors.

The privatization of large state enterprises (the telephone and power companies and some mining corporations), the re-capitalization of rescued banks, and a significant external debt-to-equity conversion by private firms strongly promoted the development of the stock market and the pension fund managers (the largest institutional investors in Chile) and helped extend the ownership of capital throughout society.

e. External Financial Deregulation, 1991-99

In this period, the reforms started in the late 1980s were strengthened and, moreover, a number of constraints related to external capital account transactions were lifted. Specifically, first, firms with good credit rating were allowed to issue bonds and shares in external markets; second, institutional investors, such as banks, pension fund managers, and insurance companies, were allowed to hold external assets; third, the permanence requirements for external investment and profits were gradually eased; and fourth, international trade payments transactions were liberalized. Until recently, however, the Central Bank maintained capital controls in the form of an unremunerated reserve requirement on external funds, which was advocated on the grounds that it deterred volatile short-run capital. In September 1998 this requirement was virtually eliminated.

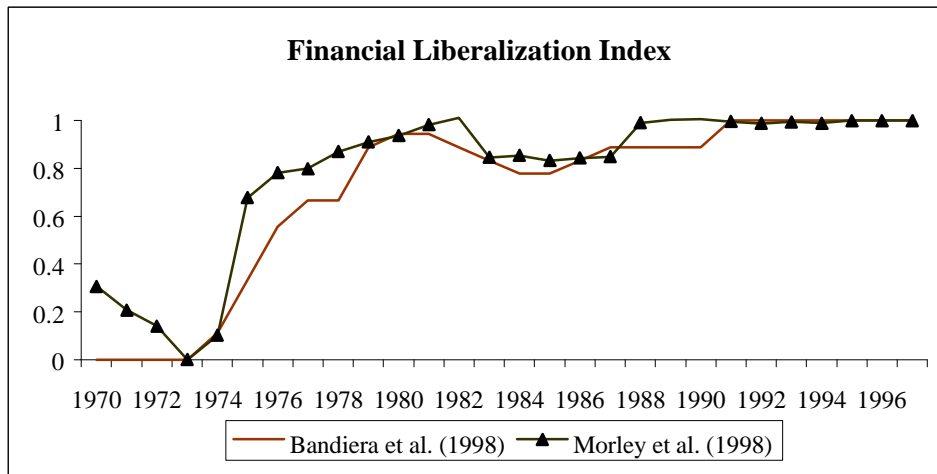
In 1997, a new capital market law was passed by congress that regulated the participation of banks in non-traditional areas, such as factoring, non-pension insurance, and investment banking.

Finally, it is in this period when some regulations regarding the operations of private pension funds started to show some flaws. Specifically, the capital penalties imposed by law for underperformance led all private funds to mimic each other's portfolio excessively. Furthermore, the restrictions on the type of investments that private pension funds were allowed to hold produced asset portfolios not sufficiently diversified.

Indices of financial sector policies

The policy changes studied above can be summarized in financial liberalization indices. This has been done by Bandiera, Caprio, Honohan, and Schiantarelli (1998) and Morley, Machado, and Pettinato (1998). These indices are presented in Figure 2.1. Both indices reflect well the 5 periods of Chilean financial policy, with the initial liberalization in the mid-1970s, the partial reversion after the crisis in the early 1980s, and the strengthening and expansion during the 1990s.

Figure 2.1



Source: Author's elaboration using Bandiera et al. (1998) and Morley et al. (1998).

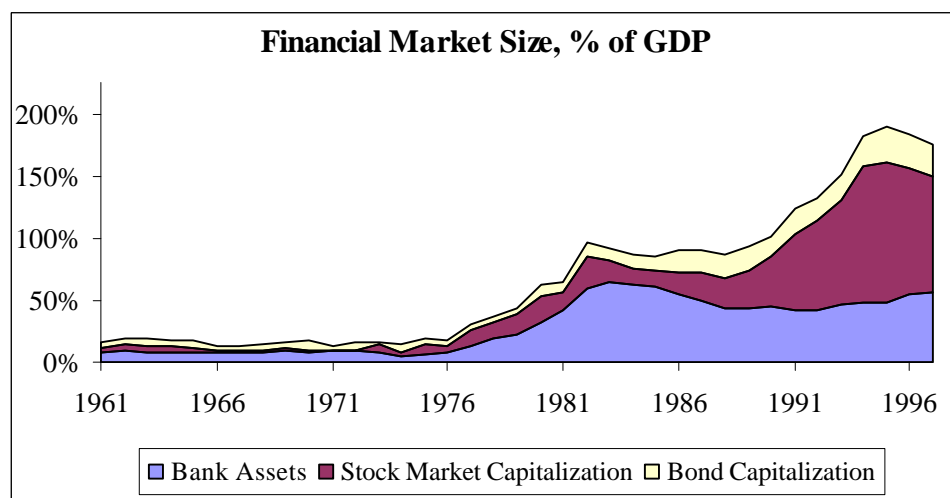
B. Financial Sector Performance

This section will describe the main results of the Chilean financial system, emphasizing the measures proposed by Demirguc-Kunt and Levine (1999) to determine the size, activity, and efficiency of banking and capital markets. At the end of this section, we compare the relative development in the main financial markets. Thus, we attempt to assess whether the Chilean economy can be best characterized as bank-based or stock-market-based.

a. Financial System: Global Results

Figure 2.2 presents the evolution of the size of the financial sector in Chile from 1960 to the present. It also presents the contribution of the main financial markets, namely, banks, the stock market, and the bond market, all relative to GDP.

Figure 2.2



Source: Beck et al. (1999), Jeftanovic (1979), Central Bank of Chile, and CB Capitales.

From the mid-1970s onwards the financial system starts to grow, particularly the banks but also the stock market. The bond market expanded particularly in the 1980s, while the stock market experienced a striking increase in the 1990s. Then, it would appear that the financial policy changes and the macroeconomic outcomes during the period had a significant impact not only on the overall growth of the financial sector but also on its structure and composition. However, it is interesting to observe that the growth of financial markets has not been smooth but has also experienced temporary booms. For instance, the banking credit boom that took place before the 1982 crisis was partially reversed, and so was the stock market expansion in the mid-1990s, though to a lesser extent.

b. Banking Sector

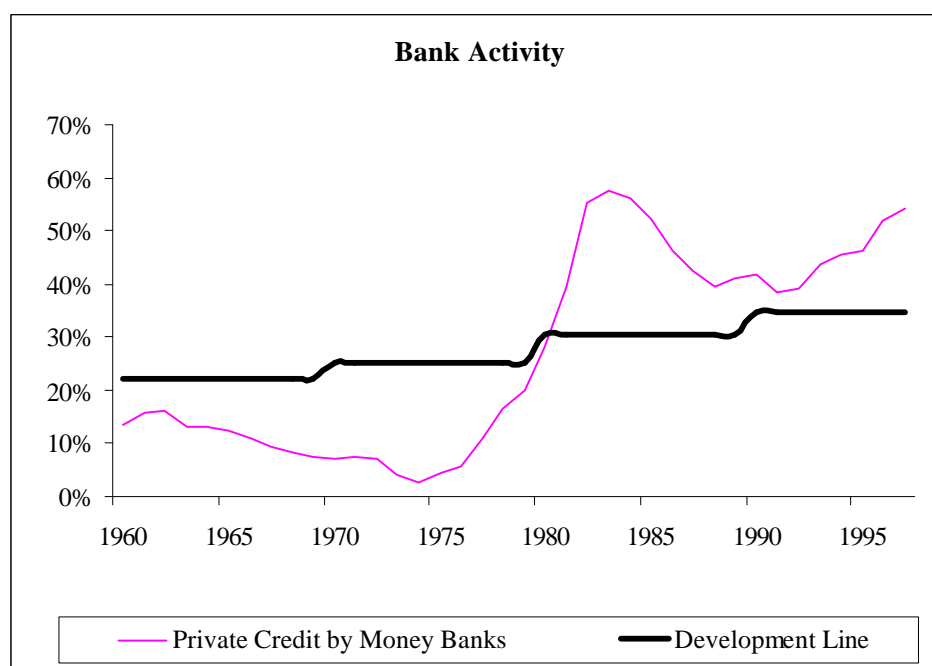
Size. Figure 2.2 shows the evolution of banks' financial assets as a fraction of GDP. It exhibits a growing trend from 1977, with a downward correction in the mid-1980s. By 1997, the financial assets of the banking sector represented 55.1% of GDP, a proportion higher than the world average (52.6%) and the largest in Latin America (whose average is 27.9%.)

Activity. To examine the activity of the banking sector, we consider the behavior of private credit extended by commercial banks relative to GDP. As Figure 2.3 shows, the evolution of banking sector activity is very similar to that of its size, with a sustained growth from 1974 to 1982, a reversal from 1982 to 1988, and a new increase from 1991. It

is important to note that the “reversal” in the 1980s reflected, to a large degree, the correction of an unsustainable “credit boom”, as described by Gourinchas, Landerretche, and Valdés 1998. This alerts us to the fact that some changes, particularly short-lived ones, in these outcome indicators not always reflect financial development or weakening.

In the 1990s, banking activity has experienced a moderate and steady growth, following the new regulatory framework of the late 1980s and accompanying the fast development of other financial sectors, mainly the stock and bond market.

