Board structure, Ownership structure, and Firm performance: Evidence from Banking[*]

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Abstract

This paper examines the interrelations among five ownership and board characteristics in a sample of 260 bank and savings-and-loan holding companies. These governance characteristics, designed to reduce agency problems between shareholders and managers, are insider ownership, blockholder ownership, the proportion of outside directors, board leadership structure, and board size. Using two-stage least squares regressions, we present evidence of interdependencies between board and ownership structures. The results suggest that banks substitute between governance mechanisms that align the interests of managers and shareholders. These findings suggest that cross-sectional OLS regressions of bank performance on single governance mechanisms may be misleading. Indeed, we find statistically significant relationships between performance and insider ownership and blockholder ownership when using OLS regressions. However, these statistically significant relationships disappear when the simultaneous equations framework is used. Together, these findings are consistent with optimal use of each governance mechanism by banks.

Keywords: Corporate governance, board structure, ownership structure, performance, banking, simultaneous equations

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1.Introduction

The separation of ownership and control in publicly held corporations induces conflicts of interest between managers and shareholders (Berle and Means, 1932). Shareholders are interested in maximizing the value of the firm, but managers' objectives may also include the increase of perquisite consumption and job security. A number of governance mechanisms may help to align the interests of managers with those of shareholders. This includes equity ownership by managers (Jensen and Meckling, 1976), by outside blockholders (Kaplan and Minton, 1994) and executive compensation (Mehran, 1995). In addition the board of directors may play a central role in monitoring managers (Fama, 1980). Board size, board composition and the leadership structure of the board are important characteristics that affect the effectiveness of the board in monitoring management (Jensen, 1993).

The role of ownership structure (Morck et al., 1988, and McConnell and Servaes, 1990) and board structure (Baysinger and Butler, 1985; Rechner and Dalton, 1991; Yermack, 1996, Eisenberg et al., 1998, and Bhagat and Black, 2002) in monitoring management and so improving firm performance has been largely investigated in empirical corporate governance literature. While the results are mixed the approach used in studying the relation between governance mechanisms and firm performance is mostly the same. Underlying these studies on the effect of ownership and board structure on performance is the assumption that there is an optimal ownership and board structure which is common to all firms, and that firms which diverge from the optimal level of these characteristics will experience lower performance.

The alternative view is that several governance mechanisms, among which ownership structure and board structure, are available at the same time, and that they are endogenously determined according to the costs and benefits of each. The costs and benefits of each governance mechanism may vary across firms, making the use of one more attractive to one firm than to another. Each mechanism will be thus used by each firm up to a level where the marginal benefit equals the marginal cost. Consequently, optimal corporate governance structures vary across firms, and result in equally good performance. Under this view there will possibly be no empirical relationship between ownership and board structure and performance. Studies that have adopted this approach include Demsetz and Lehn's (1985) investigation of the determinants of ownership concentration, Himmelberg et al.'s (1999) examination of the determinants of managerial ownership, Hermalin and Weisbach's (1991) investigation of the interaction between board composition and insider ownership and their effect on performance, and Cho's (1998) study of the interactions between managerial ownership, investment and corporate value. Agrawal and Knoeber (1996) and Mak and Li (2001) adopt the same approach but work with a more complete set of governance mechanisms.

In banking, this approach has been adopted by a number of authors, among whom Schranz (1993) and Booth et al. (2002) who look at the effect of the presence of regulation in the banking industry on the use of other corporate control mechanisms, designed to provide managers with incentives to maximize firm value. Schranz (1993)

looks at the effect of the restriction of takeover activity in some states on the use of other corporate control mechanisms, such as the concentration of equity ownership and management ownership of stock , and on firm performance. Using a simultaneous equations framework she finds that when takeover activity is restricted, banks have higher levels of managerial ownership and equity concentration. Nevertheless, higher levels of managerial ownership and equity concentration have a smaller effect on profitability and do not completely compensate for the absence of an active takeover market. Booth et al. (2002) study the effect of regulation on the role of internal monitoring mechanisms such as the presence of independent outside directors, managerial stock ownership and the separation of the chairman and CEO titles. They find that in regulated industries such as banking the interrelations among internal governance mechanisms are not as strong as in industrial firms. They interpret this as evidence that regulation serves as a substitute for internal monitoring mechanisms. However, their analysis suffers from a simultaneity bias since they recognize the simultaneous determination of the different internal corporate control mechanisms but do not control for it in their empirical analysis.

The present study continues the above line of research by investigating the interrelations among a number of corporate control mechanisms and with firm performance in a sample of U.S bank (BHC) and savings-and-loan holding companies (SLHC). It adds to studies such as Schranz and Booth et al. in two ways. First, contrary to both studies we work with a more complete set of governance variables, which relate to board and ownership structure. In this respect, our study compares more to Agrawal and Knoeber (1996) and Mak and Li (2001). Second, we use a data set from a recent period; the year 2002. This allows us to examine the trade offs between corporate control mechanisms and their effect on performance when banks face the same external disciplinary mechanisms nation wide. Recently the banking industry has undergone important changes that shifted the business environment of banking firms to a more competitive one. Deregulation that started in the 1980s, and continued in the middle of the 1990s with the Riegle-Neal Interstate Banking and Branching, made banks less protected by expanding the market for corporate control. The Gramm-Leach-Bliley Act, which became effective in 2000, increased competition on the product market and expanded the banking opportunity set by broadening the range of activities banks can engage in. All these changes unified the market for corporate control and the market for financial services, and led banks to operate under the same "threats" nation wide. Consequently, governance mechanisms such as the board of directors and ownership structure are expected to play a more active role in aligning managers' interests with those of shareholders. Working with data from a recent period allows to neutralize the effect of regulation, regarding the takeover market and the product market, on the choice of the other corporate control mechanisms by banks. Since the intensity of these external mechanisms became the same for all banks, we can get a better insight on how the latter design their ownership and board structures in order to reduce the manager/shareholder agency problem.

