Investment Banking and Security Market Development: Why is Chile Different from the United States?*†

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Abstract

There is vast evidence that in developed security markets, particularly the United States, firms access "direct" markets through investment banks with whom they establish long-term relationships. By contrast, we present evidence from a small emerging economy—Chile— which suggests that local intermediaries do not establish relationships with firms but rather engage in "arm's length" investment banking. This does not affect conglomerates and large Chilean firms very much, because they list abroad and directly establish relationships with global investment banks. Nevertheless, firms that are not large enough to list abroad have a much harder time in accessing the capital market, particularly to finance fast growth. We argue that local relationships are missing because in the Chilean market few firms generate large trading and deal volumes.

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1. Introduction

It is usually argued that developed security markets produce more precise information about firms. Thus firms are screened and monitored better, and the cost of capital is lower. But why do developed markets generate better information? Adequate regulations may be part of the story. For example, disclosure requirements and protection of minority shareholders tend to be more demanding in the United States, probably the most developed market in the world. This paper explores a different (but complementary) determinant of the quality of information—long-term relationships between investment banks and firms.[1] There is vast evidence that in developed markets, particularly the United States, large corporations access "direct" markets through investment banks with whom they establish long-term relationships.[2] By contrast, we present evidence from a small emerging market—Chile— which suggests that local intermediaries do not establish relationships with firms but rather engage in "arm's length" investment banking. This does not affect conglomerates and large Chilean firms very much, because they list abroad and directly establish relationships with global investment banks. Nevertheless, firms that are not large enough to list abroad have a much harder time in accessing the capital market, particularly to finance fast growth. We argue that local relationships are missing because in the Chilean market few firms generate large trading and deal volumes.

It is convenient to start by defining what we mean by "long-term relationship". One outcome of a relationship, which one can measure, is that the same investment bank repeatedly brokers deals made by a given firm. Nevertheless, we have in mind repeated interactions where the bank not only does the paperwork required to bring a security issue to market, but also invests resources over time to learn about the firm's prospects. A large literature argues that relationships facilitate

[1] Activities of investment banks can be classified into three broad categories: (i) investment banking services; (ii) trading and principal investments; (iii) asset management and security services (see Wilhelm and Downing [forthcoming, ch. 3]). In this paper our focus is on investment banking services, which comprise equity and debt underwriting, financial restructuring and merger and acquisitions (M&As) advisory services—that is, those that directly affect firm financing.

[2] Until about 25 years ago the rule in the industry was that a firm would maintain relationships with only one investment bank. This has changed in the recent past, but it is still the case that firms establish long-term relationships (see Nanda and Warther (1998) for an analysis of the trends in the strength of underwriting relationships). For example, Baker (1990) examined ties between investment banks and corporations with market value of more than $50 million between 1981 and 1985. He reports that the 1091 corporations that made two or more deals during this period used three lead banks on average (these firms made eight deals on average). All but nine granted more than 50 per cent of their business to their top three banks and, on average, 59 per cent of the business was allocated to the top bank. Similarly, Eccles and Crane (1988, ch. 4) report that among the 500 most active corporations in the market between 1984 and 1986, 55.6 per cent used predominantly one bank to float their security, and the rest maintained relationships with only a few banks. They did not find any corporation selecting underwriters on a deal-by-deal basis. James (1992) finds that in the first common stock security offering after an IPO, 72 per cent of firms choose the same lead bank as before; for debt offerings, 65 per cent of issuers do not switch banks. Similarly, Krigman et al. (2001) show that 69 per cent of firms that did an IPO between 1993 and 1995, and a seasoned equity offering (SEO) within three years of the IPO, chose the same lead underwriter.

monitoring and screening and can overcome the problems created by asymmetric information.[3] As Boot (2000) argues, in a relationship the bank invests in obtaining firm-specific information, which is often proprietary in nature, and evaluates the profitability of these investments through multiple interactions with the same customer over time or across products. Thus, the benefits of relationships stem from the investment bank making decisions based on better information than what is publicly available. In particular, as Booth and Smith (1986) argue, underwriters certify that the valuation of the security made by the firm is appropriate. In so doing, they increase the net flow of capital to issuing firms and, moreover, ensure that on average higher quality firms get funding. If so, then security markets with an established investment banking industry should perform better

Not surprisingly, it is very hard to measure information acquisition and relationships. For this reason, we document the inexistence of relationships in Chile with two types of evidence. First, the technology of relationships imposes restrictions on *observed* investment banking structure.[4] In other words, if relationships are present, investment banking structure must exhibit a particular set of characteristics. In section 2 we develop a simple model, which is based on our previous work, that characterizes investment banking structure in the presence of relationships. We then use the model's prediction to analyze investment banking structure in Chile between 1990 and 2001 and compare it with market structure in the United States. Second, to complement this indirect evidence we interviewed many participants of the Chilean market—investment bankers, fund managers and big issuers—and asked them about investment banking practices prevalent in Chile.

The starting point of our model is a set of properties of any relationship established by an investment bank and a firm: (i) the investment bank incurs a sunk set up cost to establish a relationship[5]; (ii) the firm pays the investment bank only when it makes a deal— "loose linkage" in the jargon of the investment banking literature—which implies that relationships are not verifiable; (iii) to a significant degree the investment bank cannot prevent other banks from free riding on the information created by the relationship—that is, information is not excludable. It can be easily seen that (i)–(iii) imply that relationships are not compatible with perfect competition because investment banks would free ride on each other's information. Price competition would then drive the fee paid by each firm below what is needed to cover sunk relationship-specific investments. We show that this imposes two observable restrictions on industry structure that can be used to detect whether relationships are present.

The first restriction is that relationships can emerge only if the relationship segment is an

[3] See Boot (2000) for a survey.

[4] By "technology" we mean the shape of the production function of relationships.

[5] This is frequently referred to as a 'relationship-specific investment.' See Williamson (1979).

oligopoly of a quite distinct nature. This follows from the observation that in equilibrium it must be in the interest of relationship banks to refrain from price undercutting, which leads to a cooperation inequality that is quite standard in repeated games. In the model, at any moment, investment banks compare the present value of continued cooperation with the short-term gains of cheating by undercutting. We show that free riding makes cheating very profitable and this leaves room for only a few investment banks in the industry. But contrary to standard repeated games, here cooperation is necessary for the industry to exist; the alternative is not a competitive market. A key implication of the inequality is that these banks must have similar market shares: on the one hand a small bank would have incentives to increase its market share by cheating; on the other hand, should one investment be dominant, the rest would make small profits cooperating and prefer free riding. Thus, intense price competition or a skewed distribution of market shares is evidence *against* the existence of relationships. In addition, similar market shares also imply a maximum number of investment banks that can coexist (i.e. a lower bound on industry concentration) which is independent of market size. Hence, a second prediction is that the number of relationship banks neither increases when the market grows nor falls when the market shrinks.

Guided by the model's results we examine market shares and practices in Chile in three different segments: bonds, IPO's and foreign bond issues. It is immediately apparent that market structure in Chile is quite different from the United States. As our model predicts, in the United States investment banking is dominated by a small group of six to ten "bulge bracket" banks who have similar market shares; for example, in equity and bond issues C1 is consistently less than 0.2. Moreover, the identity of the top banks changes relatively slowly over time (roughly one new bank makes it to the top six every five years), price competition is very soft, underwriting of issues is the norm and market structure is invariant to large increases in the size of the market.

By contrast, investment banking structure and practices in Chile are quite different and inconsistent with long-term relationships. For example, market shares in local bonds are highly skewed: C1 is often above 0.40 (6 of 12 years), it falls below 0.30 in only two years and its simple average over 12 years is 0.41. Moreover, concentration tends to fall with market size, price competition is strong (according to market participants fees in bonds are between 10 and 20 basis points) and there is no underwriting: almost all security flotations are best efforts.

The second restriction is that the investment banking market should be *vertically segmented*: if relationships emerge, only firms that generate a large enough volume of deals will establish them and be served by large relationship banks; small–volume firms, by contrast, can access only arm's length investment banks. The reason behind segmentation is that sunk set up costs introduce scale economies at the level of each relationship. Since these set up costs are incurred by investment banks, they will not establish relationships with firms that generate small levels of deals. We also show that in a precise sense arm's length investment banking neither competes with relationship

investment banking nor affects fees paid by business firms that generate large volumes of deals.