Figure 2.3



Source: Beck et al. (1999), and Central Bank of Chile

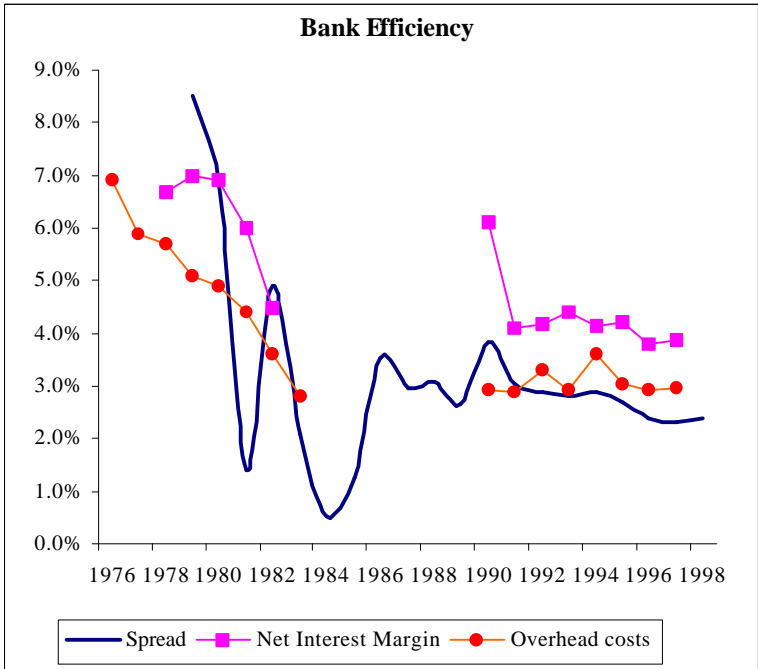
Figure 2.3 also serves to compare banking sector activity in Chile with that of the world. The “development line” proposed by Demirguc-Kunt and Levine (1999) corresponds to the world average of banking activity. According to their criterion, a country’s banking sector can be regarded as “developed” if its activity is above the “development line.” In the case of Chile, the banking sector can be regarded as highly underdeveloped until the early 1980s; it then attains a developed status, which is maintained for the rest of the period.

Efficiency. To assess the efficiency of the banking sector, we analyze the evolution of overhead costs and the sector’s gross margins. We have data available for 1976-82

(from De la Cuadra and Valdés-Prieto 1992) and for 1990-97 (from Beck et al. 1999.) Both overhead costs and gross margins of the banking sector fell notably in the 1970s, that is, at the start of the liberalization process. In the 1990s, both indicators are relatively stable. This should not be taken to imply that the sector’s efficiency has stagnated during the period. According to Fuentes and Basch (1998), this stability is related to the higher degree of competition faced by banks in providing financing sources, which has led them to concentrate in alternative markets, such as personal banking or small to medium firms, which are associated with higher costs.

To complement the previous analysis (and to fill the 1980s gap,) we also study the spreads on short-run (less than a year) banking lending and borrowing operations. As Figure 2.4 shows, the behavior of banking spreads tell a similar story for the 1970s and 1990s to that of overhead costs and gross margins. The information provided by banking spreads in the early and mid-1980s should be taken with care. In particular the sharp fall in banking spreads in 1984 does not reveal a dramatic (and short-lived) improvement in efficiency but the workings of the policy of controlled and implicitly subsidized interest rates.

Figure 2.4



Source: Beck et al. (1999), De la Cuadra and Valdés-Prieto (1992), and Central Bank of Chile

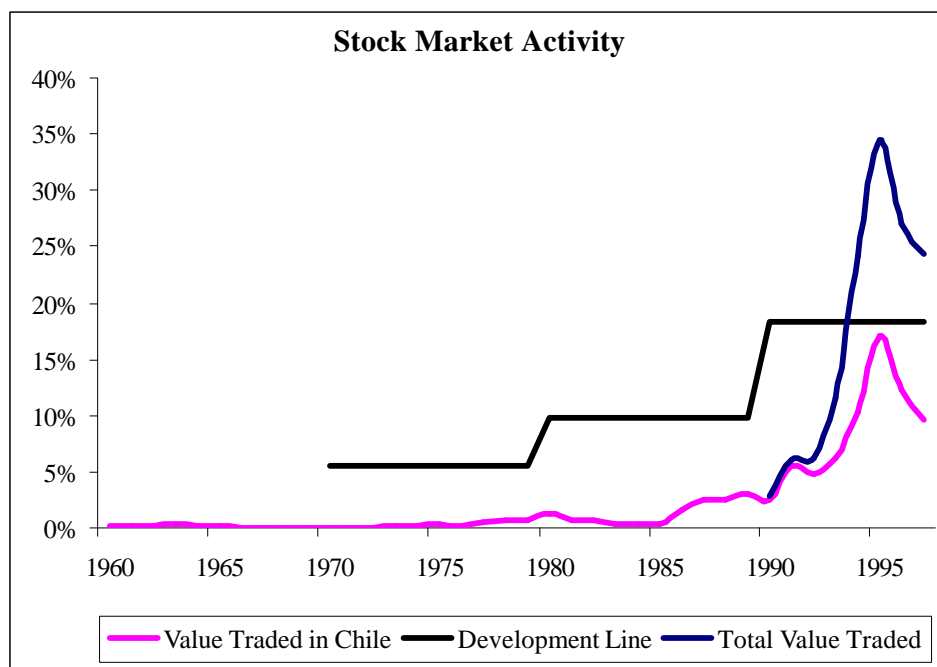
c. Stock Market

Size. As customary, we assess the size of the stock market by its capitalization relative to GDP. Figure 2.2 shows that the size of the stock market grew gradually in the 1970s and 1980s and experienced a rapid expansion in the last decade, reaching 105% of GDP in 1995. Only in the 1990s the size of the stock market in Chile became larger than the world average (which was 18.5% in the 1970s, 28.4% in the 1980s, and 38.2% in the 1990s.)

Activity. To measure the activity of the stock market, Demirguc-Kunt and Levine (1999) propose to use the stock traded value to GDP. The evolution of this variable in Chile is presented in Figure 2.5. It shows a gradual increase in the 1970s and a rapid rise since 1985, which led the stock market activity to reach a peak of 17% of GDP in 1995. Despite this growth, using the criterion described in the section on the banking sector, the stock market in Chile would still be classified as underdeveloped. (The “development line” in Figure 2.5, representing the world average, gives the threshold above which a country’s stock market is classified as developed.)

However, as explained in the section on financial policies, starting in the 1990s it is possible for firms with good credit rating to issue shares abroad. This means that for this group of firms, the relevant stock market is not only Chile’s but also that of developed countries, particularly the U.S. For this reason, Figure 2.5 also presents the total traded value, which is the sum of traded value in the Chilean stock market and abroad. Interestingly, the traded value of Chilean shares doubles when their activity in the U.S. stock markets is included (from 8.5% to 17.1% of GDP in the 1990s). However, given the large transaction costs involved in issuing share abroad, medium- and small-size firms are in practice restricted to operate in the still relatively illiquid Chilean stock market.

Figure 2.5



Source: Beck et al. (1999) and Valenzuela (1984).

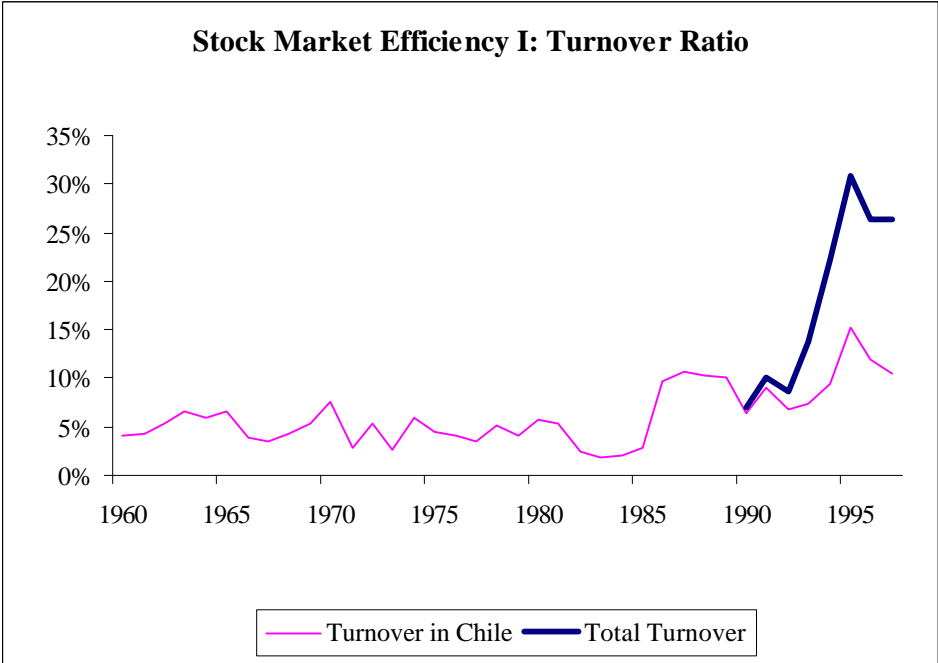
Efficiency. Demirguc-Kunt and Levine (1999) argue that both the stock market traded value to GDP and the turnover ratio provide information as to how efficient the stock market is. These, however, are incomplete proxies and we would like to complement them with measures that directly address the transaction costs to participate in the stock market.¹

Considering the turnover ratio as measure of efficiency, Figure 2.6 shows the significant rise in the stock market efficiency during the 1990s, especially after 1992 when Chilean shares began to be traded offshore. Note that during the first liberalization stage (1974-81), the turnover ratio did not rise with respect to its historical average, even though there was a significant increase in its size during that period. Figure 2.6 presents the turnover ratio that includes the Chilean shares traded abroad. As in the case of the traded value to GDP, total turnover is also twice as big as that in the Santiago stock exchange.