In order to examine the interrelations of board and ownership variables and their possible effect on firm performance we work on a sample of 260 bank and savings-and-

loan holding companies. We use a simultaneous equations framework and test for two hypotheses. The first hypothesis states that banks substitute between the different corporate control mechanisms designed to reduce the agency conflict between managers and shareholders (the substitution hypothesis). The second hypothesis states that banks use the different corporate control mechanisms in an optimal way, depending on the costs and benefits of each. If this is the case an empirical analysis that takes into account the endogeneity of corporate control mechanisms should reveal no relation between them and firm performance (the optimal use of governance mechanisms hypothesis).

The findings of this paper indicate that there are interrelations among board and ownership structures of banking firms. Banks with higher equity ownership by managers and directors (insiders) have a lower proportion of outside directors sitting on their board. Since both outside directors and insider ownership are both considered as mechanisms designed to mitigate the manager/shareholder agency problem, we interpret this as evidence that banks substitute between corporate control mechanisms intended to accomplish the same role. The results indicate also that banks with higher insider ownership have a lower probability to have a CEO who is also the chairman of the board. Consistent with the "passing the baton" hypothesis suggested in earlier studies we find that CEOs with a longer tenure are more likely to hold the chairman title. The findings are also in favor of the optimal use of governance mechanisms hypothesis. An OLS regression of the set of governance mechanisms on firm performance, as measured by the Tobin's Q, reveals a negative and statistically significant effect of insider and blockholder ownership on bank performance. However, when the Two stage Least Squares (2SLS) procedure is used these statistically significant effects disappear. Overall the results of this study show that corporate ownership and board structures of banking firms are inextricably linked and that banks use optimal levels of each governance mechanism.

The remainder of this paper proceeds as follows. Section 2 discusses some possible directions for the interrelations among governance mechanisms and with firm performance. Section 3 introduces the empirical approach used to study the relationships among the governance mechanisms. Section 4 introduces the sample and provides descriptive statistics. Section 5 discusses the results, and section 6 summarizes and concludes the paper.

2. Relationships among governance mechanisms and with firm performance

Several governance mechanisms work together to provide incentives to managers and, so, alleviate the agency problems between shareholders and managers resulting from the separation between ownership and control. This includes what is called the internal control system, composed mainly by the board of directors, who has the task to hire, reward, potentially fire managers, and to design the system of incentives for them. It includes also the external governance mechanisms, such as the product market, the market for corporate control, the presence of concentrated shareholdings by persons or institutions, the labor market for managers, and the capital market, whenever the company relies partly on debt. An empirical analysis focused on companies belonging to

the same industry, such as banking, has the advantage that most of the external control mechanisms have the same effect on all companies, at least of a certain size, in the industry. For instance the intensity of the market for corporate control and the competitiveness of the labor market for managers and of the product market are common to all banks. Thus focusing mainly on internal governance mechanisms, in a single industry, may give a better idea of the interrelations among internal governance mechanisms and their potential effect on performance. This study is mainly focused on the interrelations among internal governance mechanisms in banking firms. Nevertheless, blockholder ownership is included as a governance mechanism, since its extent varies from one bank to another even when the other external mechanisms are common to all banks. The internal governance mechanisms are the equity ownership by officers and directors (insider ownership), the proportion of outside directors, the duality of leadership structure[1], and the number of directors sitting on the board (board size).

2.1. Manager and director ownership

Managers and directors whose personal wealth is significantly linked to the value of the firm will have the incentive to act in the interests of outside shareholders. According to Jensen and Meckling (1976) if outside shareholders can costlessly assess the extent to which an owner-manager imposes agency costs on other shareholders, the market value of the firm's stock will be reduced, decreasing therefore the owner's wealth. The corporate governance literature argues that increasing stock ownership by managers and directors can be an effective control mechanism designed to reduce the moral hazard behavior of firm managers. If this is an effective control mechanism, then an increase in the extent of its use would induce a reduction in the level of other monotoring mechanisms such as the presence of blockholders and outside directors.

2.2. Blockholder ownership

The presence of shareholders holding a high proportion of the firm's capital constitutes another way to mitigate the effects of the separation of ownership and control on firm value. The manager of a firm in which each shareholder holds only a small fraction of the firm's capital can engage in value reducing activities (Berle and Means, 1932). Indeed a shareholder with a little stake in the firm has weak incentives to engage in the monitorong of managers since he or she supports all the costs of minitoring while getting only a small fraction of the benefits (the typical free rider problem). In contrast, an ownership structure in which one or more shareholders own a large block of stock has the potential for refuting managers from engaging in moral hazard behavior. The presence of blockholders may represent a threat to the company's management because of the power to launch a proxy fight, or in the extreme, a takeover bid. A blockholder may also nominate a person to represent him or her on the board of directors, in order to ensure that management is acting in the interests of shareholders. Consequently, firms with blockholder ownership are expected to have less agency problems, and the need for alternative control mechanisms is reduced.

[1] Throughout this paper "duality of leadership structure" refers to the situation where the CEO holds the title of the chairman of the board.

