Product Market Competition, Controlling Shareholders, and Board of Directors

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Abstract

This paper explores the effect of the interaction between product market competition and controlling shareholders' control power on the structures and activities of board of directors. We empirically demonstrate that there exist negative relationship between the control power of controlling shareholders and the board characteristics as measured by their size, composition, leadership structure, number of committees, and "vote no" activities only when the industry is relatively less competitive. The negative relation decreases or disappears altogether for firms in more competitive product markets. These results suggest that competitive product market fosters more independent and vocal boards of directors.

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1. Introduction

Board of directors is an important control mechanism for addressing agency problems (Fama, 1980; Fama and Jensen, 1983) as it can mitigate a manager's incentive to pursue his own interest. Existing literature shows that the extent to which this control mechanism works is determined by firms' characteristics and external environment. For example, Hermalin and Weisbach (1998) found that when managers possess a high degree of bargaining power (as determined by their performance and tenure), they can undermine the independence of board of directors. Similarly, Mace (1971) argued that since managers are closely involved in determining the structures of boards, the extent to which boards of directors can effectively monitor those managers cannot be ensured. In contrast to these studies, some research has found a substitution relationship between corporate insider ownership and the monitoring role of boards of directors (Denis and Sarin, 1999; Linck et al., 2008). They have shown that when corporate insiders own a significant portion of the firm, they are less likely to pursue private benefits of control and thus substitute for board monitoring. These studies therefore suggest that to maximize the efficiency with which boards of directors monitor managers, various factors and stakeholder interests should be considered.

In this paper, we explore the effect of controlling shareholders' control power[1] on board structure and activity. More importantly, we investigate whether this effect is moderated by the level of competition in a given product market. Recent literature related to the activity of controlling shareholders has shown that they affect internal control mechanisms of firms (Shleifer and Vishny, 1997; Baek et al., 2004). They hold considerable control power over management, which allows them to affect the ways in which board of directors are structured, and thus, the ways in which those board act. To extend current literature on this issue, we focus on the moderating effect of product market competition on the ways in which controlling shareholders affect the structure and activities of board of directors. Corporate governance is primarily determined by environmental factors (Durnev and

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[1] The classical principle-agent theory focuses on the conflict of interest between managers and shareholders mainly under dispersed ownership structure (Berle and Means, 1932). However, in practice, a large number of firms have controlling shareholders with concentrated ownership structure, and it is more so in emerging markets. In these countries, controlling shareholders have considerable control power on corporate decision-making beyond managers (Johnson et al., 2000; Claessens et al., 2000). As a necessity, the framework of agency problem needs to be switched into a relationship between controlling shareholders and minority shareholders

Kim, 2005; Gillan et al., 2006; Linck et al., 2008; Pfeffer and Salancik, 1978). As an external control mechanism, product market competition compels managers to maximize shareholder value (Griffith, 2001; Shleifer and Vishny, 1997). A competitive market also increases the bankruptcy risk that results from inappropriate investment decisions (Hart, 1983; Holmstrom, 1982). Similarly, Alchian (1950) and Stigler (1958) argued that firms in competitive markets practice good corporate governance as a bonding mechanism to minimize the cost of capital.

In this paper, we focus on the Korean economy where controlling shareholders with extensive control power frequently get involved in corporate decision-making process such as the appointment of board members as well as executive managers and influence shareholder value (Baek et al., 2004; Joh, 2003). In emerging economies with less-matured capital markets and inefficient external control mechanisms, monitoring managers chiefly depends on internal corporate governance. As a result, boards of directors have been considered the most critical control mechanism for corporate governance (Kim and Kim, 2008).[2] Additionally, markets for corporate control and managerial labor are not well developed as alternative governance mechanisms in the Korean economy.

This paper represents the first study to investigate the moderating effect of competitive threat on the relationship between controlling shareholders' control power and the structure of the firm's board of directors. The literature on the relationship between internal corporate governance and external corporate governance is largely inconsistent. Shleifer and Vishny (1997) and Cremers and Nair (2005) showed that there is a complementary relationship between internal corporate governance and external control mechanisms. Raheja (2005) and Coles et al. (2008) similarly argued that a simultaneous consideration of environmental factors and internal characteristics is the most effective way to deal with the agency problem. Contrarily, Giroud and Mueller (2011) reported a substitution relationship between product market competition and internal corporate governance. Given these conflicting results, we seek to address the question as to how internal corporate governance and external control mechanisms interact, by using data from an emerging market economy.

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[2] In Korea, inefficient external markets are considered to be the chief impetus of past economic crises. Regulatory authorities have attempted to control board characteristics as a complementary device for addressing the agency problem (Black and Kim, 2011).

Another interesting aspect of the corporate governance of firms in emerging economies is that controlling shareholders exercise significant control power by using not only direct ownership but also indirect ownership through links derived from a pyramid structure and cross-holdings among affiliate firms (Joh, 2003; Johnson et al, 2000). Based on control rights derived from these avenues, controlling shareholders are able to exert considerable power to influence board structure and activity as a means to maximize their own utility. As such, we consider both of the direct and indirect ownership of controlling shareholders as quantifiable indicators of their control power.

To produce comprehensive and robust results, we also utilize various proxy measures for board structure and activity. The first of these proxies relates to the size of a given board of directors. As the number of board members tasked with supervising manager increases, the firm can more efficiently monitor and resolve the agency problem.[3] The second proxy we employ is the ratio of outside directors on a board to the board's total membership, a variable we refer to as board composition. Previous literature related to the monitoring role of boards of directors has explored the roles of outside directors who are relatively free from managers' control power. Thus, many studies have used board composition as proxy for the efficiency of board monitoring to show that a manager's agency problem significantly decreases and decision-making is more geared towards maximizing shareholder wealth with higher composition of outside directors (Fama, 1980; Weisbach, 1988). As a third proxy variable, we use board leadership structure on the basis of whether the CEO of the firm also serves as chairman of the board. Brickley et al. (1997) argued that if a firm's CEO is not also the chairman of the board, the board of directors is better suited to maximize shareholder value. We treat the case in which an outside director (rather than the CEO) serves as chairman of the board as an efficient structure for monitoring the agency problem. Fourth, because monitoring and strategic advice functions are often specialized in intra-board committees (Adams et al., 2010), we use the number of committees on the board as a proxy measure for the board members' influence. Firms with many committees feature boards of directors that can monitor the manager more efficiently, and thus, have

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[3] Yermack (1996) demonstrated that the costs of a larger board size outweigh its benefits, and that larger boards negatively impact firm value. Nevertheless, previous literature investigating the determinants of board structure has used board size as a proxy for the monitoring capabilities of a board of directors (Denis and Sarin, 1999; Linck et al., 2008).

more influence on management. Fifth, we consider whether firms establish monitoring committees related to auditing, nominating, or compensation.[4] This follows from various lines of research in corporate governance that regard the board of directors as a monitoring device to address agency problems. However, boards also serve in an advisory capacity to assist corporate decision-making (Mace, 1971; Fama and Jensen, 1983). Therefore, we use the number of monitoring committees as proxy for the board's monitoring capability (Byun et al., 2013). Finally, we consider whether outside directors oppose board activity. Grundfest (1993) demonstrated that shareholder's "vote no" actions signal managers' incompetence and increase turnover sensitivity relative to performance (Del Guercio et al., 2008). In this regard, outside directors who oppose the corporate agenda serve as watchdogs that can control the agency problem. Because the "vote no" variable more accurately represents an action than a structure, empirical results using this variable would provide valuable insight into how outside directors perform their monitoring role compared to the executive power of controlling shareholders.

In addition to the contributions outlined above, this paper extends previous literature related to the effect of competitive threat on company management. Past research that has treated product market competition as an external control mechanism has largely focused on how competition interacts with other control devices to mitigate the agency problem (Giroud and Mueller, 2011; Kim and Lu, 2010). Existing studies also have analyzed the direct effect of competitive threat on agency costs or internal corporate governance. For example, Karuna (2010) showed that product market competition had a non-linear effect on corporate governance. However, we show that controlling shareholders' control power over board characteristics is largely contingent upon competition in the product market. This approach provides more detailed evidence related to the role of competitive threat as an external control mechanism.

To empirically explore the issues discussed above, we used 667 firms that were listed on the Korea Exchange between 2005 and 2009. We selected the sample on the basis of availability of information related to board characteristics and ownership structures. To measure the degree of

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[4] This follows in the tradition of Faleye et al. (2011), and Black and Kim (2011).

competitiveness in a given product market, we used the Herfindahl-Hirschman index (HHI), which has a long history of use in various lines of industrial organization research. To explore the interaction effect related to product market competition and controlling shareholders' control power on the structure of boards of directors, we construct three dummy variables based on results from the HHI. In addition to these dummy variables, we include an interaction term between these variables (respectively) and the controlling shareholders' control rights. This approach has been used in Giroud and Mueller (2011) and Ammann et al. (2011).

To avoid potential biases in our findings, we also employ extensive robustness checks. First, because the relationship between board structure and ownership structure poses an endogeneity problem (Hermalin and Weisbach, 1998; Weisbach, 1988), we use a lagged variable model, estimate clustered standard error that incorporates firm-level, and utilize a random-effects model in a panel analysis. Second, to control for bias resulting from the correlation between the HHI and the ownership structure of controlling shareholders, we divide the sample on the basis of subjects' HHI scores and estimate the effect of controlling shareholders' control rights on board characteristics in each subsample. Finally, in addition to the HHI, we employ alternative measures (i.e., CR_4 and price-cost margin) to gauge the degree to which the product market is competitive.

These analyses produced several notable results. First, controlling shareholders' control power was shown to negatively affect board structure and activity. This result indicates that controlling shareholders have an incentive to expand their discretion on corporate resources by weakening the monitoring function of boards of directors. However, the negative influence of controlling shareholders' control power on board structure and activity is more pronounced in less competitive markets, which suggests that competitive threat mitigates the controlling shareholders' incentives to regulate their respective boards. We also found that when we use divided samples or other statistical methods to mitigate empirical problems that result from multicollinearity, correlation, or endogeneity, we nonetheless obtain results comparable to those obtained from analyzing the full sample. Similarly, our use of CR_4 and price-cost margin as alternative measures for product market competition do not

yield results that differ from those of our main analysis. These findings provide evidence for the robustness of our results.

The rest of this paper is organized as follows. Section 2 discusses relevant literature and presents our hypotheses. Section 3 describes the data and the construction of variables. Section 4 reports the empirical results of our analyses, and Section 5 presents our conclusion.

2. Hypotheses development

In this paper, we investigate the effect of controlling shareholders' control power on certain characteristics of board of directors. Although boards of directors are critical control mechanisms for addressing the agency problem, they are affected by managers who have considerable bargaining power and incentives to maximize their own utility from monetary compensation and private benefits of control.[5] As a result, some managers aim to weaken the degree to which their company's board of directors engages in monitoring activities (Hermalin and Weisbach, 1998). In emerging markets, this effect is often spearheaded by controlling shareholders whose control power (derived from direct and indirect ownership) over corporate decision-making exceeds that of the company's CEO (Johnson et al., 2000; Shleifer and Vishny, 1997).

Controlling shareholders' utility relates to both monetary benefits (e.g., dividends, capital gains) and the private benefits of control (e.g., overinvestment, related party transaction) (Johnson et al., 2000). Thus, controlling shareholders are strongly driven to exert their influence to weaken the monitoring function of boards of directors. For example, controlling shareholders with significant cash flow rights may incite managers to pay huge dividends or repurchase shares regardless of the profitability or opportunities for growth associated with these particular courses of action. The private benefits enjoyed by controlling shareholders are proportional to firm size, so controlling shareholders have a strong incentive to overinvest as a means to expand their private benefits of control on the basis of the discrepancy between control rights and cash flow rights (Jensen, 1986). Controlling

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[5] While external investors can diversify their portfolio to minimize firm-specific risk, managers concentrate entirely on the firm, so they assume all the risk related to management. As a result, they have a strong incentive to maximize their own private benefit rather than shareholder value (Holmstrom, 1979).

shareholders would be likely to undermine the monitoring role of the board of directors to retain the discretion needed to increase the value of their own cash flow rights or private benefits of control. In sum, the control power of a company's controlling shareholders has a significant negative effect on the monitoring function of that company's board of directors.