¹ A simple example may clarify why traded value or turnover are incomplete proxies for stock market efficiency. Suppose that domestic firms start to issue shares abroad. This will likely lead to a decrease in the activity and liquidity of the domestic stock market. If however, domestic stockbrokers become more cost-effective to regain their market participation, then the stock market becomes more efficient even though the ratios of activity and liquidity indicate otherwise.

Still, total turnover remains below the world average for the 1990s and, thus, should be considered as underdeveloped.

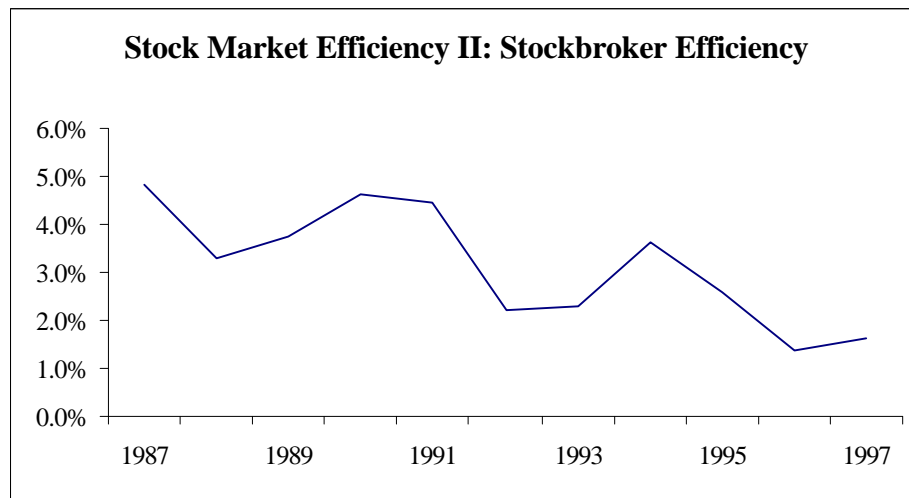
Figure 2.6



Source: Beck et al. (1999) and Valenzuela (1984).

Given the incomplete information on efficiency provided by the turnover ratio, we present a complementary measure based on the costs to participate in the stock market. This is proxied by the ratio of stockbrokers' gross profit over assets. Considering that stockbrokers concentrate most of daily transactions, this measure indicates the costs of trading in the stock market. According to this measure Figure 2.7 also indicates improving market efficiency over the last decade.

Figure 2.7



Source: SVS (various issues).

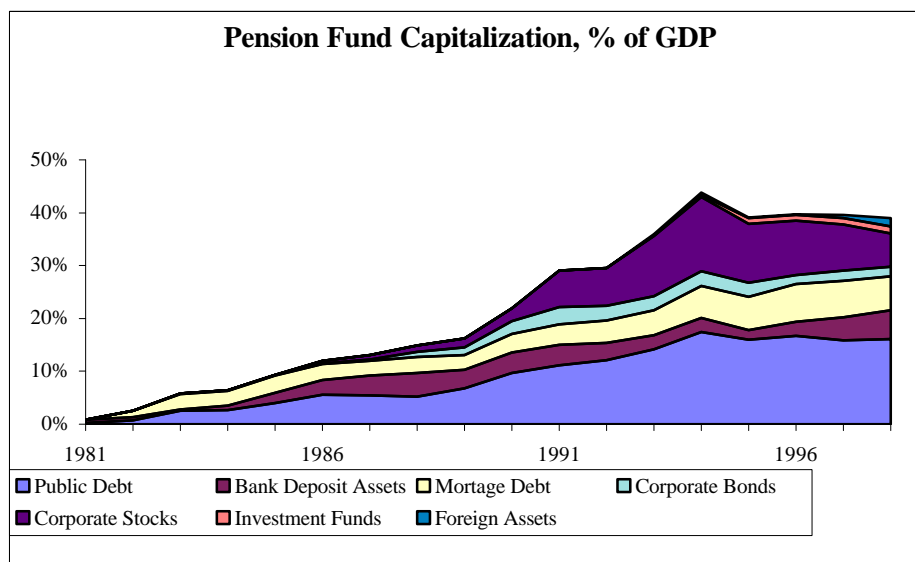
d. Other capital markets

Among the other functioning financial sectors in Chile, we can cite, (i) the pension fund management companies (PFMC), (ii) insurance companies, (iii) mutual funds, (iv) financial societies, and (v) the public and private bond market. In this section we identify the main characteristics of the evolution of these sectors, with emphasis on its size and activity.

Pension Funds. As mentioned in the section on financial sector policies, in 1981 the pension system was transformed into a system of fully-funded individual capitalization accounts, managed by the PFMCs. The fund administrators invest the pension savings in a series of instruments, ranging from domestic public debt to foreign bonds. These agents have mobilized a gradually increasing amount of financial resources, with a strong positive effect on the development of other financial sectors and activities.

Figure 2.8 shows the evolution of the PFMCs' pension assets together with their composition. The pension funds' assets have grown since their inception, reaching levels above 40% of GDP in the 1993-98 period. Regarding the funds' composition by instrument, public bonds represent in average as much as 9% of GDP, which corresponds to about 40% of total public debt. Other important investment instruments used by the pension funds are mortgage bonds (4% of GDP or 60% of total mortgage bonds); corporate bonds (1.4% of GDP or 50% of total corporate bonds in Chile); and stock shares (6% of GDP in average or 10% of the total stock of shares).

Figure 2.8



Source: Schmidt-Hebbel (1999).

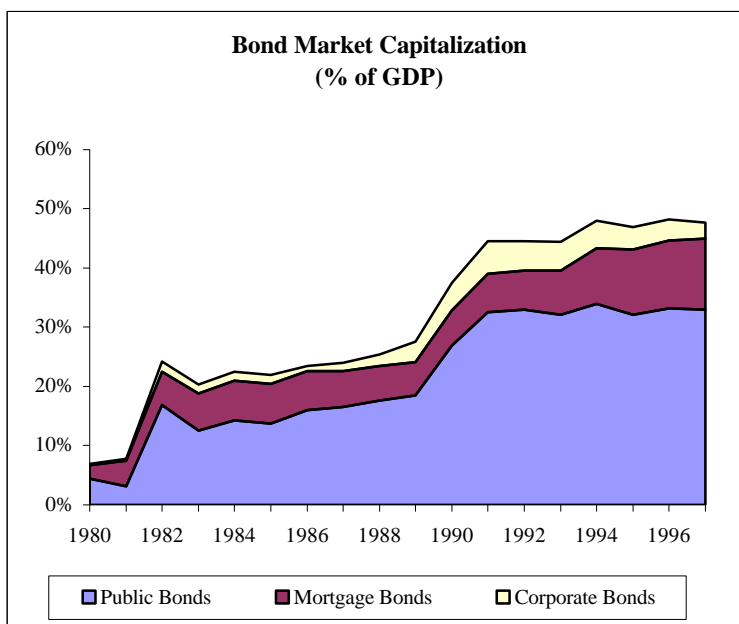
It is interesting to note that the life insurance market benefited significantly from the development of the private pension funds. This occurred because of the requirement for the pension fund managers to purchase life insurance on behalf of all their contributors. Payments to insurance companies from the PFMCs averaged about 0.24% of GDP in 1988-97, which represented revenues for the insurance companies of 10% of their assets.

Regarding the pension funds' efficiency, their average return has been very high, that is, 11% in average since 1981. However, the operational costs of the pension management companies have also been high in comparison with international standards, which raises doubts as to their efficiency.

Bond market. The most active bond markets in Chile correspond to public bonds (mostly from the Central Bank), mortgage bonds, and corporate bonds. Figure 2.9 shows the evolution of each instrument since 1980. It can be seen that public bonds have a large jump in the early 1990s, partly due to the policy of sterilizing the large capitals flows from abroad. The mortgage bonds show an important development since 1980, from an average of 1.4% of GDP in the previous two decades to about 6.7% of GDP in 1981-97 (reaching 11% of GDP in 1997.) Finally, corporate bonds were first issued in 1975, grew slowly until the late 1980s, and increased more markedly in the 1990s. Thus, from a level of 0.2%

of GDP in 1975-80, corporate bond capitalization obtained an average of 2.5% of GDP in 1981-97.

Figure 2.9



Source: SVS (various issues), Eyzaguirre and Lefort (1999), and CB Capitaes.