2.3. The proportion of outside directors

Another mechanism designed to mitigate the moral hazard behavior of managers is monitoring by the board of directors. Most corporate charters require that shareholders elect a board of directors, whose mission is to monitor management and assist in strategic planning within the firm. Most importantly, for the board to be effective in carrying out its task of management monitoring it has to be independent of the management team. Therefore, it is argued by a number of academicians and professionals that the presence of directors who are not employees of the firm may enhance the effetiveness of the board of directors in monitoring managers, and improving firm value. The rationale behind this is that outside directors are more likely to defend the interests of outside shareholders. Fama and Jensen (1983) argue that outside directors have the incentive to act as monitors of management because they want to protect their reputations as effective, independent decision makers. Weisbach (1988) finds that outside-dominated boards are more likely than inside-dominated boards to replace the CEO in response to poor performance. In banking, the results regarding the effectiveness of outside directors are mixed. Brewer III et al. (2000) find that bid premiums offered for target banks increase with the proportion of independent outside directors. However, Pi and Timme (1993) and Adams and Mehran (2002) find that the proportion of outside directors is not related to performance measures. Since the presence of outside directors entails costs to the firm, that take the form of fees, travel expenses, stocks and stock-options, we would expect that banks will use higher numbers of outside directors only when the other corporate control mechanisms are weak.

2.4. CEO-Chairman duality

Many shareholder activits and corporate governence scholars consider that separating the titles of chairman and CEO will reduce agency costs and improve firm performance. The reason is that when the CEO is also the chairman of the board, the power within the firm is concentrated in one person's hands. This allows the CEO to control information available to other board members. The board becomes under the control of managers, which prevents it from effectively accomplishing its tasks of hiring, eventually firing, and rewarding top executive officers, and to ratify and monitor important decisions. Given the decrease in the effectivenes of the board, the potential agency costs resulting from the separation of ownership and decision making are exacerbated. Jensen (1993) recommends that companies separate the titles of CEO and board chairman. Pi and Timme (1993) study a sample of banks over the 1987 – 1990 period. Their results suggest that after controlling for bank size and other control variables, costs are lower and return on assets are higher in banks with two different persons holding the CEO and chairman titles. Control mechanisms designed to mitigate the agency problem are therefore expected to be used to a larger extent in companies operating with a dual leadership structure.

2.5. Board of directors' size

The largely shared wisdom regarding the optimal board size is that the higher the number of directors sitting on the board the less is performance. This leans on the idea that communication, coordination of tasks, and decision making effectiveness among a large group of people is harder and costlier than it is in smaller groups. The costs overwhelm the advantages gained from having more people to draw on. Jensen (1993) states that "Keeping boards small can help improve their performance. When boards get beyond seven or eight people they are less likely to function effectively and are easier for the CEO to control." (p. 865) Lipton and Lorsch (1992) also call for adoption of small boards, and recommend that board size be limited to seven or eight members. A number of empirical studies have documented a negative effect of board size on firm performance (Yeramck, 1996 and Eisenberg et al., 1998). Therefore corporate mechanisms such as insider and blockholder ownership, and the presence of high proportions of outside directors become more important in firms with large boards.

2.6. The effect on firm performance

The classical argument about the relationship between corporate governance variables and firm performance is that, for some variables, the greater the level of the variable and the better is firm performance; the opposite holds for other variables. Consider for instance, stock ownership by insiders and blockholders. The largely shared wisdom, about these two control mechanisms, is that firms with more insider ownership and blokholder ownership achieve a better performance. The same argument holds for the presence of outside directors on the board, *i.e.*, the more outside directors the firm has on its board the better is its performance. Regarding the size of the board, a number of academicians and professionals call for smaller boards of directors, based either on intuition or empirical findings. The rationale behind this is that the effectiveness of larger boards is lower, and firms will gain, in terms of performance, if they choose to operate with boards composed of a limited number of directors.

However, another argument consists to say that each corporate control mechanism generates benefits to the firm but also entails costs. Therefore, a corporate control mechanism will be used up to a level where the marginal benefits equal the marginal costs. Most importantly, the optimal levels of the different control mechanisms may vary across frims, yielding different levels of use of each mechanism but with equally good performance. In addition to the optimal use of each corporate control mechanism, a number of these mechanisms are designed to achieve the same objective, which is to reduce the extent of the moral hazard behavior by managers. Consequently, higher levels of the use of one mechanism may induce lower levels of the use of other mechanisms, without having a negative effect on firm performance. According to this argument, a cross sectional analysis would not yield any significant relationship between corporate governance mechanisms and firm performance, all other things being equal.

2.7. Hypotheses

Since all of the governance mechanisms we described above are alternative ways to provide incentives to managers, each might plausibly be used instead of another. If so, we would expect the use of the different mechanisms to be related to each other. Depending on the mechanisms of interest, positive, as well as negative, relations might exist. For instance banks with higher levels of insider ownership would have less blockholders and less outsider directors. Likewise, banks with higher insider ownership, blockholders or higher proportions of outside directors would have less of a need for smaller boards or the separation of the CEO and chair titles. Accordingly, the first hypothesis to be tested in this paper is the substitution hypothesis:

H_1: Banks substitute between the alternative governance mechanisms. That is banks with heavy use of one mechanism will use lower levels of the other mechanisms.

We also argued that firms choose the level of their corporate governance mechanisms in a way that maximizes performance. That is the different corporate governance mechanisms are used in an optimal way. Therefore, the second hypothesis to be tested in this paper is the optimal use of governance mechanisms hypothesis:

H_2: Banks use the governance mechanisms in an optimal way. That is any cross sectional variation in their use reflect differences in the costs and benefits of each mechanism between banks. These differences in costs and benefits are themselves due to external factors, such as the business environment of the bank. Consequently, if these differences are controlled for, or if mechanism use is unrelated to the environment, there should be no cross-sectional relation between the level of the use of corporate governance mechanisms and measures of firm performance.