Investment banking is vertically segmented in the United States. Basically, large corporations are served by "bulge bracket" banks, and smaller firms by a "fringe" of more than 1,100 smaller banks. By contrast, market-level evidence would seem to suggest that in Chile firms are forced into the arm's length segment of investment banking, because there is no relationship segment. Interviews with market participants, however, tell a slightly different and more interesting story. In fact, most large firms and conglomerates establish long-term relationships, but with global investment banks (e.g. J.P. Morgan, Citicorp, Deutsche Bank, Merryl Lynch, Goldman Sachs, Salomon, UBS, CS-First Boston). Some banks have Chilean offices (e.g. J.P. Morgan, Deutsche Bank, Salomon, Citicorp) and some have a banker assigned in New York (e.g. Goldman Sachs). But their main business is to underwrite the security issues that these firms make abroad. As in the United States, global banks do not deal with smaller firms because, in words of a banker, "[...] volume from small firms is not worth our time". As in the United States, global banks underwrite the issues made by these firms and conglomerates and price competition among them is soft. For example, they charge a uniform 65 basis points for issuing bonds. Thus, from the point of view of firm financing both markets are vertically segmented; the difference is that conglomerates and large Chilean firms establish relationships with global banks to do deals in a foreign market. Thus, no local relationship segment exists.

Our model suggests why there is no local relationship segment in Chile. A standard non-negative profit condition indicates that the aggregate profits made by each relationship bank must be large enough to cover the entry costs into a market. Thus, when the market is "small," in the sense that there are few firms that generate large volumes of deals, industry-level entry costs may prevent relationships from emerging in the local market. This is not relevant for large firms or conglomerates that seek capital in a developed market. Global banks can establish relationships with them because this market level set-up cost is no longer necessary—global banks exist already and whenever they do a deal they use their teams located in their home country, predominantly the United States.

Why is the Chilean market "too small"? An easy answer to the first question is that the Chilean economy is small and, for this reason, few firms are large. A *local* relationship segment can emerge only in markets endowed with many large firms, because only then aggregate deal volumes will be large enough to pay the setup costs of relationship banks. Many market participants, however, doubt that this is the whole story. On the supply side, it was repeatedly pointed out to us that concentrated ownership of most Chilean firms leads to lower volumes of deals. Concentrated ownership reduces liquidity of the firm's stock and makes analyst following less attractive. This further reduces the willingness of investors to buy the securities of the firm and reduces the attractiveness of maintaining a long-term relationship. On the demand side, market participants

point out that most securities are acquired by the four main pension funds. Pension funds, which manage the mandatory savings of Chilean workers, tend to keep the securities they buy and trade relatively little. Moreover, they are heavily regulated and fined by regulators whenever their return deviates from the average of all funds either upwards or downwards. For this reason, they tend to be very cautious and do their own research. In summary, it seems that the size of Chilean firms could support a larger security market.

The inexistence of a local relationship hurts firms which are not quite large enough to list abroad, and particularly those which have good growth prospects. Thus, for example, firms of similar size that are public in the United States, have substantial difficulties in becoming public in Chile. As a further example, consider that in all IPOs that have been made in Chile, local investment banks used a best effort contract, even though by their size an overwhelming majority would have probably gotten a firm commitment contract in the United States. In a firm commitment contract the investment bank assumes risk, and, presumably, invests more in acquiring information about the firm.

The rest of the paper proceeds as follows. In section 2 we present a model of relationships and investment banking structure and use it to characterize the US. market. In section 3 we describe investment banking structure in local bonds and IPOs and document vertical segmentation. Section 4 concludes.

2. Theory: relationships and investment banking structure

In this section we develop a simple model to deduce some observable market–level implications of bank–firm relationships. The central idea is that relationships have certain well-documented characteristics which determine their technology. This technology, in turn, imposes restrictions on observed investment banking structure. If relationships are present, then, structure must exhibit a particular set of characteristics. As we proceed we show that the model's predictions can be used to explain investment banking structure in the United States.

2.1. The basic economics of investment banking relationships

The technology The technology of relationships has three important characteristics: sunk set up costs, lose linkages and nonexcludability. We discuss and motivate each in turn.[6]

Firm-bank relationships are long-term and there is evidence that investment banks have to incur sunk costs to set them up and acquire information. For example, James (1992) presents evidence suggesting that the information gathered by an investment bank for one deal can be

[6]See Anand and Galetovic (2000, 2001) for a more detailed discussion.

reused in future deals. Moreover, a significant fraction of these sunk costs is incurred by the investment bank. This occurs because most of the exchange of information takes place through direct interaction with the bank's staff person.

Second, firms and investment banks interact constantly, but the bank is paid only when a deal is made. Eccles and Crane (1988) call this the 'loose linkage' between costs and fees. It implies that investment banks recover sunk relationship costs only if selected to do a deal.[7] Why loose linkage? We will not provide a model that explains why investment banks are not paid fees just for establishing and maintaining relationships; we just point out that it is commonly argued that it is difficult for business firms to evaluate the quality of the advice provided, unless a deal is done (see Eccles and Crane [1988]). This suggests that relationships are non-verifiable and hence cannot be contracted upon.

Third, to a significant degree investment banks cannot establish property rights over the information gathered in a long-term relationship—i.e. information is not excludable.[8] This is so for three reasons. First, as said, most of the exchange of information takes place through direct interaction between the firm and the investment bank's staff person. The relationship-specific knowledge walks with employees when they are hired away.[9] For example, Deutsche Bank built a global investment bank in a year (Deutsche Morgan Grenfell) by hiring away staff *en masse* from other major banks. The second reason is that ideas and products can be copied.[10] Last, in many cases relationships are not exclusive (see Eccles and Crane [1988]).

A simple model of relationships One can model this technology assuming that an investment bank must incur a sunk cost R to do the deals of a firm.[11] This cost is sunk because once R is incurred the bank can do any number of deals with the same firm at no additional cost. Nevertheless, this cost is not excludable: once incurred, *all* investment banks can do deals with the firm without incurring *any* costs. (To keep things as simple as possible, most assumptions are extreme; but, as we show in Anand and Galetovic [2001], this entails no loss of generality.) When a bank does a deal (but only then) it charges a commission proportional to the size of the deal; this is loose linkage. Call this proportional fee λ, with $0 \leq \lambda \leq 1$.

Now consider a very simple one-period game where each firm establishes a relationship with

[7] The extreme case of lose linkage is analysis, where banks earn most of their commisions from investors who trade the firm's security.

[8] A good or service is excludable if the owner can prevent others from using it at a very low cost.

[9] See Anand and Galetovic (2000).

[10] Tufano (1989) estimates the costs of designing a security, including product development, marketing and legal expenses to be between \$0,5 million and \$5 million. These productas cannot be patented and all details become publicly available once the offering is filed with the SEC. For a model of product innovation in investment banking, see also Bhattacharyya and Nanda (2000).

[11] We have fully developed the model we present in Anand and Galetovic (2000, 2001).

one investment bank (it is easy to generalize this to multiple relationships; see Anand and Galetovic [2001]). After investment banks incur sunk relationship costs R, they set fees λ, deals are implemented and fees paid.

The reader probably knows already how the equilibrium of this game looks like. Non-excludability implies that *any* investment bank can do the firm's deal at a cost considerably less than R after relationships have been established. Hence, in a one period game all find it profitable to free ride on the effort and expenses of others and the equilibrium fee will be driven well below what is necessary to recover the sunk relationship cost R; in fact, in this example Bertrand competition drives fees to zero. Loose linkage, in turn, implies that investment banks do not charge for establishing relationships. Anticipating all this, no investment bank will establish a relationship in the first place. Thus:

Result 2.1 (Price competition vs. relationships). *If price competition is intense relationships cannot emerge.*

The previous result illustrates the well-known tension between competition and relationships. As Aoki and Dinc (1997) point out, financiers will establish relationships only if they expect to obtain long-term rents that cover the sunk investment cost. But intense price competition is deleterious to long-term rents. Hence, one will not have relationships unless competition is imperfect.

Among the mechanisms that can restrain price competition are regulations,[12] frictions like informational monopolies,[13] and contracts.[14] Nevertheless, the investment banking industry tends to be quite unregulated, informational monopolies are unlikely because non-excludability and loose linkage suggests that contracts for bonding firms to investment banks are almost inexistent. What remains is voluntary 'cooperation' among investment banks not to undercut each other. In fact, the industry is notorious for soft price competition. For example, Matthews (1994 p. 161) notes that spreads on high-quality, long-term corporate bonds have been 7/8% of capital raised for many decades. Similarly, in England, underwriting fees have been 1.25% of the capital raised, for several decades as well.[15] And recently, Chen and Ritter (2000) document the remarkable clustering of IPO spreads at seven percent.[16] We now present a simple model of the investment banking industry that shows how voluntary cooperation among investment banks can emerge, which in turn sustains relationships.