Hypothesis 1: Control power (control rights) of a company's controlling shareholders has a significant negative effect on the monitoring function of that company's board of directors.

Further, this paper examines whether the effect described in Hypothesis 1 is affected by the degree to which a given external business environment is characterized by competitive threat. Competitive threat increases managers' sensitivity to performance and leads them to expend more effort maximizing shareholder wealth (Hart, 1983; Schmidt, 1997). Further, in a competitive market, managers are more likely to disclose high quality information related to minimizing the cost of capital (Hart, 1983; Holmstrom, 1982). In the long term, product market competition leads managers to produce a highly efficient corporate governance structure to lower transaction costs as a means to gain a competitive advantage in the market (Alchian, 1950; Stigler, 1958).

Although controlling shareholders may feel strongly incentivized to undermine the monitoring functions of boards of directors, doing so in competitive markets may burden them with high investment risks and bankruptcy costs. Further, to procure financing from external sources, controlling shareholders in more competitive markets should establish effective mechanisms of corporate governance to signal the firm's high value as well as to guarantee a lower level of conflict of interests between insiders and outside investors. In doing so, their incentives for weakening the extent to which boards of directors engage in monitoring are alleviated (La Porta et al., 2000).

In contrast, controlling shareholders are relatively free from competitive threat in less competitive markets. As such, they are more susceptible to maximizing their own personal utility and actively undermining the monitoring function of boards of directors. In summation, controlling shareholders' incentives to pursue personal gains are largely dependent on the level of competition in

the product market. We propose that the negative effect described in Hypothesis 1 is more pronounced in less competitive markets but decreases or disappears in more competitive markets.

Hypothesis 2: The effect of controlling shareholders' control power (control rights) on board structure and activities is more pronounced in a non-competitive market but decreases or disappears in a competitive market.

3. Data and methodology

3.1 Data

Our sample was drawn from the listing of firms featured on the Korean Stock Exchange (KSE). We excluded financial and insurance companies as well as firms with impaired capital. We then required that sample firms report information related to board characteristics, the ownership structure of controlling shareholders, financial and accounting information, and stock return data. By applying these selection criteria over all firms listed from 2005 to 2009, we collected a sample of 667 companies (3,019 firm-years). Financial and accounting data were obtained from a TS-2000 database developed by the Korea Listed Company Association (KLCA). Daily stock returns as well as information related to foreign and institutional ownership was obtained from Fn-Guide, a Korean financial data provider.

Information related to board characteristics and the ownership structure of controlling shareholders was provided by Korean Corporate Governance Services (KCGS),[6] a non-profit organization that has annually compiled corporate governance data on all KSE-listed companies. It provides information on firm-level corporate governance through a score that is comprised of five sub-indices: shareholder rights, the board of directors, corporate disclosure, audit committee activity, and dividend policy. Since it is produced by a quasi-governmental organization and incorporates various corporate sub-indices, the index score provided by KCGS is objective and comprehensive (Byun et al., 2012). Using KCGS's internal database, we constructed several proxies to represent

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[6] Detailed information about the corporate governance index developed by KCGS can be found in Byun et al. (2012).

board structure, board activity, and corporate ownership structure.

The Korean Fair Trade Commission (KTFC) was founded in 1981 to monitor conglomerate activity. The primary goal of the KTFC is to establish a fair trade policy and to monitor unfair transactions. To perform these functions, the KFTC annually reports on conglomerates, paying particular attention to the controlling family's influence over member firms and the size of their assets. Data from the KTFC were leveraged by Kim et al. (2007) and Almeida et al. (2011) and will likewise be used in this study.

3.2 Variables

3.2.1 Board characteristics

In developing the proxies for board structure and activity, we employ various measures that have been previously used in related research. Their construction and incorporation into this study will serve to produce more comprehensive and robust results. First, we construct a variable based on board size. As the number of directors on a board increases, firms are better equipped to monitor managers and compel them to act in the best interests of shareholders.

Second, we develop a variable that relates to board composition—specifically, the ratio of outside directors on the board (Fama, 1980). Previous work related to the monitoring role of boards of directors has largely focused on the role played by outside directors who are relatively free from the control power of managers and can thus act independently. Inside directors, on the other hand, are appointed and granted tenure by managers, so they are often hesitant to replace them on the basis of poor performance. As a result, internal directors are not effective agents of control. Given this dynamic, many studies have used board composition as proxy for the efficiency with which a board monitors managers. Weisbach (1988), for example, shows that firms with a high proportion of outside directors on the board are more likely to replace CEOs on the basis of poor performance. In addition, Byrd and Hickman (1992) demonstrate that firms with a greater number of outside directors than inside directors on their boards have higher stock returns. They argue that outside directors are more adept at making rational decisions for the sake of maximizing shareholder value.

Third, we use the structure of board leadership as a predictor variable. This variable is based on whether the CEO[7] of a company also serves as chairman of the board. Brickley et al. (1997) argue that if the CEO of a company is not also the chairman of the board, the board of directors is better suited to maximize shareholder value. Following from this, we propose that when the chairman of the board is an outside director, managers make corporate decisions that maximize the wealth of minority shareholders. In this way, board leadership structure is a discrete variable consisting of three values; the variable takes on a value of 2 if the chairman of the board is an outside director, a value of 1 if the chairman of the board is an inside director, and a value of 0 if the CEO serves as chairman of the board.

Fourth, we use the number of committees on the board of directors as an independent variable. Boards of directors often serve dual roles: monitoring and strategic advising. These respective loci of these roles are within specific committees on the board (Adams et al., 2010). Therefore, boards that have multiple committees efficiently monitor managers and exert greater influence over management.

Following from the last point, the fifth proxy used in this study focuses on the monitoring function of boards of directors. Specifically, we consider whether firms utilize committees specifically for the purpose of monitoring managers. These committees may specialize in auditing, nominating outside directors, and controlling compensation.[8] Various studies in corporate governance treat the board of directors as a monitoring device to address the agency problem, but boards also play an advisory role in corporate decision-making (Fama and Jensen, 1983; Mace, 1971). Under an agency framework, we concentrate on the ways in which controlling shareholders affect board structure. To accurately quantify the monitoring role of boards using committee-related information,[9] we aggregate the number of committees on a board as a proxy for intensive monitoring capacity of that board. This strategy has been used in research on Korean firms by Black and Kim (2011) and Byun et al. (2013).

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[7] Because controlling shareholders for Korean companies are actively involved in the appointment of the CEO, the CEO is expected to make decisions that maximize the utility of controlling shareholders. To ensure that their utility is maximized, shareholders sometimes appoint themselves as CEO or director. Therefore, firms in which the CEO also serves as chairman of the board do not efficiently monitor managers.

[8] These criteria were used by Faleye et al. (2011).

[9] Monitoring committees intrinsic to a board are understood to be fundamental devices for controlling the agency problem, but a lack of access to detailed information regarding committee development and operations has rendered studies related to monitoring committees rare (Adams et al., 2010).

Finally, we determine whether outside directors oppose or revise the dominant board agenda as a proxy for board activity. Grundfest (1993) and Del Guercio et al. (2008) argue that shareholders' "vote no" activity is a strategy that publicly signals managers' incompetence and increases performance-related turnover sensitivity. In this regard, outside directors who oppose the corporate agenda serve as watchdogs that can control the agency problem. Opposition activity by outside directors is represented by a dummy variable that adopts a value of 1 if an outside director simply votes "no" against the corporate agenda. It adopts a value of 0 otherwise.

3.2.2 Control power of controlling shareholders

Controlling shareholders exert extensive control power through leveraging not only direct ownership but also indirect ownership obtained through pyramid-derived ownership links and cross-holding among affiliate firms (Joh, 2003; Johnson et al, 2000). Direct ownership (cash flow rights) is calculated as the sum of controlling shareholders' (and their relatives') ownership. Indirect ownership consists of ownership rights obtained through affiliates and senior managers of the firm. On the basis of this combined control power (control rights), controlling shareholders can influence board structure and activity to maximize their own utility.[10] Therefore, we use the sum of controlling shareholders' direct and indirect ownership as a proxy measure for their control power.

3.2.3 The level of product market competition

To measure the degree of competition in a given product market, we use the Herfindahl-Hirschman Index (HHI). This measure is computed by the sum of squared market shares based on sales of firms in each industry.[11] Firms' sales data are taken from the TS-2000, and each company is assigned to an industry by matching it to a 3-digit Korea Standard Industry Code (KSIC). When computing the HHI, we include not only listed companies but also private firms with large assets who

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[10] Regardless of whether cash flow rights or discrepancy serve as a proxy measure for control power of controlling shareholders, results are similar to those derived from using control rights. This indicates that controlling shareholders have an incentive to weaken the monitoring role of board of directors to increase monetary compensation and private benefits of control.

[11] HHI is a commonly used metric in the economic (e.g., Tirole, 1988) and corporate finance (e.g., Grullon and Michealy, 2007 and Giroud and Mueller, 2011) literature.

have considerable influence within their industry. More specifically, private firms with assets equaling more than 7 billion won are regulated by the Act on External Audits. The inclusion of private firms in our composite HHI measure renders it a more complete variable than those that have been used in studies that incorporate only listed firms or firms with high market shares (Giroud and Mueller, 2011). Because there is an inverse relationship between HHI score and industry competitiveness (i.e., a high HHI score reflects non-competitive industries, and a low HHI score reflects competitive industries), we use 1-HHI as a variable to represent the extent to which a produce market is competitive. To accurately measure a firm's HHI score, we divide all firms into 235 industry classifications. There are 100 industries into which the sample firms were categorized.

Table 1 displays the sample distribution based on HHI scores. We classify all firms into 10 groups on the basis of their HHI score and show the proportion of total firms that fall into each section. Distribution of sample firms based on the HHI (column 6) is similar to that of total firms (column 3). According to the HHI score distribution, 78.56% of all firms and 64.33% of sample firms operate in a highly competitive market. This suggests that our results are not susceptible to sample selection biases; the Korean market structure is effectively represented within our sample.

[Insert Table 1 here]

To verify the robustness of our results, we utilize alternative measures of product market competition. First, we employ the Concentration Ratio (CR_4), which is the sum of the market shares for the four largest firms (in terms of market share) in an industry. Like the HHI score, there is an inverse relationship between CR_4 and market competitiveness (i.e., a high CR_4 indicates a less competitive market). Therefore, we use 1-CR_4 as a proxy for the level of product market competition.

The second proxy we use to gauge market competition is product substitutability (Carlton and Perloff, 1994), calculated as the price-cost margin in a given industry (Karuna, 2007). Consistent with prior studies, we calculate the price–cost margin as total industry sales divided by total operating costs. As with the HHI index and the CR_4, score, there exists a negative relationship between product substitutability and price-cost margin; more intense price competition resulting from high substitutability indicates a smaller price–cost margin.

Because the Korean economy is largely dependent on imports and exports, it is important to consider market pressure in foreign as well as domestic markets. Thus, competitive pressure in foreign markets must be controlled. Because product substitutability assumes that the level of competition in a market is endogenously determined, the measure sufficiently reflects the competitive pressure in foreign markets. To compute industry sales and operating costs, we added either industrial sales or operating costs for firms in a given industry classification.

3.2.4 Control variables

To account for undue influences on corporate governance, we include a number of firm-specific control variables in our models. First, we include the logarithm of assets to control for firm size, which may affect several characteristics of boards of directors. In addition, because firms with substantial assets are more strictly regulated by corporate governance laws in Korea, we utilize asset size as a control variable (Black et al., 2009).[12] Second, we include the leverage ratio as a control, which is total leverage divided by total assets. A higher leverage ratio indicates higher interest costs and default risk and reduces problems related to overinvestment. Third, because highly profitable firms can readily invest in corporate governance, we also include a control variable that is calculated as net income divided by total asset. Because firm growth can also affect corporate governance, firms have an incentive to establish more effective corporate governance as a means to impress investors and raise future capital. Therefore, the fourth variable we use as a control measure is the market-to-book ratio, which is computed as the book value of debt and market value of equity divided by book value of assets. Fifth, to control for the influence of systemic business cycles on board characteristics, we include the natural log of firm age (i.e., current year minus foundation year plus 1) as a control variable in the models. Sixth, because highly volatile firms experience high degrees of operating risk, they may not be able to afford the expenses associated with monitoring managers. However, these

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[12] After the economic crisis, policy authorities in Korea recognized the limitations associated with disciplining managers solely through market mechanisms. As such, they adopted new regulations related to corporate governance with boards of director as the focus of these regulations. In 1999, they stipulated that all listed firms must have a board of directors that is comprise by no less than 25% outside directors. In 2000, they added that firms with assets equaling over two trillion won should have more than three outside directors and more than half of the board should consist of outside directors.

firms would establish an effective board structure to make a breakthrough. As such, we include the standard deviation of daily stock returns for the past one year as a proxy for firm risk.