3. Empirical Analysis

The choice of any of the five ownership and board variables may depend upon choices of other ownership and board variables, and other factors related to the bank's underlying environment. These factors are related to bank size, bank age, and CEO characteristics and are treated as exogenous variables. To develop the system of equations, we draw on previous studies that have examined the determinants of ownership and board structure of firms (e.g., Demsetz and Lehn, 1985; Agrawal and Knoeber, 1996; Cho, 1998, Himmelberg et al., 1999, and Mak and Li, 2001).

There are five equations in the system of equations for ownership and board structure. The endogenous variables in the system of equations are insider ownership (INSOWN), blockholder ownership (BLOCK), the proportion of outside directors (OUTDIR), board leadership (LEADER), and board size (BSIZE)[2]. In estimating the system of equations, the following variables are used as instruments: RISK, TENURE,

[2] The definition of the variables used in the study is given in table 1 in the appendix.

LNCSIZE[3], RETURN, AGE, NINS, NYSE, and SLHC[4], where RISK is the standard deviation of monthly stock returns over the last 60 months, TENURE is the tenure of the chief executive officer, LNCSIZE is the natural logarithm of the company's size, RETURN is the average monthly stock retrun over the last twenty-four months, AGE is the number of years since the bank has been organized as a holding company, NINS is the number of top executive officers and directors in the bank, NYSE is a dummy variable that takes on 1 if the bank is listed on the New York Stock Exchange and 0 otherwise, and SHLC is a dummy variable that takes on 1 if the bank is a savings-and-loan holding company and 0 otherwise.

Consider the first equation in the system which relates to insider ownership (INSOWN). We expect INSOWN to depend not only on the levels of the other corporate governance mechanisms but also on other factors, such as the riskiness of the bank, its size and the number of persons holding these stock shares. Bank risk may impact insider ownership in two different ways. On the one hand, higher insider ownership levels, all else being equal, imply less diversification for insiders. Consequently, for risk averse managers and directors, the greater is the riskiness of the bank's stock return the lower is the optimal level of stock ownership. On the other hand, Demsetz and Lehn (1985) offer another explanation for the relation between firm risk and managerial ownership. They argue that a higher volatility of the stock returns may be considered as a signal for the higher noisiness of a firm's activity and environment. For such firms managerial behavior is more difficult to monitor. Therefore, firms operating in noisier environments should have higher insider ownership in order to limit the moral hazard behavior by managers. Similar to risk, bank size has an ambiguous effect on the scope for moral hazard and therefore on insider ownership. One argument leads to expect a positive association between bank size and insider ownership. According to this argument larger banks hold more opaque assets, increasing the scope for managers to engage in value reducing activities. The cost of monitoring in larger banks is higher, which increases the optimal level of insider ownership.

The other argument is that larger banks are the subject of more monitoring and control by regulators, reducing therefore the scope for moral hazard behavior by managers. This will, in turn, lead to a lower optimal level of insider ownership in larger banks. Besides, for a given fraction of ownership, investing in one firm's capital requires more wealth the larger is the firm. Risk aversion implies that the larger the firm and the lower is the proportion of the firm's capital held by insiders. INSOWN should be positively related to the number of officers and directors, denoted NINS. Indeed the cost of insider shareholdings, resulting from under-diversified portfolios, will be less when these shares are divided among a larger number of insiders (Agrawal and Knoeber, 1996). SLHC is included as an exogenous variable in all the equations since the

[3] In all the estimations the distribution of bank size (CSIZE) is normalized by using its natural logarithm, LNCSIZE.

[4] To satisfy the order condition, ensuring that the equations in the system are identified, each equation must exclude at least four of the exogenous variables since each equation includes four endogenous variables as regressors (Kennedy, 1998). The specification of equations (1) – (5) is partly driven by the need to satisfy this order condition.

governance structure may be determined differently in Savings and Loan Holding Companies[5]. We therefore have the following model:

$$\begin{aligned} INSOWN = a_0 + a_1 BLOCK + a_2 OUTDIR + a_3 LEADER + a_4 BSIZE + a_5 LNCSIZE \\ + a_6 RISK + a_7 NINS + a_8 SLHC + e_1 \end{aligned} \quad (1)$$

The second equation in the system relates to blockholder ownership (BLOCK). Similar to eq (1) we include the four other board and ownership variables as explanatory variables, and we add other exogenous variables which we think determine the extent of stock ownership by blockholders. We define BLOCK as the percentage of equity owned by persons and institutions holding 5% or more of the company's equity. BLOCK may be affected by RISK and LNCSIZE in the same way as INSOWN. Indeed the same arguments discussed above are valid for the extent of ownership concentration within outside shareholders' hands. Following Agrawal and Knoeber (1996) we also include NYSE to control for the possibility that BLOCK depends on whether the bank is listed on the New York Stock Exchange or not. In particular, institutional investors may be attracted by banks listed on the NYSE (see also Himmelberg et al., 1999 for a similar argument). So, NYSE should be positively related to BLOCK. Summarizing, we have:

$$\begin{aligned} BLOCK = ß_0 + ß_1 INSOWN + ß_2 OUTDIR + ß_3 LEADER + \\ ß_4 BSIZE + ß_5 LNCSIZE + ß_6 RISK + ß_7 NYSE + ß_8 SLHC + e_2. \end{aligned} \quad (2)$$

