Bankers on the Board and the Debt Ratio of Firms *

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Abstract

We investigate the impact that bankers on the board have upon a firm's debt ratio, debt to total capital, one year subsequent to their appointment. We find that the presence of lending bankers on a firm's board negatively affects the debt ratio, while the impact of non-lending bankers varies with the firm's probability of financial distress. The results suggest that non-lending bankers provide expertise and certification for distressed firms while exercising a monitoring role for non-distressed firms. In contrast, the results suggest that lenders on the board exercise a monitoring role independent of the firm's financial distress. When combined with established findings in the literature, we conclude that there may be two ways to avoid conflict between a board-appointed banker's fiduciary responsibility and the interests of her bank. When the potential for conflict is high, lenders may forgo board positions, while non-lending bankers may merely alter their role on the board.

JEL classification: G32, L22

Key words: Boards of directors; Capital structure; Commercial banks

1. Introduction

Do commercial bankers who join company boards follow fiduciary or self-interests? Recent work has suggested that when potential conflicts of interest are high, bankers are discouraged from joining a board (Kroszner and Strahan, 2001). Negative stock market reactions may also discourage commercial bankers from joining boards to advance their own interests (Kracaw and Zenner, 1998). These results may be particularly true for lenders, whose conflicts of interest would be most severe. But once on the board, are commercial bankers restrained from monitoring by the same factors that keep them off boards?

To answer this question, we examine the impact that commercial banker (henceforth simply "banker") appointment to the board has on company debt ratios, debt to total capital. We examine the impact on debt ratios for two reasons. First, recent work has suggested that the relation between bankers on the board and debt ratios may be an indicator of whether bankers serve a monitoring role in protection of self-interests or a service role following fiduciary interests (Booth and Deli, 1999). Second, banking industry and fiduciary interests are likely to diverge over company debt policy, especially for financially distressed companies (Kroszner and Strahan, 2001).

In a departure from prior studies, we control for the probability of financial distress. Kroszner and Strahan (2001) have argued that the degree of potential conflict between bankers and shareholder interests is a function of the information asymmetry between inside and outside risk assessors and the firm's probability of financial distress. Previous studies have controlled for the former factor, but not the latter. We introduce a control for the probability of financial distress, in recognition of the fact that creditor and shareholder interests are likely to diverge most for financially distressed firms. This study also departs from early ones by controlling for endogeneity in the banker-debt ratio relationship. Using a longitudinal data set and simultaneous estimation with instrumentation, we attempt to tease out preceding, concurrent and subsequent effects of banker appointment to the board. Conclusions from previous cross-sectional studies have been tempered by the difficulty in isolating causal relationships.

We examine three possible role scenarios for commercial bankers on board: 1) expertise provider 2) enabled monitor 3) disabled monitor. We also make a distinction between lenders, that is, commercial banks with an outstanding loan contract with the firm, and non-lending commercial banks. If the role of bankers on the board were to provide debt market expertise, among other areas, then we would expect lenders and non-lending bankers to have a similar impact on the debt ratio. We might also expect this impact to be consistent with shareholder interests. The second scenario, "enabled monitor", assumes that while potential conflicts of interest keep bankers off boards, once appointed to a board, bankers influence debt ratios in a manner consistent with their own interests, which may be at odds with shareholder interests. The "disabled monitor" scenario falls in between the first two. Under this scenario, potential liability costs constrain lenders from exercising a monitoring role, though they could benefit most from doing so (Kroszner and Strahan, 2001). Thus, their impact on the debt ratio may be muted. Meanwhile, non-lending bankers (henceforth "other bankers") may be free to act as indirect monitors with the associated debt ratio effects.

Our findings suggest that the impact of board-appointed lenders on the debt ratio is consistent with an enabled monitor role, while the impact of other bankers depends on the probability of financial distress. Results suggest that other bankers provide expertise and certification for distressed firms, while exercising a monitoring role for non-distressed firms. We confirm that bankers, especially lenders, are least likely to join firms where creditor-shareholder conflicts of interest are most acute (Kroszner and Strahan, 2001). Yet, the results also suggest that once on a company board, lenders exercise downward pressure on debt ratios in a manner divergent from shareholder interests. We may thus surmise that when monitoring benefits outweigh the costs, we are more likely to find lenders on the board exercising a monitoring role. When the costs of monitoring exceed the benefits, then lenders opt out of board representation (Kroszner and Strahan, 2001). Meanwhile, other bankers may serve on boards at the behest of the firm (Booth and Deli, 1999), since their impact is more closely aligned with that of investors.

We also find evidence consistent with the notion that conflicts of interests are most severe for firms where information asymmetry is compounded by the threat of financial distress. Controlling for information asymmetry, financially distressed firms[1] are less likely to add a lender to the board. But once appointed, the debt ratio impact of this lender diverges most from other bankers and investors on the board when the firm is financially distressed.

Our results extend findings from previous studies that the appointment of lenders may be bad news for shareholders. Creditors with board positions may gain an information advantage over outside creditors (Leland and Pyle, 1997; Kracaw and Zenner, 1998; Kroszner and Strahan, 2001). This advantage may be particularly detrimental to shareholders of financially distressed companies (Kroszner and Strahan, 2001). For these companies, creditor and shareholder interests diverge and creditors may have greater influence over management decisions. Thus, problematic appointments may be avoided and when they do occur, the market may react negatively (Kracaw and Zenner, 1998). Given our findings, the expectation by markets and firms that lender appointment to the board may bring conflict seems to be warranted, especially for financially distressed companies.

The rest of the paper proceeds as follows. First, we review why creditors on the board may lead to an information monopoly and the resulting dilemma this presents. Second, we review the ramifications of the information monopoly threat for banker appointment to the board and the subsequent role for bankers on the board. Third, we introduce our data and methods. These are followed by univariate and multivariate results. We present our conclusions in Section 6.

[1] When we refer to "financially distressed firms", we include those that are nearing financial distress. For the sake of convenience, we refer to any firm that has a high probability of bankruptcy as "financially distressed". "Non-distressed firms" have a low probability of entering bankruptcy.

2. Monopoly proposition reintroduced

Recent work has strongly suggested that commercial bankers on the board may be a mixed blessing. Kroszner and Strahan (2001) suggest that although commercial bankers are widely prevalent on the boards of non-financial firms, it is not to the degree that we would expect given the benefits of close banker relationships.

Firms may gain several benefits by having bankers on the board. Bankers on the board may provide expertise to management, especially in the form of financial or investment advice (Mace, 1971; Lorsch and MacIver, 1989). In addition, board-appointed bankers may enhance access to capital by economizing on the cost of monitoring (Fama, 1985), which in turn may lower the cost of funds (James, 1987). Board positions provide monitoring superior to loan covenants due to greater access to information and the ability to discipline management through compensation structure or termination (Williamson, 1988; Kroszner and Strahan, 2001). The information advantage afforded by a board position permits better assessment of a firm's creditworthiness facilitating loans from the represented bank (Kracaw and Zenner, 1998; Kroszner and Strahan, 2001; Fama, 1985). This is particularly true for firms whose investment opportunities and returns are uncertain or opaque to public financial markets (Kroszner and Strahan, 2001; Kracaw and Zenner, 1998; Leland and Pyle, 1997; Fama, 1985). Efficiencies in monitoring afforded by bankers on the board may have indirect consequences as well. A banker on the board may be a form of certification, helping a firm secure capital from other banks, public debt markets, or from investors (Fama, 1985; Kracaw and Zenner, 1998). We allow for the possibility that in some cases a board position may be a proxy for a close banker–borrower relationship, which may be the true source of the information advantage (Fama, 1985; Kracaw and Zenner, 1998).

On the negative side, a close relationship with a bank may lead to an information-based monopoly (Rajan, 1992; Kracaw and Zenner, 1998). A pricing advantage may arise when a closely tied bank is able to use information derived from the relationship to more precisely match interest rates with project risk than distant, potential creditors (Leland and Pyle, 1997). A board position may also facilitate improved

monitoring to guard against opportunism, such as the reallocation of funds from lower to higher risk projects (Stiglitz and Weiss, 1981). Given the pricing and monitoring advantage of closely tied banks, bankers not closely tied to the firm may likely forgo the opportunity to compete for the firm's loan business lest they suffer the Winner's Curse (Rajan, 1992).[2] The monopoly that arises from this information asymmetry becomes problematic for the firm since it may allow the closely tied bank to extract rents (Rajan, 1992; Kracaw and Zenner, 1998). As a result, recent work has found that the stock market reacts negatively to the announcement for loan renewal when the loan involves a bank that is represented on the firm's board (Kracaw and Zenner, 1998).

Problems arising from information asymmetry are compounded by dependence on commercial loan capital. Dependence on commercial loan capital gives a bank with an information monopoly the leverage to extract rents. Thus, as some have suggested, we might expect firms with a greater weight of short-term or long-term debt to have less direct access to public capital markets, and those in financial distress to be more subject to holdup by board represented banks (Kracaw and Zenner 1998; Kroszner and Strahan 2001). This reasoning suggests a yet unexplored interaction effect between information asymmetry and dependence.

In this study, we give attention to this possible interaction effect by accounting for firm heterogeneity in the probability of financial distress. Consistent with Graham et al. (1998) and MacKie-Mason (1990), we use a modified version of Altman's (1976) Z-score to capture a firm's probability of financial distress. We expect the potential conflict of interests between bankers and shareholders to vary with firm Z-scores for three reasons. First, we expect distressed firms to be more dependent on external financing, especially

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[2] The Winner's Curse refers to the following situation. Let us assume a common-value auction in which bidders' point estimates of the item's worth are dispersed around the true value because of uncertainty. If bidders base their bid on their individual estimate, then adverse selection will result. The high bid will be higher than the true value, so winners will overpay (Kagel and Levin, 1986). Banks with superior information (i.e. less error) in their estimation of project cash flows will be less likely to under-price loans. By contrast, banks that have inferior information may only win loan business when they have in fact priced below risk-adjusted costs.

debt financing, so the Z-score may indicate the degree of influence that a commercial banker on a board may have (Gilson, 1990). Second, we expect banking and shareholder interests to diverge most notably for distressed firms. For residual claimants that are at least somewhat diversified, the downside of increased leverage leading to bankruptcy is limited, while the potential upside of such leverage for shareholder returns is unlimited. By contrast, bankruptcy presents a real risk to debtholders, while their upside from loan transactions is capped. So for distressed firms, debtholders may desire less leverage than shareholders and they may have the influence to coerce this outcome (Gilson, 1990).[3] For non-distressed firms, bankers should be more willing to place new loans. Thus, their appetite for higher leverage should approach that of shareholders. Concomitantly, their ability to effect outcomes at odds with shareholder interests should be less. Third, the information advantage enjoyed by bankers on the board may be less for non-distressed firms, assuming that they have higher quality projects. Rajan (1992) suggests that as project quality increases, the information advantage of inside, informed lenders over outside, uninformed lenders diminishes.

3. Pre- and Post-Ramifications

The information asymmetry and dependence problem may lead to two key ramifications for bankers on the board. The first concerns the selection process: When are bankers appointed to the board? The second ramification concerns behavior, given selection: Are bankers on the board free to monitor?

3.1 Banker self-selection

Recent research has gone a long way towards answering the first question. Kroszner and Strahan (2001) argue that in the selection phase, we may expect bankers to eschew board representation when

[3] This outcome may also be effected through the price mechanism. For distressed firms with associated risks, banks with board representation may charge sufficiently high interest rates for loans that leverage becomes less attractive to the firm. Banks with board representation may have the flexibility to raise interest prices given their information advantage; outsider banks will be reticent to undercut the rates offered by banks with insider information (Rajan, 1992).

potential conflicts of interests are high. Information asymmetry may also lead to costs for the board-represented bank. Since a banker board position leads to a conflict between banking and fiduciary interests, liability costs may increase for the board- represented bank.[4] Thus, bankers, especially existing lenders, may shun board positions for firms where information asymmetry is high. As outlined in Kroszner and Strahan (2001), we expect the potential for information asymmetry to increase with the following parameters: volatility of returns, size of firm, growth opportunities, and investment in specialized or intangible assets.

Kroszner and Strahan (2001) show that bank representation on the board is more likely when information asymmetry is low to moderate. The presence of lenders on the board is especially sensitive to information asymmetry as measured by the volatility in stock returns. They also show that dependence on short-term debt is positively related to bankers on the board. Surprisingly, they find no relationship between another dependence variable, the debt ratio, and banker presence.[5]

We pursue a similar analysis, but with two modifications. First, to determine whether firm dependence may exacerbate information asymmetry hazards, we examine the effect of Z-score interacted with stock return volatility. Second, we conduct a longitudinal study in an attempt to isolate causality. We suggest that these two modifications may help clarify the role that a firm's capital structure (as measured by the debt ratio) plays in determining the net benefits of bankers on the board.

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[4] Kroszner and Strahan (2001) posit that liability may arise from one of two sources. Investors and outside creditors may charge the bank with using its board position to coerce policy concessions from management. A board-represented bank may also be open to the charge of using its insider information to adjust its own policies in transactions with the firm such that risk is shifted to other creditors. For firms where information asymmetry is high and, ergo, potential conflicts of interest, liability costs may exceed the information and monitoring benefits afforded by a board position.

[5] Other studies, however, have found such a relationship. An empirical study by Mizruchi and Stearns (1994) found a positive association between the presence of bankers on the board and a firm’s debt ratio.

3.2 Bankers on the Board as Disabled Monitors

Given the selection process described above, we might wonder whether board-appointed bankers have either the incentive or ability to be effective monitors. Booth and Deli (1999) juxtaposed the role of banker on the board as monitor, and the role as expertise provider. In this cross-sectional study, they find evidence that non-lending bankers are associated with higher levels of bank debt, while no significant relationship exists between lenders and debt levels. They infer from this result that non-lending bankers serve on boards as expertise providers, while the role of lenders is not clear.

We suggest two possible explanations for the result regarding lenders on the board. The first explanation is that lenders may be "disabled" monitors. Given the liability concerns outlined in the discussion of the selection process, board-appointed lenders may go out of their way to avoid perceived conflict of interest charges. As such, we might expect their impact on the debt ratio to be either muted or similar to that of investors, as lenders seek to compensate for their perceived conflict of interests. Under this scenario, those bankers who could most gain from monitoring become the least likely to exercise monitoring. They become disabled.

