

London School of Economics and Political Science

Three Essays on Corporate Governance in Korea

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Abstract

This thesis analyzes three topics regarding Korean firms' corporate governance.

The first chapter examines whether organized employees play a role in limiting executive compensation. Considering that employees' voices and power are best represented by labor unions and unionization rates, I conclude that labor union existence and rates are both negatively associated with cash compensation. I also find that such negative association is progressively stronger for upper percentile executive pay. I show that the existence of labor unions has a strong negative correlation with stock option use as well, but that the union rate does not. This implies that, if a firm has an organized union, it may become more difficult for that firm to introduce a new payment method such as an executive stock option.

The second chapter tests owner-managed firms' demand for the Directors' and officers' liability insurance (D&O insurance). D&O insurance covers the litigation costs that have to be paid by the directors and officers in case they are sued by other stakeholders. Because D&O insurance premium is paid by the corporation (shareholders), not by directors and officers, even though it primarily protects these people, the agency cost related benefits that shareholders could draw from this insurance were frequently discussed in previous studies. In this chapter, I hypothesize that, because such functions of D&O insurance are less useful in case there are few interest conflicts, firms that rarely suffer from agency issues should demand the insurance less. I focus on owner-manager firms as examples of where there is little agency issue and test the hypothesis. I show that both the probability of purchase and the size of insurance coverage are lower in owner-managed firms. The price of insurance was also lower in owner-manager firms, implying that owner-management signals lower litigation risks.

The third chapter seeks to answer the fundamental question in insurance research: Does corporate risk increase corporate insurance demand? I run a natural experiment using a legislative change which increases litigation risk as an exogenous shock, and provide empirical evidence that firms increase insurance demand when they are exposed to increased risks. The Korean Government has decided to adopt shareholder class action law for public firms with assets over a certain threshold. With shareholder class action, even small shareholders can raise litigation against a board of directors, executives, or a firm itself, so increasing the firm's litigation risk. In a differences-in-differences model, I find that the firms that are subject to the law increase the insurance demand significantly more during the period than the firms that are free from class action law.

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Introduction

Corporate governance refers to the ways in which providers of finance to corporations ensure that the firms are managed in a way that maximizes firm value, generating the best return to their investment (Shleifer & Vishny, 1997). The patterns of financing vary across countries, resulting in significant differences in ownership structures which lead to different corporate governance issues in different areas of the world.

The comparisons and contrasts have been often presented in terms of two models of corporate governance, the Anglo-Saxon model and the Continental European model. The Anglo-Saxon model is characterized by the following traits; higher reliance on equity financing, dispersed ownership, well-functioning financial markets and flexible labor markets. The Continental European model can be characterized by long-term debt finance, large blockholders, relatively weak markets for corporate control and relatively rigid labor markets. Although these classifications efficiently sketch the possible differences in corporate governance issues around the world, they only partially explain parts such as East Asia, Eastern Europe, and multinational firms (Aguilera & Jackson, 2003).

This thesis studies corporate governance in the Republic of Korea, one of the largest economies in East Asia. The corporate governance of East Asian firms, including Korean, is closer to that in Continental Europe than in Anglo-Saxon countries due to the presence of large blockholders and relatively high debt-to-equity ratio. However, with the exception of Japan, in East Asia family control is a much more dominant form of corporate ownership than in Continental European firms, and holding families' dominance over the management board is more wide-spread, resulting in strong owner-manager tradition. For example, among twenty of the largest publicly traded firms, 35% are family-controlled in Korea, 45% in Singapore and 70% in Hong Kong while in Germany it is just 10% and 20% in France, and, in the case of Anglo-Saxon countries,

20% in the US and 5% in the UK (La Porta, Lopez-De-Silanes, & Shleifer, 1999). In the data set comprising all publicly traded firms, 67.9% of Korean firms are family-controlled and the ratio is similar in Hong Kong (64.7%) and Taiwan (65.6%) (Claessens, Djankov, & Lang, 2000).

Although problems within the Anglo-Saxon type of corporate governance based on the standard agency theory have attracted vastly more studies than those of other systems, one has to ask whether similar results would be found when examining governance in countries with concentrated ownership firms. In the latter case, key concerns include majority shareholders expropriating minority shareholders, performance issues, separation of ownership and control through pyramidal ownership structure, as well as instances of powerful families' lobbying their government (Claessens, et al., 2000; Morck, Wolfenzon, & Yeung, 2004). These issues can be equivalently discussed in relation to the governance of Continental European firms and East Asian firms. However, the possible effects of the strong tradition of owner-manager as well as cultural differences in East Asian firms are not yet fully discussed.

Korea is one of the countries where owner-managers are particularly influential actors in corporate governance. Korea has achieved a fast economic development since 1962. The development was government-led, therefore firms relied on the government for financing. Many of the current large-size Korean enterprises and conglomerates began as a family firm and grew massively during the period thanks to government financial assistance. As the Korean financial market developed in the 1980s and 90s, firms grew more with private financing and the size of government stake decreased. However, the tradition of owner-manager in the form of a family firm persisted because the owner-manager's wealth accumulated in the earlier period was reinvested in the firm and the founder's influence was maintained by the substantial stakes held directly by him and his family members or through pyramidal ownership structures and cross-holdings of shares in cases where they expanded to conglomerates. The reforms of company law and

securities law in 1995-1996 reinforced minority shareholder protection and corporate governance regulation reform in the early 2000s contributed to the modernization of the corporate governance system in Korea, but, the new regulations had little influence over ownership structure and owner-manager presence in Korean firms.

In this thesis, by studying corporate governance issues in Korea that may have been influenced by strong owner-managers, I aim to improve the understanding of an under-studied area of corporate governance literature. I present three independent chapters on the related questions of how actors (employees, management, shareholders, owner-managers) of Korean firms interact with each other or respond to given circumstances. More specifically, the three studies quantitatively analyze whether firms efficiently adjust their decisions regarding executive compensation and corporate insurance in a way that satisfies different stakeholders' needs under its given corporate governance characteristics. Firms' behaviors are predicted based on the agency theory and are empirically tested using panel data. The results are interpreted based on the agency theory as well as institutional and cultural background in Korea.

In Chapter 1, I study the employee's influence over corporate decision on executive pay level in Korean firms. By focusing on the employees, I draw attention to the role of a third stakeholder in addition to the much studied shareholders and management. Employees or labor are often taken as exogenously determined by labor markets in the agency theory (Aguilera & Jackson, 2003). However, corporate governance might be the outcome of possible interdependencies among various stakeholders in the firm (R. Freeman, 1984), and particularly the role of employees in takeovers, growth decision, and firm risk levels is increasingly considered important in corporate governance literature

In this chapter, by testing employee influence over board decision on executive compensation, I aim to see how Korean firms interact with employees as well as the

influence of embedded ownership structure and culture over corporate decisions. I test whether Korean firms pay lower cash compensation and stock options to their executives when employees have a strong voice in the firm. According to the agency theory, agents have discretion about the degree of cooperation with principals. Because principals (management or shareholders) need to improve agents' (employees') satisfaction at work to achieve performance goals, they are hypothesized to have incentives to listen to employees, especially if employees have a strong voice mechanism in firms. Employees prefer to be treated equally at work and the pay gap between CEO and employees was a hotly debated topic in the recent financial crisis. I test whether the employee voice, when systematically organized, can extend to influence decision on executive pay.

The correlation between employee voice and executive pay is hypothesized to be stronger than that in the Western countries due to Korean firms' ownership structure and culture traits as well as the presence of strong and autonomous firm-level unions which represent the employee voice. The commonly found family ownership and control in Korean firms tend to extend its unique familial identity over employment relations resulting in a paternalistic approach to employment relationship that emphasizes direct emotional ties and responsibility for employees (T. W. Kim & Bae, 2004, p. 41; Steers, Shin, & Ungson, 1989). At the same time, there is a predominant culture that prioritizes collectivism, solidarity and emotional dependence among members of an organization over individual achievement (Hofstede, 1983). Altogether, these should make management more conscious of what employees feel or think about their own compensation and put higher pressure on them to adjust such when employees express negative voice over their pay, even without a systematic co-determination regulation or employee representation on board.

In Chapter 2, I analyze whether presence of an owner-manager implies high monitoring ability of shareholders by empirically testing whether owner-managers replace a firm's

demand for a type of monitoring tool, which is directors' and officers' liability insurance (D&O insurance) in this study. Previous studies suggested various reasons why D&O insurance is useful for monitoring and incentivizing managements in Anglo-Saxon style firms, where firms are widely held. However, in owner-managed firms, which is a more frequently found form of ownership structure in other parts of the world, agents (management) are also principals (shareholders), therefore conflicts of interest between them would be less severe and shareholders' monitoring of management should be easier, if necessary at all. Given this, it is predicted that buying less of such a monitoring and incentivizing tool is a more efficient decision for owner-managed firms. In addition to the insurance purchase decision, I also test whether the insurance is priced to be lower for owner-managed firms, implying that such organizational form signals lower firm risks.

In this chapter, I investigate the role of owner-managers in Korean firms. As mentioned earlier, Korean firms have a strong tradition that the founder or his or her adjacent family members hold a large percentage of the shares and takes the role of CEO or board member. Therefore it presents an ideal setting to test whether owners' high proprietorship provides incentive for them to monitor, as suggested by Jensen and Meckling (1976). Although some argue that blockholders would have enough incentive to monitor shareholders (Demsetz & Lehn, 1985; Pound, 1988; Shleifer & Vishny, 1986) and act like owner-managers, blockholders can also suffer from lack of expertise or free-rider problems among themselves (Admati, Pfleiderer & Zechner, 1994). Family firms or owner-managed firms differ from firms held by blockholders in that the family members are deeply involved in the management and have exceptional interests in and concerns over their firm's success due to the substantial private wealth and family history vested in the firm. For this reason, I expect to find evidence that the presence of owner-manager implies an organizational structure that contains higher monitoring ability and lower firm risks. The approach in this chapter assumes implicitly that

insurance is purchased to cover risks in owner-manager firms, and not for other purposes such as following what may be deemed ‘best practice’. I turn to this question in the next chapter.

In Chapter 3, I examine whether Korean firms protect themselves by lowering the expected costs of risks through corporate insurance purchase when they experience increased risk. Increased firm risks can be a threat to a firms’ growth, performance or establishment; therefore, it poses a threat to all types of stakeholders of the firm. Therefore, firms, as legal entities, might increase the demand for insurance when there is increase in risks. In Korean firms, it might also partly reflect the preference of the founding family that is found in 67% of the public firms. In case of family ownership, blockholders, who have to bear highest risk of loss with increased firm risk, may not be able to exit from ownership readily given their unique relationship with their firms, therefore they might influence decision to increase insurance demand.

I run a natural experiment using the Korean Government’s legislative change as an exogenous shock. The Korean Government decided to adopt shareholder class action law for public firms which have total assets over 2 trillion Korean Wons (approximately 1.8 billion US dollars at the exchange rate of July, 2013) from 2005 and for all public firms from 2007. Shareholder class action allows even small shareholders to raise litigation against the board of directors, executives, or firms themselves, therefore increasing firms’ litigation risks. Therefore, I test whether firms that were subject to the law between 2005 and 2007 increased the insurance demand more than the firms that were free from class action law.

The results from the experiment should also show whether firms purchased corporate insurance because they needed the primary role that insurance plays, covering potential risks. A widespread academic debate suggests that reducing agency costs is the prime goal that firms aim to achieve through corporate insurance purchase, and rejects risk as a

source of corporate insurance demand, given that shareholders can avoid risks by diversifying their own portfolios. In Chapter 2, based on this argument, relative insurance demands are tested for firms with high agency costs and firms with low agency costs. However, Chapter 3 approaches the more fundamental question of whether agency issue is the main motivation or covering risks is still one of the important sources of corporate demand for insurance.

In addition to investigating the possible owner-managers' role in various aspects of corporate governance, I look at different aspects of firms' decisions to protect their stakeholders and themselves, emotionally and practically, through the three chapters. The first study is about whether employees' requests for equity at work are respected through reduced executive compensation. Through adjusting executive pay according to employee voice, firms might protect both employees by meeting their emotional needs and shareholder value through improved employee satisfaction at work. Through the process of searching for evidence that high agency costs lead to high demand for corporate insurance and vice versa, the second chapter shows that D&O insurance is a useful tool to protect shareholder value. The final analysis investigates whether firms protect themselves using insurance when they face risks. Firms face risks in business operations and, even though some shareholders can avoid them by diversifying, firms' establishment as legal entities is threatened by costs from the risks. I study whether the firm, as a representative of many different stakeholders' interests, protects itself through the purchase of corporate insurance.

In the rest of this thesis, I present the three chapters and then conclude by summarizing my findings and contributions.

Chapter 1 . Unionized employees' influence on executive compensation

1.1. Introduction

Since the financial crisis of the late 2000s, executive compensation has been one of the most heavily discussed topics in the sphere of business and economics. A number of financial institutions have revealed that they paid extremely high compensation packages to managers whose business decisions caused severe pain to other stakeholders, resulting in plummeting share prices and greater than ever layoffs. The discussion on who decides the amount of executive pay and how it is decided continues. In particular, in the recent Financial Crisis, the great debate is whether it is fair that chief executives take on such large compensation packages while their employees are asked to leave the company or endure wage concessions.

Top management compensation is decided in a way that balances the interests of the different groups of people who are often referred as stakeholders. Shareholders and managers and their relationships have been much studied as a key for compensation decision. Also, in troubled times like economic crises, governments can intervene in a firm's executive pay settings, as the French Government did in 2009, based on the notion that the firm's financial soundness can threaten the public's economic well-being. Who has greater power over the decision of CEO compensation or how different stakeholders' interests are balanced through it remains an empirical question. When the balancing mechanism fails to adjust the power of each party, the compensation given to CEOs can be too high or too low. For example, in their managerial power theory, Bebchuk and Fried (2003) insist that too much discretion has been given to managers in the US since the 1990s and that this is why their levels of compensation have soared over the same period.

So far, managerial compensation research has been largely skewed to shareholder-manager relationships based on the agency theory. However, as Jensen and Murphy (1990) emphasize, CEO pay is no longer a private matter between principals and agents as it is now publicly disclosed to third parties in many countries and affects many aspects of corporations such as governance and culture. More stakeholders such as employees, labor unions, consumers, government, and the media have access to this information, and therefore have the potential to affect levels of executive compensation, either directly or indirectly. Given that it can be affected by a more diverse group of people, attention to other stakeholders will provide a better understanding of executive pay. One of the potential subjects that requires exploration is employees. Employees play an influential role in managerial effectiveness and firm performance as suppliers of labor, one of the major and most critical inputs for a firm. Indeed there is a large amount of literature that shows how employees, as one of the major stakeholders, have influence over corporate strategies or corporate governance.

There are reasons to develop the rationale that employees may affect executive compensation. First, employees can be active monitors of managerial misbehavior given that their interest is closely linked to how their firm is managed. Secondly, since demotivated workers with disadvantaged and unfairly treated feelings cause productivity concerns (J. Adams, 1966; Hatfield & Sprecher, 1984), managers have an incentive to care about the upper- and lower-level employee wage disparity.

My study in this chapter aims to explore whether these theoretical predictions work. I use the presence of labor unions and the rate of unionization as measures of employees' voice and power in a firm. I run OLS regressions with firm and year fixed effects using 11 years of panel data from 242 Korean firms, controlling for the variables that reflect the business circumstances and corporate governance structure that individual firms face. The economic variables are firm size (total assets), firm performance (ROA), growth opportunity (Tobin's Q) and stock return volatility. The corporate governance variables

are board ownership, ownership structure and board size. This is to minimize the possibility that the coefficients contain the effect of a third factor, either economic or corporate governance, that could simultaneously cause union rate increase and executive pay decrease. Also, to avoid the possible reverse causality issue, I repeat the regressions using lagged union presence and rate.

I found that the presence of labor unions and rates are both negatively associated with cash compensation. This means that, as employees are organized and as more employees become organized, executives are likely to be paid less. Additionally, using quantile regression, I also found that such negative association is progressively stronger with executive pay in the upper percentile. This means that labor unions play a role in compressing the range of executive cash compensation and maintaining a higher level of equality with regard to employee payments. Secondly, I found that the presence of labor unions has a strong negatively correlation with stock option use in executive compensation, but that the union rate does not. This implies that a union presence is a critical determinant of stock option use, and how strong the union is less critical. It also means that, if a firm has an organized union, it may become more difficult for it to adopt an executive stock option scheme. Thus, I conclude that when employees are organized and active in manifesting their voice, they can play a strong role in reducing total executive compensation and that, by having an organized union, they can effectively suppress the introduction of new methods of payment such as executive stock options even though the unionization rate is not high.

The rest of the chapter proceeds as follows. Section 1.2 consists of a literature review of work on the relationship between employee voice, labor union and executive compensation and background knowledge for labor unions in Korean firms. Section 1.3 describes the data set and methodology. Section 1.4 presents the findings of this chapter. Section 1.5 concludes.

1.2. Literature Review

1.2.1. Employees and Executive Compensation

There are some reasons to predict a negative relationship between strong employee power and executive compensation. Firstly, employees, as stakeholders, can be active monitors for managers given that their interest is closely linked to how managers operate their firm. If managerial misbehavior brings economic troubles such as increased layoffs and lower worker wages, employees' interests are the first to be damaged. While such monitoring is most likely to be carried out by executives' close subordinates, lower level employees are also able to engage in invigilating executives with the support of employee stock ownership (ESO) and union representation in annual meetings which systemize and institutionalize employees' rights to request corporate information. When they discover examples of managerial misbehavior, employees often try to fix it, and the resulting limited executive power may result in limited executive compensation (Bebchuk & Fried, 2003). Employees can do the same directly toward compensation decisions. When they find executive compensation to be unfairly high compared to lower level employees' remuneration and performance (Akerlof & Yellen, 1988), employees should have the incentive to prevent them securing the financial soundness of their firm and the stability of their own employment.

Secondly, there is always some tension that stems from concerns about fairness between employees and executives, which may lead executives to being paid less in firms where they have well-organized employees with an influential voice. When the difference between the remuneration provided for lower and upper level workers grows larger, this can make lower level workers feel unfairly treated and cause union protests that directly aim to achieve higher levels of equity. For example, Dornstein (1991) finds that lower-level employees indeed compare their pay to that of upper-level groups and that this

comparison can make them develop feelings of inequity. Such feelings can also indirectly influence executives in choosing lower payments. Since unfair payment at work often leads lower-echelon employees into absenteeism, strikes, vandalism and violence (Martin, 1982; Staw, 1984) and makes them less supportive of the goals of a better rewarded group (Hatfield & Sprecher, 1984), it also results in decreased productivity and efficiency and eventually becomes a cost to management. Given that executives' long-term compensation or job security depends on firm performance, managers have an incentive to get rid of the elements that obstruct productivity. To do so, they might voluntarily forego excessive pay to some extent to express their equity concerns towards average employees. DeAngelo and DeAngelo (1991) catch supporting evidence by showing that CEOs receive lower compensation for their union-negotiation years compared to other years in order to be able to show their sacrifice and ask employees to work hard for lower payments. Although DeAngelo and DeAngelo (1991)'s case represents only short-term reduction in executive compensation, if unions are strong enough, executives might have more incentive to keep levels of compensation low.

Thirdly, employees' voice regarding executive compensation may be raised by labor unions strategically for their own organizational imperative and active campaigns by labor unions or media coverage on them might put pressure on executive pay. To be able to maintain recognition and bargaining rights, labor unions need the ability to mobilize their members (Crouch, 1982). In order for employees to join and to act according to labor unions' mobilization, they should share common interests (Traxler, 1995). As one of these common interests, labor unions may use the issue of executive compensation. Executive pay can be of general interest to all employees as they commonly care about the fairness of financial distribution among different levels of workers. Marsden (2013) also argues that labor unions' collective voice should compete with individual voice when employees have sufficient market power such as readily available marketable

skills and that to aggregate individual voices into a unionized form, labor unions need to generate demand for unionization that is more generalizable to all workers. Continuing to target executive pay may help labor unions create such demand and may result in increased solidarity among members and an improved ability to attract new members. Labor unions' success in aggregating individual voices through executive pay means higher pressure on management and shareholders to lower the pay; therefore, I hypothesize a negative relationship.

In fact, these phenomena presented above can be spotted in the media quite often, and they have appeared very frequently over the past few years. For example, when American Airlines gave its CEO a 10% salary raise in 2010 while resisting wage increases for its employees, the labor union planned to exert public pressure through media exposure and strikes. From the labor unions' perspective, this was an expression of concern about fairness as well as sincere monitoring of their company's business operation since it was the only major US airline company to lose money (Koenig, 2011). The labor union of the Motion Picture and Television Fund reported similar complaints in 2013, stating that their CEO was being paid excessively while employees were asked to make continuous concessions (Ellingson, 2013). There are many similar reports from almost all developed countries. This shows that organized employees actively monitor their executives and express concerns and complaints freely when they feel there is a degree of unfairness with regard to payments. This may also foster an organizational imperative in labor unions and increase solidarity among members who share viewpoints.

Various channels can be identified through which employees affect top executive pay. Although it is possible that employee voice could increase executive compensation, when they bargain for their own wages, based on the established belief that there should be a fair pay differential between different hierarchical employee groups, there are more channels through which unions will decrease executive compensation. One possibility is the employees' direct request for an executive pay concession. Since employees

generally have a preference for equal pay and fairness in an organization, when they find that executives are paid too much, they can oppose the management through institutionalized voice and by threatening industrial action (Gomez & Tzioumis, 2006). As employees' representatives, labor unions actually demand that executives make concessions in order to receive compensation in collective bargaining and negotiations, especially when workers are asked to do so (Singh & Agarwal, 2002). Such action has become more easily available to employees because of the increasingly loud voice given to them through employee share ownership (ESO) or their representation on boards which give them some degree of control over companies. Another relevant factor is that employees, when they are unionized, can have some influence on executive compensation decisions through their influence on a firm's profitability (Banning & Chiles, 2007) and financial market performance (Gomez & Tzioumis, 2006). Banning and Chiles (2007) interpret unionized employees as a tax imposed on a firm in that they take more rent from firms' profits. Lower profits may reduce the level of executive pay. As previous studies show (Abowd, 1990; Becker & Olson, 1989; Bronars & Deere, 1994), collective bargaining by employees can have a negative impact on firms' stock prices, and can eventually reduce the incentive effect of executives' stock options. This may distort the original intention of the compensation design and make firms adjust compensation to counteract it (Gomez & Tzioumis, 2006). One more possibility is that executives decide to withhold excessive pay due to employee pressure based on an 'implicit regulation hypothesis' (M. C. Jensen & Murphy, 1990). When executive pay is high, employees perceive that a firm is financially healthy and demand wage increases for employees. To avoid coping with unhappy employees, executives could choose to have less in the first place because employees can accelerate the process by raising a political campaign or media exposure about unfair treatment from management (Singh & Agarwal, 2002). Gregg and Machin (1988) named a similar phenomenon 'threat effect' in which management abstain from introducing a policy against labor unions as they are afraid of their reaction.

This chapter is not the first to suggest that employee voice can affect levels of management compensation. Previous studies have shown that unions can both increase (Mahoney, 1979; Simon, 1957) and decrease CEO compensation (M. C. Jensen & Murphy, 1990). Employees can raise CEO compensation levels by lifting the lower levels of workers' wages based on the social norm that there has to be a fair degree of difference between lower and upper-level employee pay. On the other hand, employees put pressure on executives through negotiating executive pay concessions in collective bargaining and public exposure aiming to reduce compensation for CEOs, therefore achieving a higher level of equity. Singh and Agarwal (2002) call the former a 'ratchet effect' and the latter a 'braking or dampening effect'.