[12] See, for example, Hellmann et al. (1997).

[13] See Besanko and Thakor (1993), Boot and Thakor (2000), Fischer (1990), Rajan (1992) and Sharpe (1990).

[14] See Aoki and Dinc (1997, s.3) for a discussion of these mechanisms.

[15] See "Some Old Peculiar Practices in the City of London," *The Economist* (February 18, 1995).

[16] See also "Overcharging Underwriters" (*The Economist*, June 27, 1998), where it is noted that "... studies in both countries suggest issuing companies are overcharged, and that they are stung for more in America." Similar attributions to bankers can be found elsewhere, as noted by Chen and Ritter (2000, p. 1106). For an empirical analysis of the IPO market see Hansen (2001).

2.2. Relationships and the structure of the investment banking industry

To establish relationships, cooperation among investment banks must be self enforcing: that is, it must be in each bank's self interest not to undercut its rivals, despite that in the short run it is profitable to do it. It seems that investment banks manage to restrain price competition in some markets. But how do they do it? As is well known, cooperation is in principle possible when agents repeatedly interact. This suggests that the appropriate setting to explain relationships is a repeated game among investment banks.

Relationships imply similar market shares So consider a repeated game where investment banks are infinitely lived and play the one-period game that we sketched in the previous section over and over again. They discount the future, so that one dollar at the beginning of next period is worth only δ dollars today, with $0 < \delta < 1$. Suppose also that each investment bank must pay a one-time sunk entry cost $\mathcal{E}$ to enter the industry. Last, call $\lambda^{(c)}$ be the proportional fee charged by investment banks in equilibrium (the superscript 'c' stands for cooperation). Which are the conditions under which investment banks cooperate?

Relationships can be sustained when the long-run profits that each bank expects to make from continued cooperation are greater than the short-run profits that can be made by undercutting and free riding on rival's efforts. Long-run profits are obtained as follows. Suppose that all banks cooperate forever. If the volume of deals made by a firm is V on average (more on the determination of V later), then each firm leaves a surplus $\lambda^{(c)}V - R$. With $f^{(r)}$ firms that establish relationships in the whole market, and a market share η_i, then the present value of continued cooperation for bank i is

$$\frac{1}{1-\delta}\eta_i f^{(r)}(\lambda^{(c)}V - R).$$

Now for the value of undercutting. Note that when bank i undercuts by offering a shade below $\lambda^{(c)}$ it will attract business from all firms for one time, increasing its market share from η_i to 1. It is costless for bank i to do additional $(1-\eta_i)f^{(r)}$ deals; this is non-excludability. Assuming that deviators destroy cooperation forever (that is, after a deviations investment banks never cooperate again[17]), the one-time gains of undercutting are

$$(1-\eta_i)f^{(r)}\lambda^{(c)}V.$$

[17] That is we use a trigger strategy where one deviation reverts the game to the equilibrium of the one-period game. In this game this is the strongest possible punishment. As is well known, repeated games have multiple equilibria. Nevertheless, in a precise sense there is no loss of generality in assuming this extreme punishment, because with any other weaker punishment the maximum number of relationship banks that is sustainable in equilibrium is *smaller*. See Anand and Galetovic (2000, section IIIC).

Thus, relationships will be sustainable if for all banks,

$$\frac{\delta}{1-\delta}\eta_i f^{(r)}(\lambda^{(c)}V - R) \geq (1-\eta_i)f^{(r)}\lambda^{(c)}V \tag{2.1}$$

(the present value of continued cooperation is discounted because the decision not to undercut is made after relationship costs have been incurred).

The cooperation condition (2.1) tells several things about the investment banking industry. First, since $(1-\eta_i)f^{(r)}\lambda^{(c)}V > 0$, it follows that $\lambda^{(c)}V - R > 0$; fees paid by a firm cover more than the relationship cost. These rents are not the whole story as far as investment bank's profits are concerned (recall the entry cost $\mathcal{E}$; see below), but they cannot be competed away. The reason is that any bank can always make profits by undercutting. Hence, if $\lambda^{(c)}V - R = 0$, all would like to undercut and there would be no incentives to establish relationships.[18] All this, again, is the consequence of non-excludability—R does not appear on the right hand side of the cooperation condition (2.1).

The second implication is that investment banks neither be too small nor too large. On the one hand, if η_i is too small, then undercutting becomes more attractive than cooperating and relationships cannot survive. On the other hand, if one investment bank becomes very large, it will be happy too cooperate. But since market shares add up to 1, the rest will be too small, and they will find it more profitable to undercut. All in all, condition (2.1) says that there is room only for a few large investment banks of not-too-different size. Some manipulation of this condition yields that

$$\frac{(1-\delta)\lambda^{(c)}V}{\lambda^{(c)}V - \delta R} \leq \eta_i \leq 1 - (m-1)\frac{(1-\delta)\lambda^{(c)}V}{\lambda^{(c)}V - \delta R}.$$

It follows that:

Result 2.2 (Relationships and market shares). *Relationship banks must have similar market shares.*

One can further exploit the cooperation condition (2.1). By letting all market shares be the same (i.e. the case in which each investment bank grabs a fraction $\frac{1}{m}$ of all relationships) one obtains an upper bound on the number of investment banks that can participate in the industry, call it $m^{(c)}$. After some simple algebra, one can show that this upper bound satisfies

$$\frac{\delta}{1-\delta}f^{(r)}(\lambda^{(c)}V - R) = (m^{(c)} - 1)f^{(r)}\lambda^{(c)}V. \tag{2.2}$$

[18] For example, Chen and Ritter (2000) argue that spreads in IPOs are above competitive levels. For a different interpretation, see Hansen (2001).

Note that an upper bound on the number of investment banks means a lower bound on concentration. Hence, condition (2.2) suggests that the investment banking industry is a natural oligopoly. But, in addition, a central prediction of this condition is that the lower bound on concentration is independent of industry size. This follows from the observation that $f^{(r)}$, the number of firms that establishes relationships and a measure of the size of the industry, multiplies both sides of the cooperation condition (2.1). In other words, a larger market makes both cooperation and undercutting more attractive in the same proportion. One implication is that once an investment banking industry exists, its structure should not change with the size of the market. This is a central prediction of the model and quite different from standard IO models, which predict that concentration should fall with market size as entry costs and scale economies become less important.

Result 2.3 (Market structure and market size). *Market structure and concentration in the relationship segment is independent of market size.*

Do these predictions square with the facts? Figure 1 plots the market share of the top-8 US. banks in underwriting between 1950 and 1986 at intervals of five years (left-hand side) and the volume of securities underwritten during the same period (right-hand side). Figure 2 does the same for M&A's, but the period is 1987–1998. Both figures tell essentially the same story: the industry is quite concentrated, concentration is stable over time, and it does not show any systematic relation with market volumes. Volumes in underwriting increase more than 80 times, 12 times in M&As, yet market structure remains the same.

Table 1a shows market shares in underwriting in 1999 according to the size of issues (all credit is assigned to the underwriter that lead the syndicate), and Table 1b does the same according to fee income (these are fees actually cashed by the underwriter). While volumes are much higher than in 1986, the share of the top 8 underwriters remains above 70%. More remarkably, as predicted by the model, there is no dominant investment bank—the largest has a share of slightly more than 15%. This pattern is similar for other investment banking markets (see, for example, Santomero and Babbel [2001, ch.21]). Again, market structure has remained remarkably stable between 1950 and 1986, as Table 2, which presents C1, C4, C6 and C8 for underwriting, confirms.

Vertical segmentation So far the focus has been on aggregate market structure. But sunk costs to establish relationships introduce scale economies at the level of each relationship, which suggests that relationships will not be worth their cost for low-volume firms.

To think about this, assume that firms are of two types, high– and low–volume.[19] A high-volume firm generates a volume $v^{(h)}$ of deals, and a low–volume firm generates a volume $v^{(\ell)}$, with

[19] Again, no loss of generality here. In Anand and Galetovic (2001) we work with a continuous distribution over volumes.

$v^{(\ell)} < \frac{R}{\lambda^{(c)}} < v^{(h)}$. A fraction ζ of firms is high-volume, and there are f firms in total (clearly, $f \geq f^{(r)}$). Firms can do deals using an investment bank, in which case they do not incur in any transaction cost beyond the fee they have to pay. Alternatively, they can use some other means to do the deal, but this imposes a proportional transaction cost βv on the firm. That is, the costs of the alternative increase proportionally with the size of the deal. We call this alternative "arm's length" investment banking.