The second possibility for the result stems from the limitations of a cross-sectional analysis. To address this issue, we conduct a longitudinal study that attempts to deal with the endogeneity issue intrinsic to the board composition - debt ratio relation. In addition, we control for firm heterogeneity in the probability of financial distress. We expect lenders to be more active monitors for financially distressed firms. If, after making these modifications, we find evidence of lender monitoring, this would be strong support for the notion that bankers on the board may be there to serve the interests of their bank, despite a conflicting fiduciary responsibility.

3.3 Banker Roles and the Debt Ratio

To clarify whether bankers on the board are functioning as either 1) providers of expertise, 2) enabled monitors or 3) disabled monitors, we compare and contrast the debt ratio impact of three different board member types: lenders, other bankers, and investors. Investors on the board are those board members

who represent individuals or institutions holding 5 percent or more of shares outstanding. We use investor impact on the debt ratio as the baseline for comparison. Among all board member types, we generally expect investors' preference for leverage to be the highest given the potential for increased returns and the limited downside associated with bankruptcy. Findings by Berger, et al. (1997) suggest that investors on the board drive increases in leverage, overcoming management's aversion to debt.

If bankers serve as providers of expertise, their expertise regarding capital markets may be particularly valuable. Thus, we might expect bankers to have an impact on the company's debt ratio.[6] Given that bankers on the board are providing a service to the firm in this instance, we would also expect their impact to be consistent with shareholder interests and thus similar to that of investors on the board. So evidence that lenders, other bankers, and investors on the board all have a similar impact on the debt ratio would suggest that the primary role of bankers on the board would be to provide expertise.

If bankers on the board function as enabled monitors, we might expect the debt ratio impact of lenders and other bankers to diverge from that of investors. Both lenders and other bankers may serve monitoring roles that would place them at odds with investors, especially when the probability of financial distress is high and the probability of bankruptcy increased. As the probability of financial distress increases, bankers acting as monitors would likely prefer less leverage than their investor counterparts on the board.

In addition, we might also expect a gap between the impact of lenders and other bankers. Other bankers may serve as monitors for the banking community. Mintz and Schwartz (1985) suggest that bankers have the incentive and means to act in coordinated fashion on behalf of the community of creditors, even when they have no direct exposure. The incentive to act in concerted fashion is driven by

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[6] There is some empirical evidence that outside directors, in general, influence capital structure. Lorsch and MacIver's (1989) survey of nearly 300 outside directors revealed their role in advising company management on capital structure. As one outside director stated in a follow-up interview, "[Directors must decide] whether the company [should] be borrowing a lot of money as a matter of policy and leveraging itself, as opposed to contracting and not leveraging itself." (p. 66)

the interdependencies among banks.[7] Mintz and Schwartz (1985) highlight that loan consortia and the concentrated nature of the industry give banks the means for collective action. Booth and Deli (1999) raise the possibility of an "in-kind monitoring market" among commercial bankers in which non-lenders help safeguard the exposure of lenders, although their results fail to support this theory. Though other bankers may serve as monitors, lenders, which have direct exposure, have an even stronger incentive to act and to act aggressively (Gilson, 1990). As a result, we might expect the impact of lenders on the debt ratio to diverge most from that of investors, while the impact of other bankers as monitors would diverge, but to a lesser degree.

If bankers on the board are constrained from active monitoring by liability concerns, we might expect the impact of the three board member types to diverge once again, but in a different fashion. Liability constraints may be greatest for lenders, which have the most to gain from monitoring. This suggests that lenders may be more disabled in their monitoring than other bankers, whose conflict of interest is indirect verses direct. Thus, the impact of other bankers on the debt ratio may diverge most from investors. Meanwhile, the impact of lenders may either converge with that of investors or be non-existent as they seek to avoid any appearance of impropriety.

4. Data

4.1 Data description

The data set for this study was based on the 500 largest U.S. manufacturing firms in fiscal year 1980, as reported in the May 1981 listing by *Fortune*, followed yearly through 1991. We were able to acquire complete information on 456 of these firms for 1980. Because of our time-series design, our units of

[7] The financial viability of banks is linked in at least three ways, according to Mintz and Schwartz. First, their loan portfolios are intertwined through participation in multiple loan consortia. Second, they rely upon each other for lines of credit to supply short-term cash needs. Third, and most importantly, they rely upon the same thread of confidence that ensures a supply of deposits. A run on one bank will precipitate others. Thus, the externalities of bank failure make it the interest of each institution to safeguard the investments of debtholders as a group.

analysis are firm-years. Our initial data set contained 4,067 firm-year observations. Proxy statements filed with the Securities and Exchange Commission (SEC) were our primary data source. For each firm-year we recorded the size of the board, the number of inside and outside directors, the directors' committee memberships, background information on the firm's CEO, and the principal affiliations of the outside directors. In a 1978 amendment to the Securities Exchange Act of 1934, the SEC began requiring the disclosure of "certain significant economic and personal relationships" between directors and the firms that they govern. These directors were termed "affiliated non-management directors." One such director was a person who was the officer, director, or a 1 percent equity holder of a creditor of the firm. The threshold for disclosure of such relationships was based on the loan size. Disclosure was required when the creditor's loans exceeded either 1 percent of the firm's consolidated total assets or $5 million, whichever was less (SEC, 1978 ,p. 58525). On the basis of this reporting requirement we were able to identify lending relationships between board-represented banks and firms. Firm financial data were gathered from Standard & Poor's COMPUSTAT service.

The analysis in this paper is based on a subset of the 4,067 cases. Creation of third-order lagged variables (described below) precludes the use of data for years 1982 through 1984 in our model estimations, resulting in a subset of 2,149 firm-years. This subset consists of 283 firms over the 1985 to 1991 timeframe. Of these, 49 firms drop out of the sample before the end of the period due to merger or acquisition. Missing data further reduces the number of firm-years available to 1,395.

4.2 Variable Definitions

4.2.1 Key explanatory variables

We calculate the debt ratio as long-term debt as a percentage of total capital [LTD / (LTD + Equity)]. We use the market value of equity, which we calculate using the market value of common stock plus the book value of preferred shares. To facilitate analysis of debt ratio changes, we create two additional variables. The first is long-term debt divided by total assets. The second is the market value of equity divided by total assets. We refer to these as weighted debt level and weighted equity value respectively.

By weighting the long-term debt and equity components by total assets, we can identify whether changes in the debt ratio are due to changes in debt, equity, or both components. All of our debt measures include bank and non-bank debt. Findings by Booth and Deli (1999) suggest that while the association between bankers on the board and bank debt may be strong, the association with non-bank debt may be insignificant. Thus our use of aggregate debt may be conservatively biased, failing to detect some finer grain relationships.[8]

The firm's board composition is tracked using four variables.[9] First, we identify the number of commercial bankers on the board whose bank had an outstanding loan contract with the firm. We initially express this lender representation as a percentage of total board size (LENDER). We then identify the percentage of the board that was composed of non-lending commercial bankers (OTHER BANKER). Third, we calculate the percentage of the board that consisted of blockholders (INVESTOR). Consistent with SEC filing procedures, we use the term blockholders to refer to non-management equityholders that own 5 percent or more of the company's outstanding shares. Finally, we determine the percentage of the board that consisted of outsiders who were neither debtholders nor investors (OTHER OUTSIDER). These include representatives of investment banks and life insurance companies, among other entities, that had little to no equity investment in the firm. We make no prediction about the impact of these agents. Previous studies suggest that these outsiders have little impact on the debt ratio (Booth and Deli, 1999) and that outsiders as a whole do not predict debt ratios (Berger, et al., 1997). The remaining board members are current and retired officers of the firm. The percentage of management-affiliated board members is not included in the analysis, since it is a linear function of the first four variables.

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[8] To illustrate why combining bank and non-bank debt might render our results more conservative, consider a situation in which a new banker comes on a firm's board and the firm switches from bank to non-bank debt (or vice versa) but maintains its level of total debt. Although this finding might be consistent with our argument, the effect of the banker on the board would not appear in our analysis. We thank an anonymous JCF reviewer for this suggestion.

[9] We express composition initially in percentage terms, but then later consider alternate operationalizations: presence / absence by type and numerical count by type.

Expressing board composition in percentage terms allows efficient, linear three-stage least squares estimation in our multivariate analyses. To test the robustness of our results, we also consider two alternative operationalizations: a count of board members by type, and the presence or absence of board members by type. We discuss these alternative operationalizations in Section 5.2.3 below.

Consistent with Graham et al. (1998)[10], we calculate modified Z-scores as follows:

$$3.3\frac{\text{EBIT}}{\text{Total Assets}}+1.0\frac{\text{Sales}}{\text{Total Assets}}+1.4\frac{\text{Retained Earning}}{\text{Total Assets}}-1.2\frac{\text{Working Capital}}{\text{Total Assets}} \qquad (1)$$

Because we predict that debt ratio preferences will be a function of the firm's probability of financial distress, interaction variables are calculated by taking the product of each of the above composition variables and the Z-score. In this way, marginal effects of bankers on the board over the range of Z-scores can be determined. No prediction is made for the marginal effects of OTHER OUTSIDER but this along with its corresponding interaction variable are included for consistency.

Last among our focal parameters is volatility in equity returns. Consistent with Kroszner and Strahan (2001), we measure volatility as the standard deviation in monthly equity returns measured over the three-year period preceding the date of the observation. Data on monthly returns were obtained using the CRSP (Center for Research on Security Prices) monthly stock file.

4.2.2 Control variables

In our multivariate analysis, we introduce several control variables in order to isolate the board composition - debt ratio relation. Our controls are focused on firm-specific, time-variant factors and period effects. Using the first-difference approach described in the multivariate analysis, we remove time invariant factors (the fixed effects) from consideration. These include factors such as industry affiliation, business risk, and idiosyncratic firm preferences for debt.

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[10] The function is based on Altman's (1976) discriminant analysis predicting which firms, of a group of 66, would file bankruptcy during the period 1946 - 1965. Consistent with Graham et al. (1998, p. 146), we omit the ratio of market value of equity to book value of debt given similar terms to measure the firm's growth opportunities and the debt ratio.

Our firm-specific, time-variant controls are as follows. First, we control for firm size, operationalized as the log of total assets (LOG ASSETS). Larger firms have a lower probability of experiencing bankruptcy, making debt a more attractive option (Titman and Wessels, 1988). Larger firms also have easier access to debt and equity markets (Titman and Wessels, 1988), making them less dependent on commercial bank financing. The management of larger firms also tends to be more entrenched since the threat of takeover is lower (Berger, et al. 1997). This factor makes equity issues more attractive as size increases.

Second, we control for internal funding capability (INTERNAL FUNDING). This is operationalized as the change in retained earnings divided by total assets in the base year. Third, we control for the collateral value of a firm's assets (COLLATERAL VALUE). Mehran (1992) operationalized this as the value of property, plant and equipment plus inventory as a percentage of total assets. Greater collateral value reduces lending risk and increases the attractiveness of debt arrangements. Fourth, we control for the asset specificity of a firm's projects. In accordance with previous literature (Berger, et al., 1997; Kochhar, 1996), this is operationalized as R&D as a percentage of sales. It is necessary to control for asset specificity since greater specificity of investments increases the agency costs of debt. Fifth, consistent with previous studies, we include a ratio of market-to-book value of the firm's equity as an indicator of the firm's growth opportunities (MARKET-TO-BOOK). As specified by Berger, et al. (1997), we use one plus the difference between market and book equity divided by total assets at the beginning of the period. Sixth, we control for reliance on short-term debt. Kroszner and Strahan (2001) argue that firms with a greater percentage of short-term to total debt (SHORT-TERM DEBT) are more dependent on commercial banks. Finally, we control for selection bias. Several firms drop out of our sample during our window due primarily to merger or acquisition. Thus, we must correct for possible sample selection bias by first estimating a probit model on the selection outcome. Then we introduce the resulting inverse Mills ratio, the risk of selection for firm *x* in year *t*, (INVERSE MILLS RATIO) into our regression model of interest (Maddala, 1983). For the probit model we use size, return on assets, percent sales growth, and period variables as covariates.

The regression models also include period effects, which cut across all firms, through the introduction of year dummy variables. These variables help to capture factors such as recession, interest rates, and the marketability of equity issues.[11] Table 1 summarizes the operationalization of all variables used herein.

5. Results

5.1 Univariate Analyses

Table 2 provides the descriptive statistics. We make the following key observations from this table and related data. On average, firms have a large number of outsiders, 59 percent of total board members, who are neither bankers nor investors. Across firm-years, the average percent representation for lenders, other bankers, and investors is low: 1 percent, 3 percent, and 3 percent respectively. However, there is at least one banker (either a lender or a non-lender) on the board for 37 percent of all firm-years and at least one investor on the board for 17 percent of firm-years. Meanwhile, 31 percent of firms in the sample have a lender on their board at some point during the period and 52 percent have a non-lending banker on their board for some duration, and 34 percent of firms have investor representation at some point. In addition, some individual firms have a high degree of banker/investor representation. The maximum representation percentages for lenders, other bankers, and investors are 30 percent, 62 percent, and 100 percent respectively.

[11] In a subset of our analysis, we examined the impact of one additional control variable. It is possible that stock ownership by board members alters incentives and counteracts the conflict of interests for bankers on the board. For roughly half of our sample (725 firm-years) we had data on the percentage of shares held by board members. Mehran (1992) used this measure to suggest a link between board member equity ownership and leverage ratios. We ran the model with the smaller sample size, with and without the additional control so that we could separate the impact of the smaller sample size from the impact of equity ownership. On the basis of our analysis, we determined that inclusion of this variable in the model does not affect our substantive conclusions.

5.1.1 Comparison of means and medians

For each board member type (lender, other banker, and investor), we identify firm-years in which the board has one or more members with this type of affiliation. We split our sample on this basis and compare means and medians when the board member type is and is not present. Table 3 presents the means for each subsample pair and shows results for the test of equality of means and medians between the two subsamples. We make comparisons across the following sets of variables: board composition, information asymmetry, dependence, and the debt ratio with its components.[12]

In Table 3 we notice differences that suggest the selection process for lenders, other bankers, and investors on the board varies. To start, we are more likely to find investors on boards that are below average in size, while lenders and other bankers tend to be on larger boards. Not surprisingly, lenders and other bankers may be substitutes for each other since the presence of one type decreases the likelihood of having the other type represented. The difference in means and medians is not significant, however. The results also suggest that other bankers and investors may be substitutes, though again the difference does not achieve statistical significance. By contrast, lenders are statistically more likely to be present when investors are also present. These two groups may therefore be complementary.

