The Effect of Cross-Industry Ownership on Pricing. Evidence from Bank-Pension Fund Common Ownership in Chile*

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Abstract

We employ daily data from the Chilean banking industry for the 1994-2001 period to estimate the impact of cross-industry ownership structure within financial conglomerates on the pricing behavior of deposit and lending operations of banking institutions. Controlling for bank specific fixed effects, and for bank and market characteristics, we test whether banks with a pension fund affiliation had overall different pricing strategies with respect to non-affiliated banks, whether these banks display a different response to monetary policy changes and whether they reacted differently during the 1998 liquidity shock to the Chilean economy. Preliminary evidence suggests that banks with pension fund affiliation display a broader deposit and loan base and enjoy higher spreads, but they seem to react similarly to monetary policy changes with respect to non-affiliated banks. Finally, the evidence collected for the period around the liquidity shock suggest that banks with pension fund affiliation enjoyed some degree of insulation from market events, attracting a larger share of funds at the expense of other banks.

* The views expressed herein are those of the authors and not necessarily those of the Banco Central de Chile, The Federal Reserve Bank of Chicago or The Federal Reserve System.

I. Introduction

The Chilean pension fund system has become a key participant of the domestic capital market since its inception, accumulating resources, in a time period of 20 years, above 50% of domestic GDP by 2001, transforming this industry in the second largest in importance after the banking sector. Pension funds accumulate and administer savings for retirement of a large share of the work force. On the other hand, during this period, financial conglomerates have gained increasing relevance in the market, resulting very common to find holding companies that control, at the same time, a pension fund and a commercial bank, as well as other providers of financial services like insurance companies and mutual funds.

It can be argued that banking institutions within these conglomerates could take advantage of the association with pension funds, being the largest providers of funding in the economy, to generate some sort of insulation from competitive forces behind changes in market conditions or monetary policy. However, we must made clear from the outset that Chilean financial regulation, precluding this potential non-competitive behavior, establishes tight and multiple regulations that constraint the potential exposure of pension fund resources to related companies within a conglomerate. Nevertheless, preliminary figures shown in tables A to C below, suggest that those limits on investment on a bank's conglomerate member, measured as a percentage of deposits or bank's capital, are non-trivial.

The implications of this investigation could be relevant beyond the boundaries of Chilean financial markets. For instance, recent regulatory changes that took place in the U.S., contained in the Graham-Leach-Bliley Act of 1999, which lifted barriers to the consolidation of financial services providers of different industries, give more relevance to the study of patterns of pricing of bank deposits and loans within the context of cross-industry ownership. Also, these patterns of cross-industry ownership are not uncommon in other Latin-American countries where the model of private pension fund accumulation has been adopted, but where also the dynamics of the pension fund industry is evolving into more concentrated markets.

The study takes advantage of a rather unique panel data set containing information at the *daily* frequency for deposit and loan interest rates and related quantities reported by each bank operating in the Chilean financial system over the period beginning on May 2nd 1995 until June 29th 2001. Controlling for bank specific fixed effects, and for bank and market characteristics, we test whether banks with a pension fund affiliation have overall different pricing strategies with respect to non-affiliated banks, whether these banks display a different response to monetary policy changes and whether they reacted differently during the 1998 liquidity shock to the Chilean economy. From the methodology point of view, this work is based on Berger and Hannan (1989) and Hannan and Berger (1991). The very high frequency of the data set, however, is especially useful and it is an innovation in and of itself, in that it allows keeping a more precise track of the response of banking institutions to changes in monetary policy. We find some evidence consistent with the hypothesis that banks affiliated to pension funds may enjoy some

form of competitive edge in the market place. Such banks display an above average rate spread and a larger deposit and loan base. These results were especially amplified in the occurrence of the 1998 liquidity shock to the Chilean economy. There is no evidence, however, of a differential response of pension fund-affiliated banks to changes in monetary policy during normal periods. At the same time, the process of deregulation which has made pension funds less dependent on domestic sources of investment, seems to have reduced the importance for banks to be tied via common ownership to a pension fund.

Section II briefly describes some of the appropriate pension fund regulations. Section III describes the data set and the methodology employed. Section IV presents and discusses the results and also elaborate potential explanation for the findings. Section V concludes.