Contrary to the relationship technology, the transaction cost of this alternative equals βv, increases linearly with the size of the deal and there are no economies of scale at the firm level—larger deals are more costly. We have not specified who bears this cost. But, as long as there isn't a loose linkage, this is irrelevant because then one way or the other the firm will bear the cost of the deal.

Now it is straightforward to note that

$$\lambda^{(c)} v - R \geq 0. \tag{2.3}$$

is necessary for an investment bank to establish a relationship with a given firm (note that v is the volume of a given firm, not average volume V; hence the weak inequality). Hence, firms with small vs will not be chosen by investment banks. In our example, that is the case of low-volume firms, since $v^{(\ell)} < \frac{R}{\lambda^{(c)}}$ by assumption. Hence:

Result 2.4 (Relationships and firm size). *Relationships are for large-volume firms.*

It may not come as a surprise that low-volume firms do not participate in the market, because it is well known that the average cost of issuing securities falls with the size of the issue, and considerably so after issues surpass the $20 million threshold (see Ritter [1987] and Lee et al. [1997]). Nevertheless, note that inequality (2.3) is not driven by the costs borne by the firm, but by the sunk costs of establishing a relationship, which are paid by the investment bank. Thus, the inequality says is that investment banks will exclude low-volume firms, not that costs will make low-volume firms unwilling to establish relationships. Why? Note that $\lambda^{(c)} \leq \beta$. Hence no matter how small, a firm would always like to establish relationships. This is again loose linkage: fees do not depend on R. Therefore banks must decide who gets to establish relationships.[20]

Now interpret the alternative available to low-volume firms as a fringe of investment banks that do deals on an arm's length basis. The size of the relationship segment of the industry (ζf in the model) is determined by condition (2.3), so that the market can be split in a relationship

[20] For the case of IPOs Chen and Ritter (2000, p.1114) argue that the conventional wisdom is that the costs of large, prestigous investment banking houses are so high that that they do not find it profitable to do small deals.

segment and an arm's length segment. A prediction that follows directly from condition (2.3) is that deals will be smaller on average in the arm's length segment.

In fact, there is evidence that this is so in practice. In Anand and Galetovic (2002), we report that the average size of an M&A deal done by a firm who did two or more of such deals between 1987 and 1998 is about three times larger than the average deal size of a firm that did only one M&A deal.[21] In the IPO market, Table 3, which is taken from Ritter (1987, p. 272), shows that best-effort contracts are predominant for firms with IPO proceeds of $2 million or less, but almost non-existent for IPOs with gross proceeds of $10 million or more.[22] By contrast, firm–commitment contracts are predominant for larger issues. In a best-effort contract the issuing firm and the investment bank agree on an offer price and a minimum and maximum number of shares to be sold. Then the investment bank makes its 'best efforts' to sell the shares to investors. In a firm-commitment contract the investment bank guarantees the firm a given proceed from the issue after the final prospectus is issued, whether or not the issue is fully subscribed at the offer price (see Ritter [1987]). As Ritter points out, a firm–commitment offer involves relatively more certification than a best-effort offer, which is consistent with the fact that the major bracket investment bankers almost always do firm commitment offers. Chen and Ritter (2000, p.1114) argue that the conventional wisdom is that large, prestigious investment banks have costs that are so high that they do not find it profitable to do small deals.

The second question of interest is how arm's length investment banks affect competitive conditions in the relationship segment. A striking implication of rationing is that not at all, because loose linkage implies that there is no price indifference condition that links both segments. This implies that one should speak of two separate industries: on the one hand relationship investment banking, where a few large banks serve larger firms. On the other hand, arm's–length investment banking, which is tailored to smaller firms. This is vertical segmentation.

Result 2.5 (Vertical segmentation). *Relationship banks do not compete with arm's length banks.*

It is convenient to examine a bit more closer why vertical segmentation occurs (see Anand and Galetovic [2001, sections 3.4 and 3.5] for a detailed discussion). First, as said, given that $\lambda^{(c)} \leq \beta$, all firms, high– or low–volume would like to establish a relationship. But relationship

[21] Of course, both averages include only acquirors, not targets.

[22] In a best-effort contract the issuing firm and the investment bank agree on an offer price and a minimum and maximum number of shares to be sold; the price is set before the investment bank gathers information about investor valuation. Then the investment bank makes its 'best efforts' to sell the shares to investors. In a firm-commitment contract the investment bank guarantees the firm a given proceed from the issue after the final prospectus is issued, whether or not the issue is fully subscribed at the offer price. The offer price is set after the investment bank has gathered information about investor's valuation. See Ritter (1987) and Loughran et al. (1994).

banks only like large-volume firms, because they cannot charge directly for relationships. Loose linkage (or, in more standard terms, non-verifiability) implies that relationship banks ration out low-volume firms. Second, relationship banks are protected against the competition of arm's length banks by the scale economies inherent in the relationship technology. Since $\beta v > R$ for large enough volumes, the cost advantage of relationship banks grows with volume. Thus, arm's length banks cannot compete for the business of large-volume firms because they are inherently more costly (and they must be, otherwise, there would be no point in having relationships in the first place).

Now both vertical segmentation and the market structure implications of relationships hinge on loose linkage. To see this, assume verifiable relationships. In that case banks would charge directly for them, and the equilibrium price of a relationship would be R. Given that price, firms with $\beta v > R$ would establish relationships; firms with $\beta v < R$ would choose to go with arm's length banks; and firms such that $\beta v = R$ would be indifferent—hence, as in any standard market there would not be any segmentation.

2.3. When will a *local* relationship segment emerge?

The third role of condition (2.3) is to determine the size of the relationship segment. In our example, low-volume firms are excluded by investment banks, so that only ζf firms (i.e. those that are large) are eligible for relationships and average volume is $v^{(\ell)}$. The size of the relevant market is therefore only ζf. Now if, as it seems reasonable, deal volume is positively correlated with firm size, this suggests a link with the (physical) size–distribution of business firms. Ceteris paribus, the relevant market for relationship investment banking should be larger in countries where there are more large firms. It will be seen next that this imposes an endowment constraint on the existence of relationship investment banking: relationships cannot emerge if ζf is too small, i.e. when large firms are few.

To see this note that investment banks must make enough profits to cover the entry cost $\mathcal{E}$. The present value of profits made by investment banks in a long-run equilibrium with relationships equals $\frac{1}{1-\delta}\frac{f^{(r)}}{m}(\lambda^{(c)}V - R)$ when all banks have the same market share. This present value must be enough to cover the entry cost $\mathcal{E}$. Hence

$$\frac{1}{1-\delta}\frac{f^{(r)}}{m}\left(\lambda^{(c)}V - R\right) \geq \mathcal{E} \tag{2.4}$$

is an additional constraint, which defines a second upper bound on the maximum number of banks in the market. This upper bound must satisfy

$$\frac{1}{1-\delta}\frac{f^{(r)}}{m^{(zp)}}\left(\lambda^{(c)}V - R\right) = \mathcal{E}, \tag{2.5}$$

where $m^{(zp)}$ is the number of intermediaries consistent with zero long-run profits or a normal return on capital invested.

Note that, in contrast with the upper bound $m^{(c)}$ derived from the cooperation condition (2.2), $m^{(zp)}$ increases with the size of the relevant market $f^{(r)}$, because the entry cost $\mathcal{E}$ is spread among more relationships. Hence, when the market is sufficiently large, $m \leq m^{(c)}$ becomes the only relevant constraint; (2.4) always holds with slack and scale economies at the industry level are irrelevant as a determinant of market structure.[23] More than that, because investment banks must make rents to preserve the incentives to establish relationships, and rents grow with market size, the industry will make profits that are higher than normal. Yet these supranormal profits will not attract further entry because when $m > m^{(c)}$ cooperation is no longer self–enforcing. Hence, profits above normal should survive in the long-run.

On the other hand, scale economies matter when the relevant market is small. To see this, let $\lambda^{(c)} = \beta$, $m = 1$ and substitute in constraint (2.4). If

$$\frac{1}{1-\delta} f^{(r)}(\beta V - R) = \frac{1}{1-\delta} \zeta f(\beta v^{(h)} - R) < \mathcal{E} \tag{2.6}$$

then an investment banking industry is not sustainable, because banks would lose money. Inequality (2.6) also shows that a "small" market may mean that the economy is small and there are few firms (a small f), or, rather, that few firms are high-volume (a small ζ). Thus, provided that volumes increase with (physical) firm size, being endowed with enough large firms is key for relationship investment banking to emerge.