Insurance companies, mutual funds, and financial societies. The assets of insurance companies have grown from 0.7% of GDP in the late 1970s (Jeftanovic, 1979) to 11% in 1997. This asset growth was caused by an increase in both insurance penetration and density. Mutual funds have developed particularly since the early 1990s, reaching a level of 6% of GDP in 1997. Finally, financial societies flourished in the initial period of liberalization (until 1981) but suffered serious problems during the banking crisis. They have grown moderately during the 1990s but have yet to reach asset levels above 2% of GDP.²

C. Financial Structure: Bank-Based or Market-Based?

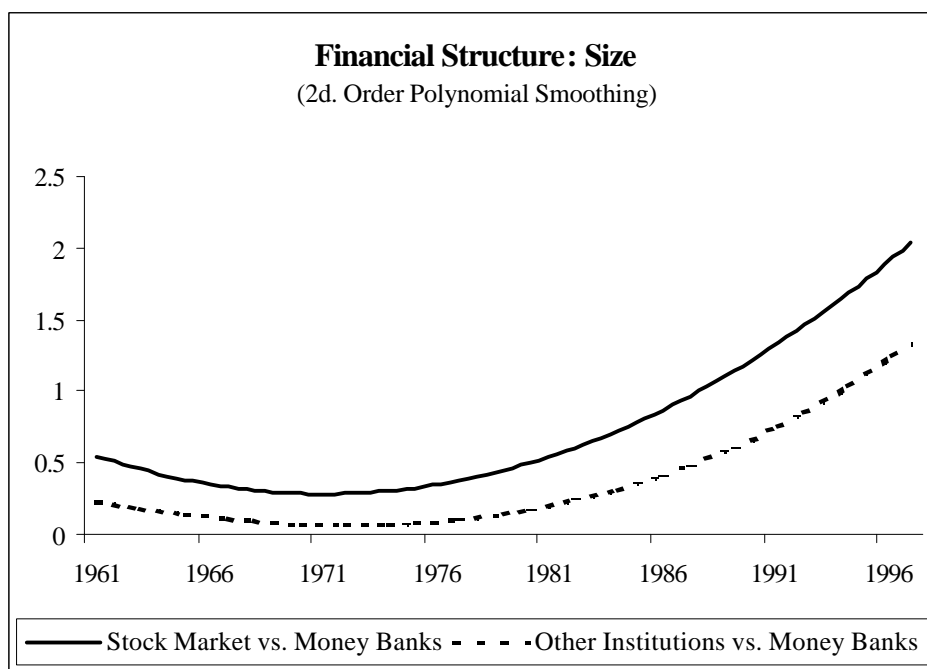
We now study whether the Chilean economy is based on banks or markets. To analyze this point, we use the approach and indicators developed by Demirguc-Kunt and

² Financial societies are saving and loan institutions that, in contrast to banks, do not create money.

Levine (1999.) That is, we study the evolution of size, activity and efficiency of the banking sector, relative to those of the stock and other capital markets.³

Relative Size. With regards to the relative size of the different sectors of the financial system, Figure 2.10 shows two measures. The first compares banks and the stock market and the second, banks and other financial institutions, namely, financial societies, PFMCs, mutual funds, and insurance companies. The liberalization process has been generally related to a shift in the financial structure of the economy, in a way such that the stock and other capital markets have gained importance relative to the banking sector. This trend started in the 1970s and has accelerated in the late 1980s and 1990s.

Figure 2.10

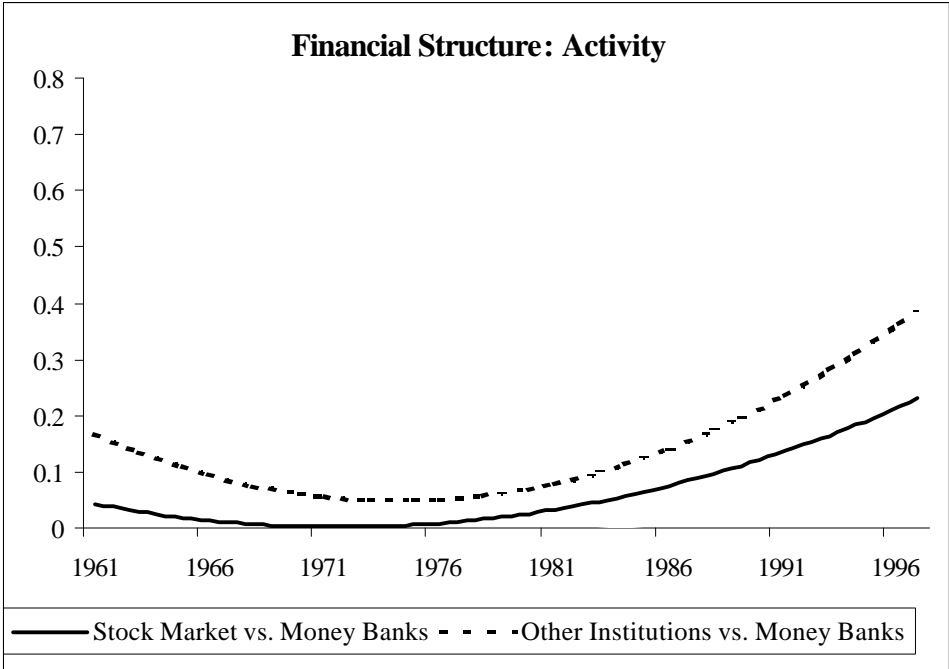


Relative Activity. As Figure 2.11 shows, the activity of the stock and other capital markets relative to that of the banking sector has an increasing trend since the early 1970s, which mimics the trend in their relative size. These trends may be the result of an adjustment from an initial situation in which the non-banking sector was too small for the

³ We should note that the financial indicators under consideration suffer from high volatility in the short term. This is exacerbated when we combine two or more of them. Given that we are interested in long-run trends, we smoothed the financial structure ratios by fitting a second order polynomial.

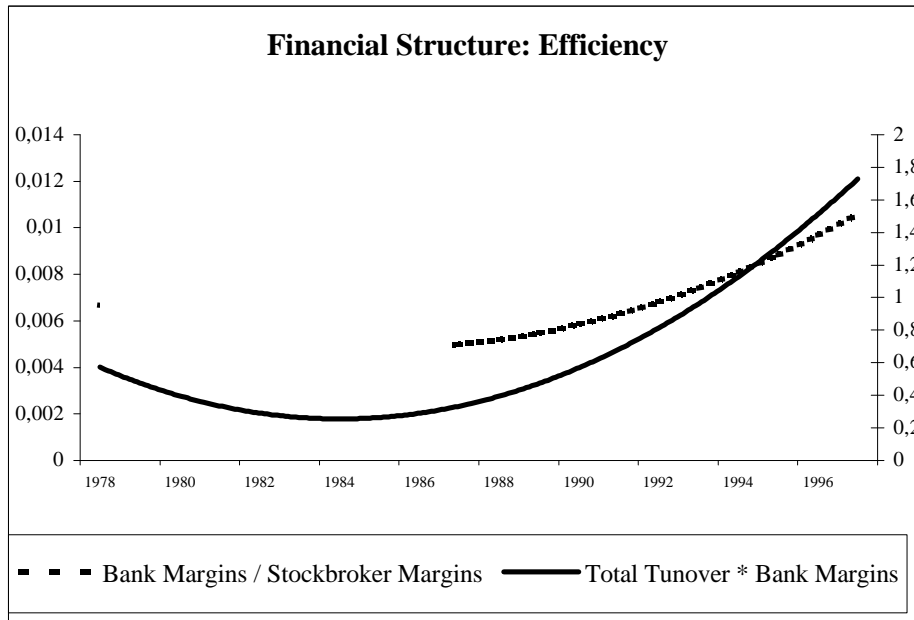
level of development of the Chilean economy. In this sense, the change in the financial structure in Chile is analogous to a stock-adjustment process –the economy “accumulates” the financial institutions of relative scarcity. Therefore, it is likely that the increasing trend in the relative importance of non-banking institutions tapers off in the future.

Figure 2.11



Relative Efficiency. Finally, we examine two alternative indicators to study the efficiency of the stock market relative to the banking sector. The first indicator is the one proposed by Demirguc-Kunt and Levine (1999) which compares the stock market’s turnover with the spreads on banking borrowing and lending operations. The second indicator is the ratio of banking spreads to stockbrokers’ return on assets. A rise in both indicators represents an increase in the stock market’s efficiency relative to the banks’. The evolution of these indicators is presented in Figure 2.12. The results for both indicators are very similar and show that the stock market has been gaining in efficiency relative to the banking sector since the mid-1980s. This result confirms the increasing relative importance of the non-banking sector that we see when we use size and activity as the comparison criteria.

Figure 2.12



3. MICROECONOMIC EVIDENCE

In this section, we study the access to financial markets, the balance-sheet composition, and the growth performance in a sample of Chilean firms. The emphasis of the empirical exercises presented here is on how financial developments at the macroeconomic level have affected the performance and financial structure of firms.

Sample and data. Our sample consists of 79 firms that are quoted at the stock market and for which annual balance-sheet data for the period 1985-95 are available and complete. We focus on the period from 1985-95 because, first, it corresponds to before and after the second wave of financial liberalization in Chile; second, it is the period of significant stock market development; and, third, it is the period for which reliable data are accessible. Table 3.1 presents descriptive statistics for the four dependent variables examined below. This is done for the whole period as well as for the sub-periods 1986-90 and 1991-95. As argued in the section on macro developments, the latter period is characterized by a further liberalization of domestic financial markets and an opening to international capital.

Balance-sheet data are obtained from the *Ficha Estadística Codificada Uniforme* (FECU), which is a mandatory report submitted by corporations to the corresponding government supervisory board. The FECU contains the firm's balance sheet data in a comparable base for the 1985-95 period. Market value data are obtained from the *Reseña de la Bolsa de Comercio de Santiago* (RCBS), which is the annual report of the Santiago Stock Exchange. Finally, macro-financial data are obtained from Beck, Demirguc-Kunt and Levine (1999) and extended using the Chilean national sources cited in the previous section. For further details on data sources and definitions, see Annex 1.