To account for the associations between board characteristics and other corporate governance mechanisms, we also include control variables specific to corporate governance in our model. These variables include a dummy-coded variable related to chaebol membership, institutional ownership, and foreign ownership. Korean chaebols are conglomerates with huge influence over the national economy. Controlling shareholders for companies in a chaebol have a strong incentive to maximize their private benefits of control and exploit shareholder rights (Beak et al., 2004). Because of this possibility, authorities regulate the corporate governance structures of chaebol member firms and closely monitor transactions among them. To control the effects of this regulation, we include a dummy variable that adopts a value of 1 if a firm belongs to chaebol and 0 if it does not. In addition, foreign and institutional investors are considered to be effective overseers of managers. With expertise in management and access to internal information related to the firm, they are adept at maximizing shareholder wealth (McConnell and Servaes, 1990). In this way, they may substitute or complement the monitoring role played by boards of directors (Cremers and Nair, 2005). As a result, when foreign or institutional ownership exceeds 5%, we use it as a control variable.[13]

3.3. Descriptive statistics

Panel A of Table 2 reports our sample distribution across the targeted years. The 667 firms we selected produced 3,019 firm-year observations. Firms are evenly distributed among sample years. Panel B provides summary statistics of the variables described above. On average, boards of directors had approximately six members, 34% of which were external in kind. The average value of the variable related to board leadership structure is 0.0391, suggesting that the CEO serves as chairman of the board in the majority of firms. The mean of number of committees is 0.5131, indicating that many of firms do not utilize committees at all. Following from this, the average number of committees on

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[13] Since 2004, Korean firms have not been required to make public announcements of ownership. However, if institutional or foreign investors own more than 5% of a company, then that company must disclose it. This is due to the fact that substantial levels of foreign or institutional ownership can significantly influence managerial decisions in the firm (Klein and Zur, 2009).

boards whose primary purpose is monitoring is 0.3872. The mean score for "vote no" activity by outside directors is 0.0318, which shows that only about 3% of outside directors vote against board-sponsored bills. Combined direct and indirect ownership of controlling shareholders averaged 0.4128, indicating a concentrated ownership structure among Korean firms. In this way, controlling shareholders can significantly influence managerial decision-making on the basis of their control power. This shows that controlling shareholders' power should be considered when analyzing the relationship between ownership structure and board monitoring in an emerging market. The average value for the variable related to the HHI measure (i.e., [1 − HHI]) was 0.8941, indicating that in general, Korean firms operate in competitive environments. The average score for the 1-CR$_4$ variable and price-cost margin are 0.5552 and 0.9344, respectively. The means for each of the firm-specific measure are as follows: 1.3 billion won in total assets, a leverage ratio of 0.4413, a ROA of 0.0209, an M/B ratio of 1.1998, and a volatility score of 0.0335. On average, sample firms are 36 years old. Further, 23.12% of firms in our sample belong to a chaebol, and on average, sample firms are characterized by 4.36% foreign ownership and 3.36% institutional ownership.

[Insert Table 2 here]

Table 3 reports the Pearson correlations among the main variables in this study. Controlling shareholders' control power and board size are negatively correlated, indicating that as controlling shareholders' control rights increase, the effectiveness with which the board monitors the agency problems decreases. Ownership of controlling shareholders is negatively correlated with 1-HHI, 1-CR$_4$, and Price-cost margin, but not all of these correlations are significant. Proxies for the competitiveness of the product market and ownership structure are negatively correlated with most other variables, revealing the possibility that a high degree of product market competition can substitute for the monitoring role of boards of directors (Karuna, 2010). The proxy measures for product market competition are significantly correlated with one another. Significant and positive correlations among variables of board characteristics are also observed, but the correlation coefficients are not high, signifying that each variable measures proxies for the board's different functions.

[Insert Table 3 here]

4. Empirical results

4.1. Univariate test

Table 3 shows the differences between firms whose controlling shareholders enjoy a large degree of control power and those whose controlling shareholders have a low degree of control power. In Panel A, we divide the sample using a median split related to the control rights of controlling shareholders. Firms whose controlling shareholders have low control power tend to have smaller boards of directors and lower board composition values. This suggests that controlling shareholders who possess high levels of control power can weaken the monitoring role of board. This result is consistent with previous work by Hermalin and Weisbach (1998) that explored the relationship between bargaining power and board structure. For firms in which controlling shareholders possess greater levels of control rights, it is less likely for an outside director to be appointed chairman of the board. Instead, because CEOs of Korean firms (and their relatives) tend to possess greater degrees of control rights, we argue that they prefer to serve as chairman of the board to operate the firm as they see fit.

The number of committees featured on a board, the number of monitoring committees on a board, and the probability that outside directors will vote against the firm's agenda are all significantly higher in firms that have controlling shareholders with low control power. Because outside directors' voting behaviors vary according to the ownership structure of controlling shareholders, it becomes clear that controlling shareholders affect the monitoring role of outside directors. All reported differences between firms whose controlling shareholders have small control rights and firms whose controlling shareholders have large control rights are significant (p < .01).

The primary purpose of this paper is to examine whether product market competition affects the relationship between controlling shareholders' control rights and board structure. To explore this possibility, we divide all sample firms into high, medium, and low HHI sub-samples and re-divide the sub-samples in terms of their competitive environment (i.e., more or less competitive; see Panel B of

Table 3). Using a difference in difference method, we compare the mean value of all variables in each sub-sample. In less competitive markets, firms with low degrees of ownership on the part of controlling shareholders were shown to have larger boards of directors ($p < .01$). In contrast, in highly competitive markets, this relationship becomes non-significant. The difference in board sizes for firms in more and less competitive markets is significant ($p < .01$), indicating that product market competition significantly affects the relationship between ownership structure and board monitoring. Controlling shareholders ownership also affects the ratio of outside directors on a board. Board leadership structure was also demonstrated to affect board size ($p < .05$).

In both more and less competitive markets, firms with small ownership of controlling party have a greater number of committees and similarly, a greater number of monitoring committees. However, these relationships are more pronounced in less competitive markets. A difference in "vote no" actions by outside directors who possess differing degrees of control power was revealed only for firms in less competitive markets ($p < .01$).

The negative relationships we observed between controlling shareholders' control power and board monitoring is chiefly observed in a less competitive environment. We interpret this to mean that controlling shareholders in highly competitive markets experience difficulty in managing firms to their advantage because of competitive threat. As such, they are less likely to weaken the monitoring role of boards of directors. It is also possible that firms in more competitive markets prefer to establish sound corporate governance practices and signal the value of their firm to potential investors to obtain a competitive advantage. We find that as an internal corporate mechanism, board monitoring of managers is highly influenced by external corporate mechanisms.

[Insert Table 4 here]

4.2. Multivariate results

In addition to the above analyses, this paper also examines the effect of controlling shareholders' control power on board monitoring by performing regression analyses that incorporate controls. To explore whether the effect of controlling shareholders' control power on board monitoring differs on

the basis of product market competition, we (a) divide the entire sample into three groups of firms who respectively experience with high, median, and low levels of market competition and (b) create dummy variables to represent various firm- and market-level characteristics. Using interaction terms between controlling shareholders' control power and the market competition dummy variables, we analyze the moderating effect of product market competition on the relationship between controlling shareholders' control power and board monitoring. To mitigate the effects of any interpersonal/intragroup correlation in the residuals and to avoid serial correlation and heteroscedasticity in the panel data, we use robust standard errors to test the significance of the coefficients. Further, we include a dummy variable in this regression equation to control for industry effects. Finally, we include another dummy variable to control for any effects that may be explained by the year. Board characteristics in the model include size, composition, leadership structure, number of committees, number of monitoring committees, and "vote no" activity by outside directors. See Appendix 1 for definitions of all variables.

$$
\begin{aligned}
Board\ characteristics_{it} = \ &\beta_0 + \ \beta_1 Control\ power_{it} + \ \beta_2 Control\ power_{it}*High_{it} \\
&+ \ \beta_3 Control\ power_{it}*Median_{it} + \ \beta_4 Control\ power_{it}*Low_{it} + \ \beta_5 High_{it} \\
&+ \ \beta_6 Low_{it} + \ \beta_7 Size_{it} + \ \beta_8 Leverage_{it} + \ \beta_9 ROA_{it} + \ \beta_{10} M/Bratio_{it} + \ \beta_{11} Age_{it} \\
&+ \ \beta_{12} Volatility_{it} + \ \beta_{13} Chaebol_{it} + \ \beta_{14} Foreign_{it} + \ \beta_{15} Institution_{it} + \ \varepsilon_{it}
\end{aligned}
$$

4.2.1 Board size

Table 5 reports the results of our regression analyses for which board size was the dependent variable. In Model (1), the coefficient for controlling shareholders' control rights is significant and negative ($p < .01$). This relationship holds even when we control for firm-specific variables, industry effect, and year effect in Model (2) and include other corporate governance mechanisms in Model (3). These results suggest that as controlling shareholders' control power increases, they reduce the number of members on the board of directors to exert their power more freely (i.e., in the absence of an effective monitoring mechanism). This result is consistent with Hypothesis 1 and replicates previous findings that demonstrated that managers with significant bargaining power have incentive to

weaken board monitoring. We find that in an emerging market, controlling shareholders have such an incentive, as they can significantly influence the structure and activity of firm management.

In Models (4) through (6), we analyze whether the degree to which a product market is competitive moderates the relationship between ownership of controlling party and board size. The interaction term between control rights of controlling shareholders and the dummy variable indicating high levels of market competition does not have a significant coefficient. However, when product market competition is low, the coefficient of the interaction term becomes significant (-0.5424; p < .01). This result suggests that as competition in the product market increases, the effect of control rights on board size dissipates. In a more competitive environment, competitive threat mitigates controlling shareholders' incentive to expand their locus of control into management. As such, they are less likely to reduce the size of the board. In less competitive environments, however, they are relatively free from competitive threat and tend to take a more active approach to decreasing board monitoring. These results remain consistent even after controlling for industry and year effects in Model (5) and other corporate governance mechanisms in Model (6). This implies that external regulatory mechanisms, such as the competitiveness of a given product market, play a key role in establishing effective internal corporate governance. This result is consistent with Hypothesis 2.

Because the statistical significance of the coefficients differs depending on whether they are part of the high or low product market competition model, the direct effect of product market competition on board size is difficult to generalize for Korean firms. The competitiveness of a given product market does not exclusively affect board size, but it does mitigate the negative influence of controlling shareholders' control power on it. In this way, this paper provides new evidence that explores the interaction among various corporate governance mechanisms and board structure.

Because Korean governance regulates the size of boards of directors on the basis of the size of the firms, firm size is a significant predictor of board size. Coefficients for leverage are significant and negative, indicating that a high degree of leverage mitigates the agency problem. The M/B ratio (as proxy for growth opportunity) is a positive predictor, demonstrating that firms with a large number of opportunities for growth are more likely to have effective corporate governance as a means to signal

their firm value to potential investors. There is a positive relationship between firm age and board size; older firms' boards have more members. In addition, the coefficients associated with the chaebol dummy variable are significantly negative. Significant, positive coefficients for the terms representing foreign investment indicates that as foreign ownership of a firm increases, boards of directors are larger in size and therefore are more adept at monitoring managers. We interpret this result as an indicator that monitoring by foreign investors complements the monitoring activities of the board of directors. However, we cannot rule out the possibility that foreign investors invest in firms with good corporate governance to gain benefits from it.