Consistent with previous studies, it appears that lenders and other bankers on the board may be more likely when information asymmetry is low to moderate. The typical firm with a lender on its board has slightly greater-than-average return volatility, but it is also larger, has more tangible assets, has fewer growth opportunities, and has less investment in R&D. Firms with other bankers on their boards are like

[12] As a univariate, cross-sectional comparison, we exercise caution in drawing conclusions. As a general rule, we can draw greater inference from results regarding information asymmetry and the Z-score than we can from the debt ratio and its components. Information asymmetry variables and the Z-score likely influence board composition, but the reverse relationship is less likely. For example, it is improbable that board composition has a significant short-term impact on total assets. Thus, we will interpret the information asymmetry variables and Z-score as shedding light on the board composition selection process. By contrast, the debt ratio and its components may both determine board composition and be determined by board composition. Thus, we state the nature of the relation and reserve further interpretation for the multivariate, longitudinal analyses.

those with lenders, except they have lower volatility. Firms with bankers also tend to be at lower risk of distress, although this difference is not significant. By contrast, investors tend to be on the boards of smaller firms that are at greater risk of distress, yet have greater-than-average growth prospects. Volatility is also slightly greater than average when investors are present.

Consistent with Booth and Deli (1999), other bankers are associated with higher-than-average debt ratios, while no statistically significant relationship exists for lenders. Upon examination of the debt ratio components, however, we do see some statistically significant relationships for lenders. Lenders and other bankers on the board are associated with lower equity values. This result would be consistent with Kracaw and Zenner's (1998) findings, assuming that the causal direction runs from board composition to equity values. By contrast, investors are associated with higher equity values. The presence of lenders is also associated with higher-weighted debt levels.

5.1.2 Interdependence of events

Before considering a longitudinal analysis, we wish to identify appropriate time lags for use in evaluating the potential impact of a lender, other banker, or investor added to a board. Table 4 addresses this issue. We take the sample of observations that experience an "add event", the addition of particular board member type where none existed before, and identify how long the firm retains a board member of the respective type. Table 4 flow charts the firm's board composition one, two, and three years post addition, *t+1*, *t+2* and *t+3* respectively. For some cases, the board composition data were missing due to right censoring. From Table 4 we see that after a year, just over half of the boards that added a lender still have lender representation on the board. Similarly, the half-life for investors on the board is just over a year. Meanwhile, the duration of other bankers on the board is longer, with a half-life of two years.[13] A similar analysis of drop events (not shown) reveals that the typical firm that drops lender, other banker, or investor representation from its board waits two to three years before restoring this type of representation.

[13] These results are consistent with those by Gilson (1990), who found that the half-life of banker tenure on the board of distressed firms was less than two years.

This imbalance between add and drop events is consistent with the steady decline in banker representation on boards in the 1980s (Davis and Mizruchi, 1999). Overall, this flow analysis suggests that a one-year lag period is an appropriate window to use for the effect of different board member types.

In addition to temporal substitution, we examined substitution across board member types. Table 5 addresses this issue. In this chart, we track the board composition changes that occur with the addition of a lender, other banker, or investor. In columns two and three we examine whether the addition was accommodated by either an expansion in the board or by a substitution. The remaining columns show the breakdown of substitutions by type of board member displaced. For bankers, additions usually involved a substitution rather than an increase in board size. This was particularly true for lenders. Lenders most often displaced other bankers. Meanwhile, a third of the time, other bankers displaced lenders.[14] By contrast, investors typically displaced non-banker outsiders or were accommodated by an expansion in the board. Given the degree of substitution evident from these results, we control for endogeneity in board composition in our multivariate analyses.

5.1.3 Add events

In our earlier, cross-sectional examination of means and medians, we were unable to draw clear inferences from the board composition - debt ratio relations. We use a longitudinal analysis to begin to tease apart the impact of the debt ratio and its capital structure components on board composition, and vice versa.

Our strategy is to look at differences in the debt ratio and its components before, concurrent with, and after an add event. Again, by "add event" we mean the addition of either a lender, other banker, or investor representative to the board where they did not exist in the preceding period. We compare figures between those that add a board member of the relevant type and those firm-year observations lacking this

[14] Unfortunately, we cannot distinguish between two cases. In the first case, a commercial bank that lends to the firm replaces or is replaced by a non-lending bank. In the second case, a bank with uninterrupted representation on the board either starts or ends a lending relationship with the firm.

board member type. We also compare changes in the debt ratio and its components over time. We consider both speed (first order) and acceleration (second order) changes in the debt ratio and its components.

Table 6 presents these results. When we compare firms experiencing the addition of a lender with those that have no lender, there is no significant difference in debt ratios before, during, or subsequent to the event. Part of this may be due to the small subsample used for this particular analysis; there were few cases that were observable over several periods and involved a change in lender presence. Yet, the *changes* in the debt ratio for firms that add lenders versus those where they are absent are statistically different. Firms that add lenders experience a concurrent increase in debt ratios due to declining market values for equity (see Lines 5 and 21). This result is consistent with Kracaw and Zenner (1998) in which the formation of a strong banking tie triggers a drop in equity value. Following the addition, firms experience a decrease in their debt ratios due to a decrease in weighted debt levels and an increase in equity value (see Lines 6, 14, and 22). This post-addition result may be consistent with the notion that lenders serve as monitors that hold down debt levels once appointed to the board.

We also examine whether there is a significant acceleration/deceleration (that is, second order change) in the debt ratio and its components. This test examines within-firm variations in the debt ratio trend over time. We find that the acceleration in the debt ratio concurrent with the addition of a lender is significant, while the deceleration in the ratio subsequent to the addition is marginally significant, pvalue = .107 (see Lines 7 and 8). This suggests that the earlier stated results may hold, controlling for firm fixed effects.

The results for other bankers and investors differ from lenders, but are similar to each other. Firms that add investors and other bankers tend to have higher debt ratios in the year preceding the board appointment due to higher weighted debt levels and lower equity values. This trend persists in the year of the addition. While preceding and concurrent effects for investor and other banker additions are similar in magnitude, they are significant only in the case of other bankers. Post addition, there appears to be no

significant debt ratio effect for firms that add other bankers or investors to the board, though in both cases, there is an upsurge in equity value one year hence.

Thus far, the evidence suggests that the addition of lenders involves processes distinct from those of other bankers and investors. In their antecedents and consequences, the distinction between different board member appointments becomes sharper when we control for the probability of financial distress.

5.1.4 Add events by Z-score

Next we consider the impact of bankruptcy risk for the antecedents and consequences of adding lenders, other bankers, and investors. We introduce this focus using a graphical analysis. Using the Z-score median, we identify firms that are at greater and lower risk of financial distress.[15] Figure 1A tracks the debt ratio for non-distressed firms adding a lender, other banker, or investor. The respective board member addition takes place at time $t = 0$. Below the graph we note the changes in the debt ratio in percentage points. We then partition these changes into their constituent parts: the contribution from changes in weighted debt and changes in weighted equity values.[16] Note that positive changes in weighted equity values are captured as negative contributions to the debt ratio. Figure 1B shows the corresponding results for distressed firms.

Overall we see that the board composition - debt ratio relation appears to vary greatly between financially distressed firms and non-distressed firms. The graphs suggest that the risk of financial distress may play a role both in the selection of lenders, other bankers, and investors, and in their debt ratio impact post appointment.

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[15] We choose the median as a convenient breakpoint in our sample that builds conservatism into our univariate analysis. Again, by "distressed firm" we mean those with a high probability of financial distress. We acknowledge that many firms in our above-the-median subsample may not be at risk of bankruptcy. This fact, however, serves to bias our results against finding significant differences between our two sample halves. This breakpoint is only an issue in our univariate analyses since our multivariate analyses use interaction variables rather than split samples.

[16] This partition assumes that total assets remain constant. This assumption simplifies the partition with little loss in precision.

To confirm the statistical significance of these relationships, Table 7 revisits the analysis of means for firms experiencing add events shown in Table 6. This time we look for statistically significant differences in the board composition - debt ratio relation between distressed and non-distressed firms. We limit discussion to additional insights gained vis-à-vis Table 6, which did not consider separate processes for distressed and non-distressed firms.

From Table 6 we saw that firms experience an increase in the debt ratio trend with the addition of a lender. This increase is driven by declining equity value concurrent with the addition. In Table 7 we see that the decline in equity value is associated with distressed firms, while non-distressed firms experience no such decline (see Line 23).[17]

In Table 6, subsequent to the addition of a lender, debt ratios decline. This is due to falling levels of long-term debt and increasing equity value vis-à-vis the depressed value in the year of the addition. From Table 7 we learn that these results are associated with financially distressed firms only (see Lines 14, 16, and 24). This finding would be consistent with the notion that financially distressed firms are more dependent on external financing and thus more subject to lender influence. It would also be consistent with the notion that lender monitoring would be most aggressive for these firms.

Regarding other bankers, we do not find significant effects, perhaps due to the small sample size.[18] If we test debt ratio changes with a larger sample size that does not control for firm mix (not shown), we once again find that financially distressed firms alone account for the significant effects. There is a positive upswing in the debt ratio for financially distressed firms following the addition of a non-lending banker. But the same is not true for non-distressed firms.

There are also differential outcomes for distressed and non-distressed firms with the addition of an investor to the board. Both groups experience an upswing in weighted equity values, though the upswing is significant only for distressed firms (see Line 24). This suggests that investors on the board increase

[17] The change for non-distressed firms is positive, but not significantly significant.

[18] The fact that we used total debt rather than just bank debt could also be a contributing factor as explained earlier.

company valuations, perhaps due to anticipated better monitoring and fewer agency costs. Non-distressed firms also experience a modest, offsetting upswing in weighted debt (see Line 16). As a result, on average, the debt ratio for financially distressed firms decreases post addition, while non-distressed firms experience a slight increase. Our multivariate results presented later suggest, however, that the direction of the investor-Z-score interaction effect is just the opposite of that described here.

Nonetheless, the univariate analyses are informative. They suggest that while financially distressed firms may be less likely to add a lender, lenders that acquire a board position with these firms may influence decisions such as debt policy. The impact of lender additions appears to diverge most from that of investors. Meanwhile, the impact of other bankers may diverge from that of lenders. While lender appointments appear to result in downward pressure on debt, the appointment of other bankers yields no detectable effects. These results suggest that lenders on the board may act as enabled monitors, whereas other bankers may serve as providers of expertise.

5.2 Multivariate Analyses

Given the limitations of a univariate analysis, we test the robustness of our findings using multivariate analyses. The multivariate analyses present three challenges: 1) control for fixed effects, 2) control for endogeneity between the debt ratio and board composition variables, 3) control for endogeneity amongst the board composition variables themselves. To address the first issue, we use first-differencing (Greene, 1997, p. 640; Macurdy, 1981). To address the latter two endogeneity issues, we use three-stage least squares estimation (3SLS) (Zellner and Theil, 1962; Graddy and Kyle, 1979; Jensen, et al., 1992). We explain each in turn.

Given:

$$Y_{i,t} = \delta Y_{i,t-1} + \mathbf{B}\mathbf{X}_{\mathbf{i,t-1}} + \mathbf{\Phi} W_{\mathbf{i,t}} + \varepsilon_{i,t} \tag{2}$$

where

$Y_{i,t}$ = the debt ratio for firm i at time t

$\boldsymbol{X}_{i,t-1}$ = the vector of board composition variables at time *t-1* for firm *i* (see Table 1).

$\boldsymbol{W}_{i,t}$ = the vector of exogenous control variables (see Table 1).

$\varepsilon_{i,t}$ = the disturbance, the sum of the firm fixed effect (α_i) and the white noise parameter ($\mu_{i,t}$).

We apply the first difference operator (FD) to remove firm fixed effects from equation 2:

$$FD(Y_{i,t}) = \delta\, FD(Y_{i,t-1}) + \mathbf{B}\, \mathbf{FD(X_{i,t-1})} + \mathbf{\Phi}\, \mathbf{FD(W_{i,t})} + (\alpha_i - \alpha_i) + (u_{i,t} - u_{i,t-1}) \quad (3)$$

This allows elimination of the fixed effect term, α_i:

$$FD(Y_{i,t}) = \delta\, FD(Y_{i,t-1}) + \mathbf{B}\, \mathbf{FD(X_{i,t-1})} + \mathbf{\Phi}\, \mathbf{FD(W_{i,t})} + (u_{i,t} - u_{i,t-1}) \quad (4)$$

Along with the debt ratio, we estimate each of the board composition variables, $X_{i,j,t}$ as a function of the remaining board composition variables, $\boldsymbol{X}_{i,k,t}$, the debt ratio, and its lag:

$$FD(X_{i,j,t}) = \gamma\, FD(Y_{i,t}) + \delta\, FD(Y_{i,t-1}) + B_j FD(X_{i,j,t-1}) + \sum_{k \neq j} B_k FD(X_{i,k,t}) + \mathbf{\Phi}\, \mathbf{FD(W_{i,t})} + (u_{i,t} - u_{i,t-1}) \quad (5a\text{-}d)$$

A general strategy for consistent, efficient estimation of simultaneous equation models is to use a multi-stage instrumental variable approach (Greene, 1997, p. 738): A vector of exogenous variables is used to obtain predicted values for the set of endogenous variables in the structural model. One then estimates the structural model using the predicted values for the endogenous variables as instruments (Greene, 1997, p. 740). We estimate our structural model, equations 4 and 5a-d, using one such approach, three-stage least squares (3SLS). For instruments, we use the vector of exogenous controls ($\boldsymbol{W}_{i,t}$), second-order lags of the board composition variables, and a third-order lag of the debt ratio. Use of 3SLS provides consistent estimates that are also efficient since it takes advantage of the information contained in the correlated residuals of the system of equations (Judge, 1988; Greene, 1997).

Note that in equations 5a-d we use contemporaneous board composition variables, $\boldsymbol{X_{i,k,t}}$. This is to lessen the possibility of identifying a spurious effect of debt ratio on composition.[19] In equation 4, we take the opposite approach in order to maintain conservatism in our estimates of a board composition - debt ratio relation. We use lags of the board composition variables, $\boldsymbol{X_{i,j,t-1}}$, to predict $Y_{i,t}$ to bias our estimation against finding an effect. We re-estimate the set of equations using contemporaneous board composition variables, $\boldsymbol{X_{i,j,t}}$, in equation 4 to get concurrent effects. But we draw our substantive conclusions from the models that lag composition variables by one year. So in the estimation of board composition effects on the debt ratio, there are two sources of control for endogeneity: 1) simultaneous estimation with instruments, 2) use of lagged composition variables.