There are a limited number of empirical studies on the relationship between employee influence and executive pay and their results differ from each other. In the US and Europe, DiNardo, Hallock and Pischke (1997) find little evidence that unions depress executive pay but, by finding that fewer managers are employed in unionized firms, they conclude that unions redistribute rents towards workers by reducing the number of managers instead of the amounts of their pay. Gomez and Tzioumis (2010) found a significant negative association between union presence and total CEO compensation for the US firms. This demonstrates that employees' union presence does not change the performance sensitivity of CEO compensation and while their negative impact is progressively stronger for higher pay groups, Gomez and Tzioumis (2010) conclude that the employees' voice operates as a 'fairness factor' regarding wage dispersion without sacrificing performance sensitivity. Similarly, Banning and Chiles (2007) show that CEOs in union firms are paid less compared to their counterparts in non-unionized firms but have a lower risk in terms of the composition of their pay as a trade-off. However, Singh and Agarwal (2002) identify the 'ratchet effect' that executive pay is significantly higher in unionized firms in Canadian metal-mining firms. While they imply that this could be due to the CEOs' greater responsibilities in unionized firms, they do not

exclude the possibility that the dampening effect of unions is cancelled out by the fast growth of Canadian CEOs' pay during the period that their data is being collected.

1.2.2. Employee Voice and Labor Union

To analyze the link between employee power and executive compensation, I measure employee voice by using the labor union presence and unionization rate. In previous empirical studies, the union presence or unionization rate has been widely used to measure a union's voice and bargaining power, and the findings support the usefulness of the unionization rate as a proxy for employee power (Klasa, Maxwell, & Ortiz-Molina, 2009). In this section, I explain the theoretical link between labor union presence and employee power.

Hirschman (1970) points out that the stakeholders of a firm, including its employees, can do one of two actions when they are not satisfied with their firm: exit or voice. Exit follows the classic market mechanism, namely leaving the firm when a problem is felt. In the case of employees, it means quitting their current jobs and going to another workplace that does not have such problems. Therefore, it is only open when jobs are available outside their firm. Voice is a more active behavior that aims to fix the problem by expressing complaint. Employees may participate in discussions, raise their voice about certain issues, and bargain with managers who have the authority to make changes to their workplace. Freeman and Medoff (1984) classify voice into individual and collective and point out that individual voice may be available, again, only when employees have job opportunities elsewhere. This is because when an individual voice is raised, the identity of the individual is easily exposed and management authorities may find it more efficient to remove or penalize the individual rather than making changes to the workplace to increase an individual employee's marginal satisfaction. This fear of losing their job may prevent individuals from raising their voices. Therefore, a collective

voice that is presented by employee organizations such as labor unions is likely to be the main action available for the majority of employees.

Similarly, Marchington and Wilkinson (2005) classify employee participation in the workplace into three types; direct communication, upward problem-solving, and representative participation. The first two are more informally carried out through face-to-face interactions between supervisors and their subordinates. In the third form, employee or labor union representatives play a role in leading communication and exchanging ideas between managers and the workforce via more systematic mechanisms, such as joint consultation, worker directors, or even collective bargaining. According to Marchington and Wilkinson (2005), these activities by representatives are most effective in raising major issues about the distribution of power and influence within organizations, and in the case of nationwide worker confederations, even the legislative framework of the country. In addition, these forms of employee voice initiate discussions about the allocation of financial benefits within organizations as well as about who has decision rights to distribute them and what kind of financial and economic impact these decisions would bring to the firm. After reviewing different types and meanings of employee voice, Dundon et al. (2004) also note that collective organizations of employees such as labor unions are a type of employee voice that helps them gain countervailing power to management.

However, there is also a concern as to whether labor unions effectively represent employee voice consistently in various circumstances. The main reason would be that interests between union leaders and their members or among the members themselves could diverge. The iron law of oligarchy, which states that bureaucratic power arises in any kind of organizations and that power corrupts, is often leveled against labor union leaders. The incorporation theory in industrial relations says that if union leaders stay closer to management due to their self-seeking interests, such as taking bribes from firms to exercise their authority in the union, union activities may not be an effective

threat to management (Hyman, 1975). It is often insisted that this becomes more likely as time passes after union organization (Rollinson, 1991), although empirical evidence has failed to prove it (Edwards & Heery, 1985; Rollinson, 1991). Also, especially in recent years, the nature of work diversified from manufacturing to service and from full-time to part-time or work-from-home, implying that it became harder for unions to centrally negotiate workers' interests with management because interests were not matched among workers and also because it was costly to gather workers in different locations. Management can take advantage of such difficulties experienced by unions by satisfying non-members' needs and discouraging them from joining unions, making it harder for unions to be organized. Indeed, Disney, Gosling and Machin (1996) concluded in their empirical study that entry into new establishments was the toughest task for unions and that is why union rate declined dramatically in the UK when the country experienced a shift from workplaces with homogenous worker interests, such as mining, to other industries. Although I am unable to finely test the first case, conflict between leaders and members, in this chapter, I doubt if this would be a serious issue in Korea given the relatively short history of legal recognition of labor unions and their active involvement in manifesting workplace discontent. With regard to the second issue, that is if diverging interests among employees is an issue that makes it difficult for unions to be an effective voice, whether the union is already formally organized should more critically show whether employees have a voice mechanism or not would unionization rate. If unions are already organized, overcoming the initial costs of structuring a group and building capacity for collective action (Kelly, 1998), it may imply that they have high potential to grow and, therefore, pose a credible threat to management.

In countries such as Korea, where there are no other representative forms of organizations for employees such as works councils, labor unions are likely to provide a sole collective voice to companies. In the process of delivering employee voice to

management and bargaining with them, labor unions also play a role in balancing power between managerial authorities and lower echelon employees. As they gain more power, labor unions' influence may not be limited to the issues that directly affect employees' working conditions such as wages or the working environment, and their voice may reach a wider range of workplace matters such as organizational equity or culture. Freeman and Medoff (1984) argue that labor unions are the main source of employee power that dilutes managerial authority and that their concern for various aspects of the firm fundamentally alters social relations between management and lower-level employees.

One of the issues on which systematically organized and recognized labor unions have recently raised their voices is executive compensation. For example, in the UK, Trades Union Congress (TUC) challenged executive pay, pointing out that executives kept receiving "austerity-busting" pay when employees' families were struggling to cope with "the biggest squeeze" on their incomes, and asked government to allow workers to sit on companies' pay committees to limit the executive pay (Neville, 2013). In the US, the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) created a webpage that provided extensive statistical and graphical information on the gap between executive pay and employee wages (AFL-CIO, 2013). In Switzerland as well, labor unions have criticized Swiss executive salaries, pointing out that they continue to be more than 200 times those of the lowest paid employees. In Korea where company level unions are more active than confederations, the issue was raised more frequently by a number of company unions (Y. R. Choi, 2013; Hong, 2010).

1.2.3. Labor Union and Executive Compensation in Korea

I observed Korean firms to conduct this chapter's analysis. Corporate governance in Korea is different from the model which is prevalent in Anglo-Saxon countries in the

following ways. Firstly, in more than 80% of large firms, the controlling shareholder or family members of the founders are among the top executives (Claessens, et al., 2000), and their CEOs' decision-making power is relatively limited. Such a highly concentrated ownership structure was possible due to the Korean Government's financial and regulatory support towards core industry conglomerates in the 1960s and 70s as well as with long Korean tradition of the 'owner-manager' principle. Together with the lack of powerful monitors, controlling shareholders can become rather unassailable, and minor shareholders are often overlooked (Jang & Kim, 2002). One of the features that is found in these large firms with controlling shareholders is that a substantial gap emerges between cash flow rights and control rights. While the cash flow rights of the controlling Chaebol¹ families are often relatively small (20% on average), their control rights are near absolute with a web of complex cross holdings among affiliated firms. In their study, Kim and Kim (2008) found that the average percentage of shares owned by the controlling shareholder (family) was only 22%, while they effectively exercised control over 69% of the voting rights in Korea between 1997-2005 through cross- and circular-holdings. Therefore, the average gap between cash flow rights and controlling rights for Chaebol affiliated firms is close to 50%. Therefore, given that many of the managers are also the owners of their firms, managerial power is deemed to be quite strong in Korea.

While the protection of minor shareholders is relatively weak because of the presence of major shareholders who might have great decision power as an owner-manager, labor unions draw high levels of attention. Despite their short history since 1987, labor unions in Korea have become so strong that they have sometimes affected the decision making of management boards. The reasons why labor unions become so strong as well as the subsequent changes in the unionization rate and its activeness are explained by the government's policies, economic environment, and social changes.

¹ South Korean form of business conglomerates. Through aggressive governmental support in the 1960's and 1970's, some of them have grown to be well-known international brand names, such as Samsung, Hyundai and LG.

From the industrial development in the 1960s to 1987, the government strictly restricted labor union activities in Korea with extremely repressive labor laws and pro-capital and anti-labor state policies. As a result, the wages and working environment were set by employers, not by negotiation, and there was unfair treatment and exploitation of employees' labor. After being given the freedom to organize labor unions in 1988, workers could finally raise their voice in collective bargaining over wages and work conditions. Labor unions could be organized either at firm level, as company unions, or at industry level, as industry unions. If a company level union decides to be incorporated in industry level unions, it was no longer recognized as an autonomous union anymore and therefore, lost its right to settle separate negotiations with individual firms. Any type of labor union could join either industry confederations or nationwide confederations. With the birth of labor unions, organized employees secured 15-20% wage increases in the first year, along with various improvements in company welfare provisions (Koo, 2000). Since then, Korean labor unions have become so strong and systemized that they could lead a massive nationwide strike in protest against newly passed labor laws in 1996 and 1997 which excluded the clauses that labor unions collectively requested for inclusion. This was a decade after the introduction of organized labor. The strike mobilized three million of workers and shut down production in major industries including automobile and ship building and disrupted services in hospitals, subway operations and television news broadcasting for three weeks (Koo, 2000).

As Korea experienced a severe financial crisis and went under the IMF's control in terms of economic policies in 1998, the government had to implement more neoclassical economics-type labor regulations such as a flexible labor policy that allowed large-scale layoffs. These were required by the IMF as a condition to receive bailout finance to save failing businesses. By setting the prime goal as saving the economy, the government implicitly allowed public authorities such as the police to suppress labor unions' demonstrations and let companies lay off a large number of employees. Among them,

40,000 labor union members were fired between 1999 and 2001, and with such an unstable employment status, labor unions started to lose power and voice compared with earlier periods. This is reflected in the sharp decrease in the unionization rate in that period. However, as Korea overcame the crisis, the unionization rate recovered to its earlier level even though the changes in labor regulations remained. The unionization rate declined again from the mid-2000s for many reasons. One of the main reasons was that the newly enacted labor law in 2006 enlarged the employment of temporary and part-time workers by firms. These workers, not being permanent employees, were not eligible to sign up as union members, and a growing number of temporary and part-time workers within a firm meant a decreasing number of potential union members and increasing diversity in employee type. It is thought that this made the organization of employees more difficult coupled with increasing individualism among younger generations (Seoul Economy, 2011). Other reasons included increased employee wages and industrial changes from manufacturing to services and knowledge-based sectors (Seoul Economy, 2011). Even though their activity slowed down to some extent after late 1990s Korean labor unions tend to be relatively strong compared to those in Western countries. Illustrating the experience of being oppressed and exploited by managers in the period of pro-capital policies, Korean labor unions tend to be sensitive to workers' rights, try to demand equal treatment, and often react aggressively against executives (Jin, 2013).

1.2.4. Hypotheses

Institutional information on executive compensation decision is very limited in Korea, therefore it is hard to know who and how it is set (Kato, Kim, & Lee, 2007). However, the total compensation of all executive directors is announced in annual reports every year and third parties have access to the figures. I expect a negative correlation between

employee power and executive compensation given the activeness of labor unions and high level of equity concerns in Korean firms. I also expect there to be a negative correlation between labor unions and stock option use based on frequent media coverage of the labor unions' resistance to the idea of introducing stock options in firms. A stock option is relatively new way of paying executives in Korea. It was officially introduced for the first time in 1997, when a number of large companies started to adopt it. It is still not very widespread and only 29.3% of the largest 200 firms were using executive stock options in 2008. When firms considered adopting executive stock option, labor unions tended to resist the idea, arguing that it only increased the total compensation of executives while its usefulness as an incentive was ambiguous. Therefore, I would hypothesize that it would be hard to include stock options in unionized firms. Gomez and Tzioumis (2006), who studied relationships within US firms also wrote: "Since it appears that the mere presence of a union within a firm restrains the value of stock options awarded to the CEO, it seems likely that stronger (and often more militant) unions - like those found in Korea, Japan, and most European countries - can have an important restraining effect on executive compensation."

1.3. Empirical Design

1.3.1. Data Sources

I collected data from two separate sources and combined them to construct an unbalanced panel data of KOSPI 200² firms for the period of 1998-2008. Firms that had been included in KOSPI 200 at any point during the period are included. Firms in the financial industry are excluded from this chapter's analysis because there is a known gap

² As the underlying index for stock index futures and options, KOSPI 200 consists of 200 constituents selected from all issues listed on the Korea Exchange Stock Market. Constituents are chosen based on factors such as liquidity and how well they represent their respective markets and industries. KOSPI 200 has been calculated and published since June 15, 1994 with a base index of 100 set to January 3, 1990.

between the executive compensation structure of the financial industry and other industries. The industries included are manufacturing (167 firms), electricity (5), construction (12), wholesale and retail (16), transportation (3), information and communication (10), professional and scientific activities (27), agriculture (1), business facilities and management (1), education (1) and arts (1). The final data set contains a total of 1,328 observations from 242 firms.

The first data source is annual reports. Executive compensation and union status data are collected manually from each company's annual report. Regarding executive compensation, the annual reports filed with the Financial Supervisory Service of Korea are the only source where one can find data in Korea.³ This discloses the total amount of cash compensation paid to three groups of directors: executive directors, independent directors and audit committee members. From this, I can construct figures for the average compensation per executive director. Some firms report pooled their total compensation for all types of directors and audit committee members before 2001. As it is impossible to know the amounts of executive directors' cash compensation in those observations, I did not include them in the data set, making it unbalanced. Regarding stock options, whether or not they are used in the executive pay is recorded in the annual report which is collected as a binary variable. To the best of my knowledge, my data set is the longest panel data on Korean executive compensation.

Annual reports also provide data on the existence of a labor union in a company and the number of employees who are union members, as well as the total number of employees, which is hand-collected. These data are internally collected from firms. Although the methods of collection in firms are not publicly known, it is most likely that labor unions have information on the number of their members and report this to their firms, so that firms can report it to the Financial Supervisory Service through their annual reports.

³ Listed firms' annual reports are accessible on <http://dart.fss.or.kr/>. The file format is PDF. To collect data from annual reports, it is required that one opens each file, locate the data, and collect.

The number of shares owned by board members, the number of board members and the number of independent directors are also hand-collected from annual reports, to be used as control variables. I collected additional control variables from the Korean database, KisValue. They include total assets, total liabilities, volatility, the market value of equity, net income and the first to third largest shareholders' ownership.

1.3.2. Construction of Variables

The outcome variables are executive compensation variables such as average cash compensation and stock option use. Average cash compensation is calculated by dividing the total executive director's compensation by the number of executive directors in each firm in each year. This is the closest approximation of executive compensation in Korean data sets, and a similar structure of compensation data is used in studies for countries where individual compensation data is not available; for example, Kubo (2003) for Japan, Kato and Long (2006) for China and Kato, Kim, and Lee (2007) for Korea. In my data, some firms reported the collective amount of compensation paid to all board members including independent directors and audit committee members before 2000. I did not include these, since executive directors' average compensation cannot be measured accurately. With regard to stock options, whether the firms use the option payment method is disclosed in the annual reports. Therefore, following Kato, Kim, and Lee (2007), I coded a binary variable for stock options that is equal to 1 if a firm uses stock options to pay its executives and 0 otherwise.

The explanatory variables are the presence of firm-level labor unions and unionization rate. Among the different types of unions and confederations, a company level union is the best representative of employees' voice. First of all, only the unions at company level or industry level have rights to bargain collectively, settle negotiations, and strike against firm management, while confederations, which undertake the role of organizing

protests and manifestations of general workers' welfare improvement, have less direct impact on individual companies' business decisions. Also, in Korea, a firm level union is a dominant type and industry level unions are traditionally weaker, less organized and passive in expressing and demanding employees' rights, despite the Korean Ministry of Labor's efforts to empower them. Moreover, firm level unions also shows varying employee characteristics across firms. Since most of the unionized firms (over 98%) are registered with one of the two largest labor confederations, the Korean Confederation of Trade Unions (KCTU) and Federation of Korean Trade Unions (FKTU), registration with a union confederation provides little differentiated information for each firm. Especially for firm-specific matter such as executive pay, collective bargaining or employee complaints are less likely to be organized by confederations because it is very costly for confederations to collect information on each firm and survey how employees feel about it. This is well evidenced by the fact that there is a high volume of media coverage on firm-level unions' demonstrations or delivery of complaints regarding executive pay, while there is very little on confederation-level action, if any. For this reason, I use individual firm-level labor union data in this study. In labor union data, a binary variable is collected which is equal to 1 in case union exists in the firm, and 0 otherwise. The Unionization rate is calculated as a percentage of the unionized employees among the total number of employees. The unionization rates by industry and year are provided in Table 1.1.

A number of control variables on firm and board characteristics are supplemented. Economic control variables represent the total assets as a proxy for firm size, with Tobin's Q being used as a proxy for market-based performance, Return on Assets (ROA) as a proxy for accounting performance and volatility as a proxy for firm risk. Firm size and performance affect many aspects of a company including executive compensation (Core, Holthausen, & Larcker, 1999). Also, volatility is a key explanatory factor in the use of equity-based pay in standard principal-agent theory (R. B. Adams & Ferreira,

2009). The Tobin's Q is calculated as the ratio of the firm's market value to its book value. The market value of the firm is the sum of the market value of equity and book value of debt. The ROA is calculated as the net income over average total assets. Volatility is the stock return variation during one year. It represents the standard deviation of daily stock returns in that year multiplied by a square-root of the number of trading days. Other firm characteristics that are controlled are the average employee wage and board ownership, which is the percentage of the number of shares held by board members among total number of outstanding shares, an ownership structure that is the sum of three largest shareholders' ownership expressed in percentage, and board size that is the number of all board members. All the variables except binary variables are winsorized at top and bottom 1% to remove extreme outliers. Table 1.2 shows the summary statistics of all variables, and Table 1.3 provides the correlation matrix.

1.3.3. Empirical Design

To test the link between labor union presence or its strength and executives' cash compensation, I run the following regressions with a few variations in econometric methods and samples:

$$\ln(\text{Cash Compensation}_{it}) = \alpha + \beta \cdot \text{Union}_{it} + \gamma \cdot Z_{it} + \varepsilon_{it} \quad (1)$$

$$\ln(\text{Cash Compensation}_{it}) = \alpha + \beta \cdot \text{UniRate}_{it} + \gamma \cdot Z_{it} + \varepsilon_{it} \quad (2)$$

where $\ln(\text{Cash Compensation}_{it})$ is the logarithmically transformed average executive director cash compensation in firm i and year t , while the Union is a dummy variable for labor union presence, the UniRate is the unionization rate, and Z is a vector for

controlling variables. I primarily run an OLS regression controlling for year and industry and clustering standard errors by firm. Then I use union presence and unionization rate that are lagged by one year to produce the results avoiding the potential reverse causality issue, although there is little concern for it given that it is theoretically not supported that employees organize labor union and raise their voice when executive compensation is low. Endogeneity that less talented managers are forced to choose unionized firms and are paid lower compensation at the same time is also not an issue in Korean firms. As most executives are long-term employees of their firms and are hired after climbing up the career ladders inside the firm, it is unlikely that they will self-select themselves into union or non-union firms at the executive level.

An important issue in this model is the possibility that the rate of unionization and the level of executive compensation are simultaneously influenced by a third factor. For example, if executive pay is lower in firms with poor performance giving a rise to employee discontent and unionization rate at the same time, the coefficients in the model would be misleading. Other examples would be economic distress or management dedication. To minimize the influence from such factors, I control for possible third factors. Firm size, Tobin's Q, ROA, and stock return volatility reflect economic and business conditions that individual firms face and control of them. Ownership structure and board ownership control is the basic corporate governance structure that can influence executive pay and labor union simultaneously. High ownership concentration implies strong monitoring by shareholders and high board ownership implies executives' have a large stake in the firm, therefore, both show executives' improved commitment to the firm.

I run additional regressions using firm fixed effects to address the concern that a union's presence or unionization rate may be endogenous to omitted time-invariant firm characteristics. For equation (2), I run regressions using all firms as well as using only unionized firms. In all the samples of firms, the unionization rate for non-unionized

firms is coded as 0. Therefore, there is the possibility that running regressions with all firms would exaggerate the effect that the increasing unionization level might have within unionized firms. Also, to account for the possible time difference in changes in unionization rate and cash compensation, I run the OLS regressions using measures of union presence and unionization rates that were lagged by one year. To test if unions affect executive compensation differently at different levels of unionization rate, I run additional regressions with dummy variables indicating three intervals of unionization rate as well as with the dummies interacting with the unionization rate. To test if labor unions' presence or strength is associated with executive pay at different levels of executive pay, I also ran quantile regressions.

I repeated the similar set of analysis for stock option use tendency in firms. Since the stock option use is coded as a binary variable, I estimate the following probit model:

$$\text{Prob}(\text{Stock}_{it} = 1 | \mathbf{X}_{it}) = \Phi(\boldsymbol{\beta} \cdot \mathbf{X}'_{it}) \quad (3)$$

where Stock_{it} is a dummy variable that signifies whether firm i pays their executives using stock option in year t , \mathbf{X} is a vector of regressors, $\boldsymbol{\beta}$ is a vector of the coefficient to be estimated, and Φ is the standardized normal cumulative distribution function. I estimate equation (3) including union presence and unionization rate in the vector of regressors each time. I control for year and industry and cluster standard errors by firm, and estimate the coefficients by following the same process for cash compensation, apart from quantile regression which is impossible to run due to limited data availability.

1.4. Results

1.4.1. Cash Compensation

1.4.1.1. Labor Union Presence, Unionization Rate, and Executive Compensation

An analysis of the relationship between the presence of labor unions and executive directors' cash compensation shows that executives in unionized firms are paid significantly less than those in non-unionized firms. In Table 1.4 column (1), where the OLS method is used, the presence of unions correlates with 34.5% lower cash compensation for executives ($\beta = -0.345$), and is statistically significant at a 1% level with t-statistic of -3.97. When I use the previous year's union status as the regressor, the coefficient increases slightly to -0.361 and is equally significant (t-statistic = -3.91, column (3)). These results were produced after controlling for the effects of years and industries, and for clustering standard errors by firm. I use firm-fixed effect regression in columns (2). The coefficient from the fixed-effect model is negative but much lower than those found in OLS and are not significant. Such a difference in results may be explained by the possibility that variables omitted in the OLS drive its results. However, since very few rigorous changes are found in union status over time, there is a concern that fixed effect results may not represent a large number of samples. The conclusion that the presence of a union puts pressure on executive pay implies that the incorporation theory does not appropriately predict union behavior in Korean firms, since if union leaders are corrupt and pro-management, executives may not need to lower their pay due to demand by labor unions. Among the control variables, employee wage is found to be strongly linked to executive compensation ($\beta = 0.317$, $p < 0.01$, t-statistic = 4.45, column (2)). This shows that executive directors' and employees' pay move together, sharing the risks or benefits in firms. This is similar to Kubo (2003)'s findings in Japan. He argues that the strong link between employee and executive pay stems from the emotional tie between employees and executives in Japanese firms. Such solidarity among different levels of workers is found in Korean firms as well, and it strengthens the hypothesis that

Korean executives would be responsive to employees' complaints about executive pay or pay differentials.