The proportion of outside directors is expected to be positively related to LNCSIZE. Larger banks have more opaque assets and operations which require higher monitoring of managers. One way to improve the monitoring of management is to have more outside directors sitting on the board. Furthermore, Agrawal and Knoeber (1996) argue that the greater visibility of large firms may induce more board seats devoted to representatives of the public, for example consumer or environmental interests. Based on results by Baghat and Black (2002), who find that in the aftermath of poor performance, companies tend to add more outside directors to their boards, OUTDIR is expected to be negatively related to past performance (RETURN). Therefore, we have:

$$\begin{aligned} OUTDIR = d_0 + d_1 INSOWN + d_2 BLOCK + d_3 LEADER + d_4 BSIZE \\ + d_5 LNCSIZE + d_6 RETURN + d_7 SLHC + e_3. \end{aligned} \quad (3)$$

LEADER is a dummy variable that takes on 1 if the CEO is also the chairman of the board and 0 otherwise. Based on empirical work by Brickley et al. (1997), LEADER is expected to be positively related to both TENURE and RETURN. Brickley et al. report that a CEO who performs well, and who has served for a long time within the company is likely to be granted the title of chairman of the board. Therefore, we have:

[5] Our results are qualitatively the same when we consider only the sample of bank holding companies (BHC).

$$\begin{aligned} LEADER = & f_0 + f_1 INSOWN + f_2 BLOCK + f_3 OUTDIR + f_4 BSIZE \\ & + f_5 RETURN + f_6 TENURE + f_7 SLHC + e_4. \end{aligned} \quad (4)$$

The last endogenous variable related to corporate control is board size. Yermack (1996) and Eisenberg et al. (1998) report a positive correlation between board size and the total assets of the firm, implying that larger companies have larger boards. Indeed as the bank gets larger the number and complexity of its operations increases, requiring therefore more directors to rely on. We also expect board size to be positively related to the number of years since the bank has been organized as a holding company (AGE). The reason is that as time goes on more managers are promoted to directors, and as a result boards become larger (Mak and Li, 2001). In addition, as the bank gets well established as a holding company the number of its subsidiaries may increase. This implies that more executive officers working within the subsidiaries join the board of directors of the holding company. BSIZE is therefore expected to be positively related to both LNCSIZE and AGE.

$$\begin{aligned} BSIZE = & j_0 + j_1 INSOWN + j_2 BLOCK + j_3 OUTDIR + j_4 LEADER \\ & + j_5 LNCSIZE + j_6 AGE + j_7 SLHC + e_5. \end{aligned} \quad (5)$$

4. Data

4.1. Sample selection

The sample consists of Bank Holding Companies (BHCs) and Savings-and-Loan Holding Companies (SLHCs) available in the *Research Insight* database of *Standard & Poor's*, in 2002. The following criteria have been applied to select the final sample:

1. The company has total assets of at least $1,000 millions at fiscal year end 2002.
2. Market return on common stock of the company must be reported in the Center for Research in Security Prices (CRSP) database for at least twelve months as of year end 2001.
3. Annual proxy statements for the fiscal year 2002 must be available on the Securities and Exchange Commission website.

In *Research Insight* there were a total of 287 BHCs and S&LHCs with total assets of more than $1,000 millions. Complete data were available for 260 companies. Data for the final sample (260 companies) are obtained from four sources:

1. Accounting data for the fiscal year 2002 are from *Research Insight*.
2. Stock market data are from the CRSP database.
3. Ownership and board data are collected from the annual proxy statements filed with the Securities and Exchange Commission (SEC) at the beginning of the 2002 fiscal year.
4. Data on capital structure are collected from annual reports 10-K, available on the SEC website.

Fig. 1 summarizes the selection of the final sample.

Companies in *Research Insight* with at least $1,000 millions of total assets in 2002.	287 companies
less	
Companies with less than one year of stock returns in CRSP.	12 companies
less	
Companies with no annual proxy statements on the SEC website.	15 companies
Final sample	260 companies

Fig. 1. Sample selection.

4.2. Descriptive statistics

[Insert table 2 here]

Table 2 reports descriptive statistics for the variables used in the study of the relation between ownership structure, board structure and performance. The average equity ownership by insiders (officers and directors) is 14.12% (median: 9.55%). Blockholder ownership has an average of 7.97%. The typical bank in the sample has 12 directors, among whom 83.33% are outsiders (not employed by the company), has 17 directors and top-executive officers, and has a CEO who is also chairman of the board. The typical bank has been operating as a holding company for the last 18 years, and its CEO has held his position for the last 7 years. The average bank in the sample has total assets of $21.24 billions (median: $3.12 billions). Average Tobin's Q is 1.07 (median: 1.07). Average tier 1 leverage ratio is 8.33% (median: 7.92%), and average standard deviation of monthly stock returns in 2002 is 7.44% (median: 6.9%). The risk of the typical bank, as measured by the standard deviation of the monthly stock return over the last 60 months, is equal to 8.75%, and the median monthly stock return over the last two years is equal to 1.87%. Savings-and-loan holding companies represent 25.7% of the total sample. Finally, banks listed on the New York Stock Exchange represent 23.4% of the total sample.

5. Empirical Findings

5.1. The relationships among the governance mechanisms

To examine the relationships among the governance mechanisms, we estimate Eqs. (1)-(5) as a system of linear equations using Two Stage Least Squares (2SLS). Each governance mechanism appears on the left-hand side of one equation and the right-hand side of each of the others. Results of the 2SLS estimation are presented in table 3.