Econometric Methodology. All relationships studied and estimated in this paper are characterized by the joint endogeneity of most variables involved. That is, most explanatory variables in our models either are simultaneously determined with the dependent variable or have a two-way causality relationship with it. Thus, for example, in our investment regressions, it is likely that investment and cash flow be simultaneously determined or that investment may feedback into the firm's q -value. The joint endogeneity of the explanatory variables calls for an instrumental variable procedure to obtain consistent estimates of the coefficients of interest. Taking advantage of the panel structure of our data set, we apply a GMM estimator based on the use of lagged observations of the explanatory variables as instruments (see Holtz-Eakin, Newey, and Rosen 1990; and Arellano and Bover 1995.) These are appropriate instruments under the following conditions. First, the error term must be serially uncorrelated or, at least, follow a moving average process of finite order. Second, future *innovations* of the dependent variable must not affect current values of the explanatory variables, although they can be affected by current and past realizations of the dependent variable (this being the sense in which they are jointly endogenous.)

The validity of these assumptions can be examined statistically. For this purpose we use two specification tests. The first is a Sargan test of overidentifying restrictions, which examines the overall validity of the moment conditions comparing them with their sample analogs. The second is a test of serial correlation of the regression residuals. Lack of serial correlation indicates that all lagged values of the explanatory variables can be used as instruments. Serial correlation of a given order means that the residual follows a moving

average process of the same order, which in turn indicates that only observations lagged more than this order are appropriate instruments.

The second issue we must address in the process of estimation is the potential presence of unobserved firm-specific effects. Ignoring them may produce inconsistent estimates given that firm-specific effects are likely to be correlated with the explanatory variables. An indication that unobserved firm-specific effects are present in a regression model is a persistent serial correlation of the residuals. When we find evidence of this type of misspecification in the regression in levels, we control for unobserved firm-specific effects following the procedure developed by Arellano and Bond (1992) and Arellano and Bover (1995). This procedure consists of combining in a system the regression expressed in levels with the regression expressed in first differences, each of them properly instrumented. The instruments for the regression in differences (which no longer contain the firm-specific effect) are the lagged levels of the explanatory variables. For the regression in levels, the instruments are the lagged differences of the explanatory variables. These are appropriate instruments under the assumption that the correlation between the explanatory variables and the firm-specific effect is constant over time. This procedure is called the *GMM system estimator* (for a concise presentation of this methodology, see Levine, Loayza, and Beck 1999.)

The specification tests for the *system estimator* are similar to those introduced above. The first is a Sargan test of overidentifying restrictions, and the second is a test of lack of residual serial correlation. Since in this case the residuals examined are those of the regression in differences, first-order serial correlation is expected by construction and, thus, only second- and higher-order serial correlation is a sign of misspecification.

A. Firm Investment and Financing Constraints

The first issue we study concerns the firms' access to financial markets for investment purposes. In particular, we would like to test whether, as result of the financial development experienced in the 1990s, firms are less dependent on their internal resources and balance-sheet composition and more responsive to their Tobin's *q*-value.

The basic regression model we estimate is the following:

$$Inv_{i,t} = \mathbf{b}_0 + \mathbf{b}_1 q_{i,t} + \mathbf{b}_2 Cash_{i,t-1} + \mathbf{b}_3 D / K_{i,t} + \mathbf{e}_{i,t} \quad (1)$$

where, Inv_t is the flow of annual investment as a ratio to the capital stock at the beginning of the year, q_t is the market value of the firm over its replacement value measured at the beginning of the year, $Cash_{t-1}$ is the ratio of cash flow of the previous year to the capital stock at the beginning of the year, D/K_t is the ratio of total debt to the capital stock measured at the beginning of the year, e_t is the regression residual, and the subscript i is an index for firms. All variables are treated as “weakly” endogenous, in the sense that they can be correlated with current and past realizations of the residual but are required to be uncorrelated with its future realizations. We ignore unobserved firm-specific effects because, as we discuss below, there is no persistent residual serial correlation in the levels regression.

According to the q theory of investment, in the absence of financial restrictions and corporate agency problems, firm investment depends exclusively on the (marginal) value of the firm relative to its replacement value. However, to the extent that the firm faces constraints on external financing, its investment will be determined by its internal resources, namely, retained cash earnings. Furthermore, in the face of imperfect financial markets, the degree of leverage of the firm (here represented by its debt-to-capital ratio) may deter the availability of external financing even after controlling for Tobin’s q . Therefore, we consider that a firm faces a better functioning financial system when, first, its investment is more responsive to changes in q ; second, investment is less determined by the firm’s *cash flow*; and, third, investment is less negatively affected by the firm’s liability composition, represented by the *debt-to-capital* ratio.

The first empirical exercise is a comparison between all firms in the sample and two subgroups of firms that are expected to have better access to financial markets. These are, first, the group of firms in whose shares the private pension fund management companies are allowed to invest (PFMC investment grade, for short); and, second, the group of firms that are members of corporate conglomerates (see Medina and Valdés 1998.) We compare the coefficients obtained for different sample groups through multiplicative dummies applied to the three variables of interest. The estimation results are presented in Table 3.2. Columns 1 and 2 make the comparison between all firms and PFMC-grade firms; and columns 3 and 4 make the comparison with firms belonging to conglomerate members. For each comparison, we present two estimators, a simple pooled OLS estimator and a GMM

estimator, both applied to the regression in levels. We focus on the latter estimator because it controls for the joint endogeneity of the explanatory variables and because it is supported by the Sargan and serial correlation specification test.⁴

The results presented in Table 3.2 reveal that in the sample of all firms, investment does not significantly depend on the firm's q -value but is driven positively by the firm's cash flow and negatively by its level of indebtedness. According to the interpretation of investment theory provided above, we can conclude that firms in the whole sample face important constraints on external finance. This conclusion, however, does not apply equally to all firms. In fact, the comparison between all firms and PFMC-grade firms indicates that investment in the latter type is significantly more responsive to changes in q and less dependent on cash flow. However, there appears to be no significant difference regarding the investment response to the debt-to-capital ratio. The results on q and cash flow are to be expected given that PFMC-grade firms are usually larger, better established, and enjoying the signaling derived from their investment-grade accreditation; thus, they are likely to face a more receptive financial environment than the average firm. In contrast, the comparison regarding members of conglomerates indicates that they are different with respect to the whole sample only in the sense that their investment does not depend on their debt-to-capital ratio. Given that for this type of firms the relevant amount of "internal resources" for investment is that of the whole conglomerate, we would also have expected that their investment be less dependent on each firm's cash flow. One possible explanation for this result is that the cash flows of conglomerate members are highly correlated with each other.

The second empirical exercise on the investment regression model consists of comparing the response coefficients in the 1990s with those of the 1980s. This exercise is central to our paper because the 1990s is a period of significantly higher financial development than any time before. The relaxation of financial constraints for firms in the 1990s would be a strong indication of beneficial microeconomic effects from macroeconomic financial developments. Table 3.3 presents the results of comparing the

⁴ Given that there is no evidence of persistent residual serial correlation, we do not use the GMM *system* estimator but stay with the GMM estimator in levels. The correlation tests give evidence that the residual follows a moving average process of order 1; our choice of the lagged order of the instruments is consistent with this dynamic structure of the error term.

1990s with the 1980s through multiplicative dummies on the explanatory variables. We do this exercise for the samples of all, PFMC-grade, and conglomerate-member firms, respectively. In the three cases, the GMM estimator in levels is supported by the specification tests, and, thus, we base our conclusions on its results.

The results on the three samples are similar in that they indicate that in the 1990s firm investment has been less financially constrained than in the 1980s. This conclusion is most strongly based on the PFMC-grade sample results. For this sample of firms, investment is less financially constrained in the three dimensions under consideration. That is, firm investment is more responsive to changes in Tobin's q , is no longer tied to internal cash flow, and is not affected by the debt-to-capital ratio. The first two results also hold true in the samples of all firms and conglomerate-member firms; however, the evidence that the debt-to-capital ratio no longer affects firm investment is weaker in these two samples of firms.

The last empirical exercise for the investment model consists of adding some macro-financial indicators to the regression that already considers the 1990s effect. The results are presented in Table 3.4. Column 1 considers the effect of financial size variables, namely, the ratio of bank assets to GDP and stock market capitalization relative to GDP. Column 2 considers measures of financial activity, that is, the ratio of private credit to GDP and the stock market traded value relative to GDP. Finally, column 3 considers the Bandiera et al. index of financial liberalization. The simple conclusion from this exercise is that these macro financial variables do not have an independent effect on investment once the q -value of the firm and the 1990s effect are accounted for. In other words, the effect on firm investment from macro financial development appears to work through microeconomic channels, that is, by making investment more responsive to the firm's q -value and less constrained on the use of external finance.

B. Firm Financial Structure

The second issue we study concerns the balance-sheet, financial situation of the firms. Specifically, we would like to examine whether the financial liberalization of the 1990s and the development of the banking, stock and bond markets over the last decade

have affected the importance of debt relative to equity and long-term debt relative to total debt in the balance sheet of firms.