I investigate the relationship again by referring to the unionization rate. This rate represents the percentage of employees registered as union members, and is therefore a proxy for the level of solidarity among employees in firms. It can also indirectly imply union power to mobilize members. The results from both OLS and fixed effect regressions show that a higher unionization rate is associated with lower executive compensation. In this analysis, the results of fixed effects regressions are expected to be meaningful since, although not radical, the union rate in firms changes every year. Table 1.5 shows the results. In columns (1) – (3), the analysis is carried out using both unionized and non-unionized firms, for which the unionization rate is coded as 0%. In columns (4) – (6), only unionized firms are used so that the pure effect of increases in the unionization rate, excluding the effect of changes from non-union to union firms, can be seen. In column (2), where the firm fixed effect model is used, and all time-invariant omitted variables are therefore controlled, I found that a 10% increase in the union rate is associated with a 3.48% decrease in executive cash compensation and is significant at the 5% level ($\beta = -0.00348$, t-statistic = -2.45). A consistent result was found in the OLS regression with previous year's unionization rate as well ($\beta = -0.00552$, t-statistic = -3.89, column (3)). Through the results in column (4) – (6), I find that the change in the level of union power matters, not only when firms move from non-union to union firms, but also when unions become more powerful within unionized firms. In the firm fixed effect model (column (5)), a 10% increase in the unionization rate is associated with 3.35% decrease in executive cash compensation and it is significant at 10% level with a t-statistic of -1.78. Similarly, negative coefficient is found in the OLS regression with previous year's union rate ($\beta = -0.00314$, t-statistic = -1.80, column (6)), which implies that when a union grows by 10%, executives are likely to be paid 3.14% less the next

year. I conclude that employees' solidarity and bargaining power plays a role in decreasing executive compensation, being consistent with theoretical prediction.

1.4.1.2. Unionization Rate Level and Executive Compensation: Group Comparison

To test if the union influence differs according to the level of unionization rate, I run additional regressions with dummy variables, indicating three intervals of unionization. The samples are divided into three groups according to their unionization rate, and binary variables are created to indicate which group they belong to. Since the results of the lagged union rate are constant with those with the current year's union rate in previous analyses, I use the current union rate in this analysis. The lowest unionization rate level is 0 – 30%, the middle group is 30 – 60%, and the highest level is 60 – 100%.

Table 1.6 presents the results. In column (1) where the OLS regression is run for all samples, I find that executive pay is 22.3% higher if the unionization rate in their firm is below 30% compared to if it is higher at 30 – 60%. This result is significant at 1% level ($\beta = 0.223$, t -statistic = 3.03). The coefficient for the group with a unionization rate of 60 – 100% is negative, which implies that executives are likely to be paid less in the firms with the highest union levels, although it is not statistically significant. The result shows that executive compensation level become lower as firms become more heavily unionized. This is also the evidence that employee power grows with unionization rate which supports the earlier hypotheses. It shows that employee voice starts to be incorporated in corporate decisions, such as executive compensation, when the unionization rate reaches a certain level. I run the same regression using unionized firms only in column (3) to test if this result is driven by the difference in non-union firms and union firms. The result shows similarly that, in firms with lower union rate, executives tend to be paid more. Compared to the highest union rate group of 60 – 100%, the

executive pay is 18.6% and 11.6% higher at the union rate of 0 – 30% firms and 30 – 60% firms respectively (t-statistic = 2.08 and 1.67 respectively).

1.4.1.3. Executive Compensation Level and Labor Union: Quantile Regression

In this section, I investigate if there is heterogeneity in union influence at different levels of executive pay. I adopt quantile regression which allows regression parameters to vary across different points in the conditional distribution by supplementing least-squares estimation of conditional mean with estimation of a full family of conditional quantile functions (Koenker & Xiao, 2002). Through the quantile regression, I find that executives who are paid higher compensation are more likely to be affected by labor unions compared to those with lower compensation. In particular, an executive in a unionized firm who is paid at the 95th percentile of the conditional distribution is likely to be paid 39.3% less compared to his counterpart in a non-unionized firm (t-statistic = -7.96, p<0.01, Table 1.7. column (5)), while an executive who is paid at the 25th percentile would have 24.7% less compensation (t-statistic = -4.57, p<0.01). Furthermore, the results show that, if an executive is paid compensation at the 5% percentile, there is no statistically significant difference with his or her counterpart in a non-unionized firm (column (1)). The result of union rate influence presented in Table 1.8 is similar to union presence as well. I find that executive compensation at the 95th percentile is lower by 7.1% when union rate goes up by 10% (t-statistic = -5.33, p<0.01, column (5)) while it is 3% lower if it is at the 5th percentile (t-statistic = -2.80, p<0.01, column (1)). Unlike the presence of unions which does not show a significant association for lowest percentile compensation, while the union rate appears to have a negative correlation with compensation at all levels.

The findings in this section provide evidence that unions play a role of compressing executive compensation range. One possible reason is that employees are less tolerant

when their executives are paid relatively highly compared to other executives and may act more vigorously against this situation. Another reason, which could be the result of the first one, would be that executives in unionized firms understand the idea of implicit regulation (Jensen and Murphy, 1990) and voluntarily withdraw from being paid extremely high compensation.

1.4.2. Stock Option

1.4.2.1. Labor Union Presence, Unionization Rate, and Stock Option

Analyzing the relationship between the presence of labor unions and stock option use shows that executives in unionized firms are less likely to be paid with stock options. Table 1.9 reports the results of probit regression. In column (2), I measure the predicted marginal change in the probability of stock option use that is associated with union presence. This shows that the probability of using the executive stock option for compensation payments is lower by 32.1% in unionized firms. It is statistically significant at a 1% level, and the finding is robust, using previous year's union status as well (column (4)). In Table 1.10, I test if the unionization rate is associated with stock option use, and find that the probability of stock option use decreases by 3.9% when the union rate increases by 10% using all the firms' samples ($p < 0.01$, column (2)). However, when the same model is run for the sample of unionized firms, no significant difference in the probability of stock option use is found according to the unionization rate. This implies that union presence is a more critical determinant for the use of stock options, rather than the size of unions. This is in line with the earlier prediction that, as long as unions can be organized, investing the initial costs of gathering employees and establishing a structure, they can pose a credible threat to management even with lower rate of membership. This is because the fact that they overcame such hurdles as persuading other employees and being recognized by their firms and were successfully

organized, demonstrates leaders' and members' dedication to establishing a collective voice mechanism.

1.4.2.2. Unionization Rate Level and Stock Option: Group Comparison

In table 1.11, I estimate the probit model with dummy variables indicating different levels of unionization rates, and find similar results that union level matters in all firms in the sample but not in unionized-firms only sample. Column (2) shows that firms in lowest union rate range, 0 - 30%, are 19.7% more likely to use stock option to pay their executives compared to the firms which have a middle range unionization rate of 30 – 60%. However, no significant difference is found between the middle range union rate group and highest range group. Also, the unionization level does not appear to be associated with the probability of stock option use in unionized firms, only through regression.

Overall, the fact that union presence has a strong negative relationship with executive stock option use but the union rate does not implies that union's presence may be enough to effectively suppress the introduction of stock options in a firm. It has been demonstrated that labor unions often quite actively resist when companies try to adopt stock option payments.

1.4.3. Discussion

I find that the labor union's presence is negatively associated with both the amount of executive cash compensation and the probability that executives would be paid with stock options. Additionally, I find that the union effect is progressively stronger for executives with upper tail cash compensations. I also find that such negative association

strengthens with the labor union rate, the proxy for level of union power, in case of cash compensation, but not in stock option use.

First of all, the fact that the total cash compensation goes down with the labor union's presence and unionization rate provides empirical evidence for numerous discussions that presume the labor unions' role in reducing executive compensation decisions. Unfortunately, the exact mechanism through which employees reduce executive compensation is not identified in this study. However, the results allow us to conclude that some or all of the theoretically presented channels such as labor unions' direct request or executives' voluntary withdrawal from excessive pay in unionized firms are effectively working in reality.

Second, the heterogeneous union effect at upper and lower percentile executive cash compensation implies that unions basically accept the pay differential between executive and employees and focus on acting against what they consider to be excessive pay based on their monitoring of management performance. It also provides empirical evidence of the implicit regulation hypothesis, which means that executives avoid excessive pay in unionized firms due to the concerns about productivity and efficiency issues that might arise in unhappy employees. This finding is in line with Jensen and Murphy (1990)'s argument that unions are more concerned with highly paid executives and Gomez and Tzioumis (2006)'s findings that unions place a ceiling on the amount of executive compensation.

Third, the labor union's negative association with stock option use implies lower pay-performance sensitivities in unionized firms. Jensen and Murphy (1990) predict this by the fact that labor unions truncate the upper tail of executive compensation, therefore do not allow a strong linkage between performance and pay. Unlike in Gomez and Tzioumis (2006), where it is shown that American labor unions do not affect the pay sensitivities to firm performance, my finding shows that a direct link between

performance and pay is less likely to be set up in unionized firms in Korea. This is well witnessed in media which frequently report about the labor unions' protest against the adoption of executive stock option in Korean firms (Herald News, 2010; Jeon, 2004; C. S. Kim, 2004; Sang Hoon Lee & Bang, 2005; S. J. Lee, 2007; Maeil Economy, 2002; NoCut News, 2007; Park, 2007). The reasons presented by labor unions are that it results in extreme inequality between top executive and lower echelon employees and that it is not viable under the current economic and corporate finance conditions.

Fourth, the fact that the unionization rate has a significant correlation with cash compensation but not with stock option use may imply that the level of power that unions achieve or maintain after its organization continues to matter to influence traditional form of executive pay, but the organization of unions is enough to bar the adoption of new method of payment. In other words, it can be that it is more difficult to adopt a new type of payment that is possibly controversial when the firm is unionized regardless of their level of power. This is in line with Dial and Murphy (1995)'s findings that companies replace a controversial bonus payment with conventional stock option payment in the US when they experience political pressures on pay. The adoption of stock option is a controversial topic in Korea, and many unionized firms experience union resistance when they try to adopt executive stock options. The results may replicate this phenomenon.

Fifth, union effect on executive pay could appear stronger than in the US due to Korea's unique culture being reflected in its employment relations. Even though managerial power is substantial, employment relations in Korea are characterized by the presence of paternalistic leadership through which employers or managers take responsibility for their employees under the concept of family (T. W. Kim & Bae, 2004). Also, the strong collectivism that prioritizes internal solidarity and cohesiveness and collective goal over personal sacrifices is commonly found in Korean organizations (Cho & Yoon, 2001). Such cultural characteristics might lead executives to pay more attention to their

employees' thoughts and feelings in general, and they might adjust their preferences more proactively in case employees deliver their opinions more systematically through unions.

1.5. Conclusion

This chapter begins with the question of whether other stakeholders than shareholders or managers would influence executive compensation decision, and focuses on one of the major groups of stakeholders, employees. Since employees have enough incentive to make sure that their firm is financially sound and that organizational fairness is maintained, they should also be important monitors of executive compensation. Based on the assumption that employees' voice and power is best exercised when it is organized into a labor union, the relationship between union organization level and executive compensation is tested empirically.

The results show that executives' cash compensation is likely to be lower and the stock options are less likely to be included in their compensation scheme when employees are organized into a union. Many possible reasons and implications are also presented, and I conclude that employee power plays a role to limit managerial compensation. The findings of this chapter show that employee influence over executive compensation works informally and effectively when they have a systematic monitoring and organized voice. This has the policy implication that employee representation on executive remuneration committee, which has recently been suggested by some think tanks (Carley, 2011; High Pay Commission, 2011; PIRC, 2013), may not be a strict regulatory requirement in countries with strong firm-level labor unions.

There are some related topics that are not discussed in this chapter. Firstly, there are ways in which employees exercise their influence to reduce executive compensation. Many possible channels are presented, but the empirical design and data in this chapter

are not appropriate to test each of them. Secondly, there is the question of whether this is beneficial or detrimental for shareholders. Although any additional monitoring on managerial misbehavior can be interpreted as a good thing, employees' intentions or purposes are unclear and possible spill-over effects such as their impact on firm performance or employee wages are not tested. Future research could focus on the performance elements in the model used in this study to analyze whether union monitoring improves firm performance or damages incentives for executives and, therefore, firm performance. Thirdly, whether such a reduction in cash compensation is applied to all executive directors or only to a particular group of executives is not tested due to data limitations on executive compensation, which provide only average cash compensation per executive. Assuming that employees' voices or implicit hypotheses might be relevant, such reductions in compensation can be seen as being taken by all executives equally. However, academics in Korea who request the disclosure of individual executives' compensation point out that there are incidences where companies disguise unfair executive pay in ways that benefit from collective compensation reports (Ahn, 2011). Examples of this may include when executives who are relatives of an owner-manager are paid extremely high compensation, or that a controlling shareholder who is not appointed as a member of board takes extreme payments without reporting them. If a controlling shareholder has considerable power in compensation decisions and if there is indeed serious pay discrimination between owner family members and hired executives, it is also possible that employees' roles in limiting executive pay may affect only hired executives.

Table 1.1 Unionization Rate by Industry and Year

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Agriculture	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing	31.60	34.76	34.34	31.23	32.20	34.73	35.75	35.78	35.69	35.17	35.25
Electricity	.	.	68.02	68.19	66.84	67.04	66.45	66.73	65.46	71.72	70.95
Construction	.	.	21.05	21.91	29.42	27.56	20.71	21.53	18.15	16.97	18.35
Wholesale and Retail	31.74	48.75	29.19	28.65	27.66	23.32	21.69	19.43	15.65	17.34	15.57
Transportation	.	.	75.56	77.05	61.53	56.45	55.86	56.07	36.35	35.84	34.36
Information and Communication	40.83	40.11	33.84	33.86	38.63	50.05	51.90	51.14	49.26	45.23	44.61
Professional and Scientific Activities	37.70	45.75	35.15	29.32	31.05	32.25	30.14	30.73	23.91	20.53	8.61
Business Facilities and Management	.	.	0.20	0.29	0.15	0.15	0.11	0.10	0.09	0.09	0.06
Education	.	.	.	.	.	1.60	1.55	1.47	1.51	2.63	3.49
Art	.	.	78.63	61.46	.	73.43	65.50	66.64	68.71	75.02	76.18
All-Industry Average	31.82	37.39	34.53	31.63	32.81	35.021	34.84	34.78	33.42	32.66	31.84

Table 1.2 Summary Statistics

This table shows the summary statistics of sample firm characteristics. The sample consists of a balanced panel of 242 Korean public firms for the period 1998 - 2008. Average executive compensation, average employee wage, and total assets are logarithmically transformed, and executive compensation is presented in absolute value of millions of Korean Won as well. Stock option use is a binary variable that is equal to 1 if stock option is used in executive compensation and, 0 otherwise. Union presence is also a binary variable that is equal to 1 if the firm is unionized and, 0 otherwise. Union rate is ratio of unionized employees and total employees, and it is presented for all firms and unionized firms separately. Tobin's Q is the ratio of the firm's market value to its book value. Market value of the firm is the sum of market value of equity and book value of debt. ROA is net income over average total assets. Volatility is the stock return variation during 1 year. It is standard deviation of daily stock returns in that year multiplied by a square-root of the number of trading days. Board ownership is the percentage of the number of shares held by board members among total number of shares outstanding. Ownership structure is the sum of three largest shareholders' ownership expressed in percentage. Board size is the total number of all board members.

Variable	Observations	Mean	Std. Dev.	Min	Max
Ln(Average Executive Compensation Per Person)	1326	19.30	0.86	16.98	23.31
Average Executive Compensation Per Person (Korean Won, millions)	1326	385	668	23.7	13,300
Stock Option Use	1326	0.29	0.45	0	1
Union Presence	1326	0.77	0.42	0	1
Unionization Rate (All firms - including non-unionized firms)	1326	33.75	28.29	0	86.63
Unionization Rate (Unionized Firms Only)	1005	44.17	24.23	0.06	86.63
Ln (Average Employee Wage)	1326	17.47	0.33	15.95	18.38
Ln (Total Assets)	1326	27.41	1.50	24.37	31.91
Tobin's Q	1326	1.07	0.52	0.21	5.07
ROA	1326	0.04	0.08	-0.79	0.49
Volatility	1326	52.02	18.88	0	244.99
Board Ownership	1326	10.85	12.52	0	55.41
Ownership Structure	1326	39.00	14.74	8.7	95.02
Board Size	1326	8.38	2.76	3	23

Table 1.3 Correlations of variables

	Executive Compensation	Stock Option Use	Union Presence	Union Rate	Average Employee Wage	Total Assets	Tobin's Q	ROA	Volatility	Board Ownership	Ownership Structure	Board Size
Executive Compensation	1											
Stock Option Use	0.3851	1										
Union Presence	-0.149	-0.2698	1									
Unionization Rate	-0.1496	-0.2287	0.663	1								
Average Employee Wage	0.5317	0.1074	0.0488	0.1156	1							
Total Assets	0.6015	0.1997	0.1329	0.166	0.436	1						
Tobin's Q	0.3099	0.2165	-0.0923	-0.1558	0.2147	0.1252	1					
ROA	0.2104	0.0142	0.0072	-0.0313	0.1744	0.0975	0.2372	1				
Volatility	-0.1434	0.0152	0.0196	-0.0164	-0.1841	-0.0495	0.0877	-0.235	1			
Board Ownership	-0.2162	-0.1371	-0.1046	-0.0851	-0.2655	-0.3646	-0.1224	0.0366	-0.0373	1		
Ownership Structure	-0.2148	-0.1269	0.1262	0.1965	0.0421	-0.1093	-0.0296	0.0733	-0.05	0.081	1	
Board Size	0.0697	-0.028	0.2162	0.1683	0.0494	0.3808	0.0764	0.1259	-0.0865	-0.0139	0.0162	1

Table 1.4 Labor Union Presence and Cash Compensation

This table shows the correlation between labor union presence and executive cash compensation. Dependent variable is log-transformed average executive cash compensation. Independent variable is union status that is equal to 1 if the firm is unionized in that year. Column (1) is the result of OLS regression with industry and year effect and standard errors that are adjusted for firm-clustering. Column (2) presents the result of firm fixed effect with year effect controlled. Column (3) contains the result of OLS regression with union presence lagged by one year.

	Ln(Cash Compensation)		
	OLS	FE	OLS (lagged)
	(1)	(2)	(3)
Union Presence	-0.345*** (0.0868)	-0.0454 (0.0707)	
Lagged Union Presence			-0.361*** (0.0923)
Ln (Average Employee Wage)	0.562*** (0.101)	0.317*** (0.0705)	0.589*** (0.113)
Ln (Total Assets)	0.321*** (0.0267)	0.280*** (0.0428)	0.328*** (0.0294)
Tobin's Q	0.226*** (0.0613)	0.159*** (0.0332)	0.218*** (0.0648)
ROA	1.077*** (0.247)	0.851*** (0.155)	1.039*** (0.316)
Volatility	-0.00217 (0.00132)	-0.000311 (0.000806)	-0.00181 (0.00161)
Board Ownership	0.00141 (0.00234)	-0.00146 (0.00195)	0.00146 (0.00269)
Ownership Structure	-0.00841*** (0.00197)	-0.000215 (0.00144)	-0.00800*** (0.00228)
Board Size	-0.0207 (0.0128)	0.00114 (0.00744)	-0.0191 (0.0138)
Observations	1,326	1,326	1,105
Number of Companies	242	242	229
Company Fixed Effects	No	Yes	No
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	-	Yes
R-squared	0.624	0.894	0.618

Standard errors are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 1.5 Unionization Rate and Cash Compensation

This table presents the correlation between labor union rate and executive cash compensation. Dependent variable is average executive cash compensation. Independent variable is either current (column (1), (2), (4), (5)) or previous year's union rate (column (3), (6)). Columns (1), (3), (4), and (6) present the results of OLS regression with industry and year effect. Columns (2) and (5) are the results of firm fixed effect regression. In column (1) – (3), all firms are used including non-unionized firms for which union rate is coded as 0. In column (4) – (6), regressions are run only for unionized firms. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Ln(Cash Compensation)			Ln(Cash Compensation)		
	All Firms	All Firms	All Firms	Unionized Firms	Unionized Firms	Unionized Firms
	OLS	FE	OLS (lagged)	OLS	FE	OLS (lagged)
	(1)	(2)	(3)	(4)	(5)	(6)
Union Rate	-0.00570*** (0.00134)	-0.00348** (0.00142)		-0.00359** (0.00167)	-0.00335* (0.00188)	
Lagged Union Rate			-0.00552*** (0.00142)			-0.00314* (0.00174)
Ln (Average Employee Wage)	0.631*** (0.0992)	0.328*** (0.0714)	0.683*** (0.111)	0.549*** (0.111)	0.190* (0.0989)	0.608*** (0.127)
Ln (Total Assets)	0.325*** (0.0276)	0.289*** (0.0431)	0.336*** (0.0308)	0.284*** (0.0263)	0.311*** (0.0502)	0.296*** (0.0291)
Tobin's Q	0.231*** (0.0589)	0.183*** (0.0359)	0.192*** (0.0638)	0.249*** (0.0608)	0.200*** (0.0447)	0.184** (0.0728)
ROA	0.913*** (0.243)	0.833*** (0.157)	0.930*** (0.325)	0.691*** (0.236)	0.706*** (0.179)	0.727** (0.323)
Volatility	-0.00241* (0.00132)	-0.000567 (0.000825)	-0.00215 (0.00160)	-0.00207 (0.00135)	-0.000558 (0.000920)	-0.00174 (0.00158)
Board Ownership	0.00196 (0.00236)	-0.00166 (0.00196)	0.00233 (0.00273)	0.00615** (0.00304)	-0.00216 (0.00247)	0.00691** (0.00348)
Ownership Structure	-0.00780*** (0.00193)	-0.000200 (0.00143)	-0.00711*** (0.00224)	-0.00396* (0.00209)	0.00235 (0.00159)	-0.00298 (0.00237)
Board Size	-0.0261** (0.0125)	0.000888 (0.00747)	-0.0251* (0.0135)	-0.0304** (0.0128)	-0.00152 (0.00835)	-0.0268* (0.0136)
Observations	1,315	1,315	1,105	1,005	1,005	849
Number of Companies	241	241	229	187	187	177
Company Fixed Effects	No	Yes	No	No	Yes	No
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	-	Yes	Yes	-	Yes
R-squared	0.627	0.894	0.617	0.587	0.870	0.573

Table 1.6 Unionization Rate Level and Executive Compensation: Group Comparison

The sample firms are divided into three groups according to their union rate, and indicating dummy variables are assigned for each group which is independent variable in the analysis presented in this table. Dependent variable is log-transformed average executive cash compensation. Columns (1) and (3) present the results of OLS regression with industry and year effect considered. Columns (2) and (4) are the results of firm fixed effect regression. In column (1) and (2), all firms in the data set are used including non-unionized firms for which union rate is coded as 0. In column (3) – (4), regressions are run only for unionized firms.