[Insert table 3 here]

Table 3 shows that there is an interesting pattern of interdependence among several of the governance mechanisms, which is in favor of the substitution hypothesis[6]. For Eq. (1) relating to insider ownership, the signs on the other ownership and board variables is generally consistent with these mechanisms being substitutes. However, none of the coefficient estimates is statistically significant. The results for Eq. (2) relating to blockholder ownership are similar to those for insider ownership, with none of the variables being significant. The weak findings for insider and blockholder ownership are consistent with Agrawal and Knoeber (1996), Mak and Li (2001) but conflict with those of Demsetz and Lehn (1985) and Schranz (1993).

The results for Eq. (3) suggest that the proportion of outside directors on the board decreases with the increase in insider ownership ($p<0.01$), and the decrease in board size ($p<0.01$). The relationship between managerial ownership and outside directors is consistent with these governance mechanisms being substitutes. Banks with high levels of insider ownership have less agency problems between managers and shareholders, and therefore have less need for monitoring by outside directors. However, another interpretation is that an increase in insider ownership increases the ability to influence board appointments, thereby reducing the presence of outside directors. Since smaller boards are considered as better monitors for managers (Jensen, 1993), the presence of more outside directors on larger boards may be interpreted as evidence that when the board gets larger, there is more need for outside directors. If banks "believe" that outside directors are better for monitoring managers, they will compensate for the lack of monitoring by larger boards by increasing the proportion of outside directors.

For the board leadership structure (Eq. (4)), the results suggest that the presence of a dual leadership structure is negatively associated with higher levels of insider ownership ($p<0.01$) and positively related to longer CEO tenure ($p<0.1$). The negative association between insider ownership and dual board leadership indicates that the probability of the CEO being also the chairman of the board decreases with increasing equity ownership by officers and directors. This may be seen as a sign of good governance in banks with high levels of insider equity ownership. In these banks insiders have more interest in good governance and they require the separation of the two positions (CEO and board chairmanship). The finding that CEOs with longer tenure are more likely to hold the title of chairman is consistent with Brickley et al. (1997) who argue that dual leadership is a consequence of the "passing the baton" process in managerial succession. Finally, the results for Eq. (5) indicate that banks with more insider ownership ($p<0.1$) and more outside directors ($p<0.01$) have larger boards. Again, if larger boards are considered as ineffective in monitoring managers, this suggests that the lack of monitoring due to higher board size is compensated by the presence of insiders with larger equity interests in the bank and higher proportions of outside directors.

[6] In table 3, the coefficients on the exogenous variables generally have the predicted sign but are often statistically insignificant. As a result, coefficient estimates for the endogenous governance variables may be imprecise.

5.2. Corporate govemance and bank performance

In this section we test the hypothesis of the optimal use of governance mechanisms by banks. In section 2 we argued that governance mechanisms are used by firms in a way that maximizes their performance. The optimal level of use of each mechanism varies from one firm to another depending on a number of factors related to the firm itself as well as to its business environment. Agrawal and Knoeber (1996) and Mak and Li (2001) find that once the empirical analysis takes into account the endogeneity of corporate governance mechanisms, there is no effect of individual corporate governance mechanisms on performance. In this section, we conduct a similar analysis to Agrawal and Knoeber (1996) and Mak and Li (2001), by estimating OLS and 2SLS regressions of bank performance, as measured by Tobin's Q, on various corporate governance variables. This analysis is attempted to provide further evidence on whether corporate governance mechanisms in banking companies are endogenously determined, and therefore have no effect on performance. Before allowing for the endogeneity of governance mechanisms, we first estimate regressions where bank performance depends upon only a single governance mechanism.

Table 4 presents results from OLS estimations where Tobin's Q is regressed on individual governance mechanisms along with other control variables. These variables include the capital structure, as measured by the tier 1 leverage ratio (CAPITAL), the uncertainty of cash flows, as measured by the standard deviation of monthly stock returns (STDEV), and a control for company size, as measured by the natural logarithm of total assets (LNCSIZE). Table 5 presents OLS and 2SLS regression estimates of Tobin's Q on the five governance mechanisms and control variables. The 2SLS regression is estimated by adding Eq. (6) to the system of Eqs. (1)-(5), including TOBINQ as an additional endogenous variable, and adding CAPITAL and STDEV to the set of instrumental variables. Therefore, the simultaneous equations system treats the five governance variables, as well as performance, as endogenous. The performance equation is the following:

$$\begin{aligned} TOBINQ = ?_0 + ?_1 INSOWN + ?_2 BLOCK + ?_3 OUTDIR + ?_4 LEADER + ?_5 BSIZE \\ + ?_6 CAPITAL + ?_7 STDEV + ?_8 LNCSIZE + ?_9 SLHC + e_6. \end{aligned} \quad (6)$$

[Insert tables 4 and 5 here]

Contrary to theory and expectations, the results of the OLS estimations, presented in tables 4 and 5, together show that greater insider and blockholder ownership lead to poor performance in banking companies. The results are consistent with less insider and blockholder ownership leading to better performance. But these results are also consistent with causality running the other way around. Poor firm performance may lead insiders and blockholders to reduce their equity ownership in the bank. The 2SLS estimation allows to address the issue of which way the relation runs in each case.