Result 2.6 (Local relationships and market size). *A local relationship segment will emerge only if there are enough large–volume firms.*

Now while policy can affect the number of high-volume firms (see our 2002 paper), the size-distribution of business firms depends heavily on the structural characteristics of the economy. It is in that sense that one can speak of the size distribution of firms as a structural determinant of the feasibility of local relationship investment banking. Countries in which large firms are few cannot have local relationship investment banking. This constraint is irrelevant in an economy like the United States, but is probably important in most developing countries.

Nevertheless, suppose that a large firm of a small country (e.g. the Chilean telecomm company CTC or the conglomerate Quiñenco) goes to a large foreign market (e.g. the United States). Since condition (2.4) holds in the large market, the only relevant constraint is (2.3).

[23] It is important to distinguish scale economies at the market level (this subsection) from scale economies that occur in each firm-bank relationship (the previous subsection). Relationship costs do not imply scale economies at the industry level, because duplicating the number of firms duplicates aggregate expenditures.

Result 2.7 (Large firms in a small country). *Large firms from small economies can estabish relationships by going to the large market.*

3. Investment banking and relationships in Chile

In this section we describe market structure and practices in Chilean investment banking. We have data on local bond flotations and IPOs but, unfortunately, there are no public records showing which investment bank brokered each local equity issue; we are currently collecting that information by asking market participants. We also document vertical segmentation in the Chilean market.

3.1. Investment banking structure and practices in Chile

The local bond market Table 4 shows market shares in the local bond market. First, note that in Chile direct issues (i.e. issuers who do not use an investment bank) are very important in some years: in 8 of the 12 years they represent about 20 percent or more of total issues. By contrast, direct issues are almost nonexistent in the United States.

Second, the distribution of investment banking shares is skewed. For example, C1 is often above 0.40 (6 of 12 years); below 0.30 in only two years (1993 and 2000); and it can get as high as 0.73 (Bice in 1996)[24]. All in all, the simple average of C1 in local bonds is 0.41. This is in sharp contrast with the United States, where C1 is consistently around 0.15 (see Table 2]). Moreover, in Chile the average market share of the second-largest investment bank is 0.23, a bit more than half of C1. Hence, in most years the top bank's share is considerably larger than the second–largest's. By contrast, in the United States the market share of the second-largest bank is only slightly less than C1. As shown in the previous section, long term relationships require that relationship banks have similar market shares[25].

Last, concentration, which is shown on table 5, changes considerably from year to year and tends to *fall* as market size increases. While the correlation between C1 and market size is 0.01 over the 12-year period (0.01), and 0.55 between 1998 and 2001 when market size increased almost ninefold, C2, C3, C4 and C5 clearly fall as market size increases. Thus, the correlation between volume and C2 is -0.20; -0.35 with C3; -0.47 with C4; and -0.60 with C5. These negative correlations are also negative between 1998 and 2001, respectively -0.08, -0.25, -0.46 and -0.62. By contrast, in the United States market structure hardly changes with market size. As shown by

[24] Note that if we add the flotations done jointly by Citicorp and Bankers Trust, Citicorp's market share is 90%.

[25] If one computes three-year market share tables (e.g. market share in 1990-92, 1991-93 and so on until 1999-01), C1 is somewhat smaller on avreage: 0.36 vs. 0.41. Nevertheless, the market share of the second-largest bank remains in 0.23 Interestingly, the top-three banks have similar market shares in 1996-98, 1997-99 and 1999-00. Nevertheless, in 1999-01, C1 is 0.38 and the share of the second-largest bank is 0.14.

Result 2.3, one should expect concentration to be invariant to changes in market size.

Prices and practices in the Chilean market differ from those in the United States. Local participants say that fees charged in Chile for a bond flotation are quite low, between 10 and 25 basis points (one basis pint is one-hundreth of a percentage). They also argue that issuers select investment banks mainly on the basis of price, and contact them only when they have the intention of doing a bond flotation. Thus, banks and issuers deal mainly on an arm's length basis and price competition seems to be intense.

Why are fees so low in Chile? Several market participants argued that services provided by investment banks do not warrant higher fees. In particular, it was pointed out that the due diligence made by investment banks for local bond flotations is of lower quality than in the United States. One reason is that it doesn't pay for local banks to have analysts and bankers who specialize in a handful of companies, let alone their bonds, because deal volumes are too low. As a consequence, as a fund manager pointed out, investment banks do not assume any direct risk when selling securities: there is practically no underwriting as all flotations are best efforts, and it is very uncommon for investment banks to guarantee liquidity by making a market for the bonds they have floated.[26]

The local IPO market Table 6 shows all IPOs done in Chile by firms which hired investment banks. As Celis and Maturana (1998) point out, this is a young market, since there are no records of companies that used investment banks to go public prior to 1991. Up to then "new" companies were either privatizations or companies that began to trade their stock spontaneously without sales efforts or investment bank leadership. Between 1991 and 1997 there were 37 IPOs managed by investment banks and then the market dried up: there have been no IPOs in Chile since then.[27]

The evolution of practices in IPOs is quite interesting. Celis and Maturana (1998 pp.12 and 13) argue that one can divide the 1991-1997 period in two phases. During the first phase, which lasted from October 1991 through December 1994, the market had no experience with IPOs and regulations prevented pension funds (by far the largest group of institutional investors) from buying a new issue during the first trading days. Thus, most issues were sold to individual investors and foreign funds. The second phase started in January 1995, when an amendment to the pension fund law allowed them to invest in IPOs provided that transactions took place in a stock exchange. During the second phase the placement methods came to resemble those used in the United States or the United Kingdom, where institutional investors are contacted to estimate final demand.

Comparing the two phases, it is apparent that the market increased in size (measured by

[26] It should also be noted that in Chile investment banks do not assume legal liabilities for the securities they sell.

[27] It is interesting to note that during the 1990s new issues had an important tax advantage. Individuals who bough them could deduct 20% of the amount invested from their tax bases in perpetuity. Since the top marginal rate was close to 50%, this meant a guaranteed return of nearly 10%. This tax break was discontinued for stock issues made after 1999.

volume), from $421.6 million to $757.7 million. Moreover, while the average deal in phase 1 was of $10.4 million, in phase 2 it nearly tripled to 29.3 million. The size of the median deal also increased substantially, from $16.5 million to $50 million. On the other hand, the number of investment banks fell from 8 to 5 and concentration in the IPO segment increased. As Table 7 shows, two banks (Larraín & Vial and Bankers) made more than 85% of the total volume of IPOs.

A striking feature of Table 6 is that the average size of a local IPO is not small when compared with the United States, at least according to the data presented by Ritter (1987) (see Table 3 in the previous section). The average size of a local IPO in Chile is $13,8 million and the median $21 million. Moreover, except for *Jucosa* in 1992 and *Sopraval* in 1993, all IPOs have gross proceeds of more than $4 million; moreover, gross proceeds are higher than $10 million in 31 out of 36 cases. Yet, as in bonds and equity, in Chile all IPOs are best effort contracts; investment banks have never used firm commitments to sell newly-issued shares. This is somewhat surprising, at least when compared with the United States. As can be seen from Table 3, in the United States there is a 97% chance of a firm commitment contract for an IPO of $10 million or more.

The difference in practices suggests that banks' certification role is weaker in Chile than in the United States. In fact, several market participants argued that one reason behind the drying up of the Chilean IPO market after 1997 is that investors lost confidence because evaluations made by were not careful enough. Nevertheless, Celis and Maturana (1998) find that there are long-run performance differences between firms that were brought to market by a "long-term" investment bank, and those that were brought to market by a "sporadic" investment bank.[28] Table 8 (which reproduces their Table 13) indicates that the long- run differences in cumulative abnormal returns (CARs) against a market index are positive for long-term banks and negative for sporadics. For example, after 30 months firms brought to market by long-term banks had CARs of 14.6% above the market index; by contrast, those brought to market by sporadics had negative CARs of 32.9%.[29] Thus, there is some evidence that investment banks do matter in Chile when firms go public.

Vertical segmentation Like the United States, the Chilean market is vertically segmented. Contrary to the United States, however, vertical segmentation does not occur within the local market. On the one hand, domestic investment banking is arms–length; on the other hand, most conglomerates and large Chilean firms access the international capital market and establish relationships with global banks.

Table 9 summarizes foreign bond issues made by Chilean firms since 1993, when Celulosa Arauco, a paper mill owned by the Angelini conglomerate, sold $150 millions in eurobonds. Note

[28] "Sporadics" are those who placed four or less IPOs during 1991-97; "long-term" banks are those who placed five or more IPOs (Larraín & Vial, Bankers and Citicorp).