	Ln(Cash Compensation)			
	All Firms	All Firms	Unionized Firms	Unionized Firms
	OLS	FE	OLS	FE
	(1)	(2)	(3)	(4)
Union Rate 0-30%	0.223*** (0.0735)	0.220*** (0.0716)	0.186** (0.0896)	0.204** (0.0795)
Union Rate 30-60%		0.0400 (0.0525)	0.116* (0.0696)	0.0347 (0.0547)
Union Rate 60-100%	-0.0973 (0.0742)			
Ln (Average Employee Wage)	0.637*** (0.101)	0.328*** (0.0702)	0.554*** (0.113)	0.202** (0.0963)
Ln (Total Assets)	0.329*** (0.0286)	0.293*** (0.0427)	0.287*** (0.0266)	0.322*** (0.0497)
Tobin's Q	0.213*** (0.0615)	0.160*** (0.0331)	0.212*** (0.0687)	0.165*** (0.0398)
ROA	0.945*** (0.254)	0.841*** (0.155)	0.732*** (0.238)	0.716*** (0.176)
Volatility	-0.00242* (0.00133)	-0.000483 (0.000804)	-0.00199 (0.00132)	-0.000398 (0.000888)
Board Ownership	0.00224 (0.00238)	-0.00173 (0.00194)	0.00641** (0.00307)	-0.00219 (0.00245)
Ownership Structure	-0.00766*** (0.00198)	-0.000171 (0.00142)	-0.00361* (0.00209)	0.00243 (0.00158)
Board Size	-0.0282** (0.0127)	0.00109 (0.00736)	-0.0303** (0.0125)	-0.000765 (0.00822)
Observations	1,326	1,326	1,016	1,016
Number of Companies	242	242	188	188
Company Fixed Effects	No	Yes	No	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	-	Yes	-
R-squared	0.620	0.895	0.585	0.872

Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 1.7 Executive Compensation Level and Labor Union: Quantile Regression I

This table presents quantile regression results that analyze how the association between union presence and executive cash compensation varies at different levels of compensation. Dependent variable is log-transformed average cash compensation. Independent variable is union presence. The quantile regression t-statistics are based on the Koenker-Bassett estimator.

	Ln(Cash Compensation)				
	(1) q05	(2) q25	(3) q50	(4) q75	(5) q95
Union Presence	-0.130 (0.0883)	-0.247*** (0.0540)	-0.348*** (0.0493)	-0.376*** (0.0562)	-0.393*** (0.0494)
Ln (Employee Wage)	0.522*** (0.101)	0.477*** (0.0802)	0.525*** (0.0791)	0.563*** (0.0646)	0.519*** (0.170)
Ln (Total Assets)	0.265*** (0.0266)	0.274*** (0.0169)	0.303*** (0.0137)	0.349*** (0.0178)	0.401*** (0.0302)
Tobin's Q	0.0968 (0.0611)	0.223*** (0.0482)	0.278*** (0.0475)	0.245*** (0.0781)	0.267*** (0.0787)
ROA	1.078*** (0.294)	0.839*** (0.259)	0.859*** (0.259)	0.984*** (0.237)	1.262*** (0.322)
Volatility	-0.00s0999 (0.000997)	-0.00322** (0.00133)	-0.00364*** (0.000849)	-0.00295** (0.00120)	-0.00100 (0.00216)
Board Ownership	0.00610*** (0.00170)	0.00106 (0.00196)	0.000130 (0.00227)	0.000631 (0.00222)	0.00171 (0.00307)
Ownership Structure	-0.00802*** (0.00155)	-0.00817*** (0.00150)	-0.00901*** (0.00107)	-0.00551*** (0.00186)	-0.00600*** (0.00182)
Board Size	-0.0246** (0.0123)	-0.0230** (0.0105)	-0.0178* (0.0108)	-0.0185 (0.0152)	-0.00906 (0.0141)
Observations	1,326	1,326	1,326	1,326	1,326
Year/ Industry Dummies	Yes	Yes	Yes	Yes	Yes
Sample	All Firms	All Firms	All Firms	All Firms	All Firms
Pseudo R-squared	0.31	0.36	0.39	0.43	0.50

Standard errors are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 1.8 Executive Compensation Level and Labor Union: Quantile Regression II

This table presents quantile regression results that analyze how the association between union rate and executive cash compensation varies at different levels of compensation. Dependent variable is log-transformed average cash compensation. Independent variable is union presence. In column (1) and (5), all firms in the data set are used including non-unionized firms for which union rate is coded as 0. In column (6) – (10), regressions are run only for unionized firms. The quantile regression t-statistics are based on the Koenker-Bassett estimator. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Ln(Cash Compensation)									
	(1) q05	(2) q25	(3) q50	(4) q75	(5) q95	(6) q05	(7) q25	(8) q50	(9) q75	(10) q95
Union Rate	-0.00370*** (0.00132)	-0.00416*** (0.000631)	-0.00534*** (0.00066)	-0.00608*** (0.000771)	-0.00714*** (0.00134)	-0.00359** (0.00148)	-0.00215* (0.00114)	-0.00318*** (0.000800)	-0.00546*** (0.00135)	-0.00670*** (0.00171)
Ln (Employee Wage)	0.531*** (0.0554)	0.623*** (0.0850)	0.622*** (0.0700)	0.636*** (0.0774)	0.625*** (0.150)	0.446*** (0.112)	0.440*** (0.0719)	0.608*** (0.0908)	0.625*** (0.0933)	0.516*** (0.153)
Ln (Total Assets)	0.257*** (0.0304)	0.277*** (0.0136)	0.303*** (0.0169)	0.354*** (0.0219)	0.403*** (0.0273)	0.260*** (0.0347)	0.266*** (0.0208)	0.264*** (0.0207)	0.311*** (0.0319)	0.349*** (0.0234)
Tobin's Q	0.181*** (0.0371)	0.217*** (0.0305)	0.240*** (0.0427)	0.220*** (0.0682)	0.306*** (0.0671)	0.248*** (0.0650)	0.278*** (0.0519)	0.235*** (0.0595)	0.194*** (0.0494)	0.342*** (0.108)
ROA	1.176*** (0.369)	0.927*** (0.174)	0.581** (0.233)	1.010*** (0.288)	1.381*** (0.237)	1.219** (0.578)	0.839*** (0.237)	0.440** (0.204)	0.905*** (0.288)	-0.00410 (0.605)
Volatility	-0.00120 (0.00139)	-0.00298*** (0.00109)	-0.00339*** (0.000858)	-0.00249** (0.00110)	-0.00271* (0.00155)	-0.00161 (0.00103)	-0.00346*** (0.00109)	-0.00304*** (0.000993)	-0.000876 (0.00194)	-0.00169 (0.00268)
Board Ownership	0.00599*** (0.00149)	0.00173 (0.00211)	0.000768 (0.00161)	0.00125 (0.00239)	0.00131 (0.00356)	0.00904*** (0.00217)	0.00591** (0.00272)	0.00624** (0.00243)	0.00718** (0.00328)	0.000324 (0.00352)
Ownership Structure	-0.00689*** (0.00137)	-0.00784*** (0.00182)	-0.00874*** (0.00112)	-0.00581*** (0.00169)	-0.00375 (0.00320)	-0.00527*** (0.00183)	-0.00465*** (0.00123)	-0.00439*** (0.00125)	-0.00294 (0.00184)	0.00237 (0.00257)
Board Size	-0.0200*** (0.00722)	-0.0357*** (0.00894)	-0.0200*** (0.00740)	-0.0303** (0.0119)	-0.0284** (0.0114)	-0.0129 (0.0101)	-0.0342*** (0.0131)	-0.0303*** (0.0112)	-0.0377*** (0.0136)	-0.0338*** (0.0131)
Observations	1,315	1,315	1,315	1,315	1,315	1,005	1,005	1,005	1,005	1,005
Year/ Industry										
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All Firms	All Firms	All Firms	All Firms	All Firms	Unionized	Unionized	Unionized	Unionized	Unionized
Pseudo R-squared	0.33	0.35	0.39	0.43	0.50	0.33	0.35	0.38	0.39	0.43

Table 1.9 Labor Union Presence and Stock Option

This table reports the results of the probit regression. Dependent variable is a binary variable that is equal to 1 if the firm uses stock option in executive compensation in that year, and 0 otherwise. Independent variable is union presence. Columns (1) and (3) show the probit regression results, and columns (2) and (4) present the marginal change in the probability of stock option use.

	Stock Option Use			
	Probit	Dprobit	Probit (lagged)	Dprobit (lagged)
	(1)	(2)	(3)	(4)
Union Presence	-0.891*** (0.215)	-0.321*** (0.0789)		
Lagged Union Presence			-0.939*** (0.234)	-0.341*** (0.0858)
Ln (Employee Wage)	-0.0876 (0.336)	-0.0290 (0.111)	-0.136 (0.419)	-0.0453 (0.139)
Ln (Total Assets)	0.234*** (0.0768)	0.0775*** (0.0255)	0.245*** (0.0861)	0.0815*** (0.0287)
Tobin's Q	0.413*** (0.153)	0.137*** (0.0516)	0.507*** (0.172)	0.168*** (0.0586)
ROA	-0.937 (0.796)	-0.310 (0.263)	-1.024 (0.861)	-0.340 (0.285)
Volatility	0.00490 (0.00495)	0.00162 (0.00163)	0.00868 (0.00583)	0.00288 (0.00191)
Board Ownership	-0.0107 (0.00770)	-0.00353 (0.00254)	-0.0125 (0.00845)	-0.00415 (0.00280)
Ownership Structure	-0.00168 (0.00527)	-0.000555 (0.00175)	-0.000910 (0.00573)	-0.000303 (0.00191)
Board Size	-0.0113 (0.0338)	-0.00373 (0.0112)	-0.0273 (0.0374)	-0.00908 (0.0124)
Observations	1,252	1,252	1,038	1,038
Year/ Industry Dummies	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 1.10 Unionization Rate and Stock Option

This table reports the results of the probit regression for union rate and stock option use. Dependent variable is a binary variable that is equal to 1 if the firm uses stock option in executive compensation in that year, and 0 otherwise. Independent variable is union rate. Columns (1) and (4) use sample of all firms, and columns (5) and (8) use unionized firms only. Odd numbered columns present probit regression results, and even numbered columns present marginal change in the probability. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	Stock Option Use							
	All Firms		All Firms		All Firms		All Firms	
	Probit	Dprobit	Probit (lagged)	Dprobit (lagged)	Probit	Dprobit	Probit (lagged)	Dprobit (lagged)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Union Rate	-0.0118*** (0.00375)	-0.00393*** (0.00123)			-0.00327 (0.00473)	-0.000910 (0.00131)		
Lagged Union Rate			-0.0114*** (0.00377)	-0.00381*** (0.00124)			-0.00318 (0.00489)	-0.000890 (0.00137)
Ln (Employee Wage)	0.0593 (0.325)	0.0198 (0.108)	0.0850 (0.384)	0.0284 (0.128)	-0.424 (0.379)	-0.118 (0.105)	-0.383 (0.416)	-0.107 (0.117)
Ln (Total Assets)	0.228*** (0.0753)	0.0760*** (0.0251)	0.243*** (0.0825)	0.0810*** (0.0275)	0.277*** (0.0858)	0.0771*** (0.0238)	0.299*** (0.0918)	0.0836*** (0.0259)
Tobin's Q	0.429*** (0.156)	0.143*** (0.0529)	0.453*** (0.164)	0.151*** (0.0556)	0.424* (0.218)	0.118* (0.0628)	0.434** (0.190)	0.121** (0.0555)
ROA	-1.246 (0.798)	-0.416 (0.265)	-1.247 (0.867)	-0.416 (0.288)	-0.804 (0.987)	-0.224 (0.276)	-0.704 (1.027)	-0.197 (0.287)
Volatility	0.00380 (0.00483)	0.00127 (0.00161)	0.00665 (0.00562)	0.00222 (0.00186)	0.00109 (0.00644)	0.000305 (0.00179)	0.00388 (0.00718)	0.00108 (0.00199)
Board Ownership	-0.00929 (0.00764)	-0.00310 (0.00254)	-0.0105 (0.00824)	-0.00349 (0.00274)	-0.0164 (0.0117)	-0.00457 (0.00321)	-0.0168 (0.0124)	-0.00470 (0.00340)
Ownership Structure	-0.00229 (0.00544)	-0.000764 (0.00182)	-0.00101 (0.00580)	-0.000337 (0.00194)	0.00363 (0.00619)	0.00101 (0.00172)	0.00546 (0.00635)	0.00153 (0.00177)
Board Size	-0.0295 (0.0327)	-0.00984 (0.0109)	-0.0463 (0.0359)	-0.0154 (0.0120)	-0.0265 (0.0390)	-0.00737 (0.0109)	-0.0483 (0.0416)	-0.0135 (0.0118)
Observations	1,241	1,241	1,038	1,038	933	933	786	786
Year/ Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 1.11 Unionization Rate Level and Stock Option: Group Comparison

This table reports the results of the probit regression using binary variables that indicate union rate levels. Dependent variable is stock option use indicator. Columns (1) and (3) present probit regression results, and columns (2) and (4) present marginal change in the probability. The sample is all firms in columns (1) and (2), and unionized firms in columns (3) and (4).

	Stock Option Use			
	All Firms		Unionized Firms	
	Probit	Dprobit	Probit	Dprobit
	(1)	(2)	(3)	(4)
Union Rate 0-30%	0.500** (0.236)	0.197*** (0.0703)	0.0149 (0.267)	0.00413 (0.0743)
Union Rate 30-60%	-0.0954 (0.231)		-0.134 (0.236)	-0.0365 (0.0631)
Union Rate 60-100%		0.0323 (0.0794)		
Ln (Average Employee Wage)	0.0593 (0.320)	0.0197 (0.107)	-0.449 (0.380)	-0.124 (0.104)
Ln (Total Assets)	0.231*** (0.0745)	0.0770*** (0.0247)	0.281*** (0.0852)	0.0779*** (0.0235)
Tobin's Q	0.406*** (0.151)	0.135*** (0.0513)	0.392** (0.199)	0.108* (0.0574)
ROA	-1.055 (0.815)	-0.352 (0.271)	-0.591 (0.991)	-0.164 (0.275)
Volatility	0.00419 (0.00474)	0.00140 (0.00158)	0.00146 (0.00643)	0.000404 (0.00178)
Board Ownership	-0.00919 (0.00774)	-0.00306 (0.00257)	-0.0167 (0.0120)	-0.00462 (0.00326)
Ownership Structure	-0.00201 (0.00534)	-0.000671 (0.00179)	0.00403 (0.00605)	0.00112 (0.00167)
Board Size	-0.0321 (0.0330)	-0.0107 (0.0110)	-0.0227 (0.0396)	-0.00629 (0.0110)
Observations	1,252	1,252	944	944
Year/ Industry Dummies	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Chapter 2 . Demand for Directors' and officers' liability insurance in owner-manager firms

2.1. Introduction

In 2007, LG Display Co. LTD (LG-Philips LCD Co. LTD prior to April 2007) was sued by its consumers in the US market. The reason for the class suit was that LG Display formed a cartel with two other LCD manufacturers to control the price of their products in the market and profited from such illegal action between 2001 and 2006. As a result of this class action, LG Display had to pay 380 million US dollars in fines and consumer compensation in the US in July 2012. In addition, shareholders raised another class action in 2010 against directors and officers of LG Display regarding the way they had dealt with the cartel and the litigation against it. In this second lawsuit, shareholders named 10 board members of LG Display and insisted that these board members failed to disclose information to shareholders on how the firm had achieved its profits during the cartel years, as well as on the likelihood of being fined after the consumers' class action. They claimed that the limited information given to shareholders misled their investment decision and, therefore, LG Display's directors were responsible for the shareholders' loss from downward movement in the stock price. As a result of the shareholder class action, LG Display directors had to compensate 1.91 USD per share to the shareholders who held its shares between July 2004 and December 2006.

As shown in the example, stakeholders of a company, such as shareholders, employees, creditors, suppliers, customers and government agencies have the right to raise a lawsuit against directors and officers when they are convinced that managers have not served the company in the stakeholders' best interests. The reasons for such legal claims include a wide range of executives' misbehavior, such as gross negligence to corporate matters, self-interested transactions, imprudent investment, illegal payments to officials,

accounting mistakes or fraud, employee discrimination, inadequate supervision of subordinates, interference with contractual rights, misleading representations, civil-rights violations and antitrust violations.

In these lawsuits, as representatives of the corporation, directors and officers are personally liable to cover the litigation costs and losses. However, if their company had purchased Directors' and Officers' liability insurance (D&O insurance) before litigation began, it would cover the litigation costs of the directors and officers when they suffer from such lawsuits and their subsequent losses. It covers legal fees, lawsuit losses and damages that are included in a lawsuit for managers' allegedly wrongful acts, provided that the managers' behavior was an accidental result of good faith and prudent judgment not dishonesty and inappropriate self-dealing or criminal and illegal intentions. For example, in the earlier case of LG Display, the insurance company from which LG Display bought its D&O insurance contract had to pay 19.2 million USD to LG Display to help them cover legal costs and losses regarding the shareholder suit (the second lawsuit). Together with limited liability provision (LLP) and corporate indemnification plans (CIP), D&O insurance is considered a tool to protect an executive director's wealth when they sit on the corporate board (Boyer, 2005).

D&O insurance premium is paid by the corporation, not by its directors and officers although they are the ones the insurance primarily protects. This arrangement seems unusual considering the agency problem between shareholders and managers, since removing managers' liability can give rise to moral hazard among managers. Moreover, given that almost half of corporate litigation is raised by shareholders themselves (The Wyatt Company, 1993), it seems contradictory behavior that shareholders should purchase the insurance. However, more than 90% of American firms purchase such insurance and the demand is growing fast in countries like Korea and China, where it was introduced relatively recently.

To explain corporate demand for D&O insurance, previous studies present reasons why D&O insurance benefits shareholders in the frame of the standard agency theory. These studies assume that there is information asymmetry and interest conflicts between shareholders and executives and argue that certain roles that D&O insurance plays are useful for shareholders to overcome them. For example, D&O insurance coverage incentivizes managers to be more risk-taking in business decisions, attracts highly qualified managers to executive jobs in the purchasing firms and protects corporate assets when self-seeking managers cause litigation damages to the firm (Core, 1997; Griffith, 2006a). Also, because each firm's D&O insurance contract is priced by insurance companies who undertake a thorough check of the firm's litigation risk, it is argued that the price of insurance should signal valuable information about the firm's corporate governance quality to outside shareholders. These arguments in previous studies arose in Anglo-American countries and were supported by evidence from the US, Canada and Britain where firms are relatively widely-held.

In this chapter, I re-examine the demand of D&O insurance in the context of owner-manager companies. In the broader area of the world economy outside Anglo-Saxon countries, even very large public firms or business groups tend to be controlled by a small number of blockholders through family ownership or through pyramidal cross-holdings of shares. They are often also executives of their firms. The presence of an informed owner-manager who is a CEO and a blockholder as well as a member of board suggests that the issues of information asymmetry and interest conflicts are less severe between principal and agency; therefore there are lower agency costs. If shareholders in widely-held firms do buy D&O insurance to benefit from its ability to alleviate agency problems, it should mean that owner-managed firms are in less need of such aids from D&O insurance, given that owner-managers are already efficiently monitoring their firms and have enough insider information. The fact that over 90% of American companies purchase D&O insurance while it is around 60% in Korea supports this view.

At the same time, if the price of an insurance contract signals litigation risk of a firm, the owner-manager firms are likely to pay a lower price. Most litigations are raised by shareholders who think something has gone wrong and they were unaware of it; therefore, if shareholders do not suffer from information asymmetry by also being the manager of the firm, the probability of litigation should go down resulting in lower prices of insurance.

I hypothesize that the demand for D&O insurance is lower in owner-managed firms than in firms that are managed by hired-CEOs. I test the hypothesis using the D&O insurance data from Korea, where there is a strong owner-manager tradition that is maintained through substantial stakes held by founder family members. Various firm characteristics that are included as control variables allow me to test the additional factors that explain the demand for D&O insurance in Korean firms. I also test whether the insurance price is lower in owner-managed firms. In the analysis, I found that insurance demand was negatively correlated with presence of an owner-manager. Both the probability of purchase that is measured by a dummy variable and the size of insurance coverage that is measured by insurance premium and coverage were lower in owner-managed firms. The results corroborate the hypothesis. In addition, I found that firm size (total assets), firm performance (ROA), growth opportunity (Tobin's Q) and board independence (proportion of independent directors on the board) were determinants of D&O insurance purchase in Korean firms. The determinants of insurance demand were consistent with previous studies in Anglo-Saxon countries. The price of insurance that is measured by the ratio of insurance premium to coverage was negatively associated with the presence of owner-manager, implying that owner-management signals lower litigation risks. However, the result was not statistically significant. Other firm characteristics, except firm size, were not associated with the price either.

The rest of the chapter proceeds as follows. Section 2.2 provides a brief overview of D&O insurance, reviews theoretical and empirical literature previously done on D&O

insurance and explains the institutional background of Korean businesses. Section 2.3 presents hypotheses. Section 2.4 describes the sample and empirical design. Section 2.5 presents the findings and interpretations. Section 2.6 concludes.

2.2. Related Literature and Hypothesis Development

2.2.1. D&O Insurance

Running a company on behalf of its shareholders, directors and officers have fiduciary duty owed to shareholders as well as to the corporation itself. The requirements of fiduciary duty include that directors and officers must act in good faith and honesty and in the best interest of the corporation and that they must not practice self-dealing, usurp corporate opportunities or pursue improper personal benefits. However, it is a provision that is sometimes hard to observe objectively in its execution and directors and officers carry the risk of being sued by stakeholders who believe that they violated such duties, usually when management's decision brings unfortunate results. In those cases, directors and officers become personally liable for the losses caused by their, presumably, careless management.

To avoid excessive care and risk-aversion by directors and officers, the corporation can indemnify such liability by various means. *Ex ante*, it can limit the degree of the duty of care. *Ex post*, shareholders can approve the indemnification or reduction of directors' and officers' liability burden, which has to be based primarily on the court's judgment. Another way to protect directors and officers from possible losses of their personal wealth is by providing D&O insurance that will cover the litigation costs and damages.

In general, D&O insurance consists of three coverage aspects: one that directly covers directors' or officers' loss in litigation, for which the company cannot indemnify either through legal reasons or financial insolvency; a second reimburses the company for the

amount that it pays to its directors or officers through their own indemnification provision; and the third covers claims directly against the company. Firms can buy all types of coverage, but some firms include only the first type of coverage in their D&O insurance contract. If directors and officers of the companies which bought the insurance are involved in litigations, such as derivative suits or class actions, and if decisions are made that they are liable, the insurance will cover the litigation costs and losses above deductible and below coverage purchased.

D&O insurance has been widely available in Europe and North America since the early 20th century and approximately 90% of public firms purchase it. However, it is relatively new and less popular in Asian countries. It was first introduced in 1991 in Korea and 2002 in China. The main reason is that the liability regime of directors and officers is so weak that few provisions in these countries' laws impose personal liabilities on them (Zhan & Xiu Hua, 2009). However, as laws evolve to better protect minority shareholders and consumers in these countries, not only firms' liabilities but also directors' and officers' personal liabilities are getting heavier, and therefore D&O insurance demand is growing. For example, in 2005 shareholder class action law was enacted in Korea that allowed minority shareholders to raise a lawsuit against their invested firms or directors or officer of the firms and this gave a rise to a substantial increase in the demand for D&O insurance (Jung, 2008).

2.2.2. Related Literature

D&O insurance is primarily devised to protect directors and officers from the liabilities in their job, although the premium is paid by shareholders. When there is litigation, the insurance contract will cover the costs that otherwise have to be paid by directors and officers, therefore it contributes to the reduction of expected costs for directors and officers. There are several economic and sociological arguments that do not support

shareholders' purchase of D&O insurance. Among the potential losses that can occur in business management, D&O lawsuit losses are only a small fraction. Also, D&O policies and coverage are smaller than standard corporate property and casualty coverage while the premium tends to be higher than calculated policy's risk. In addition, by reducing the threat of personal liability against the management, who are most likely to cause problems, D&O insurance would give rise to moral hazard problem and may incur even greater costs. However, over 90% of the US firms still buy it, as do an increasing number of firms in other areas too (Carayon-Sainfort, 1992), and many studies have discussed the reasons why firms still decide to buy the insurance despite the shortcomings.