The regression reported in the second column of table 5 not only considers the presence of alternative corporate governance mechanisms but also accounts for their endogeneity. Comparing the 2SLS estimates with the OLS estimates in the first column, the coefficient estimates on insider ownership and blockholder ownership loose their statistical significance. Furthermore, the performance model becomes statistically insignificant (the p-value of the F test is equal to 0.73). We interpret this as evidence in favor of the hypothesis of optimal use of governance mechanisms by banks. When the regression analysis takes into account the endogeneity of the ownership and board structure in banks it reveals no statistically significant effect of these governance mechanisms on banking performance.

6. Summary and conclusions

This paper investigates the interrelations of corporate ownership and board structure characteristics, and their effect on firm performance in a sample of bank and loan-and-savings holding companies. We argued that since banking companies face the same external disciplining factors, such as the market for corporate control and the product market, if banks internal control mechanisms are determined in an optimal way, a carefully specified empirical analysis should reveal significant links between the different corporate control mechanisms designed to mitigate the scope for moral hazard behavior by managers, but no effect on firm performance. We develop two hypotheses which are the substitution hypothesis and the optimal use of governance mechanisms hypothesis, and test them on a sample of 260 bank and loan-and-savings holding companies, in 2002. The substitution hypothesis states that banks substitute between the different governance mechanisms at their disposal, such as insider ownership, bolckholder ownership and the presence of outside directors. The optimal use of governance mechanisms hypothesis states that if the governance mechanisms are used in an optimal way, an empirical analysis should reveal no effect on performance. We use the Two Stage Least Squares approach and find evidence in favor of these two hypotheses.

The results indicate that ownership and board structures are related to each other. In particular, we find that banks with higher equity ownership by managers and directors tend to have lower proportions of outside directors on their boards. Since outside directors and higher equity ownership by insiders are considered as mechanisms designed to reduce the agency conflict between managers and shareholders, this may be interpreted as evidence that a bank that relies heavily on one mechanism has lower need for the other one. Depending on the costs and benefits of each mechanism, a bank will choose either to have a higher representation of outside directors or to have an ownership structure in which managers and directors have high stakes. The results indicate also that banks with higher insider ownership have a lower probability to have a CEO who is also the chairman of the board. Consistent with the "passing the baton" hypothesis suggested in earlier studies we find that CEOs with a longer tenure are more likely to hold the chairman title. The findings are also in favor of the optimal use of governance mechanisms hypothesis. In fact, an OLS regression of governance mechanisms reveals a negative and statistically significant effect of insider and blockholder ownership on bank performance. However, when the 2SLS procedure is used these statistically significant

effects disappear. Overall the results of this study show that corporate ownership and board structures of banking firms are inextricably linked and that banks use optimal levels of each governance mechanism. Models that consider single ownership or board characteristics, such as managerial ownership or the proportion of outside directors may therefore be misspecified.

One of the limitations of this study is the possible omission of governance variables that may be relevant in the performance equation or with strong relations to other governance mechanisms. For instance, the extent to which some banking firms rely on subordinated debt may help them reduce agency problems between managers and shareholders, and possibly rely less on other governance mechanisms. Therefore, the system of equations may be misspecified. Corporate governance theory is, unfortunately, incomplete to help taking into account all relevant mechanisms, when estimating a system of equations of governance mechanisms. The findings of this study suggest possible trails for future research. For instance, replicating this study on firms from other regulated industries, such as airline companies, media companies, or insurance companies, may enhance the understanding of the interrelations between governance mechanisms when companies are operating in the same business environment.

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Table 1: variable description

INSOWN	Percentage of equity owned by the company directors and top executive officers, including the CEO.
BLOCK	Percentage of equity owned by persons and institutions that hold 5% or more of the company's equity.
OUTDIR	The proportion of directors not currently employed by the company. It is calculated as the number of outside directors divided by the total number of directors.
LEADER	A dummy variable that takes on 1 if the CEO is also the chairman of the board and 0 otherwise.
BSIZE (board size)	The number of directors sitting on the board at the shareholders' annual meeting.
TOBINQ	Tobin's Q = (total assets book value – book value of common equity + market value of common equity)/ total assets book value.
RISK	The standard deviation of monthly stock returns over a maximum of 60 months and a minimum of 12 months, depending on data availability on CRSP.
TENURE	The number of years the CEO has held his position within the company.
CSIZE	Book value of total assets.
LNCSIZE	Log (Book value of total assets).
RETURN	The average monthly market return over the last 24 months.
AGE	The age of the company measured as the number of years since the company's organization as a holding company.
NINS	Number of insiders reported in the annual proxy statements as owning equity of the company.
CAPITAL	A measure of capital structure: the tier 1 leverage ratio collected from annual reports 10-K.
STDEV	Standard deviation of monthly stock returns in 2002.
SLHC	A dummy variable that takes on 1 for Savings and Loan Holding Companies and 0 for Bank Holding Companies.
NYSE	A dummy variable that takes on 1 for banks listed on the New York Stock Exchange and 0 otherwise.

Table 2: Descriptive statistics (sample size = 260).

Variables	Min	Median	Mean	Max	Std. Dev
Insider Ownership (INSOWN %)	0	9.55	14.127	79.38	13.712
Blockholder ownership (BLOCK %)	0	0	7.973	80.44	13.623
Proportion of outside directors (OUTDIR %)	50.000	83.333	80.825	95.833	10.057
Leadership structure (LEADER)[a]	0	-	0.55	1	-
Board size (BSIZE)	4	12	12.32	31	4.428
Company risk (RISK %)	4.908	8.754	9.314	35.622	2.783
Average past return (RETURN %)	-5.003	1.869	1.818	6.609	1.295
Company size (CSIZE) in millions of U.S $	1,005.32	3,125.21	21,243.92	758,800	75,036
Log of Company size (LNCSIZE)	6.913	8.047	8.475	13.539	1.384
Tobin's Q (TOBINQ)	0.9	1.069	1.073	1.313	0.053
CEO tenure (TENURE)	1	7	9.15	42	7.164
Company Age (AGE)	2	18	18.511	53	10.562
Capital structure (CAPITAL %)	5.1	7.92	8.33	34.4	2.403
Volatility of monthly stock returns in 2002 (STDEV %)	2.660	6.961	7.446	31.743	3.202
Number of insiders (NINS)	5	17	18.234	41	6.34
NYSE[a]	0	-	0.234	1	-
SHLC[a]	0	-	0.257	1	-

[a] For the binary variables, the mean indicates the proportion of banks for which the variable equals 1.