[Insert Table 5 here]

4.2.2 Board composition

Table 6 shows the influence of the interaction between controlling shareholders' control rights and product market competition on the proportion of outside directors on a given board of directors. Consistent with Hypothesis 1, the coefficients for control power in Models (1), (2), and (3) are significant and negative; as controlling shareholders' control power increases, the ratio of outside directors on a board decreases. In Models (4) through (6), interaction variables relating ownership of controlling shareholders and the three dummy variables associated with product market competition each have significantly negative coefficients. However, the degree of statistical significance for these interaction terms decreases as product market competition increases. In less competitive markets, the negative relationship between controlling shareholders' control rights and the ratio of outside directors on the board becomes stronger. These results are consistent with Hypothesis 2.

There is also a direct effect of product market competition on the proportion of outside directors on a board. Firms that operate in a less competitive environment tend to have a larger proportion of outside directors on their boards. This implies a substitution relationship between the competitiveness of a product market and the monitoring role of outside directors.

Several control variables were shown to affect board composition as well. The size of the firm, for example, is positively related to the proportion of outside directors on a board. ROA is negatively

associated with the board composition variable, but the relationship's significance is not consistent across the models. The M/B ratio has a significant and positive effect on board composition, illustrating that firms with opportunities for growth tend to signal their value through effective corporate governance. The firm's age likewise affects board composition; older firms tend to have fewer outside directors on the board. In contrast, firms whose operations are highly volatile tend to have a higher proportion of outside directors.

Among variables related to corporate governance, the chaebol dummy variable is shown to significantly and positively affect board composition. Extant research has argued that firms in conglomerates tend to expand their business recklessly, and thus, negatively influence shareholder value (Bae et al., 2002). The positive coefficient associated with the chaebol dummy variable shows that firms belonging to a chaebol have a high ratio of outside directors on their boards of directors. This may be a consequence of recommendations from the Korean government to establish good corporate governance practices.

[Insert Table 6 here]

4.2.3 Board leadership structure

Table 7 presents results related to the interaction effect of controlling shareholders' control power and product market competition on board leadership structure. The dependent variable, board leadership structure, is a discrete variable that can assume a value of 0, 1, or 2. As such, we use an ordered probit model to perform the analysis. In this model, a positive coefficient implies high probability of an outside director serving as chairman of the board, and a negative coefficient suggests a high probability that the CEO will serve as chairman.

In Model (1) controlling shareholders' control rights are shown to be negatively related to the board leadership variable, suggesting that controlling shareholders with large control power are likely to appoint the CEO as chairman of the board as a means to weaken board monitoring ($p < .01$). Models (2) and (3) respectively demonstrate that neither controlling for firm-specific variables, industry effects, and year effects nor including variables related to corporate governance alters this

significant and negative relationship (p < .05). In Model (4), the interaction term relating the control rights of controlling shareholder and high product market competition is non-significant. However when the firm operates in an environment marked by low levels of competition, the coefficient associated with the interaction term is significant and negative (p < .01). These results, including consistent support provided by Models (5) and (6), support Hypothesis 2.

Firm size is shown to have a significant, positive relationship with board leadership (i.e., large firms are likely to have outside directors as leaders of the board), but ROA is shown to be significantly and negatively related to board leadership (i.e., firms that enjoy higher returns on assets are more likely to have the CEO as the chairman of the board). Finally, young firms are more likely to establish effective corporate governance and signal their firm value to potential investors.

[Insert Table 7 here]

4.2.4 Number of committees

Table 8 presents the effect of the interaction between controlling shareholders' control power and product market competition on the number of committees inherent to a board of directors. Coefficients associated with the control power of controlling shareholder in Models (1), (2), and (3) are all significantly negative (p < .01), indicating that as controlling shareholders gain more control power, the number of committees on the board decreases. In Model (4), three interaction terms that relate control power of controlling shareholders and product market competition have significant, negative coefficients (p < .01). However, the negative relationship between the competitiveness of a product market and controlling shareholders' control power diminishes as market competitiveness increases.

In Model (5), we control for firm-specific variables, industry effects, and year effects. In this analysis, the coefficient for the interaction term relating the control power of controlling shareholders and low product market competition is significant and negative (p < .01), but this effect disappears as the degree of market competition increases. When we include corporate governance variables in Model (6), we obtain similar results. The negative relationship between the ownership of the

controlling party and number of committees becomes more pronounced in less competitive markets. This result is consistent with Hypothesis 2.

Several control variables were likewise shown to affect the number of committees inherent to a board of directors. Whereas firm size is positively related to the number of committees, leverage is negatively associated with it. This finding leads us to suggest that the substitution of the disciplining role of leverage for the monitoring role of boards of directors may occur. ROA is significantly and negatively associated with the number of committees on a board of directors, but the M/B ratio and volatility are significantly and positively related to it.

As a result of its utility as a bonding mechanism, membership in a chaebol is positively correlated with the number of committees on a board. In contrast, institutional ownership is negatively related to the number of committees, suggesting a substitution effect of institutional investors for board monitoring. To more comprehensively argue this point, however, research that uses firm value as the outcome variable is needed (Giroud and Mueller, 2011).

[Insert Table 8 here]

4.2.5 Monitoring committee

Table 9 presents the influence of the interaction between controlling shareholders' control power and product market competition on number of monitoring committees contained in a board of directors. Consistent with Hypothesis 1, Models (1), (2), and (3) demonstrate a significant and negative effect of controlling shareholders' control rights on the number of monitoring-focused committees on a board of directors. This result suggests that firms that have controlling shareholders who possess high levels of control power have fewer monitoring committees on their boards of directors. Models (4), (5), and (6) reinforce this finding, as the effects described in Models (1), (2), and (3) remain consistent in conditions of both high and low competition (although the relationship is more pronounced when there are low levels of produce market competition). Taken together, these findings imply that controlling shareholders weaken the monitoring role of board, particularly in less competitive environments. This is consistent with Hypothesis 2.

[Insert Table 8 here]

4.2.6 "Vote no" activity by outside directors

Table 10 features an outcome variable that relates to whether outside directors vote against the corporate agenda. To empirically examine the effect of the interaction between of controlling shareholders' control power and the competitiveness of a given product market outside directors' voting behaviors, we utilize a probit model. In Models (1), (2), and (3), the coefficients associated with control power are significant and negative. As the controlling party secures a greater portion of ownership in the company, outside directors are less likely to oppose the company's agenda. Through Models (4), (5), and (6), we show that the effect of controlling shareholders' control power on "vote no" behavior by outside members is significantly negative when the product market is less competitive. However, this relationship disappears in a highly competitive market. From this, we can deduce that an increase in controlling shareholders' control rights decreases the probability that outside directors will vote against the corporate agenda, but this dynamic occurs only markets with reduced competition. This result supports Hypothesis 2. In addition to this main finding, we also demonstrate that firm size has a positive influence on "vote no" activity by outside members, and that leverage and ROA each have the opposite effect.

For firms in which controlling shareholders possess significant control power, outside directors' ability to restrain and check managers is weakened. This reinforces our previous finding that controlling shareholders with significant control power decrease the number of outside directors or committees on a board, thus weakening the monitoring capacity of that board. However, this association is weak in more competitive environments, as product market competition tends to regulate firms. In this way, either a board of directors or an external corporate governance mechanism should serve to monitor the behaviors of managers.

[Insert Table 10 here]

4.2.7 Alternative model specifications

To verify that our results are not biased by model misspecification, we estimate the same empirical models using three alternative model specifications. In particular, it is imperative for us to control for endogeneity since board characteristics are endogenously determined. To address this issue, we use various models to verify the robustness of our results.

Table 11 presents results from various statistical methods suggested by Linck et al. (2008) to mitigate issues related to data endogeneity. Specifically, we use a lagged variable model (Panel A), estimate clustered standard error incorporating data from the firm level[14] (Panel B) and use a random effects model[15] for the panel analysis (Panel C).[16] In each of these models, both the statistical significance and the coefficients associated with the interaction terms relating controlling shareholders' control power and the product market competition dummies decrease as market competitiveness increases. In a less competitive market, the negative relationship between controlling shareholders' control power and board characteristics becomes more pronounced. This finding is also consistent with Hypothesis 2. Although the endogeneity problem is not completely addressed by the application of additional modeling methods, we nonetheless conclude that the results of this paper are not affected by data endogeneity.

[Insert Table 11 here]

4.2.8 Separated sample approach

If there exists a correlation between controlling shareholders' control power and product market competition, interaction terms that relate those two variables may introduce bias in our results. To avoid such bias and despite the fact that the correlation between the two variables is small and non-significant, we separate the entire sample on the basis of the level of competition in the product market and compare the coefficients of controlling shareholders' control power and their statistical significances in each sample. Specifically, we divide the sample into three sub-samples on the basis of

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[14] Petersen (2009) advocates the use of a pooled panel with clustered standard errors to address potential serial autocorrelation and omitted variable bias.

[15] Random effects procedures force the unobserved firm effect to remain uncorrelated with the independent variables in the regression model by placing the unobserved effects into the error term.

[16] If the empirical model includes dummy variables that are not changed in our estimation period, results from fixed effect models are biased (Gujarati, 2004). Because our empirical model includes a dummy-coded variable related to market competitiveness that barely changes in estimation period, we do not estimate the fixed effect model.

the firm's HHI score and compare these sub-samples.

Models (1) and (2) in Panel A of Table 12 respectively present the results of analyses that explored the effect of controlling shareholders' control rights on board size in markets that are less and more competitive. For firms in less competitive environments, controlling shareholders' control power is shown to be negatively related to board size (p < .01). This association in Model (2) is non-significant. These results suggest that the effect of controlling shareholders' control power on board size differs on the basis of product market competitiveness. This supports Hypothesis 2.

Models (3) and (4) show that control power is a significant negative predictor of board composition, regardless of the market's competitiveness. However, the negative relationship between control power and board composition is stronger in less competitive markets. Model (5) demonstrates that control power significantly and negatively influences board leadership structure in firms that operate in less competitive environments. As shown in Model (6), this effect is not present in firms that operate in highly competitive environments.

In Panel B, Models (1) and (2) treat the number of committees on a board of directors as the dependent variable. As above, we show that control power is a significant negative predictor of the number of committees on a board (p < .01) in less competitive markets. In competitive markets, this effect dissipates, but remains significant (p < .10). Similarly, Models (3) and (4), which treat the number of monitoring committees on a board of directors as the dependent variable, are also shown to be different. Specifically, the negative influence of control power on the number of monitoring committees on a board is more pronounced for firms that operate in markets with weak competition. A similar statistical pattern is observed in Models (5) and (6), which treat "vote no" activity by outside directors as the dependent variable.

Using a separated sample approach, we confirm that the negative influence of controlling shareholders with large control rights on board structure is contingent upon the degree to which a product market is competitive. This result is consistent with Hypothesis 2.

[Insert Table 12 here]

4.2.9 Alternative measure for product market competition

To verify the results described above, we utilize several metrics for measuring product market competition. Specifically, we use CR_4 and price-cost margin in addition to HHI. Panel A of Table 13 displays results using CR_4 as an indicator of product market competition. Consistent with our findings that used HHI as the measure for market competition, the statistical significance of coefficients is strongest in less competitive markets. Panel B presents results derived from analyses that use price-cost margin as the measure for market competition. In these analyses, statistical significance is strongest for the coefficients of interaction terms that relate control power and product markets that are less competitive. By utilizing different methods for gauging the competitiveness of a given product market, we provide evidence for the robustness of our tests. Given this, we argue that the control power of controlling shareholders weakens board structure most effectively in less competitive environments. This overall result supports Hypothesis 2.

[Insert Table 13 here]

5. Conclusion

Previous research has revealed a negative effect of managers' bargaining power on board structure. In this vein, we examined the relationship between controlling shareholders' control power and board structure in an emerging market. Moreover, we used data from Korean firms where controlling shareholders have a significant influence over managers. We further investigated the influence of product market competition as a form of external corporate governance and found that the intensity of competition in a market significantly affects the efficiency of board monitor. Although existing studies have explored the direct relationship between product market competition and board structure, we considered various corporate governance mechanisms and explored how the interaction between internal and external forms of corporate governance may affect yet another corporate governance system—board monitoring.