[29] Celis and Maturana (1998) include only firms brought to market during phase 1 because their study was made in 1997. Also, note that differences are not statistically significant, because the sample is small.

that all issues have a global bank as lead underwriter and co-manager (e.g. JPMorgan, Salomon, Merril Lynch, CSFB, Deutsche Bank). With few exceptions, all lead managers in Chilean bond issues also appear in table 1, which summarizes the top 10 banks in the US market in 1999. Moreover, foreign issues are of much bigger size than those in Chile. The average foreign bond flotation on Table 9 is $230 million (median: $250 million).[30]. As can be seen on Table 10, in Chile the average bond flotation in the local market is much smaller. It was consistently less than $35 million until 1997. Since then, the average has increased significantly, but it was still only $73 million in 2001 (median: $56 million).

Market participants argue that conglomerates and large firms establish long-term relationships with global investment banks. Some banks have Chilean offices (e.g. J.P. Morgan, Deutsche Bank, Salomon-Smith-Barney) and some have a banker assigned in New York to conduct business with Chile (e.g. Goldman Sachs). Global banks do not deal with smaller firms because, in words of a banker, "[...] volume from small firms is not worth our time". As in the United States, banks underwrite the issues made by these firms; price competition among them is soft and fees for these deals are at (much higher) international levels.

Global investment banks do not shun local deals if these are large enough, however. In fact, in most M&A deals of substantial size (e.g. the 3.5 billion merger between Banco de Santiago and Banco Santander) firms are advised by a global bank.

In conclusion, from the point of view of firm financing both the United States and Chile are vertically segmented. The difference is that conglomerates and large Chilean firms establish relationships with global banks. Thus, it seems that in Chile no local relationship segment exists.

3.2. Is the Chilean market "too small"? Does it matter?

Why is the Chilean market "too small" for a local relationship banking segment to exist? An easy answer to is that the Chilean economy is small and, for this reason, few firms are large. As Result 2.6 suggests, a *local* relationship segment can emerge only in markets endowed with enough large firms, because only then aggregate deal volumes can hope to be large enough to pay the setup costs of relationship banks. Many market participants, however, doubt that this is the whole story. They think that the Chilean economy warrants a bigger capital market.

Figure 3 plots 1975-1998 averages of market capitalization (the market value of listed firms over GDP) versus turnover (total amount traded yearly over the market value of listed firms) for 54 countries.[31] Only 15 countries have larger capitalizations. Chile's 0.51 is similar to New Zealand's

[30] By "flotation" we mean a deal done by the same firm with the same lead manager. For example, to obtain the average we considered Enerquinta's March 2001 bond flotations of $120 million and $200 million, which was leaded by JPMorgan/Salomon a single flotation.

[31] We thank Ross Levine for kindly providing his data.

0.56, Holland's 0.53 Canada's 0.50 and , Sweden's 0.7, and much larger than Belgium's 0.30, Spain's 0.24 and Germany's 0.21. Yet Chile's 0.07 turnover ratio is remarkably low; only seven (out of 54) countries exhibit lower ratios. Why is volume so low in Chile?

On the supply side, it was repeatedly pointed out to us that concentrated ownership of most Chilean firms leads to lower trading and volumes of deals. In fact, in December of 2001 the average participation of the largest shareholder in the 150 largest listed firms in Chile was 62,3% (median: 55.4%). Also on average, 92.8% of the shares was in the hands of the top ten shareholders. And in 60,7% of the firms, the dominant shareholder had more than 50% of the shares.[32,33] Concentrated ownership reduces liquidity of the firm's stock and makes analyst following less attractive. This further reduces the willingness of investors to buy the securities of the firm and reduces the attractiveness of maintaining a long-term relationship.

On the demand side, market participants point out that most securities are acquired by the four main pension funds. Pension funds, which manage the mandatory savings of Chilean workers, tend to keep the securities they buy and trade relatively little. Moreover, they are heavily regulated and fined by regulators whenever their return deviates from the average of all funds either upwards or downwards. For this reason, they do their own research but are in any case very cautious.

The inexistence of a local relationship hurts firms which are not quite large enough to list abroad, and particularly those which have good growth prospects. For example, firms of similar size that are public in the United States, have substantial difficulties in becoming public in Chile. As a further example, consider that in all IPOs that have been made in Chile, local investment banks used a best effort contract, even though by their size an overwhelming majority would have probably gotten a firm commitment contract in the United States.

4. Conclusion

The literature sharply distinguishes between bank- and market-based financial systems. On the one hand, in bank-based systems intermediaries establish long-term relationships with firms and keep loans in their balance sheets. On the other hand, in market-based systems firms sell their security directly to investors (in 'direct' markets business firms are supposed to meet face to face with investors), who form portfolios to diversify risks. Nevertheless, while this distinction is useful to help thinking about striking cross-country differences among financial systems (see, for example, Allen and Gale [1995 and 2000]), it obscures the fact that in developed security markets firms sell

[32]The source are the Fichas Estandarizadas de Clasificación Uniforme (Fecus) issued by the Superintendencia de Valores.. Listed firms must report their balance sheets and statements of income every quarter. They must also disclose the identity of the largest shareholders.

[33]For the 50 largest firms, the figures are: 59.3 in the hands of the largest shareholder (median: 50.5); 92.3% in the hands of the ten largest shareholders. In 54% of the firms the top shareholder had more than 50% of the shares.

their security through investment banks with whom they establish long-term relationships.

We have shown that market structure in the United States is consistent with long-term relationships between firms and investment banks; in Chile it is not. Interviews with market participants confirmed that in Chile investment banking is arm's length and the effort put by banks in gathering information seems is less intense. These differences should have real effects. A security market where relationships exist should allocate resources better than a market where investment banking is arm's length.

Our model also suggests that the size-distribution of business firms may be a structural determinant of the quality of the local security market. Market level sunk costs mean that *domestic* relationship investment banking will emerge only if there are sufficiently many large firms. Nevertheless, the Chilean case suggests that this is not the whole story. Concentrated ownership of firms on the one side, and concentrated demand for securities reduce volumes and the relevant size of the market. It seems that the "real" side of the Chilean economy could sustain a larger security market.

Our final observation is about indicators of security market development. We have shown that vertical segmentation characterizes both the United States and Chile. The difference is that in the US market segmentation is domestic; in Chile the relationship segment is not located domestically. If indicators of security market development, in particular turnover ratios, exclude volumes of domestic securities traded abroad, part of the contribution made by capital markets to a better allocation of resources is lost, particularly because in all likelihood those will be the firms subject to strictest scrutiny by intermediaries.

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Table 1a: Leading U.S. Underwriters: All Debt and Equity, 1999
Ranked by dollar volume raised in new issues

Lead manager	*Dollar Volume (Millions)*	*Number of Issues*	*Share of Market*	*Added Share*
Merril Lynch	$332,385	2,000	15.9	15.9
Solomon Smith Barney	261,532	1,502	12.6	28.5
Morgan Stanley Dean Witter	216,421	2,253	10.3	38.8
Goldman, Sachs	197,615	2,063	9.4	48.2
Credit Suisse First Boston	177,139	1,133	8.4	56.6
Lehman Brothers	159,002	897	7.8	64.4
Chase Manhattan	121,022	1,097	5.8	70.2
J.P. Morgan	82,639	497	3.3	73.5
Bear, Stearns	78,695	578	3.8	77.3
Bank of America	76,605	654	3.7	81.0

Source: Santomero and Babbel (2001, ch. 21).
Note: All credit is given to the lead underwriter.

Table 1b: leading US. underwriters: all debt and equity, 1999
Ranked by disclosed fees

Lead manager	*Dollar Volume (Millions)*	*Number of Issues*	*Share of Market*	*Added Share*
Morgan Stanley Dean Witter	$1,897	2,253	15.6	15.6
Goldman, Sachs	1,747	2,063	14.4	30.0
Merril Lynch	1,474	2,000	12.3	42.3
Solomon Smith Barney	1,293	1,502	10.7	53.0
Credit Suisse First Boston	987	1,133	8.1	61.1
Donaldson, Lufkin & Jenrette	795	436	6.6	67.7
Lehmann Brothers	602	887	5.0	72.7
J.P. Morgan	566	497	4.7	77.4
Bear, Stearns	369	578	3.0	80.4
Deutsche Bank	336	393	3.0	83.4

Source: Santomero and Babbel (2001, ch. 21).