Table 3: Results of 2SLS regression of ownership and board structure (sample size = 260). t-statistics are in parentheses. Asterisks indicate significance at the (1%)***, (5%)**, and (10%)* levels.

	Dependent variable				
Independent variables	**INSOWN**	**BLOCK**	**OUTDIR**	**LEADER**	**BSIZE**
Intercept	207.618	457.361	87.373***	5.691	-91.080***
	(1.07)	(0.62)	(9.48)	(1.53)	(-3.15)
INSOWN		-2.170	-0.449***	-0.038***	0.449*
		(-0.65)	(-2.62)	(-3.19)	(1.91)
BLOCK	-0.351		-0.180	0.0007	0.055
	(-0.56)		(-0.50)	(0.77)	(0.09)
OUTDIR	-2.307	-5.244		-0.068	1.063***
	(-0.90)	(-0.58)		(-1.40)	(3.75)
LEADER	-8.319	-21.635	-3.107		2.560
	(-0.29)	(-0.33)	(-0.79)		(0.50)
BSIZE	0.348	4.628	0.914***	0.054	
	(0.06)	(0.59)	(3.79)	(1.28)	
LNCSIZE	-2.093	-4.719	-1.037		1.198
	(-0.45)	(-0.33)	(-1.11)		(1.32)
RISK	-0.210	-0.333			
	(-0.11)	(-0.08)			
TENURE				0.028*	
				(1.85)	
NINS	0.852				
	(0.30)				
RETURN			0.027	-0.002	
			(0.05)	(-0.05)	
AGE					-0.034
					(-0.25)
NYSE		3.400			
		(0.31)			
SLHC	0.879	8.915	1.675	-0.047	-0.958
	(0.08)	(0.95)	(0.51)	(-0.17)	(-0.22)
Adjusted R^2	0.065	-0.021	0.125	0.073	0.080
F-statistic	3.26	0.32	6.29	3.95	4.24
(p-value)	(0.001)	(0.959)	(0.000)	(0.000)	(0.000)

Table 4: Coefficient estimates from OLS regressions of Tobin's Q on individual governance mechanisms (sample size = 260).

t-statistics are in parentheses. Asterisks indicate significance at the (1%)***, (5%)**, and (10%)* levels.

Independent variables	(1)	(2)	(3)	(4)	(5)
Intercept	1.048***	1.0225***	1.0201***	1.0254***	1.027***
	(39.51)	(40.76)	(28.85)	(40.87)	(40.18)
INSOWN	-0.0006**				
	(-2.54)				
BLOCK		-0.0002			
		(-1.19)			
OUTDIR			0.00005		
			(0.18)		
LEADER				0.0042	
				(0.66)	
BSIZE					-0.0003
					(-0.47)
CAPITAL	0.0028**	0.0034***	0.0031**	0.0031**	0.0031**
	(2.19)	(2.60)	(2.41)	(2.41)	(2.41)
STDEV	-0.003***	-0.0034**	-0.0034***	-0.0034***	-0.0035***
	(-3.03)	(-3.48)	(-3.53)	(-3.50)	(-3.61)
LNCSIZE	0.0046*	0.0066***	0.0065***	0.0061***	0.0069***
	(1.93)	(2.93)	(2.86)	(2.60)	(2.91)
SLHC	-0.0283***	-0.0259***	-0.0282***	-0.0285***	-0.0294***
	(-4.01)	(-3.49)	(-3.92)	(-3.99)	(-3.94)
Adjusted R^2	0.169	0.152	0.148	0.149	0.148
F-statistic	11.53	10.33	10.00	10.09	10.04
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 5: Coefficient Estimates from OLS and 2SLS Regressions of Tobin's Q on governance mechanisms (sample size = 260).
t-statistics are in parentheses. Asterisks indicate significance at the (1%)***, (5%)**, and (10%)* levels.

Dependent variable: Tobin's Q		
Independent variables	OLS Estimates	2SLS Estimates
Intercept	1.0681***	-0.1398
	(26.88)	(-0.06)
INSOWN	-0.0007***	0.0079
	(-2.77)	(0.60)
BLOCK	-0.0004*	0.007
	(-1.64)	(1.04)
OUTDIR	-0.0002	0.0125
	(-0.60)	(0.50)
LEADER	0.0036	0.0432
	(0.55)	(0.50)
BSIZE	-0.0001	-0.0128
	(-0.16)	(-0.52)
CAPITAL	0.0031**	0.0025
	(2.41)	(0.26)
STDEV	-0.0028***	-0.0092
	(-2.79)	(-1.04)
LNCSIZE	0.0042*	0.0275
	(1.63)	(0.65)
SLHC	-0.0258***	-0.0926
	(-3.37)	(-1.39)
Adjusted R^2	0.167	-0.011
F-statistic	6.78	0.67
(p-value)	(0.000)	(0.738)