By employing various measures of board monitoring that have been used in previous studies, our analyses produced robust results. We empirically confirmed that an increase in controlling

shareholders' control power weakens board monitoring (as measured by board size, outside board ratio, board leadership structure, the number of committees on the board, the number of monitoring committees on the board, and opposition by outside directors). This result reinforces the findings of an existing study that examined the association between bargaining power of managers and board structure in the U.S. market. We also revealed the existence of an interaction effect on board structure. Specifically, we found that the negative relationship between controlling shareholders' control power and board structure is weakened or disappears in a competitive environment. This effect is strengthened in less competitive markets. This result suggests that controlling shareholders can weaken board monitoring and influence managerial decision-making to enhance their discretion on corporate resources in a less competitive environment. However, competitive threat precludes them from doing this in more competitive markets.

In an emerging market where controlling the agency problem depends largely on internal corporate governance, this paper suggests a method for enhancing the efficiency of board monitoring. In competitive markets, board structure is not significantly affected by controlling shareholders because the board retains its control rights. However, in less competitive markets, stricter regulations related to shareholder influence should be developed and enforced. Otherwise, controlling shareholders with extensive control rights may be able to weaken board monitoring.

References

Adams, R., Hermalin, B., Weisbach, M., 2010. Boards of directors and their role in corporate governance: A conceptual framework and survey. J. Econ. Lit. 48, 58–107.

Alchian, A., 1950. Uncertainty, evolution and economic theory. J. Polit. Econ. 58, 211–221.

Almeida, H., Park, S. Y., Subrahmanyam, M. G., Wolfenzon, D., 2011. The structure and formation of business groups: Evidence from Korean chaebols. J. Financ. Econ. 99, 447–475.

Ammann, M., Osech, D., Schmid, M., 2011. Product market competition, corporate governance, and firm value: Evidence from the EU-area. Eur. Financ. Manag. Forthcoming.

Bae, K., Kang, J., Kim, J., 2002. Tunneling or value added? Evidence from mergers by Korean business groups. J. Financ. 57, 2695–2740.

Baek, J., Kang, J., Park, K., 2004. Corporate governance and firm value: Evidence from the Korean financial crisis. J. Financ. Econ. 71, 265–313.

Berle, A., Means, G., 1932. The Modern Corporation and Private Property. Macmillan Publishing Co., New York.

Black, B., Kim, W., 2011. The effect of board structure on firm value: A multiple identification strategies approach using Korean data. J. Financ. Econ. 104, 203–226.

Black, B., Kim, W., Jang, H., Park, K., 2009. How corporate governance affects firm value: Evidence on channels from Korea. Working paper.

Brickley, J., Coles, J., Jarrell, G., 1997. Leadership structure: Separating the CEO and Chairman of the Board. J. Corp. Financ. 3, 189–220.

Byrd, J., Hickman, K., 1992. Do outside directors monitor managers?: Evidence from tender offer bids. J. Financ. Econ. 32, 195–221.

Byun, H., Lee, J., Park, K., 2012. How does product market competition interact with internal corporate governance?: Evidence from the Korean economy. Asia-Pac. J. Financ. St. Forthcoming.

Byun, H., Lee, J., Park, K., In press. Ownership structure, intensive board monitoring, and firm value: evidence from Korea. Asia-Pac. J. Financ. St.

Carlton, D., Perloff, J., 1994. Modern Industrial Organization. Harper Collins College Publishers, New York.

Claessens, S., Djankov, S., Lang, L., 2000. The separation of ownership and control in East Asian Corporations. J. Financ. Econ. 58, 81–112.

Coles, J., Daniel, N., Naveen, L., 2008. Boards: Does one size fit all? J. Financ. Econ. 87, 329–356.

Cremers, K., Nair, V., 2005. Governance mechanisms and equity prices. J. Financ. 60, 2859–2894.

Del Guerio, D., Seery, L, Woidtke, T., 2008. Do boards pay attention when institutional investor activists "just vote no"? J. Financ. Econ. 90, 84–103.

Denis, D., Sarin, A., 1999. Ownership and board structures in publicly traded corporations. J. Financ. Econ. 52, 187–223.

Durnev, A., Kim, E., 2005. To steal or not to steal: Firm attributes, legal environment, and valuation. J. Financ. 60, 1461–1493.

Faleye, O., Hoitash, R., Hoitash, U., 2011. The costs of intense board monitoring. J. Financ. Econ. 101, 160–181.

Fama, E., 1980. Agency problems and the Theory of the Firm. J. Polit. Econ. 88, 288–307.

Fama, E., Jensen, M., 1983. Separation of ownership and control. J. Law Econ. 26, 301–325.

Friedman, E., Johnson, S., Mitton, T., 2003. Propping and tunneling. J. Comp. Econ. 31, 732–750.

Gillian, S., Hartzell, J., Starks, L., 2006. Tradeoffs in corporate governance: Evidence from board structures and charter provisions. Working paper.

Giroud, X., Mueller, H., 2011. Corporate governance, product market competition, and equity prices. J. Financ. 66, 563–600.

Griffith, R., 2001. Product market competition, efficiency and agency cost: An empirical analysis. Institute for Fiscal Studies working paper.

Grullon, G., Michaely, R., 2007. Corporate payout policy and product market competition. Working paper.

Grundfest, J., 1993. Just vote no: A minimalist strategy for dealing with barbarians inside the gates. Stanford Law Rev. 4, 857–937.

Guadalupe, M., Perez-Gonzalez, F., 2005. The impact of product market competition on private benefits of control. Working paper.

Gujarati, D., 2004. Basic Econometrics. The McGraw-Hill Companies, New York.

Hart, O., 1983. The market mechanism as an incentive scheme. Bell J. Econ. 14, 366–382.

Holmstrom, B., 1979. Moral hazard and observability. Bell J. Econ. 10. 74–91.

Holmstrom, B., 1982. Moral hazard in teams. Bell J. Econ. 13, 324–340.

Hermalin, B., Weisbach, M., 1998. Endogenously chosen boards of directors and their monitoring of the CEO. Am. Econ. Rev. 88, 96–118.

Jensen, M., 1986. Agency costs of free cash flow, corporate finance, and takeovers. Am. Econ. Rev. 76, 323–329.

Jensen, M., Meckling, W., 1976. Theory of the Firm: Managerial behavior, agency costs and ownership structure. J. Financ. Econ. 3, 305–360.

Joh, S., 2003. Corporate governance and firm profitability: Evidence from Korea before the economic crisis. J. Financ. Econ. 68, 287–322.

Johnson, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2000. Tunneling. Am. Econ. Rev. 90, 22–27.

Karuna, C., 2007. Industry product market competition and managerial incentives. J. Account. Econ. 43, 275–297.

Karuna, C., 2010. Industry product market competition and corporate governance. Working paper.

Kim. E., Kim, W., 2008. Changes in Korean corporate governance: A response to crisis. J. Applied Corp. Financ. 20, 47–58.

Kim, E., Lu, Y., 2011. CEO ownership, external governance, and risk-taking. J. Financ. Econ. 102, 272–292.

Kim, W., Lim, Y., Sung, T., 2007. Group control motive as a determinant of ownership structure in business conglomerates: Evidence form Korea's chaebols. Pacific-Basin Financ. J. 15, 213–252.

Klein, A., Zur, E., 2009. Entrepreneurial shareholder activism: Hedge funds and other private investors. J. Financ. 64, 187–229.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. J. Financ. 54, 471–517.

La Porta, R., Lopez-de-Silanes, F., Shleifer A. Vishny, R., 2000. Agency problem and dividend policies around the world. J. Financ. 55, 1–33.

Linck, J., Netter, J., Yang, T., 2008. The determinants of board structure. J. Financ. Econ. 87, 308–328.

Mace, M., 1971. Directors: Math and Reality. Harvard Business School Press, Boston.

McConnell, J., Servaes, H., 1990. Additional evidence on equity ownership and corporate value. J. Financ. Econ. 27, 595–612.

Petersen, M. A., 2009. Estimating standard errors in finance panel data sets: Comparing approaches. Rev. Financ. Stud. 22, 435–480.

Pfeffer, J., Salancik, G., 1978. The external control of organizations: A resource dependence perspective. Harper & Row, New York.

Raheja, C., 2005. Determinants of board size and composition: A theory of corporate boards. J. Financ. Quant. Anal. 40, 283–306.

Schmidt, M., 1997. Managerial incentives and product market competition. Rev. Econ. Stud. 64, 191–213.

Shleifer, A., Vishny, R., 1986. Large shareholders and corporate control. J. Polit. Econ. 94, 461–488.

Shleifer, A., Vishny, R., 1997. A survey of corporate governance. J. Financ. 52, 737–783.

Stigler, G., 1958. The economies of scale. J. Law Econ. 1, 54–71.

Tirole, J., 1988. The Theory of Industrial Organization. MIT Press, Cambridge, MA.

Weisbach. M., 1988. Outside directors and CEO turnover. J. Financ. Econ. 20, 431–460.

Yermack, D., 1996. Higher market valuation of companies with a small board of directors. J. Financ. Econ. 40, 185–212.

<Table 1> Level of product market competition in Korean economy

This table illustrates the level of competition in Korean product markets from 2006 to 2009. As a proxy for product market competition, we computed HHI (Herfindahl-Hirschman Index) as the sum of squared market shares in each industry. To classify industries, we assigned all public and private companies to an industry by matching 3-digit Korea Standard Industry Code (KSIC). We determined market shares using sales of firms. We divided the whole sample based on the HHI and computed the number of firms and weights in separated groups.

	Number of industries (industry-year)	%	Whole firms		Sample firms	
			N (firm-year)	%	N (firm-year)	%
Less competitive (HHI>0.9)	109	9.78	194	0.21	9	0.30
0.9≥HHI>0.8	23	2.06	82	0.09	10	0.33
0.8≥HHI>0.7	20	1.79	125	0.14	1	0.03
0.7≥HHI>0.6	24	2.15	111	0.12	3	0.10
0.6≥HHI>0.5	46	4.13	266	0.29	21	0.70
0.5≥HHI>0.4	39	3.50	1,748	1.93	87	2.88
0.4≥HHI>0.3	67	6.01	1,048	1.16	41	1.36
0.3≥HHI>0.2	102	9.15	2,932	3.24	204	6.76
0.2≥HHI>0.1	229	20.54	12,918	14.26	701	23.22
More competitive (0.1≥HHI)	456	40.90	71,193	78.56	1,942	64.33
Total	1,115	100.00	90,617	100.00	3,019	100.00

<Table 2> Sample selection and descriptive statistics

This table shows the sample distribution and descriptive statistics for the variables used in this study. To determine which firms would be included in the sample, we initially chose all firms with access to information related to characteristics of their respective boards of directors. From this sample, we excluded financial and insurance companies as well as firms with impaired capital. Finally, we eliminated those firms for which information on ownership of controlling shareholders, financial and accounting information, and stock returns data was not available. These steps resulted in our final yearly samples, displayed in Panel A. Panel B shows summary statistics for each of the variables. Board size refers to the number of directors on the board. Board composition is the percentage of outside directors on the board. Board leadership structure represents a discrete variable having value of two if an outside director is appointed as chairman of the board, a value of one if an inside director is appointed as chairman of the board, and a value of zero if the CEO also serves as chairman of the board. Number of committee refers to the number of committees within the board. Monitoring committee is a summation variable meant to represent the number of committees on the board whose primary function is monitoring (e.g., audit, outside director nominate, compensation committee). "Vote no" activity by an outside director is a dummy variable that takes on a value of one if the outside director employs a just "vote no" policy against the board's agenda. Control power is a summation of ownership of controlling shareholders, their relatives, affiliates, and senior managers of the firm. 1-HHI is one minus the Herfindahl-Hirschman Index (computed by sum of squared market shares in each industry). Market shares are derived from the sales of firms. 1-CR$_4$ is one minus the Concentration Ratio (sum of four largest market shares firms' market shares in each industry). Price-cost margin is a variable that is computed by dividing industry sales by operating costs in a given industry. To classify industries, we assigned all of the public and private companies to an industry by matching them to the 3-digit Korea Standard Industry Code (KSIC). Company size is measured in billions of won. Leverage refers to total leverage divided by total assets. ROA is the ratio of net income to total assets. M/B ratio was computed by dividing market value of common equity by book value of common equity. Age was computed subtracting the current year from the foundation year, and then adding 1. Volatility is the standard deviation of daily stock returns for the past year. Chaebol is dummy variable that takes value of 1 if the firm belongs to a chaebol conglomerate, and 0 otherwise. Foreign is the proportion of foreign investors when it exceeds 5%. Institution is the proportion of institutional investors when it exceeds 5%.