II. Details on the Chilean pension fund system

The Pension Fund system, administered by private firms, was created in the early 1980s to replace the state-owned managed pension scheme. It is characterized by the accumulation of savings in individuals' independent retirement accounts. In order to guarantee a sustainable return to the funds, they are subject to multiple regulation in terms of their portfolio construction. The large number of limits to the portfolio diversification of the pension fund system is also the result of the law that controls the

functioning of the system, Decree Law 3.500 of 1980 (D.L. 3.500), which establishes a *de jure* government insurance of a minimum pension.

The limits established in the law can be divided in limits by instrument and limits by issuer of a particular financial instrument. The limits by instrument are set by the Central Bank within the ranges indicated in the D.L. 3.500. The limits by instrument have been usually set at the maximum allowed within these ranges. For instance, the limits on instruments issued by the government or financial institutions can be set within a 35% or a 50% of the value of the fund.[1] The range for shares of domestic companies varies within 10% and 40%, but even though the limit is set forth at 40%, the percentage allocated to variable income instruments has been on a decreasing trend, following the downside behavior of the domestic stock market.

A notable exception to the regulatory pattern of setting limits at their attainable maximum is the treatment of the instruments issued in foreign markets. The authorization for pension funds to diversify their portfolio by holding worldwide instruments was the result of a gradual policy followed over the nineties. At the beginning of that decade, pension funds were not allowed to invest the resources they manage in foreign markets. In January 1992 a maximum limit to invest in foreign market is set for the first time at 1,5%, which is subsequently raised that year to 3,0%. Three years later, in January of 1995, the limit to invest abroad is raised again to 6,0%. Soon after this latest increase in the

[1] These ranges are applied to the "Fondo 1", which is the fund that contains the bulk of all savings of dependent workers compelled by law to save for retirement. There is also a "Fondo 2" that establishes larger maximum limits for fixed income instruments issued by government or financial institutions, and

maximum limit to invest in foreign instrument, the limit was raised to 9,0% of the total value of the fund, but this time the regulator established a particular restriction for variable income instrument of 4,5% of the total value managed by pension funds. Around that period, pension funds were allowed to enter the formal exchange market, which comprises the Central Bank, the financial institutions and a few exchange houses, in order to manage the transactions with foreign instruments in foreign currencies. Continuing with this gradual increase in the limit to the foreign exposure of pension funds, the limit is raised in April of 1997 to 12%, keeping the restriction of 4,5% for variable income instruments. However, the continuing pressure to diversify the portfolio by holding foreign instrument lead authorities to raised the maximum limit attainable in these instruments to 20% of the fund's value, with a 10% restriction of the fund's value in variable income instruments. Since then, the limit has been gradually increased by the Central Bank, within the range dictated by the law. A major reform in the pension fund system at the beginning of 2002 set the maximum limit to invest abroad in 20%, removing temporarily the faculty given to the Central Bank.[2]

The regulatory restrictions summarized thus far fall within the class of restrictions imposed on different types of instruments, and the limits are set by the Central Bank as dictated by the D. L. 3.500. However, there are some restrictions on a particular type of issuer, directly dictated in the D. L. 3.500, that control the exposure of pension funds on

lower maximum limits for positions in variable income instruments in order to guarantee a safer return for workers near to retirement.

[2] This reform, law N° 19.795, also increased the limit to invest in variable income instruments, in two steps, to 13% and 15% of the fund's value, in a time span of six months starting on March 2002, to finally remove this restriction completely from June 2002 onwards. Finally, the limit to invest abroad could be potentially set at 30% of the fund's value by March 2004.