First are the possible values that can be created for shareholders by the insurance. One such is that it is useful to attract highly qualified managers or to compensate highly risk-averse managers. In this aspect, some argue that D&O insurance should be seen as a part of compensation package (Core, 1997; Griffith, 2006a). Another value is that it can work as incentives for managers to make more aggressive business decisions and to solve the under-investment problem as stock options would do. If they are not protected against personal liabilities, managers are likely to adhere to overly conservative investments which would not achieve shareholder value maximization (Core, 1997). Also, D&O insurance ex-post protects shareholder value when damages are caused by risk-loving or selfish managers. Managers can cause losses by making risky business decisions based more on their own compensation maximization than positive net present value of the project. If such losses are estimated to be larger than the insurance premium, shareholders benefit from the insurance by removing the costly lower-tail outcomes (Core, 1997; Griffith, 2006a). Ex-ante, shareholders can use D&O insurance as a commitment device for efficient shareholder litigation. When directors' and officers' wealth is low, the incentive for shareholders to sue is also very low. If it is foreseeable that if shareholders will not raise a lawsuit directors and officers are less likely to act in

shareholders' best interests (Gutiérrez, 2003) and the purchase of D&O insurance can signal the possibility of litigation.

Another thread of extensive discussion on the reasons why firms buy D&O insurance concerns its role as a signal of corporate governance quality. A D&O insurance contract that is negotiated between a firm and an insurer is considered to contain useful information about a firm's corporate governance quality, because of the nature of the insurance pricing that bases itself on the estimated risk. D&O insurance purchase is related to various governance issues, such as managerial protection, litigation risk and risk management, therefore each firm's D&O insurance contract should also be shaped by their corporate governance characteristics. Insurance companies which sell D&O insurance undertake the risk to indemnify the litigation costs and damages when lawsuits are raised against their customer firms. From the insurance companies' point of view, knowing the level of litigation risk of their customer firms' management teams is essential as it lets them fairly price the insurance plan and helps them to avoid unexpected extreme costs when they have to cover their customers' losses. Thus they have ample incentives to thoroughly investigate a companies' corporate governance risk before agreeing on the insurance premium. To set a fair price, insurance companies use customer firms' corporate governance factors to calculate the probability of litigation risk of a firm, since a corporate governance structure that enabled managers to act in a selfish way against the best interests of other stakeholders would raise the possibility of lawsuits (Griffith, 2006a). Even though lower frequency in lawsuits does not necessarily bring better governance, it is known that better governance is certainly associated with lower probability of lawsuits (Griffith, 2006a). Thus, if a firm's corporate governance is identified as increasing the chance of legal disputes, not only is there the need to purchase D&O insurance but also the desired level of coverage should be high. Knowing that a firm's demand for D&O insurance comes from governance risks, insurers set higher premium for firms with poor governance. Once a customer firm has enquired

about the insurance plan and its price, insurance companies request insider information on the potential customer's management team, balance sheets and investment plans, etc. to evaluate their litigation risk. Even though exactly which variables insurance companies collect and how they evaluate litigation risks is not common knowledge, insurance companies are thought to have more information than the public.⁴ Also given that price competition is high in this type of insurance market (Griffith, 2006a), the price should be an efficient and fair evaluation of governance quality. In previous studies, it has been both qualitatively (Baker & Griffith, 2009) and quantitatively (Core, 2000) proved that insurance firms price D&O insurance contracts based on a variety of corporate governance factors. Therefore, thanks to the insurance companies' effort to collect information about the firm's litigation risk, the price of insurance coverage can be expected to signal corporate governance quality to outside investors who do not have access to inside information (Griffith, 2006a). The premium can be interpreted as the price of the insured firm's corporate governance quality, which is not easily quantifiable (Griffith, 2006a). Also, such D&O insurance pricing methods give firms incentives to improve governance (Griffith, 2006a). As high premiums signal bad governance quality, it would negatively affect the firm's market value. Knowing this, firms will try to improve governance so that they can reduce premium levels and avoid disadvantages in the financial market.

Empirical studies support the above arguments. Based on the financial market data, Bhagat, Brickley and Coles (1987), Janjigian and Bolster (1990) and Brook and Rao (1994) concluded that D&O insurance did not reduce shareholder value despite its cost and potential threat to induce moral hazard among management. Bhagat, Brickley and Coles (1987) reported positive stock return on the announcement of D&O insurance

⁴ Because these are business know-hows, insurance companies do not disclose the exact methods of information collection and litigation risk evaluation. In an informal interview, two D&O insurance experts from an insurance firm based in London admitted that there was a guideline to follow in their firm when setting prices of a plan for a specific firm, and that, following the guideline, they get to have reliable information to evaluate the firms' potential litigation risks.

purchase and showed that shareholders perceived it as a value-enhancing decision. Janjigian and Bolster (1990), who investigated the impact of the legislation that allowed D&O insurance in Delaware, also found that D&O liability elimination was benign since Delaware corporations' abnormal return on the introduction of legislation was positive. Brook and Rao (1994) concluded that there was no evidence of negative effect on shareholder value caused by liability elimination. They confirmed that the use of D&O insurance eventually benefits shareholders by showing that the net benefit of D&O insurance is larger for financially troubled firms than for other firms. More recently, Boyer (2005) showed that insurance protection increased when shareholders' risk level went up and concluded that D&O insurance was used by shareholders to protect their own wealth in case of managerial incompetence.

In summary, the arguments in previous studies provide reasons why so many firms would buy the D&O insurance in addition to litigation costs coverage. They point out that D&O insurance helps shareholders to reduce agency cost by incentivizing or monitoring hired managers and by signaling a firm's corporate governance quality through the insurance price. However, the reason that shareholders are in need of such D&O insurance functions would be because there is a significant gap between the interests of shareholders and managers, as well as information asymmetry that makes monitoring difficult. Therefore, these arguments are based on the underlying assumption of 'separation of ownership and control (M. Jensen & Meckling, 1976)' often found in widely held firms in Anglo-Saxon countries. If D&O insurance is indeed used to amend agency issues, it means that the D&O insurance is less useful in firms with lower agency costs, closely-held firms in which large shareholders are well involved in the management of the firm by sitting on the board or undertaking the role of CEO. It is because there are fewer interest conflicts and lower information asymmetry when shareholders' voting power and managerial decision rights are combined and influenced by the same person. Jensen and Meckling (1976) suggested that interest conflicts

between shareholders and CEO decline as the owner's stake increases in a firm, resulting in lower agency cost. Given that owner-manager firms experience less of such divergence in interests, an analysis on the demand for D&O insurance might need to consider ownership structure of a firm.

2.2.3. Institutional Background of Korea

Most previous studies were done in countries where corporate governance system followed the Anglo-Saxon model. The institutional environment in which Korean businesses operate is different from that in the US or the UK and one of the most distinct characteristics would be that corporate ownership is much more concentrated and owner-managers have strongest power, even in very large conglomerates. Among the 213 large firms from which the data were collected for this chapter's analysis, average ownership held by three largest shareholders was 44.17% while in the least concentrated firm, 11% was held by three largest shareholders (Table 2.1). Also, 146 of the firms were run by their CEO who was also one of the firm's five largest shareholders. This is expected to affect firm behavior in many aspects, including D&O insurance purchase. As concentrated ownership or presence of an owner-manager implies stronger monitoring ability of informed and influential shareholders, the benefits of D&O insurance argued in previous studies are likely to be less useful in these firms, giving them less incentive to buy the insurance. In this section, I explain the corporate governance system in Korea that arose in the process of its economic development, discuss the possible role and use of D&O insurance in Korean firms, and present hypotheses.

2.2.3.1. The development of modern corporate governance system in Korea

The modern development of Korean economy started in 1962 through the five 5-year Economic Development Plans centrally implemented by the Government. Many of the currently existing large-size Korean enterprises are the ones which began as a family firm prior to the economic plans and grew immensely during the period thanks to financial assistance provided by the Government which controlled the foreign investments, the only capital available in Korea after the Korean War (1950 - 53). In this period, most firms' external financing came from debt or bank purchased equity, and the government held controlling stakes in most major national banks. This meant that the government controlled supply of finance to private firms and closely monitored those firms that were subsidized. Therefore, to become government-subsidized corporations and to maintain the finance invested in them, firms aggressively followed government policy. In this process, an implicit contractual arrangement was set up between the government and firms in which the government would provide finance and protect firms from foreign companies' competition and firms would comply with government policy and contribute to the national economic development. Under such a system, the engine for Korean economy moved from agricultural products to light industries, such as flour, sugar and textiles, to heavy industries like automobile and high technology(K. Lee, 2009).

As the Korean financial market developed, firms grew more with private financing and the size of government stake decreased. However, the tradition of owner-manager in the form of a family firm persists. Owner-manager's wealth accumulated in the earlier period is reinvested in the firm and the founder's influence is maintained by the high stakes held by him and his family members or through pyramidal ownership structures and cross-holdings of shares in cases where they expanded to become business groups. This means that the major shareholder is also CEO of the firm, and managerial decisions are made to meet his or his family's interests and benefit the entire business groups' value rather than an individual firm's value. Given this, the agency issues in Korean

firms are more about major shareholders' exploitation of minority shareholders rather than managers' power wielding against shareholders. Some examples would be tunneling of profits across firms under the same business group or the succession of owner-managership to the next generation in the family, regardless of their children's talent in business management.

Such conflict of interests between controlling shareholder and minority shareholder was exacerbated by weak shareholder protection regulations until corporate governance regulation was reformed in the early 2000s following the Asian Financial Crisis of the late 1990s. In the reform, the scope of corporate information disclosure was widened, minority and foreign shareholders' protection was strengthened and independence of board was better guaranteed through stricter rules. The discussions and trials for corporate governance reform were continued. However, the regulations implemented and suggested had little influence over ownership structure and owner-manager presence.

2.2.3.2. D&O Insurance in Korea

D&O insurance first became available in Korea in 1991 and the initial contract was not bought until 1996. However, the number of D&O insurance contracts has increased rapidly since then, and 400 contracts had already been purchased by private and public firms by 2000. In 2005, 34.4% of listed Korean firms were covered with D&O insurance and the number of new contracts continued to be high at 372, 462 and 296 in 2003, 2006 and 2008, respectively.

The high increase in D&O insurance purchase was triggered by two shareholder derivative suits that were raised against directors of Korea First Bank (KFB) in 1997 and Samsung Electronics in 1998. They were the first shareholder suits in Korea. In 1997, a public interest group, the People's Solidarity for Participatory Democracy (PSPD), initiated a legal action against former officers of KFB. On behalf of 61 minority

shareholders of the bank, the plaintiffs claimed 40 billion KRW in compensation for the management's decision to provide credit to the failed conglomerate, Hanbo. The claim was ruled in favor of the minority shareholders by the Seoul District Court, issuing an award of 40 billion Korean Wons against the directors, which had to be paid from their personal wealth. The second case followed a year later. In 1998, PSPD filed another legal action against board members of Samsung Electronics. By claiming directors' various wrongdoings, including such illegal actions as bribery, they initially won 97 billion KRW of compensation, reduced to 19 billion after Samsung Electronics' appeal. These were the first legal actions that brought up monetary charge for directors' and officers' liability in Korea. Following the two landmark lawsuits, investors sued corporate directors more often and corporations recognized the importance of D&O protection and started to purchase the insurance.

Additionally, Korea's corporate governance regulation, which had become stricter following the Asian Financial Crisis in 1998, accelerated the purchase of D&O insurance. One important change was that, since 1998, all listed firms have been required to appoint at least one outside director on their boards. This regulation aims to monitor and limit insiders' power wielding and entrenchment. While outside directors collectively take the responsibility with inside directors regarding corporate decisions, it is harder for them to gain information about corporate matters compared to insiders and their reward is also smaller. Therefore, a company may need D&O insurance to persuade qualified people to take the job, and this would have raised the demand for insurance. Another regulation change that augmented the demand was the adoption of shareholder derivative class action. Since 2005, shareholder class action has been available for shareholders of listed firms with total assets higher than 2 trillion KRW⁵ and, since 2007, of smaller-sized public firms as well. With the rise in litigation risk and expected costs of lawsuits, many firms chose to buy D&O insurance upon the regulation change. For

⁵ Equivalent to approximately 1.8 billion US dollars at the exchange rate of July, 2013.

example, in 2005 there were 71 listed firms with total assets of over 2 trillion won and 68 of them either purchased the insurance or increased the amount of coverage in that year. Together with these changes in regulations, the information transparency was much improved in Korea after the financial crisis, and investors were allowed access to detailed information about corporate decisions, performance and competence. Better information to shareholders means improved monitoring, therefore higher probability that firms' wrongdoings are detected by shareholders. This might increase the litigation risk. While firms would try to enhance their corporate governance under greater transparency, they may also seek a way to protect themselves by purchasing D&O insurance.

2.3. Hypothesis Development

Previous studies took widely-held firms as a basis of analysis for D&O insurance demand and presented various reasons why shareholders should pay for the insurance. Broadly speaking, many studies concluded that D&O insurance provided more functions than litigation coverage that helped shareholders reduce agency costs. In this chapter, I hypothesize that the demand for D&O insurance should be lower in firms where agency issues are less severe.

Although some argue that blockholders would have enough incentive to monitor shareholders (Demsetz & Lehn, 1985; Pound, 1988; Shleifer & Vishny, 1986), blockholders can also suffer from lack of expertise or free-rider problems among themselves (Admati, Pfleiderer, & Zechner, 1994). Therefore, family firms or owner-managed firms are often discussed as cases in which the agency conflict between shareholder and manager would be the lowest. These firms experience better interest alignment between shareholder and CEO as well as better shareholder monitoring abilities and less information asymmetry. In general, founder families have exceptional

interests in and concerns over their firm's success due to the substantial private wealth and family history vested in the firm. It is shown in empirical studies that family firms and owner-manager firms tend to perform more efficiently and are less likely to be influenced by agency conflicts.

For German listed firms, Andres (2008) showed that family firms outperform not only widely-held firms but also concentrated ownership firms that do not have founder's involvement in management. Using Fortune 500 firms, Villalonga and Amit (2006) found that family ownership created value more than non-family block ownership when the firm's founder was serving as the CEO or chairman. Anderson et al. (2003) also showed that firms with founding family ownership experienced a significantly lower cost of debt financing and higher excess bondholder value and concluded that founding family ownership in large firms reduced the agency costs in financing. They interpreted lower cost of debt and higher value to bondholders as higher reliability of family ownership firms, and concluded that such reliability stemmed from bondholders' beliefs that family ownership reduced agency conflicts in a firm's financing decisions.

Given the presence of a founding manager with high ownership implies high monitoring ability and low information asymmetry, D&O insurances might be less useful for these firms. Also, if an owner-manager signals an organizational structure that decreases the conflicts between shareholders and managers and improves management's credibility, it may also imply that these firms pay a lower price for insurance.

In Korean firms, under heavily concentrated and complex ownership structure, a major shareholder, who is often chief executive of the firm as well as a member of board, controls the board to a great extent. This means that the major shareholder is not disadvantaged with insider information, therefore has both the ability and power to influence various board decisions. In such corporate governance system, majority shareholders face two types of interest conflicts. One is between majority shareholders

and hired executives and the other between majority shareholders and minority shareholders. However, the former is less severe than the latter, unlike in Anglo-Saxon firms, because major shareholders' monitoring of executives is relatively efficient in concentrated ownership firms due to their ability to collect insider information. The use of D&O insurance as an incentivizing or monitoring tool for management is emphasized in previous studies in the context of widely held firms. However, I hypothesize that owner-manager firms should be less attracted to such characteristics of D&O insurance, therefore do not need the insurance as much as non-owner-manager firms or relatively widely-held firms do. Therefore the purchase would be less frequent among owner-manager and concentrated ownership firms and the amount of coverage purchased would also be lower.

There can be opposing views regarding the demand for D&O insurance in owner-managed firms, focusing on the interest conflicts between majority and minority shareholders. With the presence of an owner-manager, the minority shareholders might demand high D&O insurance to protect their wealth against selfish decisions by the owner-manager who has significant influence over corporate decisions. In this case, one might expect owner-managed firms to show a higher demand for D&O insurance. However, in Korea, before the class action law was enacted in 2005, it was very hard for minority shareholders to raise lawsuits. It was only possible in extreme cases when a firm's decision led to the failure of the entire business, as seen in the previous examples of KFB and Hanbo. The fact that litigation was rarely available to minority shareholders implies that D&O insurance was not a useful protection tool for them. Therefore it is unlikely that they would have requested it. Although the law was enacted in 2005, it has taken time for it to be fully understood and utilized by minority shareholders. Since my data set is collected between 2003 and 2008, I predict that minority shareholders' influence over firms' D&O insurance demand was insignificant.

The less severe information asymmetry issues between shareholders and management in Korean firms would also imply that there is lower risk of litigations, therefore a lower price for D&O insurance contracts. More than half of corporate litigations are filed by shareholders who find out that something went wrong and they did not know about it. If shareholders do not suffer from lack of information in the first place, they might experience fewer incidences to raise legal claims; this should mean that probability of litigation is expected to be lower in firms where there is higher transparency between management and shareholders. The fact that it is less likely that controlling shareholders would sue their own firm would imply a reduction in shareholder litigation risk, which should result in lower price of insurance, provided that insurance firms price the contract based on the probability of litigation risk. The owner-manager firms' unique characteristics of long-term and credible commitment to profit maximization (Andres, 2008) would also signal that these firms are less exposed to litigations, therefore they should pay lower prices for the insurance.

Although some argue that, as time passes, younger generations in family-run firms tend to fail to inherit the same management drive and ability and deviate from being efficient monitors, this may not yet be a critical issue in Korean firms as they were only established in recent years. Most firms were established during or after the Korean Economic Development in the 1960s and half of the firms in my dataset were established in the 1970s and 80s. This implies that the management was only likely to be handed over to the second generation if the founder was not still working in the firm. Also, because my dataset is composed of large-size firms with fairly good performance, it is difficult to say whether their management's ability and deliverance of effective monitoring is unreliable.

2.4. Research Design

2.4.1. Construction of Sample

I collected data from three different sources and combined them to construct a panel data of KOSPI 2006 firms for the period of 2000-2008. First, I hand-collected data on D&O insurance, executive stock option and corporate governance factors from each company's annual report. The annual report submitted by individual company is the only source for these variables in Korea. To construct D&O insurance data, I collected a binary variable that is equal to 1 if the company purchased D&O insurance and 0 otherwise. Additional variables on the D&O insurance contracts collected are the premium and the maximum insurance coverage. For executive stock option, the only variable available is whether a firm pays executive stock option or not. Therefore a binary variable is collected. It is equal to 1 if the firm uses stock option to pay executives and 0 otherwise. Corporate governance variables that I gathered from the annual reports are board independence (the percentage of outside directors on board) and board ownership (the number of shares that are owned by the company's board members). Secondly, I collected the presence of owner-manager and accounting variables from the database, Kisvalue, the Korean firm data provider. Kisvalue provides the name of the five largest shareholders and the name of the president.⁷ If the name of the president was identically matched to one of the five largest shareholders' names, I coded him or her as an owner-manager using a binary variable. Also, even if the president's name was not listed as one of five largest shareholders in a certain year, if he or she was named in adjacent years or if it was clear that the person was a sibling of any of the five largest shareholders, I coded the person as an owner-manager. The former was because the size of stake could vary among family members, allowing the president to be 6th or 7th largest shareholder, while it was not easy for a hired-manager to be listed as one of the five largest shareholders in adjacent years. The latter was possible due to

⁶ The KOSPI 200 index consists of 200 large-size Korean companies listed on Korea stock market. The base value of 100 was set on January 3, 1990 and it contributes over 70% market value of the Korea Composite Stock Price Index (KOSPI).

⁷ Equivalent to CEO in the context of Korean business.

certain characteristics in Korean names that allow one to recognize brothers and sisters.⁸

Because the interest of a president who is a member of controlling family should resemble that of owner-managers, I considered him or her as an owner-manager. The accounting data included total assets, total liabilities, net income, return on assets, stock performance data, capital expenditure and industry codes. Thirdly, a US operation dummy that showed whether the firm had business operations in the US market was collected from the Overseas Investment Information System run by the Korea Trade-Investment Promotion Agency (KOTRA). Data from different sources were merged based on the unique company codes that were common in databases or manually based on company names. Table 2.1 provides summary statistics of sample firm characteristics and definitions of each variable.

2.4.2. Empirical Strategy

To estimate the probability of D&O insurance purchase given the presence of an owner-manager, the following probit regression analysis was conducted;

$$\text{Prob} (\text{D\&O Insurance Purchase Dummy}_{it} = 1 | \mathbf{X}_{it}) = \Phi (\boldsymbol{\beta} \cdot \mathbf{X}'_{it}) \quad (1)$$

D&O Insurance Purchase Dummy_{it} is a binary variable that is equal to 1 in cases where the firm *i* purchased D&O insurance contract in year *t* and 0 otherwise. Φ is a standardized normal cumulative distribution function. \mathbf{X} is a vector of regressors. $\boldsymbol{\beta}$ is a vector of coefficients to be estimated. Independent variable is owner-manager presence,

⁸ In cases where a president was thought to be a family member due to their name, I double checked by searching the family relationships using search engines.

a binary variable that is equal to 1 if the firm is run by an owner-manager and 0 otherwise.

Various control variables were included as proxies for firm characteristics and litigation risks. First of all, ownership concentration was controlled using the sum of five largest shareholders' ownership stakes. Blockholders have higher incentive to monitor management (Demsetz & Lehn, 1985) compared with minority shareholders, therefore the presence of blockholders is expected to influence insurance demand as would do the presence of an owner-manager. However, their influence is expected to be weaker than that of an owner-manager's because, being outsiders of the firm, blockholders also suffer from free-rider issues and lack of information(Admati, et al., 1994).

Other firm characteristics that were controlled were log of total assets, debt ratio, return on assets (ROA), Tobin's Q, board independence, board ownership, business operation in the US and stock return volatility. Logarithmically transformed total assets were used to control for the size of the firm. Firm size can be either positively or negatively correlated with the purchase of corporate insurance. Since large firms carry higher litigation risks, large firms are more likely to purchase insurance (Core, 1997). But because they are financially more immune to occasional damages, they could also have less incentive to pay for insurance (Mayers & Smith, 1990). Empirically, it is shown that large firms buy higher coverage (Core, 1997). Debt ratio, which is the ratio of total liabilities to total assets, was included to control for firm's litigation risk from financial structure. A higher debt ratio implies lower financial flexibility to business shocks, and highly levered firms are likely to experience conflicting interests between debtholders and equityholders (Regan and Hur, 2007; Yamori, 1999). This may indirectly increase the risk of litigation and is therefore expected to induce firms to increase insurance purchase. I controlled for firm performance using ROA that is the ratio of net income to total assets. Because corporate litigations mainly arise due to poor performance, litigation risk is expected to be high for low ROA firms (Core, 1997) and their insurance

demand might be high. I controlled for growth opportunity using Tobin's Q, the ratio of the sum of market value of equity and book value of liabilities to the sum of book value of equity and book value of liabilities. Directors and officers in a firm with higher growth opportunities are likely to make risky decisions and this may result in higher expected costs of litigation as well as higher demand for D&O insurance. Board independence is the proportion of independent directors on board, and was included to control for possible correlation between the purchase of insurance and the presence of outside directors. Outside directors are exposed to similar litigation risks as inside directors, but their compensation is much lower and their access to inside information is often limited as they do not spend as much time with the company as inside executives. Therefore, they should have a strong preference to sit on a board where their activities are insured by D&O insurance, and firms may provide D&O coverage to attract independent directors. Board ownership was used to control for insider's incentive to maximize profit, alleviating agency issues. US operation dummy that is equal to 1 if the firm is operating in the US controls for relatively high litigation risk that firms face in the US market. The US presents significantly higher frequency of lawsuits compared to Korea and businesses that have divisions of their firm operating in the US are supposed to face higher litigation risk. Stock return volatility controls for the financial market risk. Highly volatile stock price implies higher potential to experience stock price decline, therefore higher litigation risks and higher demand for D&O insurance.