Panel A: sample selection

Year	N	Percentage
2005	589	19.51
2006	594	19.68
2007	610	20.21
2008	629	20.83
2009	597	19.77
Total	3,019	100.00

Panel B: summary statistics

Variable	N	MEAN	MEDIAN	STD. DEV.	MAX	MIN
Board size	3,019	6	6	2	20	2
Board composition	3,019	0.3440	0.3000	0.1208	0.8750	0.1000
Board leadership structure	3,019	0.0391	0.0000	0.2195	2.0000	0.0000
Number of committee	3,019	0.5131	0.0000	1.0346	6.0000	0.0000
Monitoring committee	3,019	0.3872	0.0000	0.7762	3.0000	0.0000
"Vote no" activity by outside director	3,019	0.0318	0.0000	0.1755	1.0000	0.0000
Control power	3,019	0.4128	0.4066	0.1652	0.9354	0.0000
1-HHI	3,019	0.8941	0.9378	0.1193	0.9933	0.0000
1-CR$_4$	3,019	0.5552	0.5900	0.2075	0.9105	0.0000
Price-cost margin	3,019	0.9344	0.9404	0.0557	1.3271	0.6192
Size	3,019	1,361	215	4,933	86,024	9
Leverage	3,019	0.4413	0.4518	0.1983	0.9889	0.0100
ROA	3,019	0.0209	0.0350	0.1075	0.4355	-0.8750
M/B ratio	3,019	1.1998	0.8377	1.1312	9.8082	0.1036
Age	3,019	36	37	16	113	1
Volatility	3,019	0.0335	0.0313	0.0117	0.1039	0.0071
Chaebol	3,019	0.2312	0.0000	0.4217	1.0000	0.0000
Foreign	3,019	0.0436	0.0000	0.1097	0.8156	0.0000
Institution	3,019	0.0336	0.0000	0.0817	0.7978	0.0000

<Table 3> Correlations

Board size (Bsize) is the natural log of the number of directors. Board composition (BoardC) refers to the percentage of outside directors on the board. Board leadership structure (Chair) is a discrete variable which was given a value of 2 if an outside director is appointed as the chairman of the board, a value of 1 if an inside director is appointed as chairman of the board, and value of 0 if CEO is in charge of chairman of board. Number of committee (Comm1) refers to the number of committees within the board. Monitoring committee (Comm2) is the total number of monitoring committees (e.g., audit, outside director nominate, compensation committee) on the board. "Vote no" activity by an outside director (Vote) is a dummy-coded variable that takes a value of 1 if an outside director employs a "vote no" strategy against the board's agenda. Control power (Contr) refers to the total number of controlling shareholders, their relatives, affiliates, and senior managers of the firm. 1-HHI is one minus the Herfindahl-Hirschman Index (computed by the sum of squared market shares in each industry). Market shares are derived from a firm t sales. $1\text{-}CR_4$ is one minus the Concentration Ratio (sum of four largest market shares firms' market shares in each industry). Price-cost margin (Price) is a variable that was calculated by dividing industry sales by operating costs in a given industry. To classify industries, we assigned all public and private companies to an industry by matching them to the 3-digit Korea Standard Industry Code (KSIC). Size is the natural log of total assets. Leverage (Leve) refers to total leverage divided by total assets. ROA is the ratio of net income to total assets. M/B ratio (M/B) was derived by dividing market value of common equity by book value of common equity. Age is the natural log of the business year that was computed by subtracting the current year from the foundation year and adding 1. Volatility (Vol) is the standard deviation of daily stock returns for the past year. Chaebol (Chae) is a dummy-coded variable that takes value of 1 if the firm belongs to chaebol conglomerate, and 0 if not. Foreign (For) refers to the proportion of foreign investors when it exceeds 5%. Institution (Insti) is the proportion of institutional investors when it exceeds 5%. The highlighted coefficients are significant at least at the 0.05 level.

	Bsize	BoardC	Chair	Comm1	Comm2	Vote	Contr	1-HHI	1-CR$_4$	Price	Size	Leve	ROA	M/B	Age	Vol	Chae	For
BoardC	0.335																	
Chair	0.184	0.169																
Comm1	0.466	0.647	0.306															
Comm2	0.474	0.679	0.265	0.939														
Vote	0.221	0.290	0.234	0.375	0.338													
Contr	-0.108	-0.200	-0.071	-0.166	-0.153	-0.102												
1-HHI	-0.125	-0.188	-0.092	-0.273	-0.227	-0.164	-0.026											
1-CR$_4$	-0.111	-0.175	-0.080	-0.261	-0.233	-0.167	-0.043	0.850										
Price	-0.008	-0.017	-0.040	-0.059	-0.070	-0.056	-0.079	0.081	0.109									
Size	0.509	0.542	0.241	0.656	0.676	0.279	-0.078	-0.250	-0.300	-0.077								
Leve	0.056	0.144	0.017	0.108	0.124	0.011	-0.141	0.000	0.006	0.230	0.143							
ROA	0.095	0.037	0.027	0.096	0.100	0.022	0.176	-0.007	-0.012	-0.164	0.240	-0.296						
M/B	0.147	0.153	0.033	0.163	0.164	0.082	-0.166	-0.007	0.010	-0.006	0.197	0.060	-0.060					
Age	0.054	-0.029	-0.070	-0.032	-0.040	-0.043	-0.123	0.022	0.031	0.077	0.019	0.015	-0.033	-0.124				
Vol	-0.136	-0.048	-0.046	-0.102	-0.097	-0.047	-0.137	0.084	0.073	0.085	-0.253	0.281	-0.357	0.182	-0.054			
Chae	0.262	0.419	0.164	0.478	0.501	0.174	-0.001	-0.183	-0.219	-0.037	0.604	0.107	0.113	0.153	-0.034	-0.128		
For	0.153	-0.005	0.036	0.038	0.049	-0.006	0.047	-0.029	-0.047	-0.042	0.111	-0.097	0.079	0.013	0.012	-0.162	-0.023	
Insti	0.097	0.144	0.020	0.079	0.085	0.070	-0.083	-0.025	-0.016	0.019	0.164	0.038	0.056	0.064	0.021	-0.073	0.072	-0.049

<Table 4> Univariate tests

This table shows differences in board characteristics based on the control power of controlling shareholders and the level of competition in the product market. In Panel A, we divided the sample into two sub-samples based on a median split. In Panel B, we separated the sample into three groups on the basis of product market competition (HHI) and compared the effects of controlling shareholder's power on board characteristics between competitive market (HHI lower 33%) and non-competitive market (HHI upper 33%). The numbers in parenthesis are t-statistics. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Board characteristics based on control power of controlling shareholder

Control power	Small [N=1,496]	Large [N=1,523]	Difference (p-value)	
			t-test	Wilcoxon ranked sum test
Board size	1.7809	1.7066	0.0000***	0.0000***
Board composition	0.3638	0.3246	0.0000***	0.0000***
Board leadership structure	0.0488	0.0295	0.0162**	0.0121**
Number of committees	0.6437	0.3848	0.0000***	0.0000***
Monitoring committees	0.4853	0.2909	0.0000***	0.0000***
"Vote no" activity by outside director	0.0428	0.0210	0.0007***	0.0007***

Panel B: Difference in the effect of control power of controlling shareholder based on the level of product market competition

Product market competition	Low [N=1,027]			High [N=1,003]			
Control power	Small [N=457]	Large [N=570]	Difference (A)	Small [N=508]	Large [N=495]	Difference (B)	(A)-(B)
Board size	1.8753	1.6991	0.1762*** (7.22)	1.7168	1.6967	0.0201 (0.91)	0.1561*** (4.75)
Board composition	0.4087	0.3316	0.0771*** (9.03)	0.3315	0.3189	0.0127* (1.96)	0.0644*** (6.10)
Board leadership structure	0.0810	0.0368	0.0441** (2.35)	0.0177	0.0242	-0.0065 (-0.72)	0.0506** (2.50)
Number of committees	1.2232	0.5000	0.7232*** (8.55)	0.3524	0.2545	0.0978** (2.20)	0.6254*** (6.74)
Monitoring committees	0.8928	0.3684	0.5244*** (8.86)	0.3051	0.2061	0.0991*** (2.59)	0.4253*** (6.18)
"Vote no" activity by outside director	0.1028	0.0404	0.0625*** (3.80)	0.0098	0.0061	0.0038 (0.67)	0.0587*** (3.49)

<Table 5> Impact of the interaction between controlling shareholders' control power and product market competition on board size

This table reports results derived from an OLS regression analysis exploring the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on board size. As a dependent variable, board size is the natural log of the number of directors. High is a dummy variable that takes the value of 1 if a firm is in a competitive market (HHI lower 33%). Median is a dummy variable that takes the value of 1 if a firm is in less-competitive market (HHI median 33%). Low is a dummy variable that takes the value of 1 if a firm is in a non-competitive market (HHI upper 33%). The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	1.8426***	-0.5411***	-0.7414***	1.7983***	-0.5990***	-0.7965***
	[101.66]	[-4.49]	[-5.43]	[65.29]	[-4.78]	[-5.71]
Control power	-0.2401***	-0.1148***	-0.1078***			
	[-5.94]	[-3.18]	[-2.96]			
Control power*High				-0.0455	0.0496	0.0537
				[-0.64]	[0.76]	[0.82]
Control power*Median				-0.1322**	-0.1047*	-0.1007*
				[-2.09]	[-1.77]	[-1.71]
Control power*Low				-0.5424***	-0.2318***	-0.2207***
				[-7.46]	[-3.99]	[-3.80]
High				-0.0730*	-0.0468	-0.0486
				[-1.78]	[-1.24]	[-1.28]
Low				0.2117***	0.0152	0.0114
				[4.82]	[0.41]	[0.31]
Size		0.1227***	0.1319***		0.1265***	0.1357***
		[30.88]	[25.61]		[29.77]	[25.35]
Leverage		-0.1222***	-0.1074***		-0.1269***	-0.1123***
		[-3.61]	[-3.17]		[-3.74]	[-3.31]
ROA		-0.1303**	-0.1332**		-0.1472**	-0.1490**
		[-2.01]	[-2.08]		[-2.26]	[-2.32]
M/B ratio		0.0441***	0.0443***		0.0421***	0.0424***
		[7.85]	[7.71]		[7.50]	[7.40]
Age		0.0290***	0.0281***		0.0306***	0.0297***
		[3.91]	[3.81]		[4.15]	[4.05]
Volatility		-0.8090	-0.3272		-0.5644	-0.1007
		[-1.34]	[-0.54]		[-0.93]	[-0.17]
Chaebol			-0.0623***			-0.0620***
			[-3.65]			[-3.62]
Foreign			0.2796***			0.2766***
			[5.38]			[5.38]
Institution			0.0271			0.0166
			[0.42]			[0.25]
Industry effect	NO	YES	YES	NO	YES	YES
Year effect	NO	YES	YES	NO	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
adj-R^2	0.011	0.296	0.306	0.027	0.300	0.310

<Table 6> Impact of the interaction between controlling shareholders' control power and product market competition on board composition