Table 2: concentration in US. underwriting: 1950-1986
In percentages

	1950	1955	1960	1965	1970	1975	1980	1986
C1	17	13	15	14	13	12	15	18
C4	52	44	46	42	41	43	43	55
C6	64	56	60	55	55	57	57	76
C8	75	68	71	65	66	68	70	86

Sources: our calculations using information from Hayes, Spence and Marks (1983) and Eccles and Crane (1988)

Table 3: 1977-82 IPOs categorized by gross proceeds and contract type

Gross Proceeds ($)	*All Offers*	*Firm Commitment Offers*	*Best Effort Offers*	*Fraction of Best Effort Offers*
100,000--1,999,999	243	68	175	0.720
2,000,000--3,999,999	311	165	146	0.469
4,000,000--5,999,999	156	133	23	0.147
6,000,000--9,999,999	137	122	15	0.109
10,000,000--120,174,195	181	176	5	0.028

Source: Table 2 in Ritter (1987). Gross proceeds categories are based on nominal values.

Table 4: market shares, volumes and number of deals in local bond issues 1990-2001
Ranked by volume raised

Rank	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1	0.31	0.44	0.44	0.20	0.51	0.43	0.73	0.35	0.39	0.35	0.24	0.47
2	0.21	0.20	0.16	0.18	0.37	0.38	0.23	0.23	0.34	0.17	0.16	0.13
3	0.16	0.17	0.12	0.18	0.07	0.19	0.04	0.20	0.10	0.15	0.14	0.08
4	0.13	0.13	0.12	0.14	0.04			0.11	0.10	0.13	0.12	0.07
5	0.09	0.04	0.08	0.12	0.01			0.11	0.04	0.10	0.12	0.07
6	0.03	0.02	0.07	0.09	0.01				0.02	0.06	0.09	0.06
7	0.03		0.01	0.07						0.04	0.06	0.05
8	0.02			0.00							0.04	0.03
9	0.01										0.01	0.02
10	0.01										0.01	0.01
11	0.01											0.01
12	0.00											0.01
13	0.00											
14	0.00											
15	0.00											
16	0.00											
17	0.00											
Volume($mm)	285.3	520.9	159.9	288.3	414.7	45.1	173.1	103.9	797.9	735.9	1,363.9	2,868.5
Direct ($mm)	88.1	229.5	23.8	209.7	41.6	12.8	36.1	11.5	411.3	147.3	281.7	277.1
(share)	0.31	0.44	0.15	0.73	0.10	0.28	0.21	0.11	0.52	0.20	0.21	0.10
IB	197.2	291.4	136.2	78.6	373.1	32.3	136.9	92.4	386.6	588.6	1,082.3	2,591.4
(share)	0.69	0.56	0.85	0.27	0.90	0.72	0.79	0.89	0.48	0.80	0.79	0.90
# deals by IB	21	13	10	8	13	4	4	5	6	11	16	35

Source: Authors' elaboration from data contained in the Boletín Mensual of the Superintendencia de Valores y Seguros.
Notes: (a) Bonds are not issued through syndicates in Chile. (b) Investment banks' shares add up to one. (c) "Direct" is the share or volume of issuers who sold their bonds directly to investors; IB is the share or volume of iisuers who used an investment bank to sell the bond issue.

Table 5: concentration in local bond issues 1990-2001
Ranked by volume raised

Rank	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
C1	0.31	0.44	0.44	0.20	0.51	0.43	0.73	0.35	0.39	0.35	0.24	0.47
C2	0.51	0.65	0.60	0.39	0.88	0.81	0.96	0.58	0.73	0.52	0.40	0.60
C3	0.68	0.81	0.72	0.57	0.95	1.00	1.00	0.79	0.83	0.67	0.54	0.68
C4	0.81	0.94	0.84	0.71	0.98			0.89	0.93	0.80	0.66	0.75
C5	0.90	0.98	0.92	0.83	0.99			1.00	0.98	0.90	0.78	0.81
C6	0.93	1.00	0.99	0.92	1.00				1.00	0.96	0.87	0.87
C7	0.96		1.00	1.00						1.00	0.93	0.92
C8	0.98			1.00							0.98	0.95
C9	0.98										0.99	0.97
C10	0.99										1.00	0.98
C11	0.99											0.99
C12	1.00											1.00
C13	1.00											
C14	1.00											
C15	1.00											
C16	1.00											
C17	1.00											

Source: Authors' elaboration from data contained in the Boletín Mensual of the Superintendencia de Valores y Seguros.
Notes: (a) Bonds are not issued through syndicates in Chile. (b) Investment banks' shares add up to one. (c) "Direct" is the share or volume of issuers who sold their bonds directly to investors; IB is the share or volume of iisuers who used an investment bank to sell the bond issue.

Table 6: local IPOs 1991-2001
Proceeds in millions of dollars

Phase 1				*Phase 2*			
Firm	Investment bank	Year	Proceeds	Firm	Investment bank	Year	Proceeds
San Pedro	Bice	1991	32	Cono Sur	Bankers	1995	30
Cruz Blanca	Citicorp	1992	10	CBI	Bankers	1995	13
Santa Rita	IM Trust	1992	33	Security	Citicorp	1995	51
Edelpa	L&V	1992	6	Parque Arauco	Citicorp	1995	17.7
Polar	L&V	1992	15	Bhif G	Bankers	1996	130
Jucosa	L&V	1992	9	Enerquinta	Bankers	1996	50
Itata	L&V	1992	22	Quintec	L&V	1996	16
Naviera	(*)	1992	37	Santagrup	L&V	1996	130
Mainstream	Bice	1993	2.4	Paris	L&V	1996	80
Cadena	Bice	1993	14	Falabella	L&V	1996	82
Cintac	Citicorp	1993	16.5	D&S	L&V	1996	50
Santa Isabel	Citicorp	1993	21	Detroit	Security	1996	11
Sopraval	De la Cerda	1993	3.7	Unimarc	Bankers	1997	75
Tricolor	IM Trust	1993	10	FASA	IM Trust	1997	22
Telex	L&V	1993	27				
Coresa	L&V	1993	12				
Bata	L&V	1993	26				
Zalaquett	L&V	1993	5				
Enaex	Midway	1993	33				
Bice Corp	Bankers	1994	40				
Cochrane	Citicorp	1994	20				
Cruz Salud	Citicorp	1994	20				
Infodema	Tanner	1994	7				
		Total	421.6			Total	757.7
		Average	10.4			Average	29.3
		Median	16.5			Median	50

Source: Gustavo Maturana (see Maturana and Celis [1998]).

Table 7: investment banking shares and number of deals, IPOs, 1991-2001
Ranked by dollar volume

	Phase 1				*Phase 2*		
1	Larraín & Vial	28.9	8	1	Larraín & Vial	47.2	5
2	Citicorp	18.4	5	2	Bankers	39.3	5
3	Bice	11.5	3	3	Citicorp	9.1	2
4	IM Trust	10.2	2	4	IM Trust	2.9	1
5	Bankers	9.5	1	5	Security	1.5	1
6	Midway	7.8	1				
7	Tanner	1.7	1				
8	De la Cerda	1.0	1				
9	Others	8.8	1				
	Total	100.0	23			100.0	14

Source: author's calculation with data provided by Gustavo Maturana.

Table 8: long-run abnormal return difference between sporadics and long-term banks

Months after IPO	6	12	18	24	30	36	42	48
Long term banks	11.6%	18.0%	21.5%	16.9%	14.6%	30.8%	17.4%	53.0%
t	0.6	0.7	0.6	0.5	0.3	0.6	0.4	0.8
n	13	14	14	14	12	11	11	6
Sporadics	1.7%	-13.1%	-37.6%	-37.2%	-32.9%	-55.6%	-52.6%	-51.1%
t	0.2	-0.8	-2.0	-1.2	-0.9	-1.5	-1.0	-0.8
n	9	8	9	9	8	8	7	6
Differences in means test								
t	0.4	0.9	1.2	1.1	0.8	1.3	1.0	1.1
p-value	69%	40%	24%	27%	46%	20%	34%	28%

Source: Celis and Maturana (1998, Table 13). To qualify as a long-term Player an agent must have placed five or more IPOs between 1991 and 2001. *t* is Student's statistic and *n*,the number of observations.