5.2.1 Predicting board composition

Table 8 presents our results for models predicting the number of lenders, other bankers, and investors on the board as a percentage of the total board size. These results were generated using the 3SLS simultaneous estimation model with instrumentation and first-differencing, (see equations 5a-d). There are three sets of models for the prediction of each board member type. In Model A, our primary focus, we use the debt ratio and its lag to predict board composition. In Models B and C, we use weighted debt levels and weighted equity values respectively in lieu of the aggregate debt ratio. Models B and C help us explore the components of the debt ratio–board composition relation. This parallels the effort made in our univariate analyses, Tables 6 and 7.

Joint tests of significance for the debt ratio or debt ratio component and its lag appear at the bottom of Table 8. There is also a joint test for volatility and its square. Again, in these models, we use contemporaneous board composition variables as independent variables in order to bias the results against

[19] As previously stated, the board composition variables are simultaneously determined. This could lead to spurious relationships between debt and the board composition variable of interest if we were to omit the remaining composition variables at time t. So, for example, if investor composition at time t drove the debt ratio *AND* lender composition, then its omission could lead to a spurious relationship between debt and lender composition.

finding a relationship between the debt ratio and the percentage of lenders, other bankers, or investors on the board. So, for example, in predicting the percentage of lenders on the board in Model A1, we include the debt ratio and its lag, but we also include the current percentage of other bankers, investors, and other outsiders on the board.

These results inform our understanding of the relation between board composition and two sets of predictors: 1) information asymmetry and 2) firm dependence on external financing. As previously mentioned VOLATILITY, R&D%, COLLATERAL VALUE, and MARKET-TO-BOOK are indicators of information asymmetry, while SHORT-TERM DEBT, INTERNAL FUNDING, Z-SCORE, and the debt ratio are indicators of dependence. Firm size (LOG ASSETS) is an indicator of both low information asymmetry and low dependence.

Consistent with findings by Kroszner and Strahan (2001) and our univariate analysis, we find that lenders are more likely to be present when information asymmetry is moderate (see model A1). Our first evidence of this is from the coefficients for volatility and its square. The relative magnitude of our coefficients parallel those of Kroszner and Strahan (2001). As volatility increases, lenders on the board become more likely, but at a decreasing rate. Additional factors suggest that lenders are more likely when information asymmetry is moderate. Information asymmetry decreases with company size and increases with the magnitude of growth opportunities. Negative coefficients for these two parameters, LOG ASSETS and MARKET-TO-BOOK respectively, suggest that conflicting forces are at work in the information asymmetry – lender presence relation.

The results in Table 8 are mixed in regards to the impact of dependence on external financing. Counter to the findings in previous studies, we find that positive changes in the debt ratio predict lenders on the board.[20] This effect appears to be driven by the ratio rather than its constituent parts, since neither weighted debt nor weighted equity have a significant relationship (see Models B1 and C1 respectively).

[20] This divergence may be explained in part by the fact that Booth and Deli (1999) use bank debt to predict lenders on the board, whereas our analysis relies on combined bank and non-bank debt levels.

We may consider size a measure of dependence as well. Smaller firms and firms with greater reliance on short-term debt are more likely to have lenders on their board (Model A1). However, offsetting this trend is the impact of financial health. Lenders are more likely to be present when the firm faces less risk of distress and has greater internal funding capacity.[21] So board-appointed lenders appear to be more likely when firms make use of bank debt, but are less dependent on this debt for their survival.

The results for other bankers in Table 8 contrast somewhat with those for lenders. Like lenders, other bankers are more likely to appear on the board of firms that utilize external financing, but are at less risk of financial distress. However, increases in weighted debt, rather than debt ratio, are drivers of board participation by other bankers (Models A2 and B2). In addition, stock return volatility does not predict other bankers on the board in models A2 and B2. Model C2 suggests that if a relationship exists, it is the opposite of that observed for lenders. The impact of volatility on board representation by other bankers on the board may actually increase at an increasing rate.

Lastly, the results for investors contrast sharply with those for lenders. High levels of stock return volatility increase, rather than decrease, the likelihood of investors on the board (Table 8, Model A3). Firms with investor representatives on the board also tend to have more growth opportunities. Thus, information asymmetry appears to be high for these firms. Firms with investors on the board also tend to be more dependent on external financing as evident from the negative coefficients for Z-SCORE and INTERNAL FUNDING. Yet their increasing equity values may help them satisfy these funding needs through equity rather than debt financing. Their larger size may also help lessen dependence on commercial banks by facilitating direct access to debt markets.

In Table 9 we retest the "A" version of the models shown in Table 8 with one modification. This time, in place of the volatility-squared term, we substitute an interaction term between the Z-score (our primary measure of dependence), and volatility (our primary measure of information asymmetry). Again we expect conflicts of interests to be greatest when information asymmetry is compounded by financial

[21] We consider a possible cause for this last result in our discussion of Table 9 below.

distress. When the probability of distress is high, the interests of bankers and shareholders diverge even more and the stakes are higher given the firm's increased dependence on external financing. The corollary may also be true: non-distressed firms are less subject to the conflict of interest problems posed by bankers on the board. The interaction term allows us to test this hypothesized compound effect.

Volatility and the interaction term are jointly significant predictors of all three board member types. For lenders, we find that a high Z-score dampens the impact of high volatility. The overall impact of volatility on lender representation is positive for the healthiest of firms, Z-scores in the 87th percentile, and negative for all other firms. This result is consistent with our expectation that information asymmetry may not present as much of a problem when the probability of financial distress is low. This may explain why the Z-score has a positive impact on lender representation in Table 8, which excludes the interaction effect.

The result is quite different for other bankers and investors. They are most likely to be present when information asymmetry and financial distress are factors. This suggests that under these conditions, firms in need of debt market expertise or certification may turn to other bankers or investors in lieu of lenders with their associated conflicts of interest. In summary, we infer from Table 9 that the presence of bankers, especially lenders, on the board may be a compound function of information asymmetry and the threat of financial distress rather than information asymmetry alone.

5.2.2 Concurrent analysis & ex post analysis

The models in Tables 10 and 11 predict the debt ratio and its components using board composition at time *t* and time *t-1* respectively (see equation 4). Thus, the models in Table 10 predict changes in the debt ratio that are concurrent with changes in board composition, while the models in Table 11 predict changes in the debt ratio subsequent to changes in board composition. Model A in each table provides the baseline results, while Model B incorporates interaction terms between each board composition variable and the firm's Z-score. These interaction terms help test the notion that a firm's probability of financial distress helps predict the debt ratio impact of each board member type. Joint tests of significance for each

composition variable and its Z-score interaction term appear at the bottom of each table. Results from Table 11 are displayed graphically in Figure 2A, which captures the sum of direct and interaction effects of board composition on the debt ratio as a function of Z-score. Figures 2B and 2C show the same information for the components of the debt ratio.

First we turn attention to the impact of lenders in Tables 10 and 11. In Table 10, we see that the appointment of lenders to the board has a direct, negative impact on weighted equity value (Model A3). Again, this result is consistent with Kracaw and Zenner (1998) and our univariate analysis. The drop in market equity results in an increase in the debt ratio (Model A1). The interaction term with Z-score is not significant (Model B1). So while Z-score helps determine lender appointment, the immediate effect of lender appointment on equity value appears to be independent of the risk of financial distress.

We see from Table 11, that one year subsequent to lender appointment, the story is somewhat different. Lenders appear to have a direct, negative impact on the debt ratio that is independent of a firm's probability of financial distress (Models A1 and B1). Figure 2A illustrates the magnitude of the effect. It predicts that the addition of a single lender to the average-sized board will be followed by a three-percentage point drop in the debt ratio one year hence. A review of the models that predict the debt ratio components reveals why. We see that one year after lender appointment, the firm's equity value declines further, especially for financially distressed firms (Model B3). This places upward pressure on the debt ratio. Offsetting this, however, is a decrease in weighted debt levels, independent of a firm's Z-score. We interpret this from the negative, marginally significant coefficient (pvalue = .103) for lenders in Model A2, which predicts long-term debt as a percentage of total assets. These findings suggest that lender appointment to the board impacts the debt ratio due to an action and a reaction. The reaction is the downgrading of the company's equity value because of the anticipated, deleterious effects of a lender

information monopoly. The action may be active lender monitoring that results in lower long-term debt and less financial exposure for the lender.[22]

We now turn to the results for other bankers and investors to see how they compare with the lender results. In Table 10 we see that concurrent with the appointment of other bankers to the board, the debt ratio goes down sharply for financially distressed firms and less so for non-distressed firms (Model B1). This result is driven by both long-term debt and equity. With the appointment of other bankers, long-term debt as a percentage of total assets goes down for financially distressed firms and up for non-distressed firms (Model B2). In contrast to the market reaction to lender appointments, appointment of other bankers to the board is associated with an increase in equity value. This effect is particularly strong for financially distressed firms, as seen from the direct and interaction effects in Model B3 of Table 10. Again, these results parallel those of Kracaw and Zenner (1998).

One year subsequent to the appointment of other bankers, debt ratios increase for financially distressed firms and decrease for non-distressed firms. (See Table 11 and Figures 2A, B and C.) Again, upswings in the ratio are driven by increases in weighted debt, while down swings are driven by continued, positive market reaction in equity values.[23] Rather than acting as monitors, other bankers appear to help financially distressed firms secure additional long-term debt financing. Given the results by Booth and Deli (1999), this may be particularly true for bank debt. This additional debt offsets the rise in market equity, yielding net increases in the debt ratio of one to two percentage points for financially distressed firms. Non-distressed firms experience a slight decrease in the debt ratio due to declining levels of long-term debt and rising equity values.

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[22] This result cannot be attributed to regression toward the mean since we control for preceding changes in the debt ratio by incorporating the first-difference of the lag of the dependent variable into our models.

[23] Interestingly, although the number of other bankers on the board is a significant predictor of the debt ratio, it is not a significant predictor of the ratio's components. This may suggest that the influence processes of other bankers may truly operate upon the debt ratio rather than its constituent parts.

The results for the appointment of investors to the board closely parallel those for other bankers. The appointment of investors to the board triggers a decrease in the debt ratio of financially distressed firms due to both decreasing weighted debt (Table 10, Model B2) and increasing equity values (Model B3). One year subsequent to their appointment, investors trigger a rise in the debt ratio for firms with a high probability of financial distress and a decline for non-distressed firms (Table 11, Model B1). Both financially distressed and non-distressed firms experience a subsequent increase in weighted debt. But in the case of non-distressed firms, the increase in weighted equity value overwhelms the debt effect. At the Z-score median (2.25), a board-appointed investor has a negative 1.2 percentage point impact on the debt ratio.

These results suggest that other bankers and investors on the board have a similar impact on the debt ratio and its components. The key divergence is with weighted debt for non-distressed firms. Although investor presence contributes positively to debt levels for these firms, other bankers tend to have a negative impact. For firms with a high Z-score, other bankers have an impact on weighted debt comparable to that of lenders (see Figure 2B), though the significance of the Z-score interaction term for other bankers (pvalue = .14) precludes confirmation of this. The results suggest that other bankers may perform a monitoring role for those that need it least, non-distressed firms. For financially distressed firms, other bankers may perform an expertise provider and certification role.

5.2.3 Robustness using board composition presence and counts

Until this point in the analysis, we have relied upon board composition variables based on the percentage of the board composed by lenders, other bankers, investors, and other outsiders. Use of 3SLS estimation and first-differencing require continuous dependent variables for our system of equations, equations 4 and 5a-d. For this reason we operationalize board composition as a percent of total. However, to test the robustness of our percent composition results, we redo our analysis using alternative operationalizations in place of proportional variables: 1) presence-based composition variables and 2) count-based composition variables. Without the convenient use of 3SLS, we model the determinants of

the debt ratio, equation 4, separate from the prediction of board composition, modified versions of equations 5a-d.

There are plausible theoretical arguments for the alternative operationalizations of board composition. Regarding the presence-based analysis, it is possible that the impact of different board member types is a function of mere presence rather than their numerical weight. For example, if lenders on the board monitor, the appointment of a second lender to the board may increase the monitoring effect, but it is questionable that the effect would double. Regarding the count-base analysis, one would favor this approach if it were true that board member influence were independent of the board's size. This would be the case, for example, if two bankers on a board of 20 had the same influence as two on a board of 10. Conceptually, the count-based analysis falls in between the percentage and presence analyses.

To predict the debt ratio and its components (equation 4) for both the presence- and count-based analyses, we use two-stage feasible weighted least squares (2SFWLS) with first-differencing and instrumentation. First-differencing controls for fixed effects. As in the 3SLS case, instrumentation in this estimation addresses endogeneity; however, it does so less efficiently[24]. Weighting of observations is necessary given heteroskedasticity.

Table 12 shows the results for the prediction of the debt ratio and its components using board member presence as a predictor. Table 13 show the comparable analyses using board member counts. Figure 3 captures the effect sizes in Table 12 by charting the debt ratio effect of adding one board member of the respective type.

Some key findings are robust to changes in methods and operationalization of board composition. An examination of Figures 3 and 1A reveals that the debt ratio effects of lenders and other bankers are quite comparable across the two analyses. As was the case in percent-based analysis, other bankers positively influence the debt ratio for firms facing a high probability of distress and lower the debt ratio for other

[24] Instrumentation is also necessary given the correlation between a regressor, the first difference of the lag of the debt ratio, and the error term (Greene, 1997, p. 640).

firms. In Table 12 Model B1 the positive impact of other bankers and negative impact of its Z-score interaction variable are jointly significant. The comparable results for the count-based analysis in Table 13 Model B1 are even stronger. So again, other bankers appear to play an expertise or certification role for distressed firms and perhaps a monitoring role for non-distressed firms.

As indicated in Table 13 Model A1, lenders again show a net negative impact on the debt ratio for all firms, regardless of financial health. However, this relation does not achieve significance in the presence-based analysis.

Comparing results across Tables 11 - 13, only in the case of investors do we see a notable difference in the predicted debt ratio–board composition relation. In the percentage analysis, the influence of investor representation on the debt ratio appears to be significant. Results suggest that investor representation lowers debt ratios for firms with higher Z-scores. In contrast, results from the presence and count analyses yield a positive interaction term. Yet, we discount the divergence in results since this latter result is insignificant in both the presence and count analyses.

Next we turn attention to the predictors of board composition. To predict board member presence by type, we use conditional logit models that control for fixed effects. If there is lender, other banker, or investor representation on the board for a given firm-year, we code the corresponding composition variable as one; otherwise it is zero. Since all boards have some other outsiders present, we leave this composition variable as a percentage calculation.