financial institutions and firm's affiliates to the controlling group of a certain pension fund. Article 47, first paragraph, establishes that the exposure of a pension fund to the sum of investments on demand or time deposits, as well as other debt instruments issued by a financial institutions or an affiliated firm to the bank, or collateralized by them, could not be more than the lesser value among the Tier I plus Tier II capital of a bank, adjusted by a risk factor, and the 10% of the fund's value, adjusted by some additional risk factors set by the Central Bank. Also, the same article, in its second paragraph, establishes that the sum of direct and indirect investments of a pension fund in shares, demand and time deposits, an any other debt instrument issued by a financial institution, or collateralized by them, could not represent more than 7% of a particular fund. Article 47bis of the D.L. 3.500 establishes some restrictions on the portfolio allocation of a pension fund, due to the affiliation of the pension fund with a particular issuer. The third paragraph dictates, for instance, that the minimum risk rating for debt instrument issued by connected firms to become eligible for investment is AA. The total sum of investment according to this criterion cannot be more than 5% of the fund's value. Additionally, paragraph sixth command pension funds to invest a maximum of 1% of the fund's value on instruments issued or collateralized by a related firm. Finally, paragraph seventh mandates pension funds administrators to limit the sum, directly or indirectly invested on instruments issued or collateralized by all firms related to a pension fund, to less than 5% of the fund's value. It is also worth adding, however, that if the pension fund administrators should trespass the regulatory limits to portfolio diversification, the adjustment period is set to 36 months. Therefore, it is not unusual to observe actual

portfolio allocation percentages to be well above those imposed by regulation, as also indicated in tables A-C.

III. Description of the data set and methodology

The analysis is based on a panel data with daily observations for deposit and loan interest rates and related quantities for each bank operating in the Chilean financial system over the period beginning on May 2nd 1995 until June 29th 2001. At the beginning of the sample period there were 35 banking institutions. However, the number of banks has decreased over time as a result of mergers and acquisitions and voluntarily exits from the market.[3] By the end of the sample period there were 28 institutions left.

On July 2001, the Central Bank of Chile decided to change the monetary policy rate stance from UF-denominated to peso-denominated terms. This "nominalization" of the monetary policy had a sensible impact on UF deposit and loan rate and on its volume of operations. Given the sizeable change in the balance sheet structure of banking institutions, we decided to set this period aside for the purposes of the estimation.

Before describing the main dependent variables studied in the document, it is worth describing, at least succinctly, the so-called "Unidad de Fomento" or UF. This is a unit of account indexed to changes in the domestic consumer price index. The UF is calculated daily from the 10th of each month to the 9th of the following month, according to the variation of the previous month on the consumer price index. This unit of account

was introduced in 1967 by the Superintendencia de Bancos e Instituciones Financieras, the government agency that supervises legally established banking institutions, and is used mainly on the pricing of financial contracts of real estate transactions, long term government instruments and lending and deposit operations of banking institutions.

The empirical exercise is based on regressions of the following model specification:

$$y_{it} = Cons + a\, Banks_i + b\, X_{it} + g\, W_{it} + d\, Z_{it} + e_{it}$$

where y_{it} is either (a) the UF-denominated deposit rate for each bank i on day t, (b) the daily UF loan rate, (c) the rate spread, (d) the daily deposit volume, (e) the daily loan volume. $Banks_i$ is a vector of dummy variables capturing bank specific fixed effects, X_{it} is a vector of market and bank characteristics varying over time, W_{it} a vector of indicator variables capturing banks' response to changes in monetary policy, and Z_{it} is a vector of indicator variables capturing the effect of a bank-pension fund affiliation through common ownership. Following is a more precise description of the dependent variables and some of the regressors.

The UF deposit rate for bank *i* on day *t* is a volume weighted average of daily UF based operations from 90 days to one year.[4] Hence, the rate reported on a particular date does not include rates settled previously, but it reflects current market interest rate conditions. The operations included in the computation of this rate are UF denominated time deposits and other debt instruments issued by commercial banks in that unit of account. The UF loan rate is calculated in a similar fashion to the UF deposit rate. However, it is a

[3] For a detailed characterization of the chilean banking system see various issues published by the Superintendencia de Bancos, http://sbif.cl

weighted average of all lending operations of a bank, except for interbank operations, including consumer, mortgage, and commercial lending. The quantity variables are the volume of deposit and lending operations denominated in UF accounts for all *new* operations that a bank engaged on a given day with their clients. Therefore, they represent the outflow of credit and the inflow of deposits from the public and institutional investors.

Among the market and bank characteristics we have included the daily interbank rate, which corresponds to the overnight rate charged among banks during their daily or weekend operations. The Central Bank aims at providing the liquidity in the banking system so that the interbank rate daily approaches the *instancia* rate.[5] On average, over the sample period, the difference between the interbank rate and the instancia rate is no greater than 5 basis points. Another included market variable is the Herfindahl index of market concentration, calculated on banks total assets.