Table 9: Chilean bond issues 1993-2001
In millions of dollars

Company	*Amount*	*Date*	*Type*	*Lead manager*
Arauco	400	Sep-01	Yankee	JPMorgan
Autopista del Maipo	425	Aug-01	144A	Morgan Stanley
Transelec	465	Apr-01	144A	ABN/Salomon
Enerquinta	120	Mar-01	144A	JPMorgan/Salomon
Enerquinta	200	Mar-01	144A	JPMorgan/Salomon
Arauco	300	Aug-00	Yankee	JPMorgan
CTC	200(*)	Jul-99	Euro	JPMorgan/Dresdner/BBVA/ABN Amro
Codelco	300	Apr-99	144A	Morgan Stanley
Endesa	400	Mar-99	Yankee	JPMorgan/Salomon/NationsBank
Arica	160	Mar-99	144A	JPMorgan
CTC[1]	200	Jan-99	Yankee	Salomon
Banco Santander	200	Oct-98	Yankee Sub	JPMorgan
Endesa	400	Jun-98	Yankee	JPMorgan
CMPC	250	Jun-98	144A	JPMorgan/Chase
Arauco	175	Sep-97	Yankee	JPMorgan
Arauco	100	Sep-97	Yankee	JPMorgan
Arauco	125	Sep-97	Yankee	JPMorgan
Andina	150	Sep-97	Yankee	CSFB
Andina	100	Sep-97	Yankee	CSFB
Andina	100	Sep-97	Yankee	CSFB
Banco Santiago	300	Jul-97	Yankee	UBS
Banco Sudamericano	100	Mar-97	144A	Salomon
Endesa	230	Jan-97	Yankee	Chase
Endesa	220	Jan-97	Yankee	Chase
Endesa	200	Jan-97	Yankee	Chase
Enersis	300	Nov-96	Yankee	JPMorgan
Enersis	350	Nov-96	Yankee	JPMorgan
Enersis	150	Nov-96	Yankee	JPMorgan
Soquimich	200	Sep-96	144A	Salomon
CTC	200	Jul-96	Yankee	JPMorgan
Guacolda	100	Apr-96	144A	Merrill Lynch
Guacolda	80	Apr-96	144A	Merrill Lynch
Endesa	150	Apr-96	Yankee	JPMorgan
Pehuenche	170	Apr-96	Yankee	JPMorgan
Edelnor	250	Mar-96	144A	Salomon
Chilgener	200	Jan-96	Yankee	Smith Barney
Arauco	200	Dec-95	Yankee	JPMorgan
Arauco	100	Dec-95	Yankee	JPMorgan
CSAV	100	Dec-93	Euro	Citibank
Arauco	150	Jun-93	Euro	Chase

Source: JPMorgan. (*) In Euros. Amount equivalent to $180 million

Table 10: size of bond flotations 1990-2001
In thousands of dollars

	Average	*Median*
1990	9,315.7	3,199.7
1991	22,632.6	13,208.4
1992	13,535.3	8,280.6
1993	10,090.3	10,440.3
1994	28,684.4	19,155.3
1995	8,020.3	7,115.5
1996	34,151.1	35,134.0
1997	18,512.4	19,124.9
1998	64,837.6	38,497.0
1999	53,105.2	36,594.1
2000	67,900.8	38,780.1
2001	73,538.9	56,394.2

Source: author's calculations with data on the Boletines of the Superintendencia de Valores

Figure 1. Concentration and Volume in Underwriting
Source: Hayes, Spence, and Marks (1983), table 1, and Eccles and Crane (1988), table 5.4.
"C8-Ratio" is the share of total volume of securities underwritten in any given year by the top eight investment banks. Full credit is given to lead manager.
"Volume" is the logarithm of total volume of securities underwritten in any given year.

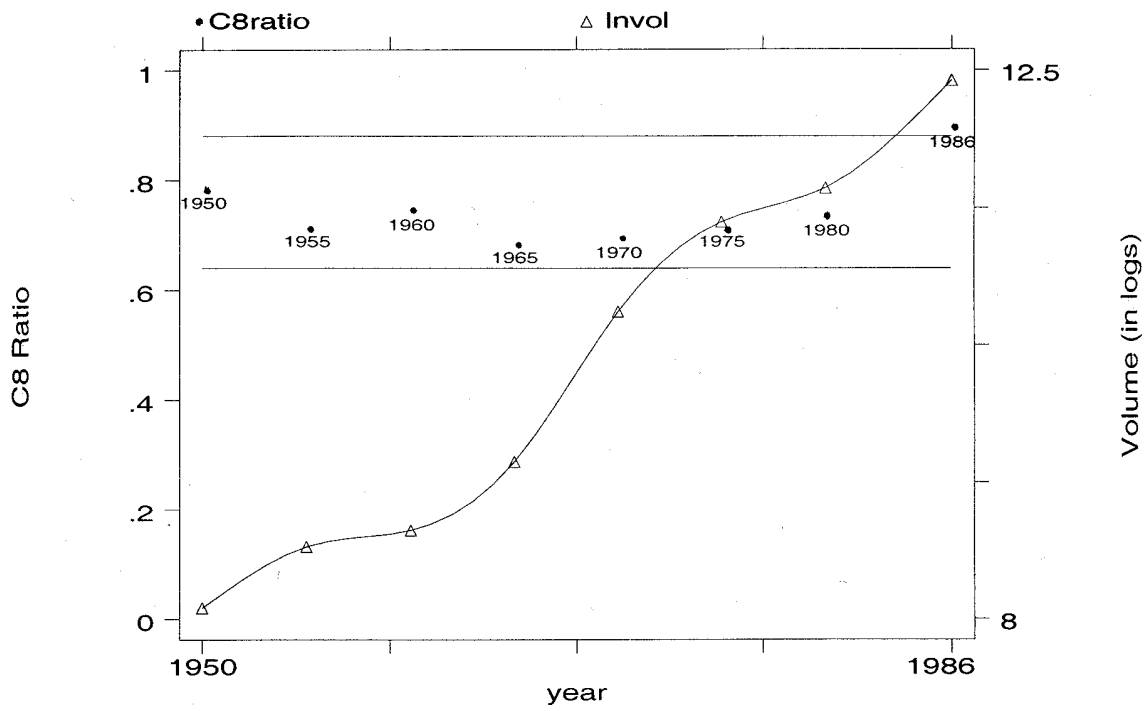

Figure 2. Concentration and Volume in Mergers and Acquisitions
Source: Author's processing of data from Securities Data Company.
"C8-Ratio" is the share of total deal value of mergers and acquisitions brokered by the top eight investment banks in any given year. Full credit is given to the acquiror's lead bank. The sample of M&A deals is restricted to those made by firms that do at least three such deals in the 12-year period 1987-1998.

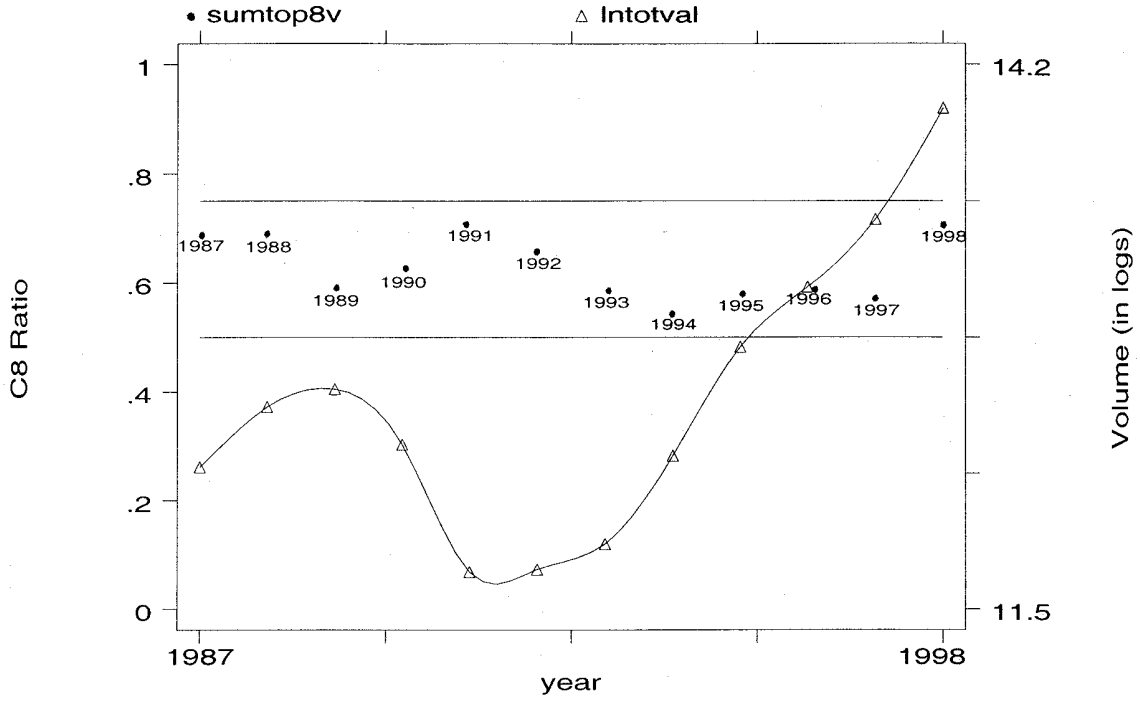

Figure 3
Turover and market capitalization 1975-1998