To predict board member counts by type we use an ordered logit model with robust standard errors (Huber, 1967; White, 1980) adjusted for clustered observations to compensate for the lack of

independence in cases due to multiple observations per firm (Rogers, 1993)[25]. We use four count categories: zero, one, two and three or more. For lenders, the count analysis was redundant with the presence analysis since, after list-wise deletion for missing data, there were very few cases with multiple lenders. For other bankers and investors, there were many cases with counts of one or two on the board, but few with three or more board members of the respective type. We therefore combined counts of three or more into one ordinal category. Use of an ordered logit model allows us to be agnostic about the interval spacing between ordinal categories. This flexibility may be important if we believe, for example, that the process of going to a single banker on the board from none differs from the process of going from one to two bankers.

Use of the above-described conditional logit and ordered logit models within a system of equations makes control for endogeneity difficult. One option would be to employ a procedure described by Maddala (1983, p.242) for mixtures of discrete and continuous variables[26]. The drawback of this approach is that it requires derivation of the asymptotic covariance matrix using the method proposed by Amemiya (1979), a cumbersome challenge given use of the conditional logit and ordered probit models (Greene, 1995, p. 662) . Instead we opted to use standard estimation approaches and constructed our models so that any bias due to endogeneity should work against our predicted findings. For example, from our earlier results there is some evidence that lenders impact the debt ratio. So in predicting the presence of a lender we included the lag of the dependent variable. This should lessen the possibility of finding a relationship between the debt ratio and lender presence due to reverse causality. Again the

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[25] Note that we are counting board members of a certain type. This should not be confused with counting events, like the addition of a certain type of board member. While a count model, such as a negative binomial, would be appropriate for the count of events, it is inappropriate for this analysis since we are predicting a "stock" value (the number of board members of a certain type on a board at time *t*). By using a count of board members by type, drop events as well as add events contribute information.

[26] In our case, the discrete variables are the presence or count of board members by type. The continuous variable is the debt ratio.

purpose of these models is to test the robustness of our findings in the percentage-based analyses regarding the determinants of board composition. So consistent results in the absence of full control for endogeneity would be stronger evidence of robustness across specifications.

Table 14 shows the results for the prediction of board member presence (Model A) and counts (Model B) by type. The results for the prediction of board composition echo earlier findings in this study and others. We confirm once again that levels of debt can be predictors of bankers on the board. In Table 14 Model A1 we see that higher levels of debt predict the presence of a lender on the board, although this effect is only marginally significant (pvalue = .103). Meanwhile, higher debt ratios in the preceding year predict presence and count of other bankers on the board (Models A2 and B2). Higher debt ratios in the preceding year also predict the presence of investors on the board (Model A3).

We find additional support that information asymmetry and dependence play a role in determining which type of outsiders is appointed. Firms that are dependent on short-term debt are more likely to appoint other bankers (Model B2), but less likely to appoint lenders and investors (Models A1 and A3). Greater collateral value and the corresponding decline in information asymmetry increases the likely count of other bankers on the board (Model B2). By contrast, greater information asymmetry appears to favor investor presence on the board, as was the case in the percent analysis. We see this from the positive coefficient on market-to-book, which represents growth opportunities (Model B3).

The presence-based and count-based analyses help confirm many of the substantive results in the percentage-based 3SLS analyses. Though these alternative models provide appropriate tests of robustness, we weight the evidence from the percent-based analysis more heavily in our conclusions. We do so because the percent study using 3SLS provides superior means for addressing endogeneity and fixed effects issues across the system of equations. The count and presence 2SLS analyses predicting the debt ratio are inefficient. The corresponding limited-dependent variable models predicting board composition are inefficient and likely biased due to incomplete specification of the endogenous relationships.

6. Conclusion

The goal of this research was to identify the debt ratio implications of having bankers on the board. By inference, we hoped that a clearer understanding of the board composition-debt ratio relation would shed further light on the role that lenders and other bankers play on the boards on which they serve. We control for the selection process by which bankers are appointed to the board, given the theorized influence of debt ratios on board composition. We also put to test our proposition that the probability of financial distress is a factor in determining banker roles post-appointment as well as being a factor in the appointment selection process.

We find that the debt ratio impact of lenders on the board is consistent with a monitoring role rather than the "disabled monitor" role. We also find that this effect is independent of financial distress. Across our analyses, the effect of lenders on the debt ratio was negative, even though their effect on equity values was also negative. To our knowledge, this is the first ex-post evidence justifying fears regarding board-appointed lenders acting in the interest of their bank. Unlike lenders, the role of other bankers on the board may be a function of the firm's financial health. When the probability of financial distress is high, our results suggest that other bankers provide certification and expertise. After the appointment of other bankers, debt ratios rise, principally due to rising long-term debt. For non-distressed firms, however, the impact of other bankers resembles that of lenders, suggesting a convergence in roles as monitors.

This result may stem from a difference between those other bankers that join the board of a distressed firm versus those that join the board of a non-distressed firm. In the latter case, other bankers may harbor ambitions of becoming lenders to an attractive client and may seek a board position as a vehicle for developing this relationship. This may explain their convergent behavior with existing lenders. In the former case, other bankers may be pulled on to the board by firm management in need of financial market expertise and certification. This may explain their convergent behavior with investors on the board. Although lenders seemingly avoid board appointments when the cost of board monitoring outweighs the advantages, other bankers may skirt the conflict of interest issue by altering their role.

By using a longitudinal dataset that controls for endogeneity, our analysis addresses riddles that surfaced in previous empirical studies. We find hypothesized, yet previously undetected, effects of the debt ratio on banker representation (Kroszner and Strahan, 2001) and lender representation on debt levels (Booth and Deli, 1999). Our analysis therefore complements these earlier studies.

We suggest future research to continue this line of work. Although we sought to determine the role of bankers on the board by examining their impact on the debt ratio, their influence should be felt beyond debt policy. This would suggest the examination of alternative dependent variables, such as dividend policy and capital spending, in order to confirm the findings herein. Second, our study is limited to relatively large firms with public ownership. Confirmation of these findings with a data set of smaller firms, some of which are privately held, would be desirable. Third, we have treated lenders and other bankers as having fixed roles. Yet many lenders become other bankers, and vice versa, over time. It would be interesting to separate the impact of banker roles from the commercial bank institutions that fill these roles. Although we control for the fixed effects of firms, we do not control for possible fixed effects among the banks. By examining the impact of a given set of board-represented commercial banks that alter their relationship with the firm over time we can begin to segment observed effects into the portion that is strictly role-driven versus institution-driven.

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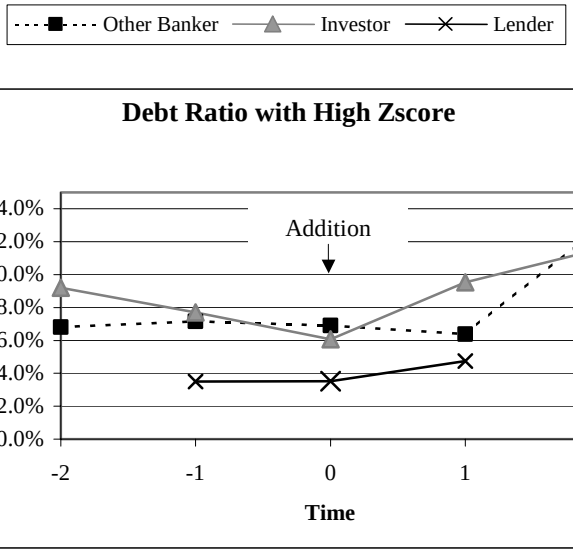
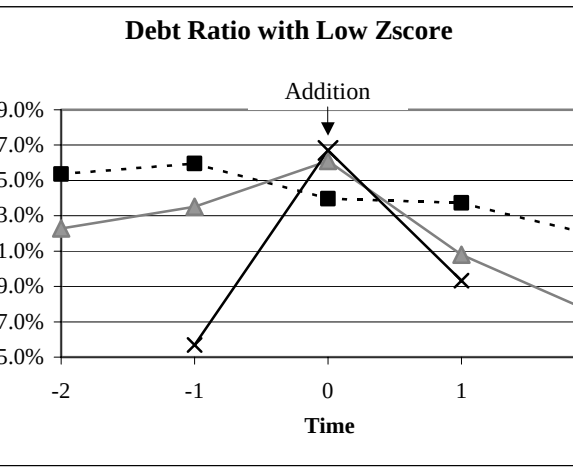
Figures 1 A and B



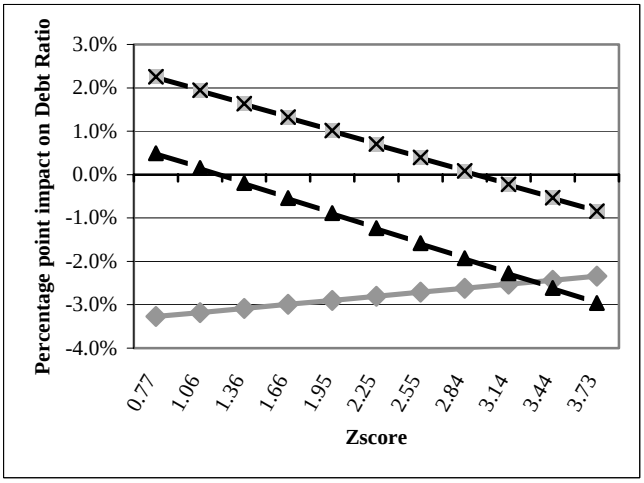
time	Lender HI Zscore			Other Banker Hi Zscore			Investor HI Zscore		
	ΔY	Contribution		ΔY	Contribution		ΔY	Contribution	
		Equity	Debt		Equity	Debt		Equity	Debt
-2				-6.4	-4.1	-2.3	-1.1	-0.1	-1.0
-1	-0.6	-1.1	0.4	0.3	-2.5	2.9	-1.5	-2.8	1.2
0	0.0	-2.4	2.4	-0.2	-0.4	0.2	-1.6	-1.3	-0.3
1	1.2	1.6	-0.4	-0.5	-2.0	1.5	3.5	-1.4	4.8
2				6.0	1.3	4.7	1.1	0.8	0.2



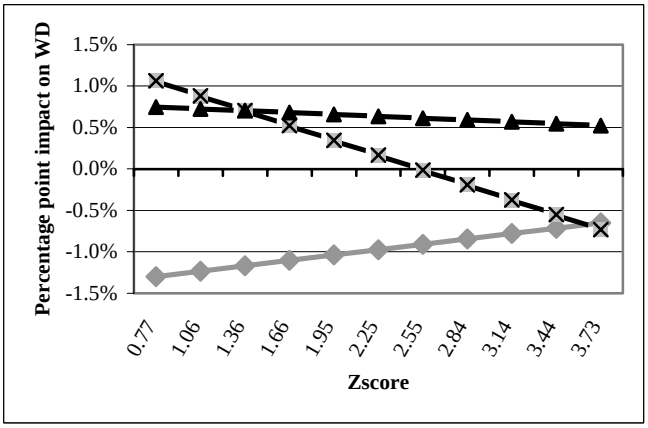
time	Lender Lo Zscore			Other Banker Lo Zscore			Investor Lo Zscore		
	ΔY	Contribution		ΔY	Contribution		ΔY	Contribution	
		Equity	Debt		Equity	Debt		Equity	Debt
-2				-2.3	-3.7	1.4	1.7	0.5	1.2
-1	-1.5	-4.0	2.6	0.6	-0.8	1.4	1.2	-2.0	3.2
0	11.0	3.1	7.9	-2.0	1.0	-3.0	2.6	-0.5	3.1
1	-7.4	0.8	-8.2	-0.2	-1.4	1.2	-5.3	-3.1	-2.2
2				-2.8	1.3	-4.1	-1.3	-0.7	-0.6

Figures 2 A, B and C

A: Impact of Single Board Member on Debt Ratio as Function of Z-Score (3SLS)



B: Impact of Single Board Member on Weighted Debt as Function of Z-Score (3SLS)



C: Impact of Single Board Member on Weighted Equity as Function of Z-Score (3SLS)

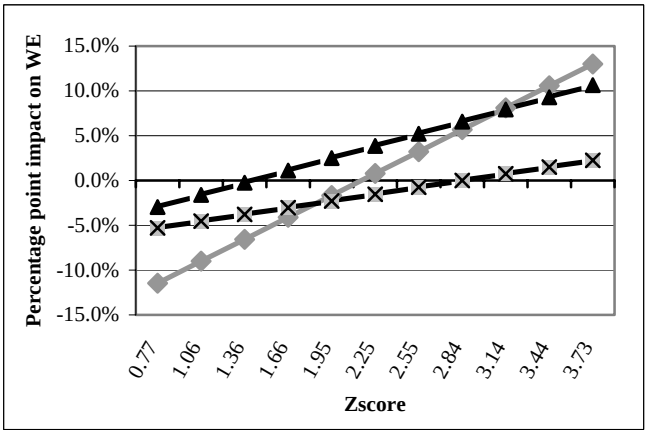


Figure 3

Marginal Impact of Single Board Member on Debt Ratio as Function of Z-Score

(2SLS – Presence Analysis)