As for variables capturing bank specific characteristics, we have included bank size, measured in terms of total assets. We have also included a measure of profitability, proxied by the monthly operational return, on an annual basis, over total assets. Apart from the interbank rate, the previously mentioned controls have monthly rather than daily variation.

[4] Regulatory restrictions on deposit operations precludes contract in UF denominated deposit, or any other unit of account, with a time to maturity lower than 90 days.

[5] The "instancia" rate is the objective policy interest rate defined by the Central Bank to conduct the monetary policy, in order to achieve an inflation target schedule.

Moreover, a dummy variable controls whether the bank is foreign owned or domestic owned. It takes the value of 1 if the bank is a foreign bank and 0 otherwise. Finally, another dummy variable controls for the episodes of merger or acquisitions of banks. It takes the value of 1 for a bank that maintains control after the merger, 0 if the bank has not been involved in a merger.

Additional control variables are introduced and described in the following section.

IV. Results

Table 1 presents the results of a set of regressions where the dependent variables are the deposit rate, the loan rate, the rates spread, the deposit quantities and the loan quantities. All regressions were run including bank fixed effects, although their coefficient estimates are not reported. The first group of regressors include the interbank rate, also at daily frequency, and a set of dummy variables for each day of the week (the excluded category was "Friday"), days before a holiday and those before a long weekend. These variables attempt to control for time specific events and time regularities in banks' daily activity.

The Herfindahl index is positive and significant in both price regressions but it is negative in the spread one. This would suggest that market concentration in Chile is the result of a dynamic evolution during which the more efficient firms have grown larger and gained market share. This improvement in overall market efficiency is reflected in the higher deposit rates offered to customers and the overall narrower spreads corresponding to periods of higher market concentration. Nonetheless, for given level of

concentration, larger banks and those with higher measures of profitability are still the ones exhibiting higher spreads. This finding is consistent with the hypothesis of the existence of dominant firms within the market, which are able to exercise some degrees of market power. This result is not necessarily in contradiction with that suggested by the estimated coefficient of the Herfindahl index: this last one may be capturing the evolution *over time* of the industry, thus indicating that in periods with higher concentration markets exhibit more competitive conditions. The coefficient of size and profitability is instead providing *cross-bank* information on industry conduct, so that at any given time some banks may be exercising more market power than others.

Also, foreign banks have lower prices and lower than average spreads. This may be due to the fact that many of the foreign banks are actually relatively smaller than domestic ones (the median foreign bank is about 20% the size of the median domestic bank).

Next, we have focused our attention on the potential role played by the possibility for banks to be affiliated, through common ownership, to pension fund companies. We have tracked over time the history of common ownership between banks and pension funds and a corresponding bank specific indicator variable, PF, was generated. Over the entire sample period, ten out of the thirty-five banks had, continuously or at least for a limited time, a common ownership relationship with a pension fund.

As mentioned earlier, pension fund companies in Chile are major players in financial markets. In particular, they are mandated to allocate a portion of their investment portfolio in bank deposits. Although there exist regulatory constraints to their ability to allocate funds in bank deposit at any bank, as table A-C show, affiliated pension funds

can still be considered as very important clients for the corresponding banks. One could argue that as a result of common ownership, such an important bank client may exhibit a relatively more rigid supply of deposits. Hence, it is interesting to ask whether common ownership and the special relationship that derives from that may translate into potential advantages for such banks in the market place.

As the regression results in columns 4 and 5 of table 1 show, banks with a pension fund affiliation display a broader deposit and loan base, as indicated by the positive and significant coefficients of the PF dummy in the quantity regressions. Moreover, as indicated in the first two columns of the same table, they also appear to offer higher deposit rates and charge higher loan rates. On net, however, the evidence in column 3 indicates such banks to enjoy higher spreads. A broader deposit base and broader spreads are indications not inconsistent with the argument that pension fund affiliated banks may have some competitive advantage related to this special relationship.