To see if the conditions of D&O insurance contract were influenced by the presence of owner-manager, I implemented following analysis using ordinary least square (OLS) regression controlling for industry and year effect and clustering standard errors by firm;

$$\text{D\&O Variable}_{it} = \beta_0 + \beta \cdot X'_{it} + \varepsilon_{it} \quad (2)$$

D&O variable includes three different D&O insurance related variables; Insurance premium, insurance coverage, and insurance price. Insurance premium is the actual fee that a firm pays to its insurance company to buy its contract, and D&O Coverage is the maximum amount of indemnification that the insurance company would pay to contracted firms in case of litigations. I defined the price of insurance as the ratio of insurance premium to its coverage given that it stands for how much each firm paid to buy an equal amount of coverage ($D\&O\ Insurance\ Price = 100*(Premium/Coverage)$). X is a vector of regressors. β is a vector of coefficients to be estimated. ϵ is error term. In the vector of regressors, the variables that are known to influence the purchase of corporate insurance and the level of litigation risk were included as control variables as in the equation (1). Although my data set is based on a panel of firms, and would allow the introduction of fixed effects, it may not be appropriate in this analysis because there were few changes over time in the most critical independent variable, the presence of an owner-manager.

2.5. Results

2.5.1. Owner-manager and D&O insurance purchase

First of all, I present 2-by-2 tables that show the frequency of the D&O insurance dummy in the two groups of firms, owner-managed firms and the others. These tables show that owner-managed firms had higher tendency to be located in non-buyer category regarding D&O insurance⁹.

⁹ In 2005, shareholder class action was allowed in Korea. Because it was supposed to increase the risk of lawsuits for the firms under the law, there was a large increase in D&O insurance demand by Korean firms. The table shows that the increase of D&O insurance demand was much greater in non-owner-manager firms. This should imply that non-owner-firms not only buy more D&O insurance in the first place but also react more strongly to external shocks regarding D&O insurance.

I tested whether firms run by owner-managers had lower demand for D&O insurance compared to ones run by hired CEOs. At the same time, I tested which firm characteristics explained the purchase decisions of D&O insurance in Korean firms. Table 2.2 presents the result of the probit regression that estimates the probability of insurance purchase according to the presence of owner-manager and various corporate governance variables. Industry and year effects were controlled and standard errors clustered by firms. Columns (1) and (3) present probit regression results and columns (2) and (4) report marginal effect on the probability that is associated with a unit change in independent variables.

The hypothesis that the presence of an owner-manager might be associated with lower D&O insurance demand is corroborated. In column (4), where the marginal effect is estimated, it is found that the presence of an owner-manager is associated with 14% lower probability that a firm would purchase D&O insurance. I interpreted the result in two ways. First, that the roles that the D&O insurance are supposed to play in the shareholder-CEO relationship are less useful in cases where a shareholder is also a CEO. Because in such cases shareholders do not suffer from information asymmetry or managers' selfish decisions, D&O insurance as an incentivizing or monitoring tool would not appear attractive to these shareholders. Second, that the presence of an owner-manager creates an organizational structure that improves reliability of a firm and that this might result in lower litigation risk. If the owner-managership generates loyalty and trust (Tagiuri & Davis, 1996) based on their commitment to long-term profit maximization (James, 1999), there might be lower probability that things would go wrong and also lower probability that stakeholders file a legal claim, even when things did not go well, because of the trust-relationship that help stakeholders to remain patient till the firm resolves the issues. These can be tested in more detail using insurance price in the next section.

Among other firm characteristics variables, firm size (Log Assets), firm performance (ROA), growth opportunity (Tobin's Q) and the proportion of independent directors on board (Board Independence) were found to be significant variables that explained corporate demand for D&O insurance. The positive and significant coefficient on firm size showed that larger firms tended to buy D&O insurance more often. This finding is in line with those in previous studies that provided evidence that litigation risk grows with firm size (Core, 2000; Zou, Wong, Shum, Xiong & Yan, 2008). This is because as firm size grows, i.e. as firms become more visible, there is more chance that their wrongdoings are detected and the firm becomes a target of legal claims. It is also because large firms are subject to higher regulatory requirements of information disclosure. Such increased litigation risk must lead to higher likelihood of insurance purchase.

Firm performance showed a negative association with the insurance demand. Since good performance implies efficient management and more resources to be shared among stakeholders, there might be less litigation risk, therefore lower demand for the type of corporate insurance. Tobin's Q, a measure of growth opportunity, was also positively associated with D&O insurance dummy. Firms with high growth opportunities are expected to take more risks and experience higher litigation risk, therefore they are more likely to purchase the insurance. The final explanatory variable that shows significant association was board independence which was measured by the percentage of outside directors on board. While outside directors collectively take the responsibility together with inside directors regarding corporate decisions, their reward is smaller and it is relatively harder for them to gain information on corporate matters. Such asymmetry between reward and exposure to risks for outside directors leads to higher demand for D&O insurance by firms with more outside directors, since it helps firms to persuade able outside directors to sit on their board. Overall, the results were consistent with theoretical prediction that the degree of litigation risk or the risk-tolerance level of the

agents on board was related to demand for D&O insurance protection. Board Ownership and Ownership Concentration, the characteristics that firms possess under concentrated ownership, showed negative association with D&O insurance purchase, implying that firms tended to buy D&O insurance less frequently if board members owned a large stake or the ownership was concentrated. However, these findings are not statistically significant, implying that the existence of a blockholder alone is less powerful than the presence of an owner-manager to reduce agency costs.

2.5.2. Owner-manager and D&O insurance size and price

In this section, I tested the association between the presence of an owner-manager and the structure of D&O insurance contracts: D&O insurance price and the size of premium and coverage. In this analysis, a subset of observations was used that consisted of D&O insurance purchasing firms only. If non-purchasing firms were to be included, the price, premium and coverage should be coded as 0. Including these firms could exaggerate the effect of the owner-manager in the hypothesis that owner-managers should be associated with lower size and price of D&O insurance contracts. Therefore, to capture the difference in pricing tendency that is associated with the existence of an owner-manager, I omitted those observations.

I regressed D&O price, premium and coverage on the presence of an owner-manager controlling for firm characteristics that may influence these dependent variables and year and industry effects. In Table 2.3, which reports the results, I found that both the size and price of D&O insurance tended to be lower in firms that were run by their owner-managers, although only the coefficient for insurance premium was statistically significant. Specifically, D&O insurance premium was lower by 0.14 billion KRW¹⁰ on average in firms that were run by owner-managers (t-statistic = -2.12, significant at

¹⁰ Approximately 0.14 million US dollars.

10%). Other things being equal, the fact that the premium was lower in these firms would imply that either they buy lower coverage or they pay lower price per unit of coverage. The negative coefficients for both in column (1) and (3) weakly support this view as well as the hypothesis that the presence of an owner-manager is associated with lower coverage demand and cheaper contracts. Since the level of general demand for this type of insurance was low in owner-manager firms, as shown in the purchase decision analysis, they seemed to buy lower coverage in case where they decided to buy a contract. As predicted in the hypothesis,, in terms of price, they might be charged a lower unit price based on owner-managed firms' unique characteristics that they are highly reliable due to the long-term presence in and commitment to the firm of important personnel (large shareholders and CEO) (Anderson, et al., 2003; James, 1999).

Unlike the theoretical prediction that the price of D&O insurance should give information on corporate governance quality, the results showed that the price was insensitive to many other firm characteristics. In column (1), the only explanatory variable that was significantly associated with insurance price was firm size. It was shown that large firms tended to pay higher price per a unit of coverage which is explained by the fact that large firms have higher litigation risks. The fact that the amount of insurance coverage was correlated with various variables (column (3)) while price was not may imply that either firms independently decided the level of coverage or they, as customers, had more power than the insurance company over the details of the insurance contract. In either case, the results showed that the insurance company lacked the authority to negotiate the insurance contracts based on each firm's characteristics. In other words, it implies that they had very limited ability to provide information on corporate governance quality through their contracts unlike the theoretical ideas argued in previous studies (Baker & Griffith, 2007, 2009). These findings could be specific to Korea where D&O insurance industry is still in its early stages, since the lack of know-

how or the necessity to market a new product may limit the insurance firms' ability to be efficient.

2.6. Conclusion

The main research question in this chapter is whether owner-managed firms have lower demand for D&O insurance, given that they experience less severe agency problems between shareholders and managers. I also tested whether the presence of an owner-manager implied lower risk of litigation of their firm through lower insurance price.

Using panel data from Korea, I found that insurance demand was negatively correlated with the presence of an owner-manager. Both the probability of purchase that was measured by a dummy variable and the size of insurance coverage that was measured by insurance premium and coverage were lower in owner-managed firms. The results corroborate the hypothesis. The fact that the demand of owner-manager firms for D&O insurance is lower would be counter-evidence for the arguments in previous studies that D&O insurance is used to reduce agency costs in widely-held firms. In addition, I found that firm size (total assets), firm performance (ROA), growth opportunity (Tobin's Q) and board independence (proportion of independent directors on the board) were determinants of D&O insurance purchase in Korean firms. The determinants of insurance demand were consistent with previous studies in Anglo-Saxon countries.

The price of insurance that is measured by the ratio of insurance premium to coverage was negatively associated with the presence of owner-manager, implying that these firms carry lower litigation risks. However, the result was not statistically significant. Since other firm characteristics, except firm size, were not associated with the price either, it appears that the D&O insurance price only weakly signals corporate governance quality in Korea, unlike many theoretical debates suggest. This result may be due to the short history of D&O insurance in Korea. Its short history implies that

insurance companies lack data to write custom-tailored contracts and are forced to use more formulaic methods, such as considering only very visible firm characteristics.

A future study can be suggested for the counterargument mentioned earlier in this chapter: whether the high demand for D&O insurance from minority shareholders in owner-managed firms would interfere with the conclusion in this chapter when D&O insurance starts to protect minority shareholders. This will be made possible when D&O insurance data are collected for the post 2008 period.

Table 2.1 Summary Statistics

This table shows the summary of sample firm characteristics. *Owner-Manager Dummy* is equal to 1 if the firm is run by one of five largest shareholders. *Ownership Concentration Rate* is the fraction of outstanding shares owned by five largest shareholders of the company. *D&O Insurance Purchase Dummy* equals 1 if the company purchases D&O insurance in the year. *D&O Insurance Premium* is the amount of money the company paid to buy their insurance contract. *D&O Insurance Coverage* is the maximum insurance money that the company can receive from insurance company in case they experience D&O lawsuits. *D&O Insurance Price* is calculated using the equation, $100 * (\text{Premium} / \text{Coverage})$. *Stock Option Dummy* equals 1 if the company uses stock option to pay their executives. *Total Assets* is measured in billions of Korean Won. *Debt Ratio* is total liabilities divided by total assets. *ROA* is return on equity. *Tobin's Q* is drawn using the equation, $(\text{Market Value of Equity} + \text{Book Value of Liabilities}) / (\text{Book Value of Equity} + \text{Book Value of Liabilities})$. *Board independence* is the fraction of outside directors among all board members and *Board Ownership* is % of outstanding shares owned by board members. *US Operation Dummy* is 1 if the company is operating in the US in latest year (2008) with any of the following business type; sales, service, branch, or contact office. *Stock return volatility* is standard deviation of daily stock returns in that year multiplied by a square-root of the number of trading days.

Variable	Obs	Mean	Std. Dev.	Min	Max
Owner-Manager Dummy	1347	0.61	0.49	0	1
Ownership Concentration Rate (%)	1020	44.17	15.10	11.00	88.66
D&O Insurance Purchase Dummy	1347	0.55	0.50	0	1
D&O Insurance Premium (KRW, bn)	1347	0.20	0.77	0	9.95
D&O Insurance Coverage (KRW, bn)	1347	10.35	22.28	0	200
D&O Insurance Price (%)	1347	0.89	1.34	0	10.09
Stock Option Dummy	1347	0.29	0.45	0	1
Total Assets (KRW, bn)	1347	2,827.85	7,305.03	20.88	72,519.22
Debt Ratio	1347	0.30	0.10	0.04	0.77
ROA	1347	0.04	0.10	-2.41	0.80
Tobin's Q	1347	1.07	0.53	0.21	5.07
Board Independence (%)	1347	34.37	16.25	0	81.25
Board Ownership (%)	1347	11.33	13.06	0	84.74
US Operation Dummy	1347	0.27	0.45	0	1
Stock Return Volatility	1347	52.91	18.17	0	125.34

Table 2.2 Number (%) of firms with the owner-manager dummy and the D&O insurance purchase dummy by Year

<2003>

	D&O Insurance = 1	D&O Insurance = 0
Owner-Manager = 1	33 (39.8%)	50 (60.2%)
Owner-Manager = 0	40 (55.6%)	32 (44.4%)

<2005>

	D&O Insurance = 1	D&O Insurance = 0
Owner-Manager = 1	59 (48%)	64 (52%)
Owner-Manager = 0	60 (61.2%)	38 (38.8%)

Table 2.3 Owner-manager and D&O insurance purchase

This table shows results of probit regressions of *D&O Insurance Purchase Dummy* on corporate governance characteristics. The sample consists of Korean firms that have been included in the composite index, KOSPI200, in the year between 2000 and 2008. The dependent variable, *D&O Insurance Purchase Dummy*, is equal to 1 if the company purchased the insurance in the year and 0 otherwise. Column (1) and (3) display results of probit regressions and column (2) and (4) report the marginal change in the probability of D&O insurance purchase. The figures in parentheses are robust standard errors, and asterisks stand for significance; *** p<0.01, ** p<0.05, * p<0.1.

D&O Insurance Purchase (1 if purchased)				
	Probit	Dprobit	Probit	Dprobit
	(1)	(2)	(3)	(4)
Owner-Manager			-0.388*	-0.140**
			(0.200)	(0.0703)
Ownership Concentration	-0.00507	-0.00190	-0.00590	-0.00220
	(0.00540)	(0.00202)	(0.00542)	(0.00201)
Log Assets	0.451***	0.168***	0.457***	0.170***
	(0.102)	(0.0377)	(0.100)	(0.0368)
Debt Ratio	0.350	0.131	0.489	0.182
	(1.043)	(0.390)	(1.037)	(0.386)
ROA	-1.780*	-0.665*	-1.782*	-0.663*
	(1.016)	(0.379)	(1.004)	(0.373)
Tobin's Q	0.460**	0.172***	0.438**	0.163**
	(0.179)	(0.0664)	(0.179)	(0.0662)
Board Independence	0.0129*	0.00483*	0.0134*	0.00499*
	(0.00673)	(0.00251)	(0.00684)	(0.00255)
Board Ownership	-0.00688	-0.00257	-0.00372	-0.00139
	(0.00800)	(0.00300)	(0.00802)	(0.00299)
US Operation Dummy	0.135	0.0500	0.115	0.0422
	(0.241)	(0.0877)	(0.242)	(0.0879)
Volatility	0.00261	0.000974	0.00232	0.000863
	(0.00513)	(0.00192)	(0.00521)	(0.00194)
Pseudo R-Squared	0.290	0.290	0.300	0.300
Industry Effect	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes
Observations	1,009	1,009	1,009	1,009

Table 2.4 Owner-manager and D&O insurance size and price

This table shows regression results of price and size of D&O insurance contracts on corporate governance characteristics. The sample in this analysis is a subset of the dataset, and it consists of the companies which purchased D&O insurance. *D&O Insurance Price* is insurance premium's fraction in insurance coverage limit. *D&O Insurance Premium* is the amount of money that the company paid to purchase insurance contract in billion KRW, and *D&O Insurance Coverage* is coverage in billion KRW, which is the maximum amount losses that the company can recover through the contract in case of lawsuits. The figures in parentheses are robust standard errors, and asterisks stand for significance levels; *** p<0.01, ** p<0.05, * p<0.1

	D&O Price	D&O Premium	D&O Coverage
	OLS	OLS	OLS
	(1)	(2)	(3)
Owner-Manager	-0.173 (0.196)	-0.144** (0.0679)	-4.665 (3.063)
Ownership Concentration	-0.00794 (0.00562)	-0.00322* (0.00165)	-0.0641 (0.0768)
Log Assets	0.218* (0.131)	0.228*** (0.0600)	11.74*** (2.208)
Debt Ratio	0.575 (1.266)	-0.975* (0.528)	-35.23* (19.81)
ROA	0.884 (0.748)	-0.196 (0.338)	-19.85 (14.32)
Tobin's Q	0.0596 (0.202)	0.0795 (0.0766)	5.673* (2.971)
Board Independence	-0.00237 (0.00859)	-0.00182 (0.00339)	-0.0306 (0.125)
Board Ownership	-0.00327 (0.00645)	-0.000298 (0.00201)	-0.0340 (0.0904)
US Operation Dummy	0.00595 (0.260)	0.0391 (0.0881)	0.753 (4.148)
Volatility	0.000205 (0.00673)	-0.00318** (0.00159)	-0.116 (0.0749)
R-squared	0.302	0.443	0.505
Industry Effect	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes
Observations	621	621	621

Chapter 3 . Corporate demand for Directors' and Officers' liability insurance

3.1. Introduction

Modern corporations purchase substantial amounts of insurance, so more than 50% of insurance premiums are paid by businesses. Most previous studies on corporate insurance have assumed that the underlying source of such heavy demand is the risk aversion of shareholders (Mayers & Smith, 1982). My previous chapter on directors' and officers' liability insurance (D&O insurance) also concludes that it serves to the interests of shareholder by playing a monitoring role over management that will eventually reduce litigation risks. However, Mayers and Smith (1982) point out that firms' risk aversion may not be an appropriate basis for corporate insurance analysis in modern and publicly held firms. They argue that any shareholder can hold a diversified portfolio to offset idiosyncratic risks and therefore insurance does not add value to a firm. Mayers and Smith (1982) suggest that because risk reduction is not an obvious reason for a corporation to purchase insurance, there are likely to be other incentives. Their discussion is based on the idea that insurance purchase is just another aspect of corporate financing decisions that attempt to reduce costs. Using the framework of the Modigliani and Miller (1958) theorem, which showed that corporate financing policy is irrelevant to the value of a firm in the case of investment with no tax or contracting costs, Mayers and Smith (1982) suggest that taxes, contracting costs, or impact on other investment decisions are the main motivations for corporate insurance demand. Following Mayers and Smith (1982), many studies have presented related discussions both theoretically (Grace & Rebello, 1993; Han, 1996; MacMinn, 1987; MacMinn & Garven, 2000; Mayers & Smith, 1987; Skogh, 1989; Smith, 1986) and empirically (Aunon-Nerin & Ehling, 2008; Core, 1997, 2000; Hoyt & Khang, 2000; Mayers & Smith, 1990; Regan & Hur, 2007; Yamori, 1999; Zou & Adams, 2006). As a result, in

recent studies, it is generally accepted that there are many other and more important reasons than risk management for the demand for business insurance. However, while some naturally accept this view and the others argue against it, whether or not corporations purchase insurance because of the risks to which they are exposed remains rather unclear. This chapter investigates this fundamental question and provides empirical evidence that firms do indeed demand more insurance due to the increased level of risk.

I use D&O insurance data from Korean companies. The data set provides an opportunity to run a natural experiment in which one group of firms becomes exposed to a higher risk of litigation while the others remain in status quo during the process of a corporate law change. The Korean Government decided to allow shareholder class action for public firms with assets over two trillion Korean Won¹¹ (henceforth KRW) from 2005 and extend this to all publicly-listed firms from 2007. When the shareholder class action came into effect, even minority shareholders were able to instigate litigation against the firm in which they had invested or against its board of directors, unlike under the pre-existing shareholder derivative suit which only allowed major shareholders to institute litigation proceedings. Therefore, the introduction of shareholder class action law implies a clear increase in shareholder litigation risk for firms that are covered by the law. The two-year window between 2005 and 2007, when only one group of firms was bound by this law, provides a natural experimental setting in which to compare insurance demands between the two groups of firms above and below the asset threshold of KRW 2 trillion.

Exploiting this legal change, which posed a litigation risk shock to some firms for the specified two year period, I developed a differences-in-differences (DID) model and tested whether increased litigation risk results in increased demand for D&O insurance in large firms. D&O insurance is a corporate insurance that covers litigation costs and

¹¹ Approximately USD 1.8 billion at the exchange rate in July 2013.

losses in the case that directors and officers – or the corporation itself – are sued by stakeholders. Although various stakeholders, such as shareholders, employees, suppliers or consumers, can file lawsuits against their company's wrongdoings, most litigation issues are raised by shareholders regarding financial market matters. Therefore, even though D&O insurance covers a wider range of litigation, it is primarily linked to shareholder litigation risk.

The DID results in this chapter show that firms increased their insurance coverage due to the pressure of potential shareholder class action. This provides counter-evidence to previous studies that rejected risk concern as a source of corporate insurance demand and proves that risk is an important driver of firms' insurance purchase. It also underlines my findings in Chapter 2 which show that D&O insurance can be used as a substitute for owner-managers' monitoring in non-owner-manager firms, resulting in relatively high insurance demand in those firms. The fact that firms that are lacking effective monitoring use D&O insurance more frequently implies that insurance demand is influenced by the level of company risks, because effective monitoring is supposed to prevent litigation issues. In this chapter, I demonstrate a more direct link between company risk and insurance demand.

I ran two robustness tests to address specific concerns in the natural experiment. The first robustness check concerns the regression discontinuity design that restricts the sample to those firms around the asset threshold of KRW 2 trillion. The exogeneity of the introduction of the law only for large firms is critical in this natural experiment. For example, if the enactment of shareholder class action is the result of increasing general interest in and demand for all types of corporate litigation among large firms' stakeholders, this may imply that the risks of other types of litigation were already increasing for large firms before the introduction of the law. If this were driving up the insurance demand, the results of the DID model could be misleading. The regression discontinuity design addresses such concerns by running the DID analysis using samples

that have more homogeneous firm sizes. The second robustness test was undertaken by running the DID analysis using pre- and post-law windows that were extended to longer time periods. This shows whether the effect of the law on insurance demand is sustained or whether it is only temporary. The longer period windows also make it possible to test whether small firms copy large firms' increased demand for insurance as time passes, even though they are not subject to the law. This may happen because it is seen as a good and prudent practice, in which case insurance demand may not be due to increased risk. Using longer time period windows, it is also possible to smooth out any insurance coverage changes that occurred as a result of other influential factors that coincided with the change in the law. In this case, the results proved to be robust in both checks and it can thus be determined that insurance demand results from increased risk.

The results also show that other factors identified as determinants of D&O insurance demand are not significant after controlling for litigation risk. These are debt ratio, growth opportunity, number of independent directors, board size, board ownership, ownership structure and stock price volatility. The result supports Mayers and Smith's (1982) argument that idiosyncratic risk should not affect insurance demand given that shareholders can overcome it by diversifying their portfolios; thus, only systematic risk should increase insurance demand. Shareholder class action law is a systematic risk that affects all firms in the financial market and it appears to be the most powerful determinant of demand for D&O insurance.