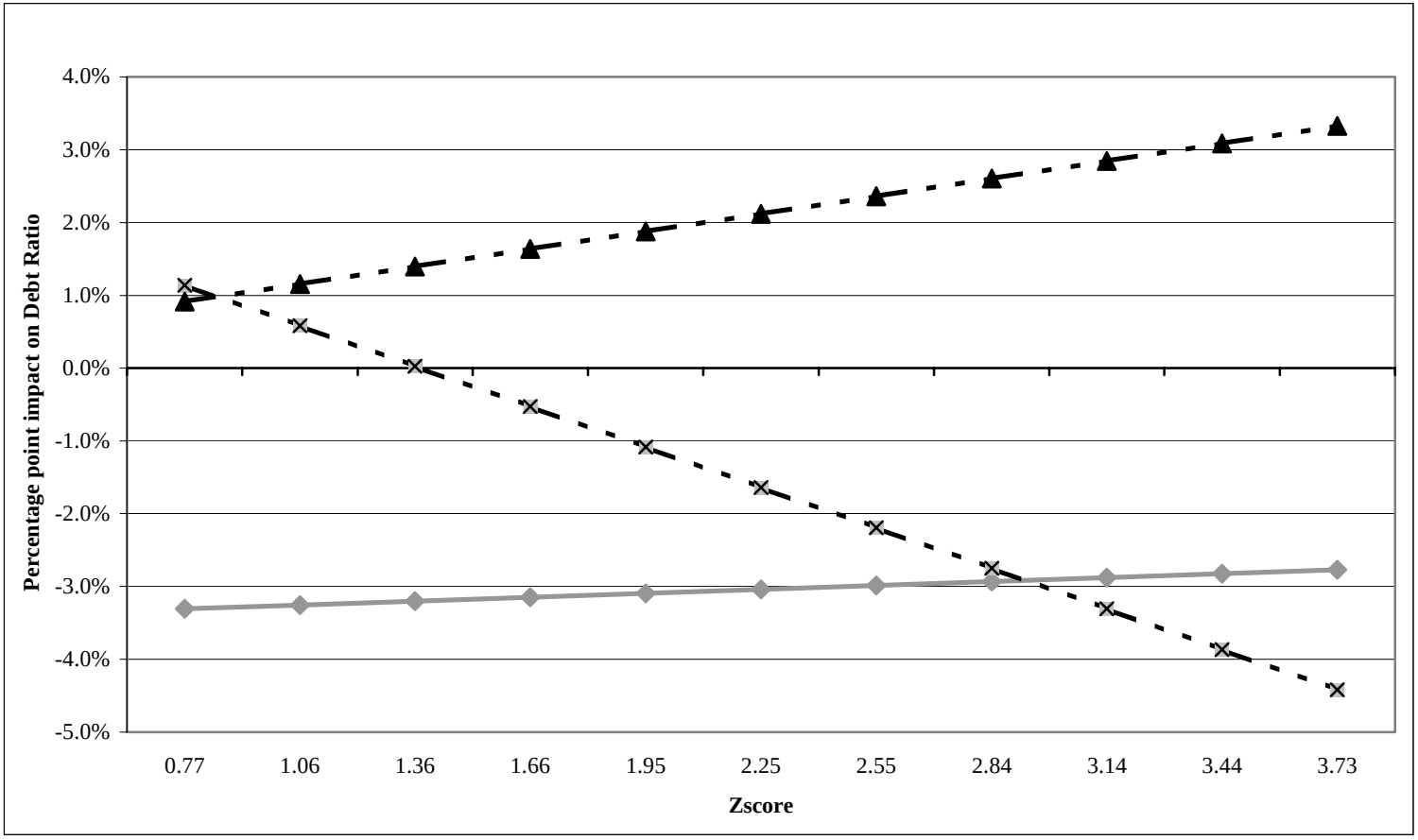


Table 1
Operationalization of Variables

Variable (Abbreviation)	Description
Debt ratio and components	
Market debt ratio (Y)	• Debt Ratio - (LTD / (LTD + Equity) where equity equals the market value of common stock plus the book value of preferred shares and LTD = long-term debt
Weighted debt (WD)	• Ratio of long-term debt to total assets
Weighted equity (WE)	• Ratio of equity market value over total assets
Board composition (Percent)	
LENDER	• Percent of board directors that represent a commercial bank with an outstanding loan to the firm
OTHER BANKER	• Percent of board directors who are commercial bankers, but not lenders
INVESTOR	• Percent of board directors that consist of non-management blockholders, i.e. those owning five percent or more of shares outstanding.
OTHER OUTSIDER	• Percent of board directors who are outsiders, but are neither commercial bankers nor investors
Controls	
Collateral value of assets (COLLATERAL VALUE)	• Collateral assets (inventory + PPE) as a % of total assets
Internal funding capability (INTERNAL FUNDING)	• Internal funding capability (change in retained earnings as a % of total assets)
Size (LOG ASSETS)	• Natural log of total assets
Control for selection bias (INVERSE MILLS RATIO)	• Inverse Mills ratio generated from Probit equation indicating the instantaneous probability of dropping from the sample
Proxy for the probability of financial distress (ZSCORE)	$3.3\frac{\text{EBIT}}{\text{Total Assets}} + 1.0\frac{\text{Sales}}{\text{Total Assets}} + 1.4\frac{\text{Retained Earning}}{\text{Total Assets}} - 1.2\frac{\text{Working Capital}}{\text{Total Assets}}$
Research and Development Expense (R&D %)	• R&D expenses a percent of sales
Ratio of market to book value of equity (MARKET-TO-BOOK)	• [(market value of equity – book value of equity) + total assets] / total assets at the beginning of the year (i.e. lagged value of year-end ratio).
Ratio of short-term debt to total debt (SHORT-TERM DEBT)	• Short-term debt as a percent of total debt
Volatility	• Standard deviation in monthly stock returns over the prior 36-month period

Table 2

Summary Statistics and Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Board Size	1.00																
2	LENDER	-0.01	1.00															
3	OTHER BANKER	0.04	-0.04	1.00														
4	INVESTOR	-0.12	-0.02	-0.02	1.00													
5	OTHER OUTSIDER	-0.05	-0.18	-0.23	-0.37	1.00												
6	Total Assets ^	0.32	-0.02	0.04	-0.07	-0.01	1.00											
7	SHORT-TERM DEBT	0.01	0.01	-0.01	0.00	-0.05	0.11	1.00										
8	VOLATILITY	-0.23	0.04	-0.03	0.08	0.02	-0.14	-0.15	1.00									
9	ZSCORE	-0.08	0.01	0.02	-0.07	-0.11	-0.13	0.17	-0.20	1.00								
10	COLLATERAL VALUE	0.02	0.06	0.07	0.01	-0.08	-0.10	-0.17	-0.01	-0.06	1.00							
11	INTERNAL FUNDING	0.05	-0.01	0.04	-0.03	-0.05	0.01	0.06	-0.12	0.39	-0.01	1.00						
12	R&D %	0.06	-0.04	-0.06	-0.10	0.02	0.07	0.32	-0.02	-0.05	-0.19	0.04	1.00					
13	MARKET-TO-BOOK	0.09	-0.03	-0.01	0.01	0.01	-0.07	0.26	-0.24	0.29	-0.19	0.28	0.27	1.00				
14	Market debt ratio (Y)	0.02	0.00	0.03	0.04	0.06	0.13	-0.40	0.38	-0.48	0.13	-0.31	-0.31	-0.49	1.00			
15	Book debt ratio	-0.02	0.00	0.01	0.01	0.02	0.03	-0.19	0.03	-0.12	0.04	-0.11	-0.10	-0.06	0.24	1.00		
16	Weighted debt (WD)	-0.01	0.00	0.01	0.04	0.09	-0.01	-0.50	0.25	-0.47	0.12	-0.36	-0.28	-0.23	0.79	0.38	1.00	
17	Weighted equity (WE)	0.07	-0.03	0.00	0.01	-0.03	-0.10	0.27	-0.32	0.35	-0.18	0.28	0.31	0.88	-0.63	-0.11	-0.36	1.00
	Obs	4050	4050	4050	4050	4050	3879	3630	3084	2737	3654	3211	3663	2279	2406	3663	3663	2410
	Mean	12.59	0.01	0.03	0.03	0.59	4,381	0.23	0.08	2.40	0.57	0.01	0.02	1.36	0.24	0.30	0.19	0.80
	Std. Dev.	3.26	0.03	0.05	0.08	0.16	11,777	0.22	0.03	0.81	0.15	0.10	0.03	0.55	0.18	0.55	0.13	0.59
	Min	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.75	0.04	-1.20	0.00	0.55	0.00	-26.20	0.00	0.00
	Max	33.00	0.30	0.62	1.00	0.92	184,325	1.00	0.36	8.10	0.92	0.98	0.18	7.26	1.00	15.94	1.41	6.77

^ in millions of dollars

Table 3

Comparison of Means with Test of Means and Medians

	Lender Present		Test of Difference		Other Banker Present		Test of Difference		Investor Present		Test of Difference		All
	No	Yes	Mean	Median	No	Yes	Mean	Median	No	Yes	Mean	Median	
Unique Firm Ids	322	145			226	241			309	158			467.00
Observations	3607	460			2996	1071			3354	713			4067
Board size	12.51	13.21	**	**	12.32	13.31	**	**	12.64	12.33	**		12.59
Board Composition % of Total													
LENDER	0.00	1.16	**	**	0.13	0.12			0.13	0.16	**		0.13
OTHER BANKER	0.36	0.32			0.00	1.33	**	**	0.35	0.34			0.35
INVESTOR	0.33	0.31			0.33	0.33			0.00	1.85			0.33
OTHER OUTSIDER	7.07	6.42	**	**	7.16	6.57	**	**	7.31	5.56	**	**	7.00
Information asymmetry													
VOLATILITY	0.08	0.09		*	0.09	0.08	**	**	0.08	0.09	**	**	0.08
R&D % of SALES	0.019	0.015	**	**	0.019	0.016	**	**	0.020	0.013	**	**	0.02
COLLATERAL VALUI	0.57	0.61	**	**	0.57	0.60	**	**	0.57	0.57		**	0.57
MARKET-TO-BOOK	1.37	1.30	*		1.37	1.35		*	1.35	1.43	**	**	1.36
Dependence													
Total assets ^	4356	4575			3876	5778	**	**	4823	2289	**	**	4381
INTERNAL FUNDING	0.01	0.01			0.01	0.02	**	**	0.01	0.01			0.01
SHORT-TERM DEBT	0.23	0.22			0.23	0.23		**	0.22	0.23			0.23
Z-SCORE	2.40	2.43			2.39	2.43			2.42	2.34	*		2.40
Debt Ratio and Components													
Market debt ratio	0.24	0.25			0.24	0.26	*	*	0.24	0.25			0.24
Book debt ratio	0.30	0.29			0.30	0.30			0.30	0.29			0.30
Weighted debt level	0.19	0.20		**	0.20	0.19			0.19	0.19			0.19
Weighted equity value	0.81	0.73	**	**	0.81	0.79		**	0.79	0.87	**		0.80

* p<.10; ** p<.05; *** p<.01, two tailed tests

^ in millions of dollars

Table 4

Flow Chart Tracking Tenure of Board Member Representation

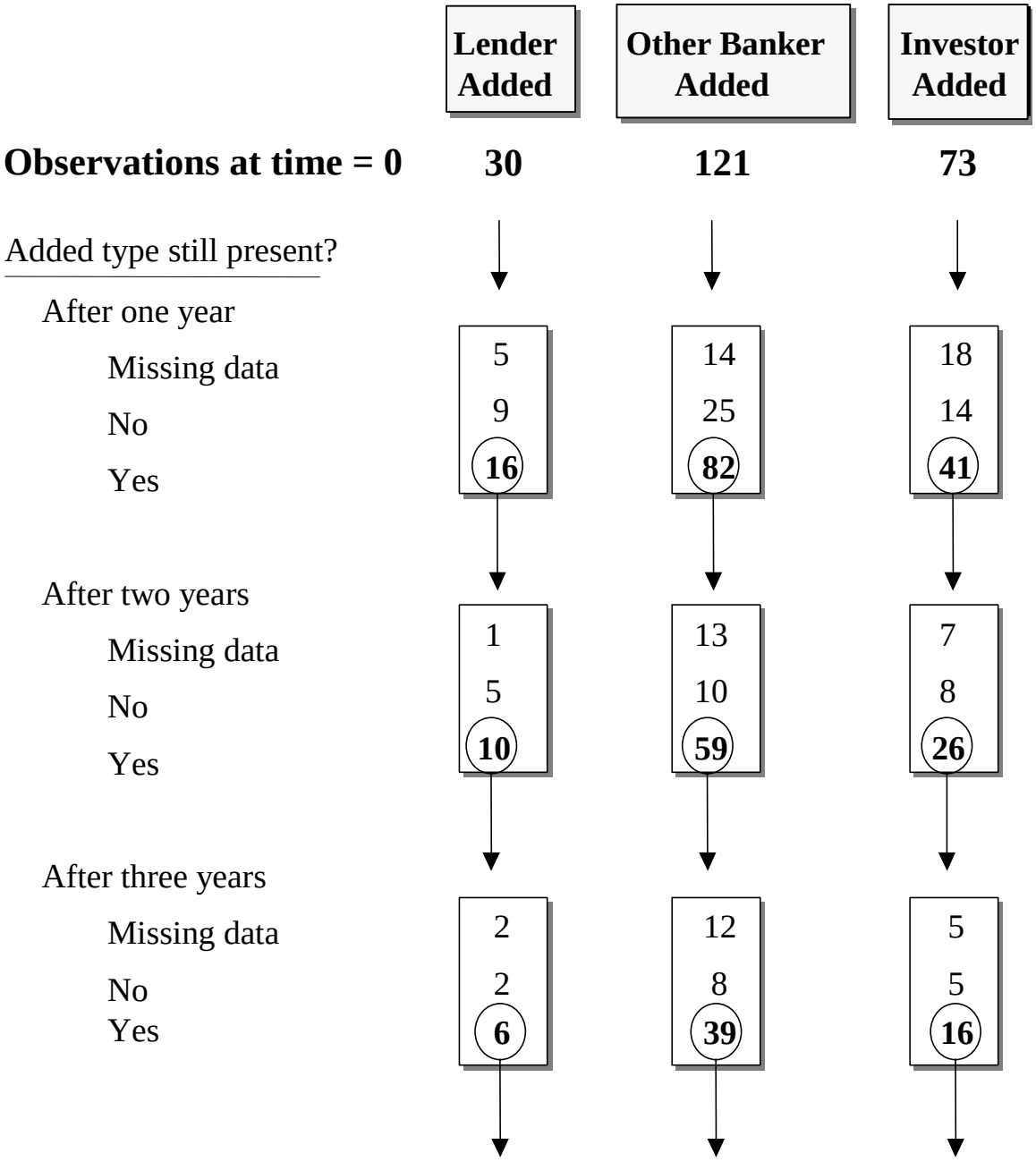


Table 5

Accommodation of Additional Outsiders through Board Expansion or Substitution

	Observed Additions	Impact on Number of Outsiders		Substitution Category					
		Increases	Remains constant	Lenders reduced	Other bankers reduced	Investors reduced	Other outsiders reduced	Combination of others reduced	Subtotal
Lender	38	4	34	NA	21	0	11	2	34
Other Banker	183	42	141	59	NA	4	77	1	141
Investor	123	42	81	9	9	NA	63	0	81