The basic regression model for each dependent variable is the following:

$$D/E_{i,t} = \mathbf{b}_0 + \mathbf{b}_1 \ln(K_{i,t}) + \mathbf{b}_2 FA/TA_{i,t} + \mathbf{b}_3 P/TA_{i,t} + \mathbf{b}_4 IntEq_{i,t} + \mathbf{b}_5 MFin_t + \mathbf{h}_i + \mathbf{e}_{i,t} \quad (2)$$

$$LD/TD_{i,t} = \mathbf{g}_0 + \mathbf{g}_1 \ln(K_{i,t}) + \mathbf{g}_2 FA/TA_{i,t} + \mathbf{g}_3 P/TA_{i,t} + \mathbf{g}_4 IntEq_{i,t} + \mathbf{g}_5 MFin_t + \mathbf{m}_i + \mathbf{u}_{i,t} \quad (3)$$

The dependent variables, D/E and LD/TD , are the debt-to-equity ratio and the ratio of long-term to total debt, respectively. K represents the capital stock, which proxies for the firm's size. FA/TA represents the ratio of fixed to total assets, which is a measure of the tangibility of total assets. P/TA is the ratio of operational profits to total assets and proxies for the firm's current profitability. $IntEq$ is a dummy variable for whether the firm has been able to place its stock shares in international equity markets. $MFin$ is a vector of variables representing macro financial outcome or policy variables. All stock variables are measured at the end of the corresponding year. The regression residuals are represented by \mathbf{e} and \mathbf{n} , respectively. All explanatory variables are treated as weakly endogenous, except the macro financial variables, which are exogenous. Finally, \mathbf{h} and \mathbf{m} are unobserved firm-specific effects. We consider firm-specific effects in the financial structure regression equations because the regression in levels exhibits highly persistent serial correlation, which leads us to reject the GMM levels estimator in favor of its GMM *system* counterpart. The Sargan and serial correlation tests support the model estimated with the GMM *system* procedure.

The firm-related explanatory variables are chosen in accordance with standard corporate finance theory (for a recent similar application, see Schmukler and Vesperoni 1999.) In contrast to the investment regression model, for financial structure there is no clear way in which macro financial development affects the coefficients on the firm-specific variables. Therefore, our previous strategy based on analyzing slope changes is not applicable to the financial structure regressions. Instead, we directly include our measures of macro financial development in the regression model and analyze their estimated coefficients. Note that since these variables do not change across firms, they are analogous to time-specific effects.

Table 3.5 reports the results on the debt-to-equity ratio, and Table 3.6, on the ratio of long-term to total debt. Columns 1 and 2 of each table report the results obtained with

pooled OLS and GMM-level estimators, respectively. Since the specification tests reject them, we focus on the results obtained with the GMM-*system* estimator, which are presented in the next three columns. In column 3, the macro financial variables are given by measures of the size of the banking sector and the stock market. In column 4, the macro financial variables studied are also outcome measures but of activity, rather than size. They are the ratio of private credit by banks to GDP (for the banking sector) and the ratio of stock share traded value to GDP (for the stock market). Finally, column 5 considers the Bandiera et al. index of financial liberalization as the macro financial development variable of interest.

Regarding the debt-to-equity ratio (Table 3.5), a rise in the firm's size and, less robustly, an increase in its assets' tangibility and profitability appear to shift the financial structure of the firm towards higher equity and lower debt. Somewhat paradoxically, the firm's access to international equity markets appears to increase the debt-to-equity ratio of the firm.⁵ It is likely that the ability to issue ADRs has a positive signaling effect on the firm's creditworthiness. This effect might decrease the costs of indebtedness sufficiently to overcome the direct equity-promoting effect of issuing ADRs.

The effects of the measures of macro financial size and activity on the debt-to-equity ratio are similar and in agreement with our priors. Larger size and activity of the banking sector lead firms to prefer debt over equity in their balance sheets. Conversely, larger size and activity of the stock market induce firms to expand equity relative to debt. The financial liberalization index has a negative impact on the debt-to-equity ratio, probably reflecting that financial liberalization in the last decade has concentrated on international capital and domestic equity markets.

Regarding the ratio of long-term to total debt (Table 3.6), once we account for unobserved firm-specific effects, the size of the firm is not significantly associated with the maturity structure of its debt. On the other hand, the tangibility of assets is positively and significantly linked with a longer maturity of the firm's debt, while asset profitability appears to favor short-term debt. The access to international equity markets seems to lead

⁵ It is interesting to note that Schmukler and Vesperoni (1999) obtain a similar result in their sample of Latin American countries but not in their East Asian sample.

to a larger share of long-term debt, possibly through the signaling mechanisms mentioned above.

As to the effect of the macro financial variables, we find that the size and activity of the banking sector is significantly associated with a longer maturity of debt in the firms' balance sheet. Given that firms are better able to finance long-term projects when they can obtain an equally-matched debt maturity, this result implies that banking development may lead firms to undertake long-term investment projects, such as those in infrastructure and technological innovation, with arguably important productivity gains (see Levine 1997.) To study the effect of capital markets on debt maturity, we use the size and activity of the bond market (instead of the stock market, which is most relevant for questions on equity ratios, as in the previous model.) The size of the bond market, measured by its capitalization relative to GDP, is not statistically related to the long-term to total debt ratio. On the other hand, the activity of the bond market, measured by its traded value relative to GDP, has a significant coefficient but of a surprisingly negative sign. This result may imply that the liquidity of the bond market carries a positive externality on the development of short-term debt markets. Finally, the financial liberalization index does not seem to affect the ratio of long-term to total debt. Following the argument provided above, this result might be explained by the fact that the financial liberalization index mostly reflects developments in the stock market, which is not directly relevant to the firms' debt maturity.

C. Firm Growth

The third issue we would like to study concerns the growth rate of the firm, measured by the proportional increase in the firm's operational revenue. We would like to study the extent to which firm-specific and macro financial market developments have impacted on the growth rate of our sample of firms.

The specification of the growth regression has been motivated by corporate finance theory and also by analogy with the macro growth literature. As in the previous models, it considers both firm-specific and macro variables. The basic firm growth regression is the following,

$$RGr_{i,t} = \mathbf{b}_0 + \mathbf{b}_1 Ro_{i,t} + \mathbf{b}_2 I / R_{i,t} + \mathbf{b}_3 Fin_i + \mathbf{b}_4 NoP_i + \mathbf{b}_5 D / E_{i,t} + \mathbf{b}_6 GDPgr_t + \mathbf{b}_7 MFin_t + \mathbf{e}_{i,t}$$

where RGr is the annual growth rate of the firm's revenues. Ro is the initial (lagged) level of revenues and is included to capture convergence effects to the firm's steady-state size. I/R is firm's investment as ratio to revenues. Fin and NoP are dummy variables for whether the firm is, respectively, a financial or a non-profit firm; they are included to account for a potentially different growth behavior in these types of firms. D/E is the initial debt-to-equity ratio and serves to control for principal/agent effects on firm growth. $GDPgr$ is the annual growth rate of GDP and is included to account for both the business cycle and overall market expansion. $MFin$ is a vector of variables representing macro financial outcome or policy variables. The regression residual is represented by ϵ .

All explanatory variables are treated as weakly endogenous, except the macro variables, which are exogenous. We ignore unobserved firm-specific effects in the growth regression because, as we discuss below, there is no indication of persistent residual serial correlation in the regression in levels. In fact, the error term appears to be serially uncorrelated. Thus, although we also present a simple pooled OLS estimator, we focus on the results obtained with the GMM estimator applied to the regression in levels. This choice is supported by the Sargan and serial-correlation specification tests.

Table 3.7 presents the results on firm's growth. The significantly negative sign of the firm's initial size reveals a convergence effect; that is, as the firm gets larger, its rate of growth slows down, *ceteris paribus*. Not surprisingly, the investment rate has a positive effect on the growth of firm's revenues. Financial firms do not appear to grow differently from the rest, while non-profit firms have a poorer growth performance even accounting for the investment rate. The debt-to-equity ratio does not significantly affect firm's growth; this suggests that if principal/agent considerations affect the growth of the firm, they would have to do it through its investment rate. Lastly for the control variables, the GDP growth rate has a positive and significant effect on the growth rate of the firm. The fact that the coefficient on GDP growth rate appears to be larger than one indicates that, *in average over the whole period*, the firms in the sample grew faster than the rest of the Chilean economy.

Regarding the macro financial variables, the size and activity of the banking sector seem to have a positive impact on the growth rate of the firms. However, the size and activity of the stock market, as well as the related financial liberalization index, have a surprisingly negative effect on growth. A casual interpretation of these results would say

that the development of the banking sector is more relevant than that of the stock market for the growth of the firm. However, the evidence does not warrant this conclusion. In fact, it is likely that this result is derived from the particular composition of our sample of firms and, thus, cannot be extended to the rest. In our empirical exercises we only used the firms that have complete data for the period 1985-95. Therefore, we do not include the “younger” firms, which are likely to have experienced a quick rate of growth in the 1990s, the period of fast expansion of the stock market. As Table 3.1 indicates, our firms grew at the impressive annual rate of 9.1% in the late 1980s, while in the 1990s their pace of growth slowed down considerably (to 1.8%.) Therefore, for our sample of firms, the expansion and increased activity of the stock market seems to have served for consolidation rather than for growth.

4. CONCLUSION

In the last 15 years Chile has experienced a remarkable development in its financial system. In our view, this is the happy outcome of the union between the market-oriented policies started in the mid-1970s and the proper regulatory framework implemented in the 1980s.