We have also added an indicator variable tracking the history of deregulation of pension funds, which over time, as mentioned earlier, have experienced a gradual relaxation of restrictions to investing abroad. Gaining increasing access to an additional venue for portfolio diversification should imply that pension funds become progressively less dependent on bank deposits. Consequently, all else equal, the potential tie between banks and affiliated pension funds may have become gradually loosen over time. The regression results seem to be consistent with this hypothesis and therefore reinforce the assertion that common ownership with pension funds may generate competitive advantages for banks. As the quantity regressions show, banks - in particular pension fund affiliated ones - reduce their deposit and loan base as a consequence of pension funds deregulation. In

addition, the spread for those banks becomes narrower as a result of deregulation, thus somewhat reverting the direction of the basic results embedded in the pension fund indicator variable.

Next, we have analyzed the response of banks to changes in monetary policy rates (the instancia rate) and the response around a period of extraordinary changes in policy rates while the country experienced significant economic turmoil. Financial fragility experienced in some Asian countries during 1997, derived from their deteriorated international liquidity position, generated pressures over the exchange rate in the domestic markets of Latin American countries. Chile could not isolate itself from the misalignment of the exchange rate. However, attempts made by the Central Bank to stand for the chilean peso and the inflation rate target for 1998, lead to a dramatic increase in the interbank rate during 1998 and to a subsequent liquidity shock. Other international events, possibly part of the aftermath of the Asian crisis (Russian moratorium and the depreciation of the Brazilian currency), are also deemed responsible for the domestic shock, which also affected the level of capital inflows and the terms of trade.[6]

First we look at changes in policy rates during "normal" periods. We explore the response of banks to increases and decreases in the policy rates separately. As suggested in Hannan and Berger (1991), an asymmetric response of banks may be an indication of less than competitive conduct. The first three columns of tables 2 and 3 present the result of regressions where we added indicator variables capturing the response of banks to

increases and decreases in the policy rate with one, two, three and four weeks delay. In these regressions we have excluded the period of extraordinary changes in policy rates (the "shock" period). Excluding the shock period, the mean decrease in the policy rate was about 30 basis points, while the mean increase was 40 basis points.

First, there is no evidence that pension fund affiliated banks display any difference in behavior from other banks in either instances of increasing or decreasing policy rates. Hence, this exercise does not offer additional evidence on the effects on competitive conduct of banks-pension funds common ownership. There is, however, some evidence of asymmetric behavior common across *all* banks, at least as far as the market for deposits go. As indicated in the first column of table 2, banks respond with a two-week delay to increases in policy rates (the indicator variable is only positive and significant for weeks three and four). However, deposit rates are lowered immediately after a decline in the policy rate and they continue to be decreased for at least four weeks after the event. On the loan side, rates seem to adjust up and down more or less symmetrically (in the second week for increases, in the first week for decreases), although the magnitude of the response seem to be lower than average in either direction. The regression in the third column indicates a narrowing of the rate spread during periods of rate increases and a broadening during periods of decreases.

[6] For further details on the facts of the 1998 adjustment period of the chilean economy, see Morandé and Tapia (2002).

Finally, we have focused specifically on the response of banks during the shock period. Banks' rates exhibit an expected strong reaction during the shock period.[7] Interestingly, pension fund affiliated banks seem to have experienced rate changes of larger magnitude, as indicated in column 4 and 5 of table 2. Also, while non-affiliated banks experienced a reduction in the rate spreads, pension bank affiliated banks document an increase in the spread as a result of the shock. This last group of banks has also experienced a large increase in their deposit base and an increase of lower magnitude of the loan base. This evidence is still consistent with the argument that the affiliation with a pension fund may at least in part insulate banks from market events. Being recognized in the market as less exposed to the effect of the economic shock, such banks seem to have attracted a relatively larger share of funds at the expense of the other banks. Confirming this, a final regression (column 6 in table 3) where the dependent variable was bank size and where the regressors were the interbank rate, the market Herfindahl, the measure of profitability, the foreign or domestic ownership dummy, the merger and acquisition dummy and the different pension fund indicators, show that pension fund affiliated banks have substantially increased their size during the shock period.