This table reports results derived from an OLS regression analysis exploring the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on board composition. As a dependent variable, board composition refers to the percentage of outside directors on the board. The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	0.4044*** [63.15]	-0.5436*** [-15.67]	-0.4222*** [-10.72]	0.3767*** [40.40]	-0.5457*** [-15.36]	-0.4275*** [-10.75]
Control power	-0.1463*** [-11.13]	-0.0981*** [-8.34]	-0.1021*** [-8.70]			
Control power*High				-0.0613*** [-2.97]	-0.0368* [-1.79]	-0.0455** [-2.21]
Control power*Median				-0.0904*** [-4.63]	-0.0830*** [-4.45]	-0.0819*** [-4.46]
Control power*Low				-0.2942*** [-12.11]	-0.1636*** [-8.77]	-0.1687*** [-9.06]
High				-0.0264** [-1.97]	-0.0121 [-0.97]	-0.0058 [-0.47]
Low				0.1154*** [7.45]	0.0378*** [3.15]	0.0417*** [3.50]
Size		0.0465*** [34.62]	0.0402*** [24.04]		0.0462*** [32.97]	0.0398*** [23.31]
Leverage		0.0155 [1.39]	0.0141 [1.27]		0.0148 [1.32]	0.0135 [1.21]
ROA		-0.0475** [-2.29]	-0.0448** [-2.18]		-0.0536** [-2.56]	-0.0517** [-2.50]
M/B ratio		0.0072*** [4.01]	0.0058*** [3.25]		0.0071*** [3.93]	0.0057*** [3.16]
Age		-0.0065*** [-2.62]	-0.0062** [-2.52]		-0.0062** [-2.48]	-0.0059** [-2.38]
Volatility		0.4624** [2.41]	0.4101** [2.15]		0.5091*** [2.63]	0.4620** [2.40]
Chaebol			0.0341*** [5.83]			0.0345*** [5.93]
Foreign			-0.0316** [-2.30]			-0.0327** [-2.43]
Institution			0.0682*** [2.77]			0.0703*** [2.79]
Industry effect	NO	YES	YES	NO	YES	YES
Year effect	NO	YES	YES	NO	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
adj-R^2	0.040	0.352	0.363	0.082	0.357	0.368

<Table 7> Impact of the interaction between controlling shareholders' control power and product market competition on board leadership structure

This table reports results derived from an ordered probit regression model that explored the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on board leadership structure. As a discrete dependent variable, board leadership structure with a value of 2 indicates an outside director is likely to be appointed as chairman of board; a value of 1 indicates an inside director is likely to be appointed as chairman of board; and value of 0 if the CEO is likely to be appointed chairman of board. The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	1.4631***	9.8766***	9.3490***	1.4532***	10.1508***	9.7829***
(cut1)	[12.02]	[12.48]	[9.59]	[9.92]	[11.46]	[9.28]
Control power	-0.9309***	-0.8499**	-0.9331***			
	[-3.10]	[-2.53]	[-2.70]			
Control power*High				0.3098	0.1960	0.0719
				[0.59]	[0.33]	[0.12]
Control power*Median				-0.8873**	-1.0725**	-1.1502**
				[-2.55]	[-2.41]	[-2.54]
Control power*Low				-1.5696***	-1.4078**	-1.4446**
				[-2.88]	[-2.18]	[-2.20]
High				-0.7262***	-0.5851*	-0.5707*
				[-2.62]	[-1.82]	[-1.79]
Low				0.3758	-0.3307	-0.3492
				[1.46]	[-1.15]	[-1.21]
Size		0.2989***	0.2726***		0.3340***	0.3160***
		[8.76]	[6.27]		[8.38]	[6.58]
Leverage		-0.3415	-0.3708		-0.3979	-0.4253
		[-1.18]	[-1.28]		[-1.36]	[-1.46]
ROA		-0.4935	-0.4190		-0.5432	-0.4815
		[-0.94]	[-0.83]		[-0.98]	[-0.90]
M/B ratio		-0.0053	-0.0066		-0.0202	-0.0197
		[-0.14]	[-0.16]		[-0.49]	[-0.47]
Age		-0.2112***	-0.2099***		-0.2141***	-0.2133***
		[-3.77]	[-3.69]		[-3.75]	[-3.68]
Volatility		4.5995	5.6862		4.6379	5.5032
		[0.80]	[1.00]		[0.81]	[0.97]
Chaebol			0.1454			0.1049
			[1.17]			[0.83]
Foreign			0.6136			0.5584
			[1.48]			[1.36]
Institution			-0.5896			-0.6954
			[-1.00]			[-1.15]
Industry effect	NO	YES	YES	NO	YES	YES
Year effect	NO	YES	YES	NO	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
pseudo-R^2	0.012	0.197	0.201	0.030	0.211	0.215

<Table 8> Impact of the interaction between controlling shareholder's control power and product market competition on number of committees

This table reports results derived from an OLS regression analysis exploring the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on the number of committees inherent to a given board of directors. As a dependent variable, number of committees simply refers to the number of committees on a given board. The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	0.9415***	-7.8322***	-6.9305***	0.4800***	-7.9394***	-7.0164***
	[14.72]	[-19.25]	[-16.15]	[7.34]	[-19.37]	[-16.23]
Control power	-1.0378***	-0.6394***	-0.7088***			
	[-7.94]	[-6.24]	[-6.87]			
Control power*High				-0.4168**	-0.1763	-0.2597
				[-2.49]	[-1.10]	[-1.63]
Control power*Median				-0.1877	-0.1677	-0.2236*
				[-1.40]	[-1.24]	[-1.65]
Control power*Low				-2.7059***	-1.5343***	-1.6004***
				[-9.38]	[-8.05]	[-8.46]
High				-0.0064	0.1501	0.1719*
				[-0.06]	[1.63]	[1.91]
Low				1.5020***	0.7324***	0.7368***
				[9.39]	[6.90]	[7.06]
Size		0.4738***	0.4301***		0.4643***	0.4188***
		[33.77]	[26.06]		[34.08]	[26.12]
Leverage		-0.0878	-0.0913		-0.0829	-0.0862
		[-1.09]	[-1.14]		[-1.06]	[-1.10]
ROA		-0.3577**	-0.3149**		-0.4540***	-0.4148***
		[-2.51]	[-2.18]		[-3.14]	[-2.84]
M/B ratio		0.0772***	0.0715***		0.0785***	0.0716***
		[4.99]	[4.54]		[5.19]	[4.65]
Age		-0.0351*	-0.0328		-0.0339*	-0.0315
		[-1.72]	[-1.59]		[-1.67]	[-1.54]
Volatility		3.7611***	2.9125**		4.2593***	3.4818**
		[2.78]	[2.15]		[3.14]	[2.57]
Chaebol			0.2626***			0.2748***
			[5.60]			[5.98]
Foreign			-0.1409			-0.1428
			[-1.26]			[-1.35]
Institution			-0.4098*			-0.3334
			[-1.88]			[-1.54]
Industry effect	NO	YES	YES	NO	YES	YES
Year effect	NO	YES	YES	NO	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
adj-R^2	0.027	0.482	0.490	0.113	0.497	0.505

<Table 9> Impact of the interaction between controlling shareholders' control power and product market competition on number of monitoring committees

This table reports results derived from an OLS regression analysis exploring the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on the number of monitoring committees on a given board of directors. As a dependent variable, monitoring committee refers to the total number of board committees whose primary function is some form of monitoring (e.g., audit, outside director nominate, compensation committee). The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	0.6837***	-6.2981***	-5.5317***	0.3425***	-6.4931***	-5.6965***
	[15.76]	[-25.07]	[-20.11]	[6.91]	[-25.45]	[-20.36]
Control power	-0.7183***	-0.3885***	-0.4483***			
	[-8.22]	[-5.56]	[-6.40]			
Control power*High				-0.4252***	-0.2331*	-0.3115**
				[-3.05]	[-1.77]	[-2.37]
Control power*Median				-0.1123	-0.0923	-0.1393
				[-1.12]	[-0.95]	[-1.42]
Control power*Low				-1.7814***	-0.8126***	-0.8690***
				[-10.02]	[-7.01]	[-7.56]
High				0.0867	0.2047***	0.2276***
				[1.05]	[2.80]	[3.15]
Low				1.0230***	0.4033***	0.4078***
				[9.87]	[5.87]	[6.01]
Size		0.3660***	0.3283***		0.3660***	0.3261***
		[40.54]	[29.50]		[38.61]	[28.42]
Leverage		-0.0100	-0.0068		-0.0053	-0.0010
		[-0.17]	[-0.12]		[-0.09]	[-0.02]
ROA		-0.2298**	-0.1921**		-0.3011***	-0.2659***
		[-2.46]	[-2.04]		[-3.18]	[-2.80]
M/B ratio		0.0608***	0.0550***		0.0604***	0.0534***
		[5.59]	[4.96]		[5.63]	[4.90]
Age		-0.0406***	-0.0388***		-0.0398***	-0.0379***
		[-2.94]	[-2.81]		[-2.88]	[-2.74]
Volatility		2.9529***	2.4120**		3.4674***	2.9987***
		[2.93]	[2.39]		[3.41]	[2.94]
Chaebol			0.2205***			0.2349***
			[5.92]			[6.41]
Foreign			-0.0076			0.0041
			[-0.08]			[0.04]
Institution			-0.3024**			-0.2399
			[-1.97]			[-1.57]
Industry effect	NO	YES	YES	NO	YES	YES
Year effect	NO	YES	YES	NO	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
adj-R^2	0.023	0.500	0.509	0.091	0.510	0.519

<Table 10> Impact of the interaction between controlling shareholder's control power and product market competition on "vote no" activity by outside directors

This table reports results derived from an ordered probit regression model that explored the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on "vote no" activity by outside directors. As a dependent variable, a value of 1 for "vote no" activity indicates that an outside director is likely to simply "vote no" against the board's agenda. The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-1.2669***	-8.5266***	-8.7193***	-1.7466***	-8.1165***	-8.3006***
	[-10.29]	[-8.46]	[-7.89]	[-7.43]	[-7.88]	[-7.55]
Control power	-1.5704***	-1.0566***	-1.0407***			
	[-4.74]	[-2.71]	[-2.58]			
Control power*High				-1.3241	-1.2436	-1.2806
				[-1.26]	[-1.03]	[-1.04]
Control power*Median				-0.9236	-0.7603	-0.6877
				[-1.53]	[-1.08]	[-0.99]
Control power*Low				-2.1733***	-1.1677**	-1.1764**
				[-5.07]	[-2.52]	[-2.51]
High				-0.1727	-0.0218	0.0276
				[-0.38]	[-0.04]	[0.05]
Low				1.0946***	0.3813	0.4302
				[3.83]	[1.17]	[1.33]
Size		0.3999***	0.4139***		0.3623***	0.3748***
		[9.43]	[8.47]		[8.32]	[7.48]
Leverage		-0.6984**	-0.7321**		-0.6718*	-0.7107**
		[-1.97]	[-2.07]		[-1.90]	[-2.01]
ROA		-1.5266***	-1.6142***		-1.5309***	-1.6215***
		[-3.22]	[-3.37]		[-3.35]	[-3.51]
M/B ratio		0.0827**	0.0810**		0.0960**	0.0952**
		[2.12]	[2.04]		[2.36]	[2.29]
Age		-0.0360	-0.0353		-0.0306	-0.0306
		[-0.58]	[-0.58]		[-0.49]	[-0.50]
Volatility		8.2607	6.5015		7.7380	5.7076
		[1.31]	[1.02]		[1.23]	[0.88]
Chaebol			-0.0648			-0.0681
			[-0.47]			[-0.48]
Foreign			-1.3151*			-1.4254*
			[-1.71]			[-1.82]
Institution			0.3908			0.3976
			[0.93]			[0.96]
Industry effect	NO	YES	YES	NO	YES	YES
Year effect	NO	YES	YES	NO	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
pseudo-R^2	0.037	0.306	0.311	0.125	0.313	0.318