The rest of the chapter is structured as follows. In section 3.2, I review related literature on corporate insurance demand. In section 3.3, I describe data on Korean firms and their insurance purchase behavior, as well as the empirical design of the DID model. Section 3.4 presents the results derived from the main model and the robustness tests. In section 3.5, I draw conclusions.

3.2. Related Literature

3.2.1. Demand for Corporate Insurance

The lengthy discussion on the drivers of corporate insurance demand began when Mayers and Smith (1982) challenged the widely accepted view that firms purchase insurance due to risk aversion. They were the first to differentiate the nature of corporations' insurance demand from that of individuals. The rationale presented by Mayers and Smith (1982) is that shareholders do not need to buy corporate insurance for a specific firm if they have access to Modigliani and Miller's (1958) perfect financial markets and can diversify their portfolio, unlike individuals who cannot mitigate the various kinds of risks they face in life through diversification. Smith (1986) adds that only closely-held firms should buy insurance as their owners have fewer opportunities to diversify their portfolios. Pointing out that risk aversion is not an adequate assumption on which to base corporate insurance research Mayers and Smith (1982) suggest that other reasons such as tax concerns, the efficient allocation of risks among different claimholders such as debtholders and shareholders, and regulatory constraints are the main sources of corporate insurance demand. Their argument is based on the framework of the Modigliani and Miller theorem (1958) that suggested these factors as conditions for corporate finance policy to be relevant.

Agreeing with Mayers and Smith (1982), many theoretical studies (Grace & Rebello, 1993; Han, 1996; MacMinn, 1987; MacMinn & Garven, 2000; Mayers & Smith, 1987; Skogh, 1989; Smith, 1986) suggest additional reasons why corporations would demand insurance other than risk aversion and prove them using economic models. The economic and corporate finance-related reasons presented by previous studies can be summarized as follows: bankruptcy costs, agency costs, transaction costs of incomplete contracts, information asymmetry, taxation, real services, and the regulatory status of firms. Regarding bankruptcy costs, MacMinn (1987) sets up a model such that when

bankruptcy costs are positive, firms can shift the risk to insurance companies by insuring them and thus reduce the probability that the cost will be incurred within the firm. This means that the resulting lower risk of transaction costs incurred through bankruptcy increases firm value and therefore there is an incentive for firms to buy corporate insurance. MacMinn's (1987) model also shows that the two types of agency costs in corporate finance suggested by Mayers and Smith (1982) – the underinvestment problem and the asset substitution problem – can be eliminated through insurance. Managers in levered firms, who act in their shareholders' interests, have an incentive to limit large investment, because a great part of the return from large investment accrues to bondholders rather than shareholders. As a result, bondholders suffer from an underinvestment problem. MacMinn's (1987) analysis shows that if an appropriate insurance policy is provided, the safety of debt improves and that it alleviates the underinvestment problem. This is also shown in MacMinn and Garven's (2000) model. The asset substitution problem arises when managers and shareholders, having obtained debt financing, switch from a relatively safe investment to a riskier investment, thus increasing the value of the company's equity but shifting the risks to the bondholders. MacMinn (1987) shows that a provision that requires insurance can eliminate any incentive for such risk shifting and eventually increase firm value through the availability of debt at a lower price.

In the discussion of transaction costs as a source of insurance demand, Skogh (1989, 1991, 2000) argues that corporate insurance demand stems from the fact that contracts are necessarily incomplete in that they are not able to address all contingencies; there are time and cost constraints as well as inability to predict future incidences. Therefore, often details concerning liabilities and precautions are replaced with a clause stating insurance should be purchased regarding such risks. Furthermore, Thakor (1982), Grace and Rebello (1993) and Mayers and Smith (1982) state that firms which suffer from information asymmetry problems in financing may use insurance as a signal of

reliability. When firms have private information that is not easily obtained by financial markets or debt providers, a third party – an insurance company – which has an incentive to obtain the information at a cost, can send a message to the market through the pricing of its service, although the information itself remains proprietary. Therefore, firms have an incentive to buy insurance to pursue this additional utility; however, it might be the case only in countries where insurance industry is mature and working efficiently because it was shown in my previous chapter that the pricing of insurance service had limited ability to reflect company characteristics when it was a newly introduced type of insurance.

Amongst other sources of demand, taxation is also pointed to as one of the reasons why companies buy insurance; because insurance premiums are deductible as business expenses, firms have an incentive to buy insurance and reduce their tax liabilities (Mayers & Smith, 1982). According to Main (1983), real services such as the assessment and administration of risks that are bundled in insurance coverage promote insurance demand. Alternatively, insurance demand by corporations may arise simply as a result of compulsory purchase imposed by regulations (Mayers & Smith, 1982). One such example would be the purchase of employee insurance.

Many empirical studies (Aunon-Nerin & Ehling, 2008; Core, 1997, 2000; Hoyt & Khang, 2000; Mayers & Smith, 1990; Regan & Hur, 2007; Yamori, 1999; Zhu, Kui, & Fang, 2011; Zou & Adams, 2006; Zou, Adams, & Buckle, 2003) have tested such theoretical claims. Mayers and Smith (1990) implemented the first attempt to analyze the issue empirically and found that default risks were significantly associated with corporate insurance demand together with ownership structure, firm size, business concentration level, and geography. Based on Japanese data, Yamori (1999) finds that firms at higher risk of default tend to show higher demand for insurance although it is not statistically significant. In addition, he finds that there is heterogeneity in corporate insurance demands by industries and firm sizes, and that ownership structure is not a

strong determinant. Hoyt and Khang's (2000) study, which tested many of the motivations delineated earlier, suggests that corporate property insurance has a function in reducing the underinvestment problem, promoting efficiencies in real services, reducing the tax burdens of corporations, and reducing bankruptcy costs. In particular, using US public firm data, they show that debt ratio and growth opportunities, which are proxies for a greater expected underinvestment problem, are associated positively with insurance demand. Also, by showing that there is higher demand for property insurance from small firms, which have less capacity to pool risks and manage within firms, they demonstrate that securing efficiencies in real services is one of the motivations for acquiring corporate insurance. In their results, tax shields and solvency probability, defined as the ratio of working capital to total assets (Altman, 1968; Ohlson, 1980), are also positively associated with insurance demand. In a more recent study that uses Chinese data, Zhu, Kui, and Fang (2011) also find that debt ratio and corporate tax ratio are positively associated with insurance demand, implying that insurance is used as a remedy for the underinvestment problem and cost reduction concerns. Zou, Adams, and Buckle (2003), who use Chinese public firm data to test the linkage between corporate risks and property insurance demand, find evidence that firm size and insolvency risks are the main determinants of the corporate property insurance purchase decision, and Zou and Adams (2006, 2008) show that addressing agency conflicts is the major goal of corporate insurance purchase in China. On the basis of a survey that addressed large UK firms directly, Main (2000) concludes that there are more complicated motivations than risk-pooling in corporate insurance demand and that these may be taxation or bankruptcy cost considerations. Using Korean data, Regan and Hur (2007) empirically show that tax considerations, ownership structure and firm size are the main determinants of insurance demand, and that debt-to-equity ratio is negatively associated with insurance demand in contrast to predictions in theoretical studies. Aunon-Nerin and Ehling (2007) find a positive relation between the expected cost of financial distress and property insurance demand using US data.

As shown above, a number of studies have presented and tested the underlying motivations for corporate insurance demand and the topic has been analyzed using a wide range of data sets from many different countries. However, the causal relation between insurance demand and its determinants is less well established and it is still not clear whether the factors pointed to as determinants affect insurance demand directly or indirectly through their impact on firms' risk levels. Furthermore, following Mayers and Smith's (1982) initiatives, in most studies the basic assumption that the management of relevant risks is the source of corporate demand is rejected without sufficient investigation and the focus is on finding reasons other than risk management. In this chapter, I intend to remedy the problem of the unclear identification of causation by adopting a DID model in a natural experimental setting to revisit the issue and empirically test whether firms purchase corporate insurance to mitigate the level of risk to which they are exposed. The study is undertaken in the context of the exogenous shock to the Korean D&O insurance market as a result of the change in legislation which is expected to increase the risk of litigation for some firms.

3.2.2. D&O Insurance Demand

In this chapter, I focus on D&O insurance, which is a type of corporate insurance that covers litigation costs and losses when a firm or its board of directors are sued by their stakeholders. Similar to general corporate insurance studies, previous studies on D&O insurance point to several reasons why firms purchase it. Some of these emphasize the direct link between demand and litigation risk (Griffith, 2006b; K. T. Lee & Choi, 2006a), while others focus more on other functions of the insurance in the corporate governance system such as managerial incentives, and its usefulness as a tool to mitigate the agency problem and transaction cost issues, and as a safety signal to shareholders (Core, 1997; Gutiérrez, 2003; K. T. Lee & Choi, 2006a). For example, Core (1997) and

Griffith (2006) argue that D&O insurance can incentivize talented directors to choose firms which have purchased the insurance as they would feel more secure in such firms. Gutierrez (2003) points out that D&O insurance can be used to tame agents by sending them a signal that there is indeed a litigation risk and that they had better meet shareholders' expectations. K. T. Lee and Choi (2006a), who empirically test the determinants of D&O insurance purchase using Korean listed manufacturing firms, show that both greater litigation risk and higher agency costs are associated with insurance demand.

In most studies, the ambiguity of the causal relation between D&O insurance demand and its determinants persists. Also, because some of the determinants identified are also associated with litigation risk, it is not clear whether firms purchase insurance due to the determinants or due to the litigation risk associated with them.

A clear conclusion regarding litigation risk and insurance demand will be drawn only when there is an exogenous variable that affects litigation risk level. In Korea, shareholder class action law became effective from 2005 for public firms with an asset size of over KRW 2 trillion and for all public firms from 2007. Although many kinds of stakeholders can raise litigation against corporations or their directors and officers, it is mainly shareholders who actually do so. Therefore, allowing shareholder class action certainly implies that litigation risk is augmented. This is an exogenous shock to which only one group of firms is exposed. Taking advantage of this opportunity to undertake a natural experiment, I aim to disentangle the relationship between litigation risk, other determinants and D&O insurance demand.

3.3. Data and Empirical Design

3.3.1. Data Description

For the analysis of companies' insurance purchase before and after the class action law introduced in 2005, I define the pre-law period as 2000–2003 and the post-law period as 2004–2007. The reason why the post-law period is defined as commencing one year ahead of the actual law enactment year is because of the nature of the insurance contract. Firms can purchase D&O insurance at any time point during a year, and the contract usually covers the litigation risk for exactly one year and terminates one day before the date on which the contract was signed a year previously. Although the class action law came into effect on 1 January 2005, its introduction was planned from 2003. Thus, firms were aware that they would be subject to the law from the first day of 2005 well in advance. Also, in the case of litigation involving accounting fraud, the fact that shareholders could raise class actions from the beginning of 2005 meant that accounting reports for 2004 could be subject to litigation (Byun, 2004). Given this, it is more reasonable to think that firms might reflect their concerns in the insurance purchase one year ahead in 2004 and indeed, several newspaper articles reported increased interest in and demand for D&O insurance in 2004. Furthermore, insurance premiums increased in 2004 due to the high demand and increased risks resulting from the class action law (Byun, 2004; E. S. Choi, 2004; Seung Ho Lee, 2004). Therefore, in the empirical analysis, I take 2004 as the critical year in which firms could be expected to increase insurance demand.

For the analysis, I took sample firms from the stock market index, KOSPI 200. The KOSPI 200 is an index that consists of 200 large-size companies listed on the Korean stock market. Its base value of 100 was set on 3 January 1990 and it comprises over 70% of the market value of the Korea Composite Stock Price Index (KOSPI). It is also one of the most actively traded indices in the world. Therefore, it is considered a representative sample of firms for the analysis of public firms in Korea. The list of indexed firms is updated every year and approximately 10% of borderline firms are replaced. To secure a large number of panel samples, I constructed a list of all the firms that were included in

the index in any year between 2000 and 2007 and collected data for all of them for the entire period, 2000–2007. In doing so, I assumed that firms which were included in the index at least once would be more or less homogeneous with the group of firms currently included in the index given that they are not far from meeting the conditions required by the index. However, if firms were excluded from the index in those years because of delisting, I dropped these samples from the database to avoid any noise introduced by firms that did not meet the KOSPI 200 standard for any reason. In sum, I used 319 Korean firms' balanced panel data for 2000–2007.

I collected variables from two different sources and combined them to construct the database. First, I hand-collected the variables on D&O insurance and the corporate governance factors from each company's annual report. The annual report submitted by individual companies to the Financial Supervisory Service is the only source of these variables in Korea. For D&O insurance, I collected insurance coverage. The corporate governance variables gathered from the annual reports are board independence (the proportion of outside directors on the board) and board ownership (the number of shares owned by the company's board members). Second, I collected accounting variables from the database Kisvalue, the Korean business data provider. The accounting data include total assets, total liabilities, net income, return on assets, and stock price. The data from different sources were merged based on the unique company codes that are common in databases.

3.3.2. Empirical Design

This study employs a DID model in which class action law is an exogenous and heterogeneous treatment to which only those firms with total assets over the KRW 2 trillion threshold are exposed. I graphically tested that the movements in insurance coverage were parallel in the two groups of firms (exposed and not exposed) before the

introduction of the class action law. I present the results in section 4.1. Based on this, I assume that expected changes in insurance coverage would have followed a parallel trend in the two groups of firms in later periods had the law not been enacted. The base DID model is as follows:

$$\Delta Cov_{it} = \alpha + \beta \cdot Over_i + \gamma \cdot \Delta I_{it} + \varepsilon_{it} \quad (1)$$

where:

$$Over_i = \begin{cases} 1 & \text{if Total Assets} \geq \text{KRW 2 trillion in 2005} \\ 0 & \text{if Total Assets} < \text{KRW 2 trillion in 2005} \end{cases}$$

Cov_{it} is the amount of insurance coverage purchased by firm i in year t . $Over_i$ is the dummy indicator that shows whether firm i has an asset size that leads them to be exposed to shareholder class actions and is equal to 1 if the firm has assets over the threshold. I_{it} comprises the control variables, defined in the next sub-section (3.3.3).

To address the concern of serial correlation in using the DID model for many years of panel data, I follow Bertrand et al.'s (2004) suggestion to average the variables before and after the treatment and run regressions with the averaged variables. By using the averages, I am able to discount the time-series information in computing standard errors and therefore avoid possible serial correlation problems (Bertrand, et al., 2004). According to Bertrand et al. (2004), this simple solution works in cases in which laws are passed at the same time for all treated individuals and my data set meets this condition. I used the differences between the averages before the law and the averages after the law to include fixed effects. Therefore, both the outcome and independent variables in equation (1) are summarized in single numbers that represent the change

between the averages of the variables in the pre-class action law period and the averages in the post-class action law period. The calculations are as follows:

$$\Delta Cov_{it} = \frac{1}{2} \sum_{t=2004}^{2005} (Cov_{it}) - \frac{1}{2} \sum_{t=2002}^{2003} (Cov_{it})$$

$$\Delta I_{it} = \frac{1}{2} \sum_{t=2004}^{2005} (I_{it}) - \frac{1}{2} \sum_{t=2002}^{2003} (I_{it})$$

Estimating the coefficient of $Over_i$ using differences in dependent and independent variables implies that I control for any time-invariant and unobserved variables.

In the analysis, I first ran regressions as in equation (1) for entire samples including both D&O insurance-purchasing firms and non-purchasing firms. In the data set, D&O coverage is coded as 0 if a firm did not buy the insurance in that year. Therefore, if there were firms which started to buy the insurance within the data period, this is captured in the variable, ΔCov_{it} . However, to avoid any possible overstatement of the regression outcome and also to see where there was an increase in insurance demand because of the law change among the firms which had already purchased the insurance, I also ran regressions using purchasing firms' data only. The firms which bought D&O insurance throughout the four-year period are classified as purchasing firms. In additional regressions, I adopted insurance coverage scaled by firm size as the outcome variable to control better for firm-size effect in insurance coverage. I also ran regressions with the logarithm of insurance coverage.

I ran two robustness tests. First, I employed the regression discontinuity design, running the DID model with the samples around the asset threshold of KRW 2 trillion. This addresses the concern that the litigation risk shock is not exogenous. For example, if there were non-measurable underlying demand for the law from the public, it could mean that there was increasing interest among stakeholders about the possibility of

initiating corporate litigation. This could gradually have been increasing the risks of other types of litigation even before the shareholder class action law was enacted. In that case, as it is likely that litigation risks would first increase for larger firms, there is a concern that the results could be driven by the heterogeneity of firm size in the control and treatment groups. Estimating the coefficients of equation (1) after excluding firms with asset sizes at each extreme is expected to present a more precise causal relationship between the law change and D&O insurance demand given that the most important firm characteristic, firm size, diverges less in the two groups.

In the second robustness test, I extended the pre- and post-law windows to longer time periods. Specifically, in the main analysis the window was two years before and after the enactment of the law, extended to three years and then to four years. In the three-year window regression, the pre-law period was defined as 2001–2003 and the post-law period as 2004–2006. The four-year window extended the periods further to 2000–2003 and 2004–2007 for the pre- and post-law periods respectively. Using wider time windows before and after the institution of the law shows whether its effect on insurance demand is sustained or only temporary. It also tests whether small firms follow large firms' insurance purchase trends as time passes, even though they are not subject to the law. They might do so solely because greater insurance coverage is seen good and prudent practice, in which case it may not be that insurance demand is caused by increased risk. Also, by including a longer term after the law, it is possible to smooth out any insurance coverage changes that occurred due to other possible influencing factors which coincided with the change in the law.

3.3.3. Description of Variables

The key variables used in my analysis are defined and explained in this section.

Insurance Coverage. The dependent variable is the D&O insurance coverage that a company chooses to buy in a given year. It shows the maximum amount that an insurance company will have to cover in the case of litigation and is a continuous measure expressed in Korean currency, Won (KRW). This is a direct observation of an individual firm's insurance demand. There may be over- or under-insurance issues for various reasons. However, based on the belief that firms carefully choose the level of coverage and also due to the impossibility of measuring issues such as these, I assume that the amount of coverage purchased in each firm best represents their demand for D&O insurance. I employed a range of control variables to account for factors that could potentially affect insurance coverage.

Class Action Law. The treatment variable is a dummy variable that identifies the firms that are subject to shareholder class action law from 2005. This takes a value of 1 if a firm has assets over KRW 2 trillion and 0 otherwise.

In the regressions, I included the following control variables:

Size. Mayers and Smith (1990) hypothesize that company size is negatively correlated with insurance demand because small firms are more concerned about costs and less likely to have internal talent to manage them. However, focusing on D&O insurance demand, Core (1997) argues that larger firms are exposed to greater risk of litigation and therefore have higher demand for insurance. He finds supporting evidence that larger firms purchase significantly higher insurance coverage; he also argues that only the fact that insurance coverage as a proportion of firm size decreases with larger firm size is consistent with Mayers and Smith (1990). Many other studies point out that firm size is an important determinant of corporate insurance demand (Core, 2000; Hoyt & Khang, 2000; Regan & Hur, 2007; Yamori, 1999; Zhu, et al., 2011; Zou & Adams, 2006; Zou, et al., 2003). Following the previous studies, I define firm size in terms of total assets.

To allow a more flexible (non-linear) relationship between insurance demand and firm size, I also included squared and cubed assets in the regressions.

Debt Ratio. A higher debt ratio implies that the firm has less flexibility to respond to economic and business shocks and is more likely to experience conflicting interests between debtholders and equityholders (Regan and Hur, 2007; Yamori, 1999). This indirectly increases the risk of litigation and is therefore expected to induce firms to increase insurance purchase. The debt ratio is measured by the proportion of total liabilities to total assets.

Growth Opportunity. Compared to those in entities with fewer new opportunities, managers in higher growth opportunity firms have more decisions to make and are given greater discretion, and their decisions are less transparent (Smith & Watts, 1992). Therefore they are exposed to higher litigation risks and higher demand for D&O insurance. Growth opportunity is also a factor in agency conflict issues that increase the underinvestment problem (MacMinn, 1987; MacMinn & Garven, 2000; Mayers & Smith, 1982) and eventually result in high insurance demand. I used Tobin's Q to capture the growth opportunities of firms.¹² Tobin's Q is defined as the ratio of the sum of the market value of equity and the book value of liabilities and the sum of the book value of equity and the book value of liabilities. The market value is calculated as the book value of assets minus the book value of equity plus the market value of equity.

Ownership Concentration. Many corporate insurance theories argue that if shareholders can hold well-diversified portfolios, insurance purchases for specific firms are unnecessary from their point of view (Mayers and Smith, 1982; MacMinn, 1987). Therefore, how concentrated a firm's ownership is signals how much its shareholders are exposed to firm-specific risks. The more concentrated a firm is the higher the

¹² Tobin's Q is the ratio of the financial market's valuation of the firm and the firm's current asset replacement cost. It shows how optimistic the market is about the firm's future performance and therefore is an indicator of anticipated returns. In many empirical studies, it is widely used as a proxy for future growth opportunities.

expected demand for insurance. However, for this specific type of insurance, if concentrated ownership implies improved monitoring of management and lower possibility of managerial misbehavior, it may mean lower insurance demand from concentrated firms. I define ownership concentration as the sum of the three largest shareholders' stakes.

Board Ownership. The size of the stake held by the board can influence insurance demand just as ownership concentration may influence insurance demand. In general, the board makes important decisions including those related to the purchase of insurance. If their stake in the firm is large, there are fewer opportunities for them to diversify their portfolio and they are exposed to company risks (Mayers and Smith, 1982). Therefore, the larger the ownership stakes of the board the greater the demand for insurance. On the other hand, large shareholders are assumed to have resources and motivations for intensive monitoring, decreasing the probability of being sued; therefore, they might not need so much insurance. In this case, insurance demand is lower in firms with concentrated ownership.

Board Independence. As outside directors are exposed to similar litigation risks as inside directors, while compensation is much lower, they have a strong preference to sit on a board where their activities are insured by D&O insurance. In line with this, many previous studies (Baker & Griffith, 2007; Core, 1997) argue that companies purchase D&O insurance to attract talented independent directors. Board independence is measured as the proportion of outside directors in the total number of board members. When a larger proportion of board members are independent directors, there is higher demand for insurance.

Stock Volatility. Annualized stock return volatility may indirectly influence litigation risk given that higher volatility has the potential to lead to stock price decline (Core, 1997), which is eventually associated with insurance demand.

Table 3.1 provides summary statistics of sample firm characteristics and the definitions of each variable.

3.4. Results

3.4.1. Preliminary Analysis

For DID models to be valid there should be a parallel trend in the outcome variable between the treatment group and the control group in the pre-treatment period. Figure 3.1 shows the results of the test of whether the trend in insurance demand in the two groups of firms was parallel before 2004. As D&O insurance coverage is greatly affected by firm size, the y-axis variable (D&O insurance coverage) is scaled by firm size which is proxied by total assets. The graph presents the trends in scaled insurance demand for firms with assets above (large) and below (small) KRW 2 trillion. As shown in the graph, the trend is parallel up to 2003 and starts to diverge from 2004, the year in which the shareholder class action law started to affect large firms' exposure to litigation risk. The demand appears higher for large firms in 2004 and 2005 as predicted in the hypothesis. Also, there was higher insurance demand from small firms from 2006 as the law became effective for all public firms.¹³ From the graph, I conclude that using the DID model is viable with my data set.