V. Conclusions

This paper has used a rather unique data set containing daily frequency information over a seven years period on deposits and loan prices and related quantities for each individual bank operating in Chile. The level of detail of the data set has allowed a first exploration

[7] The mean increase in the policy rate during the shock period was 350 basis points, while the mean

of some basic relationships between market and bank characteristics and prices and quantities settings. It has also allowed us to focus on the response of banks to monetary policy action at a frequency level typically unattainable with more customary data sets. An additional and innovative aspect of the analysis has been the focus on the common ownership between some banks and pension funds companies. Given the significant role played by pension funds being among the largest customers of banks, we have explored whether banks affiliated with pension funds through common ownership experience some form of insulation from market forces with consequent manifestation of competitive advantages.

The results of the econometric analysis have indicated that market concentration is likely to be the result of an endogenous process of market evolution, where the more efficient banks have survived and grown larger. At the same time, however, the results indicate that the larger banks and those exhibiting higher profitability display broader rate spreads.

The results on the effects of the common ownership between banks and pension funds seem to support the argument that banks benefit from such ties. In particular, affiliated banks exhibit a substantially larger deposit base and enjoy higher spreads overall. Also, in the occasion of the economic shock period, between February 1998 and March 1999, such banks have experienced a marked increase in size and higher spreads, while the other banks' spreads were instead narrowing. However, there is no evidence of a differential response of pension funds-affiliated banks to normal changes in monetary policy. Nonetheless, the regression results have highlighted a generalized asymmetric

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decrease was more than 100 basis points.

response of banks to increases or decreases in the policy rate. More precisely, banks appear to adjust deposit rates fast and with consistent magnitude in the case of decreases in the policy rate, while they are slower in circumstances of policy rates increases. Also, the overall effect associated with common ownership reduces in magnitude as pension funds are gradually allowed to expand their portfolio allocation opportunities to include international markets, thus loosening the ties with domestic banking institutions.

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Table 1

	(a)	(b)	(c)	(d)	(e)
	ufdeprate	ufloanrate	spread	ufdepmonto	ufloanmonto
tiuf	0.141***	0.115***	-0.034***	0.023***	0.001
	(0.002)	(0.003)	(0.003)	(0.003)	(0.001)
lu	0.632***	0.270***	0.085**	1.685***	0.253***
	(0.028)	(0.042)	(0.043)	(0.046)	(0.021)
ma	0.456***	0.237***	0.006	1.084***	0.182***
	(0.028)	(0.041)	(0.043)	(0.046)	(0.021)
mi	0.361***	0.165***	-0.033	0.558***	0.115***
	(0.028)	(0.041)	(0.043)	(0.046)	(0.021)
ju	0.313***	0.114***	-0.071	0.223***	0.117***
	(0.028)	(0.041)	(0.043)	(0.046)	(0.021)
holiday	-0.284***	-0.104	0.077	-0.846***	0.246***
	(0.064)	(0.095)	(0.098)	(0.107)	(0.049)
longweekend	0.221**	0.251*	0.244*	0.647***	-0.115*
	(0.087)	(0.131)	(0.135)	(0.145)	(0.067)
herfindahl	0.012***	0.005***	-0.005***	0.004***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
size	0.076***	0.134***	0.087***	1.107***	0.482***
	(0.021)	(0.033)	(0.031)	(0.035)	(0.016)
rent	-15.215***	-18.368***	12.437*	-0.402	-0.079
	(2.424)	(4.073)	(6.632)	(4.027)	(1.864)
for	-0.889***	-1.367***	-0.465***	0.758***	0.005
	(0.067)	(0.100)	(0.091)	(0.112)	(0.052)
fusion	-0.199***	0.244***	0.287***	1.603***	0.699***
	(0.062)	(0.095)	(0.086)	(0.104)	(0.048)
pf	1.021***	1.070***	0.196*	1.608***	0.659***
	(0.079)	(0.122)	(0.115)	(0.131)	(0.061)
deregpf	-0.079***	-0.070***	0.017***	-0.011**	-0.014***
	(0.003)	(0.004)	(0.005)	(0.005)	(0.002)
deregpf*pf	-0.062***	-0.075***	-0.031***	-0.092***	-0.036***
	(0.006)	(0.010)	(0.009)	(0.011)	(0.005)
Observations	51769	49478	38099	51769	51769
R-squared	0.21	0.06	0.01	0.12	0.07

Banks fixed effects are included in all regressions but coefficient estimates are not reported. Standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 2