\<Table 11> Alternative model specifications

This table reports results from a regression analysis which explored the effects of controlling shareholders′ control power and the interaction between control power and the level of competition in the product market on board characteristics. In this table, we use a lagged variable model (Panel A), estimate clustered standard error incorporating data from the firm level (Panel B), and use a random effects model for the panel analysis (Panel C). In Panel A and C, the numbers in square brackets are t-statistics computed by robust standard error. In Panel B, the numbers in square brackets are t-statistics computed by clustered standard error that incorporates data from the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Lagged variable approach						
	Board size	Board composition	Board leadership structure	Number of committees	Monitoring committees	"Vote no" activity by outside director
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-0.7571***	-0.4674***	9.4326***	-7.0349***	-5.8445***	-10.2034***
	[-5.55]	[-11.79]	[9.35]	[-16.32]	[-21.13]	[-8.29]
Control power*High	0.0581	-0.0455**	-0.1285	-0.2013	-0.2209	-0.3472
	[0.90]	[-2.13]	[-0.24]	[-1.22]	[-1.64]	[-0.28]
Control power*Median	-0.0640	-0.0685***	-1.2403***	-0.3120**	-0.1352	0.3876
	[-1.06]	[-3.45]	[-2.93]	[-2.20]	[-1.32]	[0.58]
Control power*Low	-0.2001***	-0.1618***	-1.1480*	-1.5054***	-0.8014***	-1.3376***
	[-3.34]	[-8.40]	[-1.71]	[-7.73]	[-6.68]	[-2.90]
High	-0.0305	-0.0038	-0.4384	0.0984	0.1866**	-0.0354
	[-0.83]	[-0.29]	[-1.49]	[1.04]	[2.50]	[-0.06]
Low	0.0087	0.0444***	-0.4490	0.6681***	0.3957***	0.8434**
	[0.23]	[3.62]	[-1.52]	[6.18]	[5.64]	[2.54]
Control variables	YES	YES	YES	YES	YES	YES
Industry effect	YES	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES	YES
N	2,970	2,970	2,970	2,970	2,970	2,970
adj-R^2 / pseudo-R^2	0.307	0.368	0.229	0.498	0.514	0.350

Panel B: Clustered standard error incorporating data from firm-level						
	Board size	Board composition	Board leadership structure	Number of committees	Monitoring committees	"Vote no" activity by outside director
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-0.7965***	-0.4275***	9.7829***	-7.0164***	-5.6965***	-8.3006***
	[-3.07]	[-6.68]	[7.60]	[-8.27]	[-11.02]	[-6.26]
Control power*High	0.0537	-0.0455	0.0719	-0.2597	-0.3115	-1.2806
	[0.48]	[-1.29]	[0.10]	[-0.83]	[-1.19]	[-1.07]
Control power*Median	-0.1007	-0.0819***	-1.1502**	-0.2236	-0.1393	-0.6877
	[-0.99]	[-2.94]	[-2.14]	[-0.95]	[-0.84]	[-0.97]
Control power*Low	-0.2207**	-0.1687***	-1.4446	-1.6004***	-0.8690***	-1.1764*
	[-2.09]	[-4.91]	[-1.38]	[-4.40]	[-4.02]	[-1.68]
High	-0.0486	-0.0058	-0.5707	0.1719	0.2276*	0.0276
	[-0.78]	[-0.29]	[-1.57]	[1.03]	[1.66]	[0.06]
Low	0.0114	0.0417**	-0.3492	0.7368***	0.4078***	0.4302
	[0.18]	[2.06]	[-0.82]	[3.84]	[3.39]	[1.17]
Control variables	YES	YES	YES	YES	YES	YES
Industry effect	YES	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
adj-R^2 / pseudo-R^2	0.310	0.680	0.215	0.505	0.519	0.318

Panel C: Random effect model

	Board size	Board composition	Board leadership structure	Number of committees	Monitoring committees	"Vote no" activity by outside director
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-0.1671	-0.4024***	-0.4513**	-6.2868***	-5.0836***	-0.4480***
	[-0.68]	[-7.29]	[-2.53]	[-7.49]	[-10.30]	[-3.71]
Control power*High	-0.1744*	-0.0493	0.0102	-0.0805	-0.1471	-0.0376
	[-1.66]	[-1.45]	[0.17]	[-0.55]	[-1.22]	[-1.45]
Control power*Median	-0.1974*	-0.0711***	-0.0673*	-0.1320	-0.0500	-0.0631*
	[-1.94]	[-3.65]	[-1.74]	[-0.86]	[-0.44]	[-1.89]
Control power*Low	-0.3461***	-0.1202***	-0.1619*	-1.0410***	-0.5491***	-0.1558**
	[-2.86]	[-4.49]	[-1.95]	[-3.53]	[-3.10]	[-2.09]
High	-0.0058	-0.0034	-0.0370	0.0508	0.0980	-0.0125
	[-0.11]	[-0.21]	[-1.37]	[0.50]	[1.34]	[-0.68]
Low	0.0772	0.0253*	0.0248	0.4968***	0.2709***	0.0617
	[1.29]	[1.80]	[0.63]	[3.61]	[3.25]	[1.64]
Control variables	YES	YES	YES	YES	YES	YES
Industry effect	YES	YES	YES	YES	YES	YES
Number of firms	667	667	667	667	667	667
N	3,019	3,019	3,019	3,019	3,019	3,019
Overall-R^2	0.2817	0.3463	0.0702	0.4685	0.4828	0.1075

<Table 12> Separated sample approach

This table reports results from a regression analysis which explored the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on board characteristics; this model used a separated sample approach. The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Board size, Board composition, and Board leadership structure

	Board size		Board composition		Board leadership structure	
	Low	High	Low	High	Low	High
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-0.7342***	-1.4906***	-0.4743***	-0.2373***	10.5449***	12.0970***
	[-3.42]	[-6.33]	[-7.84]	[-2.95]	[7.12]	[5.26]
Control power	-0.2481***	0.0975	-0.1562***	-0.0527**	-1.2053**	0.1238
	[-4.00]	[1.46]	[-7.78]	[-2.47]	[-2.12]	[0.18]
Control variables	YES	YES	YES	YES	YES	YES
Industry effect	YES	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES	YES
N	1,027	1,003	1,027	1,003	1,027	1,003
adj-R^2 / pseudo-R^2	0.437	0.262	0.541	0.166	0.314	0.311

Panel B: Number of committees, Monitoring committees, and "Vote no" activity by outside director

	Number of committees		Monitoring committees		"Vote no" activity by outside director	
	Low	High	Low	High	Low	High
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-7.7486***	-5.7128***	-6.1672***	-4.7680***	-8.7201***	-2.6948
	[-11.89]	[-10.71]	[-14.30]	[-10.44]	[-5.70]	[-0.70]
Control power	-1.4137***	-0.2700	-0.7528***	-0.3288**	-0.7800	-0.6682
	[-7.37]	[-1.64]	[-6.22]	[-2.43]	[-1.55]	[-0.56]
Control variables	YES	YES	YES	YES	YES	YES
Industry effect	YES	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES	YES
N	1,027	1,003	1,027	1,003	1,027	1,003
adj-R^2 / pseudo-R^2	0.589	0.327	0.633	0.319	0.392	0.279

<Table 13> Alternative measures for product market competition: CR_4 and price-cost margin

This table reports results from a regression analysis which explored the effects of controlling shareholders' control power and the interaction between control power and the level of competition in the product market on board characteristics; this model used an alternative measure for the product market competition, CR_4 and price-cost margin. CR_4 is the Concentration Ratio (the sum of four largest market shares firms' market shares in each industry). Market shares are calculated using sales of firms. Price-cost margin is computed by dividing industry sales by operating costs in a given industry. To classify industries, we assigned all public and private companies to an industry by matching them to the 3-digit Korea Standard Industry Code (KSIC). The numbers in square brackets are t-statistics computed by robust standard error. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: CR_4

	Board size	Board composition	Board leadership structure	Number of committee	Monitoring committee	"Vote no" activity by outside director
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-0.7855***	-0.4318***	9.4674***	-7.0710***	-5.7186***	-8.5463***
	[-5.63]	[-10.85]	[9.49]	[-16.32]	[-20.41]	[-7.79]
Control power*High	0.0559	-0.0555***	0.0316	-0.3102*	-0.3259**	-1.4279
	[0.86]	[-2.62]	[0.06]	[-1.85]	[-2.46]	[-1.21]
Control power*Median	-0.0877	-0.0819***	-0.9686**	-0.2308*	-0.1520	-0.7218
	[-1.51]	[-4.69]	[-2.08]	[-1.83]	[-1.58]	[-1.09]
Control power *Low	-0.2407***	-0.1633***	-1.6084**	-1.6040***	-0.8732***	-1.1312**
	[-4.11]	[-8.57]	[-2.35]	[-8.26]	[-7.49]	[-2.33]
High	-0.0377	-0.0009	-0.3774	0.1707*	0.2153***	0.1190
	[-1.00]	[-0.07]	[-1.27]	[1.88]	[2.96]	[0.25]
Low	0.0327	0.0398***	-0.1384	0.7209***	0.4027***	0.3553
	[0.89]	[3.39]	[-0.46]	[6.89]	[5.89]	[1.16]
Control variables	YES	YES	YES	YES	YES	YES
Industry effect	YES	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
adj-R^2 / pseudo-R^2	0.310	0.367	0.213	0.504	0.518	0.316

Panel B: Price-cost margin

	Board size	Board composition	Board leadership structure	Number of committee	Monitoring committee	"Vote no" activity by outside director
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	-0.7571***	-0.4153***	8.9300***	-6.9157***	-5.5055***	-8.6499***
	[-5.46]	[-10.43]	[9.03]	[-15.96]	[-19.88]	[-7.46]
Control power*High	-0.1068*	-0.0689***	-0.7794	-0.2512**	-0.1612*	-1.0180
	[-1.70]	[-3.67]	[-1.41]	[-2.07]	[-1.65]	[-1.40]
Control power*Median	-0.0678	-0.1050***	-0.8106	-0.6855***	-0.4682***	-0.9698
	[-1.10]	[-5.29]	[-1.42]	[-4.27]	[-4.25]	[-1.29]
Control power *Low	-0.1449**	-0.1299***	-1.1619**	-1.1223***	-0.6719***	-1.1202*
	[-2.48]	[-6.59]	[-2.19]	[-5.47]	[-5.04]	[-1.94]
High	0.0182	-0.0238**	-0.2446	-0.2179**	-0.1602**	-0.1258
	[0.48]	[-1.97]	[-0.75]	[-2.41]	[-2.44]	[-0.31]
Low	0.0262	0.0077	0.1472	0.2351**	0.1538*	0.0463
	[0.71]	[0.60]	[0.47]	[2.00]	[1.94]	[0.13]
Control variables	YES	YES	YES	YES	YES	YES
Industry effect	YES	YES	YES	YES	YES	YES
Year effect	YES	YES	YES	YES	YES	YES
N	3,019	3,019	3,019	3,019	3,019	3,019
adj-R^2 / pseudo-R^2	0.305	0.364	0.205	0.494	0.513	0.312

<Appendix 1> Variable definitions

Variable	Definition
Board size	Natural log of the number of directors
Board composition	Percentage of outside directors on the board
Board leadership structure	Discrete variable that takes a value of 2 if an outside director is appointed as chairman of board, a value of 1 if an inside director is appointed as chairman of board, and a value of 0 if the CEO takes on the role as chairman of the board
Number of committee	Number of committees on the board
Monitoring committee	Total number of committees on the board geared towards monitoring in some way (e.g., audit, outside director nominate, compensation committee)
"Vote no" activity by outside director	Dummy-coded variable that takes a value of 1 if an outside director exercises just 'votes no' against the board's agenda
Control power	Summation of ownership of controlling shareholders, their relatives, affiliates, and senior managers of the firm
1-HHI	One minus the Herfindahl-Hirschman Index (which is computed by adding squared market shares in each industry). Market shares are derived using sales of firms. To classify industries, we assigned all of public and private companies to an industry by matching them to the 3-digit Korea Standard Industry Code (KSIC)
1-CR$_4$	One minus the Concentration Ratio (which is computed by adding the four largest market shares within each industry).
Price-cost margin	Industry sales divided by operating costs in that industry
High	Dummy-coded variable that takes the value of 1 if a firm is in a competitive market (i.e., HHI, CR$_4$, or price-cost margin are in the lower 33%)
Median	Dummy variable that takes the value of 1 if a firm is in less-competitive market (i.e., HHI, CR$_4$, or price-cost margin are in the median 33%)
Low	Dummy variable that takes the value of 1 if a firm is in a non-competitive market (i.e., HHI, CR$_4$, or price-cost margin is in the upper 33%)
Size	Natural log of total assets
Leverage	Total leverage divided by the total assets
ROA	Ratio of net income to total assets
M/B ratio	Market value of common equity divided by book value of common equity
Age	Natural log of business year (i.e., foundation year minus current year plus one)
Volatility	Standard deviation of daily stock returns for the past one year
Chaebol	Dummy variable that takes value of 1 if the firm belongs to a chaebol conglomerate
Foreign	Proportion of foreign investors when it exceeds 5%
Institution	Proportion of institutional investors when it exceeds 5%