From the analysis of the size, activity, and efficiency of the different financial sectors and markets, we reach two basic conclusions:

- The banking sector experienced a significant development, quick but with reversals in the 1970s and most of the 1980s and gradual in the 1990s. In fact, the banking sector in Chile surpassed the world average in the 1980s and has not fallen below it since then. The stock and other capital markets also experienced improvement, moderate in the 1980s and remarkable in the 1990s. Despite this improvement, the stock market in Chile has not yet reached the world average.
- The composition (structure) of the financial system in Chile also experienced a noteworthy change. The shift in the financial structure of the economy has occurred in a way such that the stock and other capital markets have gained importance relative to the banking sector. This trend started in the 1970s and has accelerated in the late 1980s and 1990s. The shift in financial structure may be the result of an adjustment from an initial situation in which the non-banking sector was too small for the level of development of

the Chilean economy. In this sense, the change in the financial structure in Chile is analogous to a stock-adjustment process –the economy “accumulates” the financial institutions of relative scarcity. Therefore, it is likely that the increasing relative importance of non-banking institutions tapers off in the future.

The analytical objective of this paper is to examine how these developments in the Chilean financial system have affected the performance and behavior of firms. Specifically, the paper analyzes for a sample of Chilean firms their access to financial markets for investment purposes, their financing (balance-sheet) decisions and corresponding financial structure, and their growth performance. We work with a sample of 79 firms that are quoted in the stock market and for which annual balance-sheet data for the period 1985-95 are available and complete. We now summarize the main conclusions of the analytical section of the paper.

- In the second half of the 1980s, that is prior to the second wave of financial liberalization, firm investment did not significantly depend on the firm's q -value but was driven positively by the firm's cash flow and negatively by its level of indebtedness. We can conclude that firms in this period faced important constraints on external finance.
- In the 1990s, the period of largest financial development at the macro level, firm investment has been less financially constrained than in the 1980s. That is, in the 1990s firm investment has been more responsive to changes in Tobin's q , less tied to internal cash flow, and less affected by the debt-to-capital ratio. Though qualitatively common to all samples considered, these results are larger and more significant in the sample of PFMC-grade firms. Of the three indications of better access to financial markets, those related to the effects of q -value and cash flow are the strongest and most robust across samples.
- Regarding the effect of macro financial variables on the financial structure of the firms in the sample, we conclude that, first, a larger size and activity of the banking sector lead firms to prefer debt over equity and to enlarge the maturity of their debt obligations in their balance sheet. Second, a larger size and activity of the stock market induce firms to expand equity relative to debt. And, third, a larger activity of the bond market

induces firms to reduce the maturity of their debt obligations. Though somewhat surprising, this result can be explained by the beneficial externality of bond market liquidity on the market for short-term debt.

- The firm's access to international equity markets appears to increase the debt-to-equity ratio of the firm and to enlarge the maturity of its debt. The first result may seem rather puzzling. It can be explained, however, considering that the ability to issue ADRs has a positive signaling effect on the firm's overall creditworthiness. This effect might decrease the costs of indebtedness sufficiently to overcome the direct equity-promoting effect of issuing ADRs.
- Regarding the effect of macro financial variables on the firm's revenue growth, the size and activity of the banking sector seem to have a positive impact on the growth rate of the firm. However, the size and activity of the stock market, as well as the related financial liberalization index, have a surprisingly negative effect on growth. These results should not be taken to imply that the development of the banking sector is more relevant than that of the stock market for the growth of the firm. In fact, it is likely that this result is derived from the particular composition of our sample of firms, which does not include the young, fastest growing firms in the 1990s.

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Annex 1: Data Sources and Definitions

Balance-sheet data are taken from FECUS (acronyms for *Ficha Estadística Codificada Uniforme*). The FECUS are available at the *Superintendencia de Sociedades Anónimas* and contain the full firm's balance sheet in a comparable base for the 1985-1995 period. The submission of the information collected in FECUS is legally mandated for the corporations, (*Sociedades Anónimas*.) The variables constructed using this source are presented in the next table.

Variables	
Debt to Equity Ratio	Long Term to Total Debt Ratio
Sales Growth Rate	Fixed Assets to Total Assets Ratio
Profits to Total Assets Ratio	

Data on the market value of the firm's equity is obtained from *Bolsa de Comercio de Santiago* (various issues). This publication summarizes the annual activity of the Santiago Stock Market.

The raw FECUS data is used to construct the following variables.⁶

Variable	Description
Investment	$\frac{I_t}{K_{t-1}}$
Cash Flow	$\frac{CF_{t-1}}{K_{t-1}}$
Tobin's q	$\frac{D_{t-1} + MV_{t-1}}{K_{t-1}}$
Debt to Capital	$\frac{D_{t-1}}{K_{t-1}}$
Initial Level of Real Sales	$S_{t-1} \times \frac{P_{90}}{P_{t-1}}$

Where:

$$K_t = A_t - STA_t$$

$$CF_t = OP_t + d_t$$

$$I_t = K_t + d_t - K_{t-1} \times p_t$$

D = Total Debt

MV= Market Value of the Firm Equity

A= Total Assets

STA= Short-Term Assets

OP= Operational profits

⁶ Stocks are measured at the end of period t .

δ = Depreciation

π =Annual Inflation (December to December)

S= Sales Level

P= Price Level.

With respect to some firm's characteristics, we use the dummy variables defined below.

Variable	Description
PFMC Grade	Firm is eligible for investment by Pension Funds Management Companies
Conglomerate	Firm is part of an economic conglomerate of firms
Non-Profit	Firm supplies a product without a clear profit motive (like schools, hospitals, and clubs, among others).
Financial	The firm's business is related to a financial activity
Access to International Equity Market	The firm's equity is traded in an international stock market

Finally, the macro-financial variables are constructed using the definitions shown in Section 2:

Variable	Description
Bank Market Size	Total Bank Assets to GDP
Stock Market Size	Stock Market Capitalization to GDP
Bond Market Size	Total Bonds Stock to GDP
Bank Market Activity	Private Credit by Banks to GDP
Stock Market Size	Traded Value in the Stock Market to GDP
Bond Market Size	Traded Value in the Bond Market to GDP
Financial Liberalization	Index constructed by Bandiera et al. (1998)
GDP Growth	Annual GDP Growth Rate

Table 3.1
Descriptive Statistics

Variable	Sample	Mean	Std. Dev.	Minimum	Maximum
<i>Investment/ Capital Stock</i>	Full-Sample	0,133	0,231	-0,888	2,297
	1986-1990	0,140	0,239	-0,718	2,297
	1991-1995	0,126	0,222	-0,888	2,012
	AFP-Grade	0,148	0,212	-0,616	2,297
<i>Total Debt / Equity</i>	Full-Sample	0,576	1,170	0,000	17,851
	1986-1990	0,720	1,564	0,000	17,851
	1991-1995	0,433	0,505	0,000	3,905
<i>Long Term / Total Debt</i>	Full-Sample	0,351	0,288	0,000	0,985
	1986-1990	0,348	0,290	0,000	0,985
	1991-1995	0,353	0,285	0,000	0,956
<i>Sales Growth</i>	Full-Sample	0,054	0,371	-2,693	4,749
	1986-1990	0,091	0,406	-2,652	4,749
	1991-1995	0,018	0,329	-2,693	1,592

Table 3.2**Firm Investment and Financing Constraints: Effects by Types of Firms***Dependent Variable: Investment/Capital Stock**(t-Statistics are presented below their corresponding coefficients)*

Estimation Technique:	AFP Grade		Conglomerate Member	
	OLS-Level	GMM-Level	OLS-Level	GMM-Level
Instruments:	Levels		Levels	
	[1]	[2]	[3]	[4]
Constant	0,084320 6,248834	0,079072 10,577237	0,077451 5,102972	0,080707 11,820685
q	-0,008546 -0,677185	-0,013227 -2,556850	0,008387 0,643076	0,008395 1,270587
q* PFMC Grade	0,065599 2,478883	0,080109 7,917540		
q * conglomerate member			0,000710 0,027091	0,020966 1,193651
Initial Cash Flow/Capital Stock	0,371588 5,961716	0,427430 26,474843	0,346920 6,485787	0,375982 14,638472
Initial Cash Flow/Capital Stock *PFMC Grade	-0,123901 -1,311623	-0,020158 -8,713207		
Initial Cash Flow/Capital Stock * conglomerate member			-0,007207 -0,056777	-0,053956 -1,181334
Initial Debt/Capital Stock	-0,038291 -3,140048	-0,036993 -7,354128	-0,047281 -3,450214	-0,046551 -6,256173
Initial Debt/Capital Stock * PFMC Grade	-0,009238 -0,376107	0,006170 0,655535		
Initial Debt/Capital Stock * conglomerate member			0,052976 1,452392	0,038713 2,540249
No. Firms	79	79	79	79
No. Observations	790	790	790	790
SPECIFICATION TESTS (P-Values)				
(a) Sargan Test		0,479		0,169
(b) Serial Correlation :				
First-Order	0,001	0,000	0,001	0,001
Second-Order	0,932	0,860	0,921	0,794
Third-Order	0,687	0,821	0,629	0,779

Table 3.3**Firm Investment and Financing Constraints: The 90's Effect***Dependent Variable: Investment/Capital Stock**(t-Statistics are presented below their corresponding coefficients)*