	(a)	(b)	(c)	(d)	(e)	(f)
	ufdeprate	ufloanrate	spread	ufdeprate	ufloanrate	spread
pf	0.572***	0.518***	0.041	0.774***	0.658***	0.034
	(0.069)	(0.113)	(0.109)	(0.076)	(0.120)	(0.115)
deregpf	-0.082***	-0.047***	0.039***	-0.089***	-0.074***	0.023***
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.005)
deregpf*pf	-0.031***	-0.039***	-0.026***	-0.058***	-0.079***	-0.041***
	(0.006)	(0.009)	(0.009)	(0.006)	(0.010)	(0.009)
up1week	-0.017	-0.125	-0.225**			
	(0.058)	(0.090)	(0.100)			
up2week	0.089	0.152*	-0.165*			
	(0.058)	(0.091)	(0.100)			
up3week	0.183***	0.138	-0.155			
	(0.060)	(0.095)	(0.102)			
up4week	0.301***	0.033	-0.372***			
	(0.059)	(0.094)	(0.102)			
up1*pf	0.125	-0.135	-0.141			
	(0.135)	(0.209)	(0.205)			
up2*pf	0.164	-0.064	0.037			
	(0.135)	(0.210)	(0.206)			
up3*pf	0.039	0.117	0.275			
	(0.135)	(0.210)	(0.206)			
up4*pf	0.136	0.335	0.366*			
	(0.140)	(0.219)	(0.213)			
Down1week	-0.250***	-0.129**	0.141**			
	(0.037)	(0.060)	(0.064)			
Down2week	-0.306***	-0.064	0.143**			
	(0.037)	(0.060)	(0.064)			
Down3week	-0.175***	-0.079	0.076			
	(0.036)	(0.059)	(0.063)			
Down4week	-0.153***	-0.022	0.185***			
	(0.036)	(0.058)	(0.062)			
down1*pf	-0.076	-0.021	-0.030			
	(0.084)	(0.133)	(0.128)			
down2*pf	0.046	-0.151	-0.100			
	(0.084)	(0.134)	(0.128)			
down3*pf	-0.093	-0.072	0.042			
	(0.084)	(0.133)	(0.128)			
down4*pf	-0.066	-0.169	-0.135			
	(0.084)	(0.132)	(0.127)			
Shock				1.655***	1.182***	-0.491***
				(0.030)	(0.045)	(0.050)
Shock*pf				0.764***	2.077***	1.314***
				(0.061)	(0.091)	(0.087)
Observations	43812	41521	32069	51769	49478	38099
R-squared	0.12	0.03	0.02	0.27	0.10	0.02

Banks fixed effects are included in all regressions but coefficient estimates not reported. The market and bank specific variables displayed in table 1 are included in all regressions but coefficient estimates are not reported. Standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3

	(a)	(b)	(c)	(d)	(e)
	ufdepmonto	ufloanmonto	ufdepmonto	ufloanmonto	size
pf	1.243***	0.566***	1.325***	0.630***	-1.281***
	(0.128)	(0.062)	(0.131)	(0.061)	(0.016)
deregpf	0.002	-0.010***	-0.008*	-0.014***	0.065***
	(0.005)	(0.002)	(0.005)	(0.002)	(0.001)
Deregpf*pf	-0.067***	-0.034***	-0.098***	-0.037***	0.155***
	(0.011)	(0.005)	(0.011)	(0.005)	(0.001)
up1week	0.013	0.127**			
	(0.108)	(0.052)			
up2week	-0.182*	0.067			
	(0.108)	(0.052)			
up3week	0.501***	0.118**			
	(0.112)	(0.054)			
up4week	0.306***	-0.003			
	(0.110)	(0.053)			
up1*pf	-0.127	-0.012			
	(0.251)	(0.121)			
up2*pf	-0.915***	-0.146			
	(0.251)	(0.121)			
up3*pf	-0.091	0.030			
	(0.251)	(0.121)			
up4*pf	0.336	0.561***			
	(0.262)	(0.126)			
Down1week	0.027	-0.072**			
	(0.068)	(0.033)			
Down2week	-0.190***	-0.026			
	(0.068)	(0.033)			
Down3week	-0.058	0.070**			
	(0.068)	(0.033)			
Down4week	0.209***	0.012			
	(0.067)	(0.033)			
Down1*pf	0.175	0.072			
	(0.157)	(0.076)			
Down2*pf	0.091	0.045			
	(0.157)	(0.076)			
down3*pf	0.097	0.118			
	(0.157)	(0.076)			
down4*pf	0.104	-0.044			
	(0.156)	(0.075)			
Shock			0.098*	0.057**	-0.009
			(0.052)	(0.024)	(0.007)
Shock*pf			1.783***	0.159***	0.155***
			(0.104)	(0.049)	(0.013)
Observations	43812	43812	51769	51769	51769
R-squared	0.12	0.08	0.12	0.07	0.67