Table 6

Comparison of Means for Debt Ratio Trends over Time

		Add Lender			Add Other Banker			Add Investor	
		0	1		0	1		0	1
	Observations	1531	21		944	48		1144	29
	Debt Ratio (Y)								
1.	Preceding (Y*t-1*)	0.23	0.20		0.22	0.27	**	0.22	0.25
2.	Concurrent (Y*t*)	0.23	0.26		0.23	0.26		0.23	0.26
3.	Subsequent (Y*t+1*)	0.24	0.22		0.24	0.26		0.24	0.25
	Changes in Debt Ratio								
4.	ΔY_{t-1}	0.00	-0.01		0.00	0.01		0.00	0.00
5.	ΔY_t	0.00	0.06	***	0.01	-0.01	*	0.01	0.00
6.	ΔY_{t+1}	0.01	-0.03	**	0.01	-0.01		0.01	-0.01
7.	$\Delta Y_t - \Delta Y_{t-1}$		↑	*					
8.	$\Delta Y_{t+1} - \Delta Y_t$		↓	m					
	Weighted Debt (WD)								
9.	Preceding (WD*t-1*)	0.19	0.18		0.18	0.23	***	0.18	0.22
10.	Concurrent (WD*t*)	0.19	0.20		0.19	0.22	*	0.19	0.21
11.	Subsequent (WD*t+1*)	0.20	0.17		0.20	0.21		0.20	0.21
	Changes in Weighted Debt								
12.	ΔWD_{t-1}	0.00	0.02		0.01	0.01		0.01	0.01
13.	ΔWD_t	0.00	0.03		0.01	-0.01	*	0.01	-0.01
14.	ΔWD_{t+1}	0.01	-0.03		0.01	-0.01		0.01	0.00
15.	$\Delta WD_t - \Delta WD_{t-1}$								
16.	$\Delta WD_{t+1} - \Delta WD_t$		↓	*					
	Weighted Equity (WE)								
18.	Preceding (WE*t-1*)	0.81	0.79		0.85	0.80		0.82	0.84
19.	Concurrent (WE*t*)	0.82	0.74		0.83	0.81		0.81	0.80
	Subsequent (WE*t+1*)	0.84	0.79		0.86	0.87		0.83	0.88
	Changes in Weighted Equity								
20.	ΔWE_{t-1}	0.03	0.06		0.02	0.02		0.02	0.07
21.	ΔWE_t	0.01	-0.04		-0.01	0.01		-0.01	-0.05
22.	ΔWE_{t+1}	0.02	0.04		0.02	0.06		0.03	0.08
23.	$\Delta WE_t - \Delta WE_{t-1}$		↓	**					
24.	$\Delta WE_{t+1} - \Delta WE_t$								

* p<.10; ** p<.05; *** p<.01, two tailed tests / m - marginal effect (pvalue < .12)

↑ , ↓ – Acceleration, deceleration in trend respectively

Table 7

Comparison of Means for Debt Ratio Trends over Time by Z-score

		Add Lender			Add Other Banker			Add Investor		
		Lo Zscore	Hi Zscore		Lo Zscore	Hi Zscore		Lo Zscore	Hi Zscore	
	Observations	11	10		26	21		14	15	
	Debt Ratio (Y)									
1.	Preceding (Y*t-1*)	0.26	0.14	**	0.36	0.17	***	0.34	0.18	***
2.	Concurrent (Y*t*)	0.37	0.14	***	0.34	0.17	***	0.36	0.16	***
3.	Subsequent (Y*t+1*)	0.29	0.15	*	0.34	0.16	***	0.31	0.20	**
	Changes in Debt Ratio									
4.	ΔY_{t-1}	-0.01	-0.01		0.01	0.00		0.01	-0.02	
5.	ΔY_t	0.11	0.00		-0.02	0.00		0.03	-0.02	
6.	ΔY_{t+1}	-0.07	0.01		0.00	-0.01		-0.05	0.03	**
7.	$\Delta Y_t - \Delta Y_{t-1}$		↑ m							
8.	$\Delta Y_{t+1} - \Delta Y_t$	↓ *						↓ *		
	Weighted Debt (WD)									
9.	Preceding (WD*t-1*)	0.22	0.13	*	0.29	0.16	***	0.27	0.17	*
10.	Concurrent (WD*t*)	0.26	0.14	***	0.28	0.16	***	0.28	0.14	***
11.	Subsequent (WD*t+1*)	0.21	0.13	*	0.26	0.16	***	0.26	0.17	*
	Changes in Weighted Debt									
12.	ΔWD_{t-1}	0.02	0.01		0.01	0.02		0.01	0.01	
13.	ΔWD_t	0.05	0.01		-0.01	0.00		0.01	-0.03	
14.	ΔWD_{t+1}	-0.05	0.00	m	-0.01	0.00		-0.03	0.03	*
15.	$\Delta WD_t - \Delta WD_{t-1}$									
16.	$\Delta WD_{t+1} - \Delta WD_t$	↓ m							↑ *	
	Weighted Equity (WE)									
17.	Preceding (WE*t-1*)	0.62	0.97	***	0.58	1.07	***	0.70	0.98	
18.	Concurrent (WE*t*)	0.52	0.99	***	0.62	1.06	**	0.60	0.99	
19.	Subsequent (WE*t+1*)	0.56	1.04	**	0.67	1.14	**	0.68	1.06	
	Changes in Weighted Equity									
20.	ΔWE_{t-1}	0.08	0.02		-0.03	0.08		0.04	0.10	
21.	ΔWE_t	-0.10	0.02		0.04	-0.01		-0.10	0.01	
22.	ΔWE_{t+1}	0.04	0.04		0.05	0.08		0.08	0.08	
23.	$\Delta WE_t - \Delta WE_{t-1}$	↓ **								
24.	$\Delta WE_{t+1} - \Delta WE_t$	↑ m						↑ *		

* p<.10; ** p<.05; *** p<.01, two tailed tests / m - marginal effect (pvalue < .12)

↑ , ↓ – Acceleration, deceleration in trend respectively

Table 8

Predict Board Composition (Percent)

	LENDER as Percent of Board						OTHER BANKER as Percent of Board						INVESTOR as Percent of Board					
	A1		B1		C1		A2		B2		C2		A3		B3		C3	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff.	SE	Coeff	SE	Coeff	SE	Coeff	SE
Debt ratio and components																		
Y	0.14	0.03 ***					0.10	0.08					-0.51	0.07 ***				
Y_LAG	-0.07	0.02 ***					-0.02	0.05					0.24	0.05 ***				
WD			-0.04	0.07					0.41	0.14 ***					-0.14	0.13		
WD_LAG			0.03	0.04					-0.17	0.08 **					0.04	0.07		
WE					-0.01	0.02					0.01	0.04					0.12	0.05 ***
WE_LAG					0.02	0.02					-0.04	0.04					-0.09	0.05 *
Board Composition (Percent)																		
Lag Dep. Var.	-0.03	0.02	-0.11	0.02 ***	-0.07	0.02 ***	-0.22	0.03 ***	-0.25	0.03 ***	-0.17	0.03 ***	-0.05	0.03 *	-0.15	0.03 ***	-0.07	0.03 **
LENDER							0.48	0.40	0.13	0.34	1.36	0.32 ***	2.59	0.35 ***	0.60	0.31 *	1.40	0.39 ***
OTHER BANKER	0.09	0.06	-0.01	0.05	0.16	0.06 ***							-0.26	0.15 *	-0.11	0.10	-0.53	0.14 ***
OTHER OUTSIDER	0.10	0.03 ***	0.07	0.03 **	0.10	0.03 ***	-0.14	0.07 **	-0.13	0.07 *	-0.23	0.07 ***	-0.27	0.08 ***	-0.12	0.06 **	-0.32	0.08 ***
INVESTOR	0.29	0.05 ***	0.18	0.06 ***	0.28	0.06 ***	-0.54	0.13 ***	-0.51	0.14 ***	-0.78	0.12 ***						
Controls																		
COLLATERAL VALUE	-0.01	0.01	-0.02	0.01 *	-0.01	0.01	-0.01	0.02	0.01	0.02	0.00	0.02	0.01	0.02	-0.03	0.02	0.00	0.02
INTERNAL FUNDING	0.03	0.01 ***	-0.02	0.02	0.00	0.01	0.02	0.02	0.13	0.05 ***	-0.01	0.02	-0.13	0.02 ***	-0.06	0.05	-0.02	0.02
LOG ASSETS	-0.02	0.01 ***	0.01	0.01	0.00	0.01	-0.02	0.02	-0.05	0.02 ***	0.00	0.01	0.09	0.02 ***	0.02	0.02	0.03	0.02 **
INVERSE MILLS RATIO	0.00	0.00	0.00	0.00	0.00	0.00 *	0.00	0.00	-0.01	0.00 *	-0.01	0.00	-0.01	0.00	-0.01	0.00 **	-0.01	0.00 **
ZSCORE	0.01	0.00 **	0.00	0.00	0.00	0.00	0.01	0.01 **	0.02	0.01 ***	0.01	0.01	-0.02	0.01 ***	0.00	0.01	-0.01	0.01
R&D %	0.06	0.08	-0.07	0.09	0.01	0.08	-0.16	0.17	0.11	0.18	-0.16	0.17	-0.21	0.23	-0.10	0.17	0.01	0.22
LMVBVR	-0.01	0.00 **	0.00	0.00	-0.01	0.02	-0.01	0.01	-0.02	0.01 **	0.04	0.04	0.04	0.01 ***	0.01	0.01	0.09	0.05 *
SHORT-TERM DEBT	0.04	0.01 ***	-0.01	0.02	0.00	0.00	0.03	0.02	0.10	0.03 ***	0.01	0.01	-0.13	0.02 ***	-0.03	0.03	0.01	0.01
VOLATILITY	0.32	0.09 ***	0.11	0.08	0.20	0.08 **	-0.25	0.21	-0.23	0.18	-0.48	0.18 ***	-1.09	0.24 ***	-0.47	0.16 ***	-0.67	0.21 ***
VOLATILITY^2	-1.52	0.36 ***	-0.61	0.35 *	-0.90	0.32 ***	0.97	0.89	0.37	0.79	2.00	0.73 ***	5.05	0.95 ***	2.29	0.68 ***	2.37	0.83 ***
Joint Tests																		
Y & Ylag		0.00 ***		0.76		0.66		0.42		0.01		0.49		0.00 ***		0.50		0.02
Volatilty & square		0.00 ***						0.49						0.00 ***				

* p<.10; ** p<.05; *** p<.01, two tailed tests

Table 9

Predict Board Composition (Percent)
Using Information Asymmetry * Z-Score Interaction

	LENDER %		OTHER BANKER %		INVESTOR %	
	Coeff.	SE	Coeff.	SE	Coeff.	SE
Debt ratio						
Y	0.07	0.05	0.06	0.09	-0.50	0.09 ***
Y_LAG	0.02	0.05	-0.03	0.07	0.18	0.09 **
Board Composition (Percent)						
Lag Dep. Var.	-0.09	0.04 **	-0.22	0.03 ***	-0.10	0.03 ***
LENDER			0.25	0.42	2.02	0.47 ***
OTHER BANKER	0.05	0.07			-0.22	0.17
OTHER OUTSIDER	0.07	0.04 *	-0.10	0.07	-0.22	0.08 ***
INVESTOR	0.19	0.07 ***	-0.34	0.14 **		
Controls						
COLLATERAL VALUE	-0.01	0.01	0.00	0.02	0.00	0.02
INTERNAL FUNDING	0.00	0.02	0.02	0.03	-0.12	0.03 ***
LOG ASSETS	-0.01	0.01	-0.01	0.02	0.09	0.02 ***
INVERSE MILLS RATIO	0.00	0.00	0.00	0.00	-0.01	0.00
ZSCORE	0.00	0.00	0.02	0.01 ***	0.00	0.01
R&D %	0.05	0.08	-0.21	0.16	-0.22	0.21
MARKET-TO-BOOK	0.00	0.01	-0.01	0.01	0.03	0.01 **
SHORT-TERM DEBT	0.01	0.01	0.02	0.02	-0.13	0.03 ***
VOLATILITY	-0.16	0.06 ***	0.22	0.12 *	0.41	0.15 ***
ZSCORE * VOLATILITY	0.05	0.03 *	-0.12	0.05 **	-0.18	0.06 ***
Joint Tests						
Y & Ylag		0.09 *		0.79		0.00 ***
Volatilty & interaction term		0.03 **		0.04 **		0.01 **

* p<.10; ** p<.05; *** p<.01, two tailed tests

Table 10

Predict Debt Ratio and Components
Using 3SLS and Concurrent Composition Variables (Percent)

	Debt Ratio				LTD / Total Assests Ratio				Market Value Equity / Tot. Assets			
	A1		B1		A2		B2		A3		B3	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lag of Dep. Variable	1.43	0.49 ***	0.43	0.09 ***	0.29	0.12 **	0.34	0.10 ***	-1.41	0.93	0.50	0.27 *
Board Composition (Percent)												
LENDER	4.10	2.27 *	4.58	0.93 ***	-0.21	0.52	0.30	1.11	-3.71	1.88 **	1.25	3.40
OTHER BANKER	-1.17	0.65 *	-1.74	0.69 **	-0.07	0.19	-1.99	0.72 ***	1.37	0.98	6.02	2.63 **
INVESTOR	-0.71	0.55	-1.13	0.43 ***	0.40	0.26	-1.59	0.54 ***	-2.21	0.92 **	4.29	1.73 **
OTHER OUTSIDER	-0.39	0.31	-2.23	0.42 ***	0.16	0.11	-1.64	0.61 ***	0.42	0.48	2.66	1.97
ZSCORE Interactions												
LENDER			-0.28	0.37			-0.26	0.43			-1.11	1.54
OTHER BANKER			0.53	0.22 **			0.79	0.25 ***			-1.60	0.89 *
INVESTOR			0.40	0.17 **			0.69	0.18 ***			-1.51	0.73 **
OTHER OUTSIDER			0.31	0.16 *			0.71	0.23 ***			-0.66	0.75
Controls												
COLLATERAL VALUE	-0.01	0.09	-0.02	0.06	-0.02	0.03	-0.13	0.05 **	-0.36	0.15 **	0.02	0.20
INTERNAL FUNDING	-0.32	0.07 ***	-0.22	0.04 ***	-0.31	0.03 ***	-0.31	0.03 ***	-0.67	0.33 **	-0.02	0.13
LOG ASSETS	0.19	0.03 ***	0.17	0.02 ***	0.11	0.01 ***	0.09	0.02 ***	-0.03	0.10	-0.20	0.07 ***
INVERSE MILLS RATIO	0.00	0.02	-0.01	0.01	0.01	0.01 **	0.01	0.01	-0.04	0.03	0.00	0.03
ZSCORE	-0.02	0.02	-0.26	0.11 **	-0.04	0.01 ***	-0.51	0.15 ***	0.24	0.04 ***	0.67	0.49
R&D %	-0.48	0.69	-0.71	0.46	-0.54	0.27 **	-1.14	0.38 ***	1.33	1.41	0.59	1.38
MARKET-TO-BOOK	0.15	0.05 ***	0.07	0.02 ***	0.03	0.01 ***	0.04	0.01 ***	1.41	0.93	-0.52	0.26 *
SHORT-TERM DEBT	-0.23	0.03 ***	-0.26	0.02 ***	-0.23	0.01 ***	-0.24	0.01 ***	0.01	0.05	-0.02	0.05
VOLATILITY	-0.85	0.96	-1.83	0.48 ***	0.31	0.31	-0.15	0.36	-1.93	1.51	2.03	1.32
VOLATILITY Squared	-0.20	4.24	8.98	1.93 ***	0.30	1.25	2.39	1.47	3.88	5.39	-5.31	5.42
Joint Tests												
Main Effects + interactions												
LENDER				0.00 ***				0.79				0.77
OTHER BANKER				0.04 **				0.00 ***				0.04 **
INVESTOR				0.00 ***				0.00 ***				0.04 **
OTHER OUTSIDER				0.02 **				0.01 ***				0.15