Estimation Technique:	All		PFMC Grade		Conglomerate Member	
	OLS-Level	GMM-Level	OLS-Level	GMM-Level	OLS-Level	GMM-Level
Instruments:	Levels		Levels		Levels	
	[1]	[2]	[3]	[4]	[5]	[6]
Constant	0,081045 6,072926	0,068921 6,397630	0,080790 4,367407	0,073246 5,222226	0,115830 5,862451	0,110677 8,152031
q	0,001764 0,110140	-0,009892 -0,728704	0,060722 1,377322	0,041516 1,062130	0,000051 0,001308	-0,004903 -0,196978
q * D90	0,016364 1,006880	0,017056 1,491248	0,026147 0,511305	0,061941 1,591439	0,470010 0,989647	0,086643 3,660411
Initial Cash Flow/Capital Stock	0,399097 7,641838	0,445828 10,911405	0,398209 4,905757	0,471556 9,769294	0,420232 3,293167	0,471530 4,185704
Initial Cash Flow/Capital Stock * D90	-0,117827 -1,335149	-0,176207 -3,617454	-0,364000 -3,460842	-0,486296 -9,663873	-0,339486 -2,128480	-0,460838 -4,218490
Initial Debt/Capital Stock	-0,047560 -4,173719	-0,032118 -2,377987	-0,081615 -3,949663	-0,066910 -4,148956	-0,054235 -2,236373	-0,069114 -2,919854
Initial Debt/Capital Stock * D90	0,014205 0,390563	0,018089 0,802480	0,066718 1,465413	0,075926 3,203625	0,035708 0,662776	0,036420 1,014928
No. Firms	79	79	40	40	36	36
No. Observations	790	790	400	400	360	360
SPECIFICATION TESTS (P-Values)						
(a) Sargan Test		0,539		0,627		0,489
(b) Serial Correlation :						
First-Order	0,001	0,001	0,003	0,000	0,121	0,024
Second-Order	0,797	0,765	0,816	0,834	0,146	0,230
Third-Order	0,707	0,770	0,227	0,254	0,409	0,490

Table 3.4**Firm Investment and Financing Constraints: Macro-Financial Effects***Dependent Variable: Investment/Capital Stock**(t-Statistics are presented below their corresponding coefficients)*

Estimation Technique:	GMM-Level	GMM-Level	GMM-Level
Instruments:	Levels	Levels	Levels
	[1]	[2]	[3]
Constant	0,063368 0,979636	0,060834 0,810943	-0,333860 -0,282541
q	-0,010837 -0,829551	-0,008789 -0,675126	-0,011043 -0,791393
q * D90	0,018668 1,703700	0,017983 1,573458	0,019227 1,646959
Initial Cash Flow/Capital Stock	0,456415 10,660383	0,451047 10,661263	0,456488 10,377318
Initial Cash Flow/Capital Stock * D90	-0,182449 -3,615203	-0,179435 -3,494691	-0,193872 -3,343107
Initial Debt/Capital Stock	-0,028415 -2,073560	-0,030677 -2,221590	-0,029943 -2,106887
Initial Debt/Capital Stock * D90	0,004377 0,231233	0,010067 0,484364	0,007928 0,380484
Bank assets/GDP	-0,016150 -0,120481		
Stock market capitalization/GDP	0,025589 1,048645		
Private Credit by Banks/GDP		0,009077 0,049324	
Stock Market Traded Value/GDP		0,917250 0,604797	
Financial Liberalization Index			0,110750 0,916467
No. Firms	79	79	79
No. Observations	790	790	790
SPECIFICATION TESTS (P-Values)			
(a) Sargan Test	0,498	0,520	0,513
(b) Serial Correlation :			
First-Order	0,001	0,001	0,001
Second-Order	0,783	0,770	0,775
Third-Order	0,772	0,821	0,764

Table 3.5**Financial Structure -Ratio of Debt to Equity: Firm and Macro-Financial Effects***Dependent Variable: Ratio of Debt to Equity**(t-Statistics are presented below their corresponding coefficients)*

Estimation Technique:	OLS-Level	GMM-Levels	GMM-System	GMM-System	GMM-System
Instruments:			Levels and Diff.	Levels and Diff.	Levels and Diff.
	[1]	[2]	[3]	[4]	[5]
Constant	-0,681175	-0,782761	1,482724	2,595548	3,901842
	-0,772862	-2,464917	5,019774	9,168479	13,190393
ln (Capital Stock)	-0,020347	0,017522	-0,117542	-0,192560	-0,116886
	-0,504099	0,96995	-7,03815	-10,381302	-8,709620
Fixed Assets/Total Assets	0,151021	0,201798	-0,235659	-0,477531	-0,076201
	0,562319	2,114521	-2,19253	-3,690840	-0,665794
Profits/Total Assets	0,909931	1,100983	-0,032468	0,171888	-0,792670
	1,216323	3,210347	-0,174129	0,951840	-4,500945
Acces to International Equity Markets	-0,015454	0,034440	0,186109	0,218406	0,183650
	-0,146249	0,497211	2,072695	1,714409	2,419845
Bank assets/GDP	3,527226	1,801320	2,365871		
	2,098321	5,221858	10,148994		
Stock Market Capitalization/GDP	-0,330354	-0,155834	-0,110151		
	-2,232143	-2,767271	-3,035003		
Private Credit by Banks/GDP				3,016378	
				13,330112	
Stock Market Traded Value/GDP				-0,527869	
				-3,983729	
Financial Liberalization Index					-1,476938
					-11,574798
No. Firms	71	71	71	71	71
No. Observations	710	710	710	710	710
SPECIFICATION TESTS (P-Values)					
(a) Sargan Test		0,255	0,286	0,242	0,220
(b) Serial Correlation :					
First-Order	0,016	0,013	0,300	0,297	0,296
Second-Order	0,022	0,016	0,383	0,370	0,374
Third-Order	0,017	0,013	0,258	0,255	0,243

Table 3.6**Financial Structure - Ratio of Long-Term to Total Debt : Firm and Macro-Financial Effects***Dependent Variable: Ratio of Long Term to Total Debt**(t-Statistics are presented below their corresponding coefficients)*

Estimation Technique:	OLS-Level	GMM-Levels	GMM-System	GMM-System	GMM-System
Instruments:			Levels and Diff.	Levels and Diff.	Levels and Diff.
	[1]	[2]	[3]	[4]	[5]
Constant	-0,800148 -3,410032	-0,64167 -3,699624	-0,068553 -0,342582	0,015301 0,101586	0,269479 1,543398
ln (Capital Stock)	0,052568 4,247018	0,045538 4,765438	0,013657 1,242716	0,007229 1,559453	-0,003089 -0,279394
Fixed Assets/Total Assets	0,210687 2,313560	0,255605 3,302754	0,212734 2,072683	0,267626 2,789455	0,242264 2,442140
Profits/Total Assets	-0,026982 -0,107308	0,005738 0,024518	-0,263798 -2,24139	-0,357727 -3,267479	-0,350749 -3,488995
Acces to International Equity Markets	0,080378 1,413031	0,133377 2,878475	0,253841 6,735818	0,243284 7,457619	0,287906 6,823780
Bank assets/GDP	0,709564 3,569008	0,494192 3,716906	0,255012 2,849467		
Bond Capitalization/GDP	-0,635398 -2,114252	-0,542400 -4,083321	-0,113401 -1,014588		
Private Credit by Banks/GDP				0,149978 1,597504	
Bond market Traded Value/GDP				-0,299782 -3,701428	
Financial Liberalization Index					0,024540 0,055879
No. Firms	71	71	71	71	71
No. Observations	710	710	710	710	710
SPECIFICATION TESTS (P-Values)					
(a) Sargan Test		0,04	0,488	0,505	0,450
(b) Serial Correlation :					
First-Order	0,000	0,000	0,007	0,009	0,012
Second-Order	0,000	0,000	0,421	0,431	0,449
Third-Order	0,000	0,000	0,546	0,556	0,481

Table 3.7
Firm Growth: Firm and Macro-Financial Effects

Dependent Variable: Revenue Growth

(t-Statistics are presented below their corresponding coefficients)

Estimation Technique:	OLS-Levels	GMM-Level	GMM-Level	GMM-Level
Instruments:		Levels	Levels	Levels
	[1]	[2]	[3]	[4]
Constant	-0,235681 -1,137275	-0,316457 -9,806795	-0,417794 -5,103201	0,787047 6,136354
Initial Real Level of Revenues	-0,012360 -0,893143	-0,006543 -3,444856	-0,011038 -2,212130	-0,008529 -1,778931
Investment/Sales	0,008267 1,215774	0,010831 95,80607	0,005379 6,880249	0,005025 7,061981
Financial Firm	0,142922 4,015683	0,230129 0,897524	0,553800 0,068559	0,551898 0,70026
Non-Profit Firm	-0,071347 -1,017987	-0,041766 -1,846794	-0,088623 -2,127454	-0,078006 -1,855455
Total Debt/Total Equity	0,000151 -0,018985	0,005213 1,331959	0,015554 1,362413	0,091118 0,866416
G.D.P. Growth	1,435333 2,465805	1,481116 21,353825	1,592927 5,806864	1,221395 4,641959
Banks Assets/GDP	0,954565 2,487138	0,917993 21,87407		
Stock Market Capitalization/GDP	-0,124338 -3,594684	-0,117355 -20,241156		
Private Credit by Banks/GDP			1,410610 9,268829	
Stock Market Traded Value/GDP			-1,051936 -6,906845	
Financial Liberalization Index				-0,727749 -11,188487
No. Firms	66	66	66	66
No. Observations	660	660	660	660
SPECIFICATION TESTS (P-Values)				
(a) Sargan Test		0,162	0,555	0,535
(b) Serial Correlation :				
First-Order	0,470	0,417	0,567	0,477
Second-Order	0,542	0,435	0,699	0,406
Third-Order	0,212	0,186	0,24	0,181