Banks fixed effects are included in all regressions but coefficient estimates not reported. The market and bank specific variables displayed in table 1 are included in all regressions but coefficient estimates are not reported. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table A

Holding of bank's instruments by related pension funds
as percentage of bank's capital at December of each year

	1995	1996	1997	1998	1999	2000	2001
BANCO DEL ESTADO DE CHILE	1.2	1.4	1.5	3.2	2.4	2.6	-
BANCO SANTANDER - CHILE	-	8.2	11.9	5.8	5.3	4.3	3.2
BANCO DE CHILE	19.3	21.7	35.1	16.3	9.5	8.8	*31.6*
BANCO O'HIGGINS	-	0.4	-	-	-	-	
CORPBANCA	-	-	2.3	3.0	*64.4*	*67.7*	*85.6*
CITIBANK N A.	13.0	12.3	9.7	13.5	18.2	12.7	16.4
BANCO SECURITY	3.6	2.3	14.1	-	-	-	-
BBVA BANCO BHIF	-	-	*25.0*	*42.2*	37.8	27.5	30.1
BANCO SANTIAGO	*23.9*	*32.8*	*19.6*	*27.0*	19.4	15.8	12.8

Source: Authors computation using SAFP database. Bank's instruments include demand and time deposits, mortgage letter of credit, subordinated bonds and stocks.

Table B

Holding of bank's issued instruments by related pension funds
as percentage of value administered by the pension fund at December of each year

	1995	1996	1997	1998	1999	2000	2001
BANCO DEL ESTADO DE CHILE	3.7	3.6	2.3	4.9	3.1	3.1	-
BANCO SANTANDER - CHILE	-	1.9	1.5	1.1	0.7	0.6	0.5
BANCO DE CHILE	3.4	2.7	4.0	1.8	1.0	0.8	2.7
BANCO O'HIGGINS	-	4.5	-	-	-	-	-
CORPBANCA	-	-	0.1	0.1	*1.2*	*1.3*	*1.6*
CITIBANK N A.	0.4	0.4	0.3	0.7	0.9	0.5	0.7
BANCO SECURITY	0.1	0.1	0.4	-	-	-	-
BBVA BANCO BHIF	-	-	*0.7*	*1.8*	1.0	0.9	0.9
BANCO SANTIAGO	*3.8*	*5.0*	*7.0*	*6.2*	3.6	2.8	2.1

Source: Authors computation using SAFP database. Bank's instruments include demand and time deposits, mortgage letter of credit, subordinated bonds and stocks.

Table C

Deposit from connected pension funds to total bank deposits(1)
Percentage at December each year

	1995	1996	1997	1998	1999	2000	2001
BANCO DEL ESTADO DE CHILE	0.1	0.1	0.1	0.3	0.2	0.3	-
BANCO SANTANDER – CHILE	-	0.9	1.5	0.7	0.5	0.5	0.3
BANCO DE CHILE	3.1	3.2	5.2	1.9	1.1	0.8	2.9
BANCO O'HIGGINS	0.3	0.4	0.1	-	-	-	-
CORPBANCA	0.5	0.3	0.2	0.3	*8.2*	*7.9*	*10.3*
CITIBANK N A.	2.0	1.7	1.5	2.8	3.3	2.4	3.2
BANCO SECURITY	0.5	0.2	1.5	0.8	-	-	-
BBVA BANCO BHIF	-	-	*2.6*	*7.8*	5.6	5.2	4.9
BANCO SANTIAGO	*3.3*	*4.6*	*3.0*	*3.6*	2.6	2.1	1.6

(1) Bank's deposits include demand and time deposits, mortgage letter of credit and subordinated bonds.