* p<.10; ** p<.05; *** p<.01, two tailed tests

Table 11

Predict Debt Ratio and Components
Using 3SLS and Lagged Composition Variables (Percent)

	Debt Ratio				LTD / Total Assests Ratio				Market Value Equity / Tot. Assets			
	A1		B1		A2		B2		A3		B3	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lag of Dep. Variable	0.79	0.26 ***	0.42	0.19 **	0.39	0.14 ***	0.32	0.13 **	-1.50	0.96	-0.93	0.71
Board Composition (Percent)												
Lag_LENDER	-0.48	0.18 ***	-0.46	0.30	-0.14	0.09 m	-0.19	0.19	-0.06	0.44	-2.31	1.02 **
Lag_OTHER BANKER	0.14	0.09	0.40	0.16 **	0.02	0.05	0.20	0.11 *	-0.11	0.24	-0.94	0.50 *
Lag_INVESTOR	-0.04	0.08	0.18	0.09 **	-0.05	0.05	0.10	0.06	0.30	0.21	-0.84	0.34 **
Lag_OTHER OUTSIDER	0.04	0.04	-0.01	0.05	-0.01	0.02	0.00	0.03	-0.03	0.11	-0.36	0.21 *
ZSCORE Interactions												
Lag_LENDER			0.04	0.10			0.03	0.07			1.07	0.40 ***
Lag_OTHER BANKER			-0.14	0.06 **			-0.08	0.04 **			0.33	0.19 *
Lag_INVESTOR			-0.15	0.03 ***			-0.01	0.01			0.60	0.16 ***
Lag_OTHER OUTSIDER			0.00	0.02			-0.09	0.03 ***			0.16	0.09 *
Controls												
COLLATERAL VALUE	0.01	0.05	0.02	0.04	-0.03	0.03	-0.03	0.03	-0.15	0.13	-0.10	0.12
INTERNAL FUNDING	-0.33	0.06 ***	-0.23	0.04 ***	-0.33	0.03 ***	-0.31	0.03 ***	-0.59	0.34 *	-0.41	0.23 *
LOG ASSETS	0.20	0.02 ***	0.18	0.02 ***	0.12	0.01 ***	0.11	0.01 ***	-0.05	0.11	-0.12	0.08
INVERSE MILLS RATIO	0.01	0.01	0.01	0.01	0.01	0.00 **	0.01	0.00 *	-0.01	0.02	0.00	0.02
ZSCORE	-0.05	0.01 ***	-0.06	0.01 ***	-0.03	0.01 ***	-0.04	0.01 ***	0.22	0.04 ***	0.24	0.04 ***
R&D %	-0.21	0.47	-0.40	0.41	-0.45	0.28	-0.51	0.27 *	1.05	1.40	0.27	1.19
MARKET-TO-BOOK	0.12	0.03 ***	0.08	0.02 ***	0.04	0.01 ***	0.04	0.01 ***	1.49	0.96	0.88	0.70
SHORT-TERM DEBT	-0.28	0.02 ***	-0.26	0.02 ***	-0.23	0.01 ***	-0.23	0.01 ***	0.02	0.05	0.04	0.05
VOLATILITY	-1.34	0.62 **	-0.85	0.53	0.07	0.28	0.10	0.28	-0.81	1.37	-0.42	1.29
VOLATILITY Squared	5.16	2.15 **	3.93	1.95 **	1.20	1.10	1.08	1.11	-0.33	4.87	1.47	4.52
Joint Tests												
Main Effects + interactions												
LENDER				0.07 *				0.32				0.02 **
OTHER BANKER				0.04 **				0.14				0.17
INVESTOR				0.00 ***				0.00 ***				0.00 ***
OTHER OUTSIDER				0.97				0.37				0.18

* p<.10; ** p<.05; *** p<.01, two tailed tests / m - marginal effect (pvalue < .12)

Table 12

Predict Debt Ratio and Components
Using 2SLS and Lagged Composition Variables (Presence)

	Debt Ratio				LTD / Total Assests Ratio				Market Value Equity / Tot. Assets			
	A1		B1		A2		B2		A3		B3	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lag of Dep. Variable	1.09	0.35 ***	1.30	0.44 ***	0.32	0.13 **	0.20	0.13	-0.31	0.24	-0.32	0.24
Board composition (Presence)												
Lag_LENDER	-0.02	0.02	-0.03	0.02 *	0.01	0.01	0.03	0.02	0.04	0.03	0.02	0.08
Lag_OTHER BANKER	0.03	0.01 **	0.03	0.01 **	0.01	0.01	0.00	0.01	-0.01	0.02	-0.02	0.06
Lag_INVESTOR	0.00	0.01	0.00	0.01	-0.01	0.01	0.01	0.01	0.04	0.03	-0.06	0.06
Lag_OTHER OUTSIDER	0.03	0.04	0.05	0.05	-0.01	0.02	0.06	0.02 ***	-0.03	0.08	-0.31	0.13 **
ZSCORE Interactions												
Lag_LENDER			0.00	0.02			-0.01	0.01			0.01	0.03
Lag_OTHER BANKER			-0.02	0.01			0.00	0.00			0.00	0.02
Lag_INVESTOR			0.01	0.01			-0.01	0.01			0.04	0.02 *
Lag_OTHER OUTSIDER			0.09	0.04 **			-0.03	0.01 ***			0.13	0.04 ***
Controls												
COLLATERAL VALUE	-0.09	0.06	-0.08	0.07	0.01	0.03	0.01	0.03	0.04	0.11	0.01	0.11
INTERNAL FUNDING	-0.32	0.05 ***	-0.33	0.06 ***	-0.25	0.03 ***	-0.23	0.03 ***	-0.15	0.07 **	-0.17	0.08 **
LOG ASSETS	0.18	0.02 ***	0.21	0.02 ***	0.11	0.01 ***	0.10	0.01 ***	-0.26	0.04 ***	-0.24	0.04 ***
INVERSE MILLS RATIO	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
ZSCORE	-0.03	0.01 **	-0.02	0.02	-0.02	0.01 **	-0.03	0.01 ***	0.16	0.02 ***	0.20	0.02 ***
R&D %	-0.20	0.53	-0.15	0.56	-0.33	0.25	-0.43	0.24 *	-0.69	1.00	-0.49	0.99
MARKET-TO-BOOK	0.13	0.04 ***	0.14	0.04 ***	0.01	0.01	0.02	0.01 ***	0.28	0.23	0.26	0.23
SHORT-TERM DEBT	-0.24	0.02 ***	-0.23	0.02 ***	-0.19	0.01 ***	-0.19	0.01 ***	-0.06	0.04	-0.04	0.04
VOLATILITY	0.36	0.57	-0.53	0.70	-0.41	0.28	-0.03	0.28	-0.78	1.11	-0.78	1.08
VOLATILITY Squared	-4.76	2.82 *	-0.80	2.68	2.55	1.20 **	0.60	1.21	5.18	4.99	6.47	4.66
Joint Tests												
Main Effects + interactions												
LENDER				0.18				0.07 *				0.31
OTHER BANKER				0.04 **				0.40				0.89
INVESTOR				0.50				0.23				0.12
OTHER OUTSIDER				0.11				0.00 ***				0.01 ***

* p<.10; ** p<.05; *** p<.01, two tailed tests / m - marginal effect

Table 13

Predict Debt Ratio and Components
Using 2SLS and Lagged Composition Variables (Counts)

	Debt Ratio				LTD / Total Assests Ratio				Market Value Equity / Tot. Assets			
	A1		B1		A2		B2		A3		B3	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lag of Dep. Variable	1.21	0.39 ***	1.28	0.44 ***	0.40	0.15 ***	0.23	0.12 **	-0.39	0.28	-0.52	0.35
Board composition (Count)												
Lag_LENDER	-0.03	0.02 **	-0.04	0.02 **	-0.02	0.01 ***	-0.01	0.01 **	-0.03	0.03	-0.03	0.03
Lag_OTHER BANKER	0.02	0.01 **	0.02	0.01 **	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Lag_INVESTOR	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	-0.01	0.01	0.02	0.01
Lag_OTHER OUTSIDER	0.01	0.00 **	0.01	0.00 **	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
ZSCORE Interactions												
Lag_LENDER			0.02	0.02			0.00	0.01			0.09	0.04 **
Lag_OTHER BANKER			-0.02	0.01 **			0.00	0.00			0.02	0.02
Lag_INVESTOR			0.00	0.01			0.00	0.00			0.04	0.01 ***
Lag_OTHER OUTSIDER			0.01	0.00 **			0.00	0.00 **			0.01	0.01 **
Controls												
COLLATERAL VALUE	-0.12	0.07 *	-0.11	0.07	-0.04	0.03	-0.01	0.03	0.02	0.11	0.06	0.11
INTERNAL FUNDING	-0.34	0.06 ***	-0.33	0.06 ***	-0.27	0.03 ***	-0.25	0.03 ***	-0.20	0.09 **	-0.20	0.10 **
LOG ASSETS	0.19	0.02 ***	0.21	0.02 ***	0.11	0.01 ***	0.12	0.01 ***	-0.24	0.04 ***	-0.21	0.05 ***
INVERSE MILLS RATIO	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	-0.01	0.01	0.00	0.02
ZSCORE	-0.03	0.01 **	-0.02	0.02	-0.01	0.01 **	-0.03	0.01 ***	0.16	0.02 ***	0.20	0.02 ***
R&D %	-0.20	0.58	-0.34	0.56	-0.41	0.26	-0.40	0.23 *	-0.06	1.03	-0.28	1.03
MARKET-TO-BOOK	0.14	0.04 ***	0.13	0.04 ***	0.01	0.01 **	0.01	0.01 **	0.37	0.27	0.44	0.33
SHORT-TERM DEBT	-0.26	0.03 ***	-0.24	0.03 ***	-0.20	0.01 ***	-0.19	0.01 ***	-0.06	0.04	-0.04	0.04
VOLATILITY	0.09	0.61	-0.39	0.65	-0.13	0.29	0.10	0.30	-0.52	1.06	-0.02	1.01
VOLATILITY Squared	-3.32	2.73	-1.48	2.51	1.15	1.18	0.26	1.28	3.43	4.66	1.34	4.14
Joint Tests												
Main Effects + interactions												
LENDER				0.09 *				0.06 *				0.08 *
OTHER BANKER				0.02 **				0.78				0.35
INVESTOR				0.78				0.34				0.00 ***
OTHER OUTSIDER				0.04 **				0.09 *				0.13

* p<.10; ** p<.05; *** p<.01, two tailed tests

Table 14

Predict Presence and Count of Board Members by Type

	Lender			Other Banker				Investor			
	A1			A2		B2		A3		B3	
	Predict presence			Predict presence		Predict count		Predict presence		Predict count	
	Coef.	Std. Err.		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Debt ratio											
Y	5.04	3.09	m	-0.90	2.04	-0.69	0.87	0.66	1.87	-0.60	1.29
Y_LAG	0.05	2.89		2.72	1.52 *	1.69	0.89 *	4.25	1.99 **	1.55	1.21
Board composition (Using Count / Presence)											
Lag_dep. Var.	2.79	0.60	***	2.25	0.28 ***	3.41	0.19 ***	1.90	0.33 ***	3.26	0.23 ***
LENDER				-3.27	0.54 ***	-0.81	0.23 ***	-2.31	0.86 ***	-0.43	0.31
OTHER BANKER	-3.44	0.73	***					-0.27	0.62	-0.07	0.15
OTHER OUTSIDER	-16.6	3.7	***	-18.3	2.2 ***	-0.29	0.11 **	-14.9	2.3 ***	-0.37	0.06 ***
INVESTOR	-3.55	1.12	***	-0.55	0.67	-0.27	0.05 ***				
Controls											
Board Size	-0.34	0.19	*	-0.04	0.09	0.16	0.04 ***	0.21	0.12 *	0.21	0.05 ***
COLLATERAL VALUE	7.06	4.89		2.18	2.39	1.21	0.53 **	-2.01	2.51	0.51	0.71
INTERNAL FUNDING	-4.83	5.62		-0.83	2.51	2.06	1.33	-1.41	2.46	-1.07	1.22
LOG ASSETS	-1.11	1.26		0.61	0.74	0.04	0.09	0.72	0.70	-0.19	0.11 *
INVERSE MILLS RATIO	1.21	2.02		0.70	0.48	-0.02	0.19	0.07	0.79	-0.65	0.35 *
ZSCORE	0.13	0.90		-0.44	0.51	-0.11	0.13	0.23	0.48	-0.14	0.14
R&D %	-68	51		-24	23	-3.20	2.94	-6	27	-2.13	4.87
MARKET-TO-BOOK	2.04	1.37		0.56	0.58	0.17	0.19	0.63	0.51	0.62	0.24 **
SHORT-TERM DEBT	-2.77	1.99		1.32	1.10	0.79	0.37 **	-2.70	1.47 *	0.18	0.43
VOLATILITY	58	67		24	30	1.76	9.04	9	30	5.94	10.84
VOLATILITY^2	-358	335		-88	141	-28	38	-96	120	-20	41
Joint Tests											
Y & Ylag	0.22			0.20		0.12		0.02 **		0.34	
Volatilty & square	0.38			0.67		0.29		0.21		0.86	

* p<.10; ** p<.05; *** p<.01, two tailed tests / m - marginal effect (pvalue < .12)