3.4.2. Differences-in-Differences (DID) Results

¹³ I believe the main reason that large firms' insurance coverage scaled by total assets appears to be on a decreasing trend from 2007 is because the size of large firms grew very rapidly in 2007 and 2008 under the new government, which implemented radical pro-market policies. For example, the size of large firms grew on average by KRW 350 billion before 2007, but their average growth was KRW 1,500 billion in 2007 and 2008. Therefore, insurance coverage scaled by total assets may not represent the true demand of large firms for these two years. At the same time, insurance coverage did not catch up with firm size growth promptly after a large increase in coverage between 2004 and 2006. The absolute amount of insurance coverage by year and the percentage change from previous year is presented in Figure 3.2 and Figure 3.3 in the Appendix.

Table 3.2 shows this chapter's main results. It contains the results of the estimation of equation (1) for four years of data, i.e., from two years before to two years after the law's enactment. This means that the two-year averages before the law (2002 and 2003) and the two-year averages after the law (2004 and 2005) were determined for each variable to establish the change (Δ) from the pre-law average to the post-law average and regress the change in D&O insurance coverage on the heterogeneous treatment dummy that is equal to 1 if the firm has assets of over KRW 2 trillion. The results in columns (1) to (4) were obtained using the data of all firms, including D&O insurance-purchasing firms and non-purchasing firms. For the results in columns (5) to (8), I ran the same regression using only D&O insurance-purchasing firms. Columns (9) to (12) show the results for the analysis of insurance-purchasing firm data only, in which I log-transformed the dependent variable, D&O insurance coverage, to estimate the regression. For all three sets of regressions, the first columns show the results for the analysis in which I did not control for other variables. The second columns show the results controlled for firm size by including change in total assets, and the third columns show the results allowing more flexibility in firm size control by including changes in squared and cubed total assets. In the fourth columns, the results are those including all control variables. These are differences between pre- and post-law averages of debt ratio, Tobin's Q, board independence, board ownership, ownership structure, board size, and volatility. The coefficients appear positive and significant in all regressions. The estimated coefficient in the most complete regression model that used all firm data including all control variables (column (4)) is $\beta=8.426$ ($t=4.53$) and it is statistically significant at the 0.01 level. This implies that the firms that were subject to the class action law from 2005 experienced an increase of KRW 8.426 million¹⁴ in D&O insurance coverage between the pre- and post-law periods compared to the firms that were not affected by the law. This is a substantial 120% increase from the average purchase in the pre-law period (KRW 6.97 million in Table 3.1). The fact that the

¹⁴ Approximately USD 7.557 million at the exchange rate of July 2013

coefficient is higher ($\beta=10.74$) in the regression of data set comprising the insurance-purchasing firms only (column (8), $t=4.53$, $p<0.01$) shows that after the law become effective, there was on average a greater increase of D&O coverage among the firms that were already purchasing the insurance. This may imply that there is often an insurance coverage increase among purchasing firms and the transition from non-purchasing firms to purchasing firms is less frequent.

In Table 3.3, I present the regression results using the dependent variable, D&O coverage, scaled by firm size and total assets (Coverage/Total Assets). As shown in previous studies, as well as in this chapter, firm size is the most powerful explanatory variable for insurance demand and the absolute amount of insurance coverage is highly correlated with firm size. To control for the firm-size effect in insurance coverage at a higher level, I scaled it by firm size and used it as the dependent variable. Columns (1) to (4) present the results of all firm regressions and columns (5) to (8) present the results of regressions on the sample of insurance-purchasing firms only. The coefficients are positive and significant in the models in which the total assets are controlled. This implies that insurance coverage as a ratio of total assets varies with firm size in this regression. In particular, in columns (4), (7) and (8), it is shown that coverage as a ratio of total assets is lower in larger firms. In other words, this reflects the fact that the standard deviation of insurance coverage is smaller relative to that of total assets. In the all-firms sample regression that controls for all variables (column (4)), the coefficient is $\beta=1.705$ ($t=2.09$) and statistically significant at the 0.05 level, which means that in firms under the influence of the class action law, insurance coverage as a fraction of total assets tended to increase 1.7 times more than in firms that were not affected by the law when the law was introduced. The coefficient is higher at $\beta=2.625$ ($t=1.84$, $p<0.1$) for the analysis excluding those firms that did not purchase the insurance. The results are consistent with those of earlier regressions in Table 3.2. Firms increase their D&O

insurance demand when they experience higher risk in relevant areas and the effect is larger for firms which were already purchasing this type of insurance.

3.4.3. Robustness Tests

3.4.3.1. Regression Discontinuity

As previously mentioned, firm size is the most critical determinant of corporate insurance coverage. To ensure that my results were not driven simply by the heterogeneity of firm size in the two groups of firms, I set up a regression discontinuity design that restricts the sample to those firms around the asset threshold of KRW 2 trillion. More importantly, the regression discontinuity design is expected to address the issue of the possibility that the litigation risk shock may not be perfectly exogenous as previously explained (see 3.2).

Table 3.4 presents the results of the analysis based on regression discontinuity design. To secure a sufficient number of firms to return meaningful regression results, the narrowest firm-size window was set to total assets of KRW 2 trillion \pm 40%. In columns (1) to (4), the sample comprises firms with total assets of KRW 2 trillion \pm 40% (i.e., total assets of between KRW 1.2 trillion and KRW 2.8 trillion). In columns (5) to (8) and (9) to (12), the samples are firms with total assets of KRW 2 trillion \pm 50% and KRW 2 trillion \pm 60% respectively. The coefficients of the treatment dummy, *Over2tn*, remain positive and significant in all regressions, consistent with the all-sample regression results. Also, the size of the coefficient remains quite similar to that of earlier results. For example, in the sample that is most clustered around the asset threshold, the firms with assets of over KRW 2 trillion tend to increase D&O insurance coverage by KRW 8.214 million more than firms that have assets below the cut-off point ($\beta=8.214$, $t=2.21$, $p<0.05$) when control variables are included (column (4)).

When comparing the coefficients from three different samples of firms, I find that the difference in insurance demand between firms with over KRW 2 trillion in assets and those with below KRW 2 trillion in assets is greatest in the sample of firms with assets of KRW 2 trillion \pm 40%. The fact that the difference appears to be the largest in the sample that is most clustered around the asset threshold implies that the causal relation found in econometrics is not just driven by firm size, but rather that the change in law has indeed caused increased insurance demand.

3.4.3.2. Three- and Four-year Window Models

In the main analysis, the data period adopted is two years before the enactment of the law and two years after it. Setting short time periods captures the effects of the law on insurance at the time of introduction. Expanding the time windows is expected to show whether the effect is persistent. It also captures whether the effect of increased risk is sustained within large firms even with the passing of time and as small firms observe large firms' insurance purchase trends. By including a longer term after the institution of the law, it is also possible to smooth out any insurance coverage changes that occurred as a result of other influential factors that coincided with the change in the law. I expanded the time periods to three years before and after the enactment of the law in Table 3.5 and to four years in Table 3.6.

In all of the models, the coefficients are positive and statistically significant, confirming the main results once more. The coefficients become larger as the time periods are expanded. In particular, the coefficients in the all-sample regression incorporating control variables are higher at $\beta=11.40$ ($t=5.85$, $p<0.01$) in the three-year window regression (Table 3.5, column (4)) and at $\beta=12.48$ ($t=6.17$, $p<0.01$) and in the four-year window regression (Table 3.6, column (4)) compared to $\beta=8.426$ in the two-year

window regression. This implies that the difference in insurance demand between those firms which are affected by the law and others grows as time passes.

In the three-year and four-year window data sets, the coefficients remain consistently positive and significant after controlling for firm size more strictly by scaling insurance coverage by total assets as well as in the regression discontinuity designs. I present these results in the Appendix.

3.5. Conclusion

In this chapter, I explore whether companies buy corporate insurance due to the relevant risks they face. While this hypothesis was rejected theoretically by Mayers and Smith (1982) and by many other researchers who followed their initiative, it has not been tested properly to date. Taking advantage of the exogenous litigation risk shock to which only some firms were exposed, I empirically tested the causal relation between litigation risk and D&O insurance demand using a differences-in-differences model.

The preliminary analysis shows that before the law was introduced, there was a fairly clear parallel trend in insurance demand between the two groups of firms, one of which would be affected by the shareholder class action law and one that would not. In the differences-in-differences model with fixed effects, I find that companies which are subject to the law increase their D&O insurance demand more than those firms which are not affected. The result is robust with different specifications in relation to the dependent variable, D&O insurance coverage, and various econometric models.

Based on the robust results, I conclude that corporate insurance demand is caused by the risks firms face in the business environment. This is reflection of the fact that in risky situations firms use insurance to protect themselves and thereby to protect shareholder

value. The findings in this chapter also partially support those in the previous chapter, which concluded that D&O insurance benefits shareholders more than managers.

I do not exclude the possibility that my findings are specific to Korean firms' D&O insurance demand. Also, I do not imply that risk concern is the sole motivation. There may be other concurring motivations that are related to corporate finance concerns such as underinvestment or taxes. This chapter's prime contribution is that it presents the first evidence of a causal relation between corporate insurance demand and the level of company risk, something which has long been rejected by many researchers.

Table 3.1 Summary Statistics

This table shows the summary statistics of sample firm characteristics. The sample consists of a balanced panel of 319 Korean public firms for the period 2000-2008. D&O Coverage, Ownership Concentration, Board Ownership, Board Independence are manually collected from each firm's annual report that is posted on The Financial Supervisory Service (<http://dart.fss.or.kr/>). I obtain other financial information from Kisvalue, a Korean company data provider. D&O Coverage is the amount of insurance coverage purchased by each firm expressed in millions of Korean Won.¹⁵ Total Assets is the book value of assets in billions of Korean Won. Debt Ratio is total liabilities over total assets. Growth Opportunity is proxied by Tobin's Q, which is calculated as the ratio of the sum of market value of equity and book value of liabilities and the sum of book value of equity and book value of liabilities. The market value is calculated as the book value of assets minus the book value of equity plus the market value of equity. Ownership Concentration is the sum of three largest shareholders' ownership as a percentage of the total number of shares outstanding. Board Ownership is the number of shares owned by board members as a percentage of the total number of shares outstanding. Board Independence is the ratio of independent outside directors over board size. Board size is the total number of directors on the board. Volatility is a measure that shows the stock return variation during 1 year. It is standard deviation of daily stock returns in that year multiplied by a square-root of the number of trading days. Over2tn is a dummy variable that is equal to 1 if the firm has total assets over 2 trillion Korean Won in 2005, and 0 otherwise.

Variable	Mean	Std. Dev.	Min	Max
D&O Coverage (KRW, mm)	6.97	17.46	0	200
D&O Coverage in purchasing firms (KRW, mm)	15.09	22.62	1	200
Total Assets (KRW, bn)	1990.08	5609.36	11.84	72519.22
Debt Ratio (Total Liabilities/Total Assets)	0.466	0.217	0.009	3.280
Growth Opportunity (Tobin's Q)	1.005	0.494	0.212	5.069
Ownership Concentration (%)	39.45	15.59	1.2	95.02
Board Ownership (%)	11.50	13.48	0	86.57
Board Independence (%)	30.80	15.18	0	87.5
Volatility (%)	55.93	20.76	0	244.99
Over2tn Dummy	0.189	0.392	0	1

¹⁵ 1 US dollar = 1,115 Korean Won at the exchange rate of July, 2013.

Figure 3.1 D&O insurance coverage scaled by asset size in small and large firms by year

In this graph, x-axis represents year and y-axis the D&O insurance coverage measured in millions of Korean Won scaled by the total assets measured in billions of Korean Won.

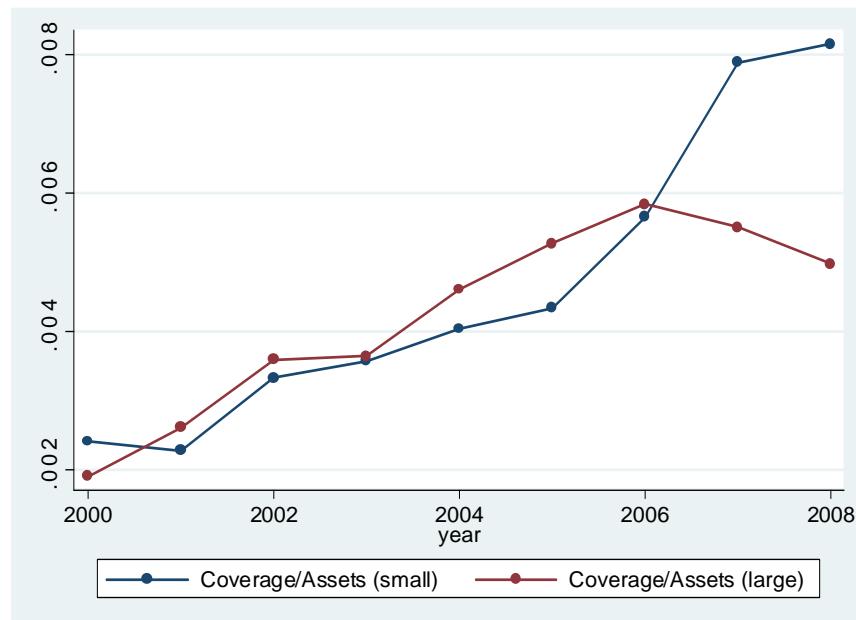


Table 3.2 Class action law and D&O insurance demand: 2 year windows pre- and post-law

This table shows results of the differences-in-differences analysis with fixed effects. Pre-law period is 2002-2003 and post-law period is 2004-2005. Dependent variable in column (1) – (8) is the amount of D&O insurance measured coverage in millions of Korean Won, and dependent variable in column (9) – (12) is log transformed coverage. Sample used in column (1) – (4) is all firms that include D&O insurance purchasing firms and non-purchasing firms. Sample in column (5) – (12) is insurance purchasing firms. For variable definitions, see Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Coverage in All Firms				Coverage in D&O Insurance Purchasing Firms				Log(Coverage)			
Over2tn	11.19*** (2.208)	5.398*** (1.679)	5.299** (2.537)	8.426*** (1.861)	11.30*** (2.142)	7.125*** (2.174)	10.87*** (2.221)	10.74*** (2.370)	0.351*** (0.0856)	0.374*** (0.100)	0.398*** (0.116)	0.443*** (0.135)
ΔTotal Assets		0.00554*** (0.00176)	0.00422 (0.00542)	-0.00464** (0.00213)		0.00381** (0.00190)	-0.00809*** (0.00265)	-0.00710** (0.00280)		-2.02e-05 (2.60e-05)	-0.000109 (0.000109)	-9.20e-05 (0.000124)
Δ(Total Assets)^2			1.48e-07 (1.45e-07)	3.51e-07*** (7.23e-08)			4.26e-07*** (8.08e-08)	4.02e-07*** (8.01e-08)			3.91e-09 (2.81e-09)	2.59e-09 (3.31e-09)
Δ(Total Assets)^3				-0 (0)			-0*** (0)	-0*** (0)			-0* (0)	-0 (0)
ΔDebt Ratio					8.794** (3.526)			15.71** (7.446)				1.083** (0.443)
ΔGrowthOpportunity						-1.123 (1.276)		-4.472 (2.765)				-0.0507 (0.153)
ΔBoard Independence						0.00793 (0.0365)		-0.0251 (0.0553)				-0.00167 (0.00613)
ΔBoard Ownership						0.00137* (0.000783)		0.147 (0.0921)				0.00626 (0.00686)
ΔOwnership Structure						0.0452 (0.0329)		0.0386 (0.0677)				0.00807* (0.00420)
ΔVolatility						-0.0365** (0.0146)		-0.0760* (0.0417)				-0.00738 (0.00459)
Observations	317	317	317	246	102	102	102	94	102	102	102	94
R-squared	0.260	0.525	0.564	0.648	0.272	0.467	0.632	0.685	0.163	0.167	0.177	0.291
Sample	All Firms				D&O Purchase Firms Only				D&O Purchase Firms Only			

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3.3 Class action law and D&O insurance demand: 2 year windows pre- and post-law using scaled insurance coverage

This table shows results of the differences-in-differences regression with fixed effects. Pre-law period is 2002-2003 and post-law period is 2004-2005. Dependent variable is the amount of D&O insurance coverage measured in millions of Korean Won scaled by total assets measured in billions of Korean Won in all columns. Sample used in column (1) – (4) is all firms including D&O insurance purchasing firms and non-purchasing firms. Sample in column (5) – (8) is insurance purchasing firms. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coverage/Total Assets in All Firms				Coverage/Total Assets in D&O Purchasing firms			
Over2tn	0.545 (0.444)	0.664 (0.493)	0.717 (0.608)	1.705** (0.816)	0.653 (0.736)	1.068 (0.804)	1.959** (0.926)	2.625* (1.429)
ΔTotal Assets		-0.000113 (0.000215)	-0.000364 (0.000919)	-0.00189** (0.000789)		-0.000378* (0.000218)	-0.00296*** (0.000883)	-0.00266** (0.00116)
Δ(Total Assets)^2			1.41e-08 (2.19e-08)	4.48e-08** (2.01e-08)			7.73e-08*** (2.32e-08)	6.52e-08** (3.21e-08)
Δ(Total Assets)^3				-0 (0)			-0*** (0)	-0* (0)
ΔDebt Ratio				2.414 (2.767)				-2.704 (4.796)
ΔGrowth Opportunity					-0.101 (1.576)			-1.909 (2.628)
ΔBoard Independence						-0.0429* (0.0254)		-0.0575 (0.0398)
ΔBoard Ownership						0.00105 (0.000923)		0.0613 (0.0629)
ΔOwnership Structure						0.0295 (0.0231)		0.0236 (0.0457)
ΔVolatility						-0.0328 (0.0288)		0.0445 (0.0515)
Observations	317	317	317	246	102	102	102	94
R-squared	0.002	0.003	0.003	0.039	0.007	0.021	0.070	0.120
Sample	All Firms				D&O Purchase Firms Only			

Table 3.4 Class action law and D&O insurance demand: 2 year windows pre- and post-law using regression discontinuity model

This table shows results of the regression discontinuity model. Pre-law period is 2002-2003 and post-law period is 2004-2005. Dependent variable is the amount of D&O insurance coverage in millions of Korean Won in all columns. Sample used in column (1) – (4) is firms that have assets size of 2 trillion Korean Won \pm 40% (that is, between 1.6 trillion and 2.4 trillion Korean Won). Samples in column (5) – (8) and column (9) – (12) are firms with assets of 2 trillion Korean Won \pm 50% and 2 trillion Korean Won \pm 60% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Coverage				Coverage				Coverage			
Over2tn	6.482** (2.503)	6.455** (2.663)	7.507*** (2.721)	8.214** (3.719)	5.575** (2.222)	5.538** (2.401)	6.525** (2.464)	7.287** (3.326)	6.075*** (1.950)	6.005*** (2.156)	6.760*** (2.270)	7.710** (2.985)
Δ Total Assets	0.000383 (0.00302)	0.0255 (0.0341)	0.00677 (0.0553)		0.000392 (0.00275)	0.0227 (0.0321)	0.00875 (0.0471)		0.000549 (0.00258)	0.0181 (0.0167)	0.0149 (0.0243)	
Δ (Total Assets) 2		-1.47e-05 (2.29e-05)	-9.87e-06 (3.50e-05)				-1.28e-05 (2.19e-05)	-1.14e-05 (2.99e-05)			-1.03e-05 (1.17e-05)	-1.23e-05 (1.55e-05)
Δ (Total Assets) 3		2.55e-09 (4.73e-09)	2.24e-09 (6.86e-09)				2.19e-09 (4.55e-09)	2.52e-09 (5.93e-09)			1.79e-09 (2.59e-09)	2.48e-09 (3.21e-09)
Δ Debt Ratio			13.15 (18.31)					11.42 (14.73)				8.543 (9.722)
Δ Growth Opportunity			-4.585 (4.809)					-5.241 (4.887)				-3.784 (4.353)
Δ Board Independence			0.0653 (0.148)					0.0803 (0.0688)				0.0329 (0.0519)
Δ Board Ownership			-0.224 (0.141)					-0.243* (0.127)				-0.217** (0.102)
Δ Ownership Structure			0.221 (0.151)					0.279** (0.122)				0.168** (0.0816)
Δ Volatility			-0.00531 (0.136)					-0.00376 (0.0640)				-0.0287 (0.0387)
Observations	38	38	38	33	50	50	50	43	66	66	66	57
R-squared	0.224	0.225	0.239	0.380	0.192	0.192	0.206	0.349	0.237	0.238	0.249	0.352
Sample	Assets 2tn \pm 40%				Assets 2tn \pm 50%				Assets 2tn \pm 60%			

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3.5 Class action law and D&O insurance demand: 3 year windows pre- and post-law

In this table, I replicate the analysis of Table 3.2 with 3 year windows pre- and post-law. Pre-law period is 2001-2003 and post-law period is 2004-2006.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Coverage in All Firms				Coverage in D&O Insurance Purchasing Firms				Log(Coverage)			
Over2tn	14.87*** (2.306)	9.386*** (1.685)	8.963*** (2.764)	11.40*** (1.949)	14.50*** (2.395)	10.09*** (2.263)	14.18*** (2.307)	14.63*** (2.833)	0.443*** (0.0980)	0.492*** (0.112)	0.565*** (0.134)	0.643*** (0.169)
ΔTotal Assets		0.00369*** (0.00108)	0.00303 (0.00437)	-0.00339* (0.00187)		0.00272** (0.00126)	-0.00657*** (0.00220)	-0.00669** (0.00257)		-3.03e-05 (2.26e-05)	-0.000194* (0.000103)	-0.000193 (0.000138)
Δ(Total Assets)^2			1.13e-07 (1.10e-07)	2.67e-07*** (5.29e-08)			3.28e-07*** (6.16e-08)	3.36e-07*** (6.39e-08)			5.66e-09** (2.53e-09)	5.37e-09 (3.42e-09)
Δ(Total Assets)^3				-0 (0)			-0*** (0)	-0*** (0)			-0** (0)	-0* (0)
ΔDebt Ratio					6.009* (3.204)			13.39 (10.88)				0.326 (0.530)
ΔGrowth Opportunity						-0.274 (1.063)		-2.685 (2.615)				0.00726 (0.169)
ΔBoard Independence							-0.0371 (0.0377)	-0.0729 (0.0685)				-0.0123** (0.00585)
ΔBoard Ownership							-0.00280 (0.00289)	0.107 (0.108)				0.00636 (0.00973)
ΔOwnership Structure							0.0258 (0.0317)	0.0486 (0.0699)				0.00589 (0.00489)
ΔVolatility							-0.0332* (0.0186)	-0.0323 (0.0493)				-0.00282 (0.00430)
Observations	319	319	319	251	102	102	102	86	102	102	102	86
R-squared	0.358	0.559	0.600	0.672	0.354	0.542	0.686	0.721	0.201	0.215	0.241	0.292
Sample	All Firms				D&O Purchase Firms Only				D&O Purchase Firms Only			

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3.6 Class action law and D&O insurance demand: 4 year windows pre- and post-law

In this table, I replicate the analysis of Table 3.2 with 4 year windows pre- and post-law. Pre-law period is 2000-2003 and post-law period is 2004-2007.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Coverage in All Firms				Coverage in D&O Insurance Purchasing Firms				Log(Coverage)			
Over2tn	17.33*** (2.421)	11.50*** (1.743)	11.31*** (2.470)	12.48*** (2.023)	19.19*** (3.089)	13.29*** (2.389)	15.81*** (2.735)	15.72*** (3.532)	0.538*** (0.117)	0.555*** (0.134)	0.544*** (0.164)	0.477*** (0.169)
ΔTotal Assets		0.00327*** (0.000636)	0.00252 (0.00319)	-0.00160 (0.00163)		0.00287*** (0.000477)	-0.000995 (0.00251)	-0.000897 (0.00342)		-8.60e-06 (1.12e-05)	2.79e-05 (0.000112)	0.000157 (0.000138)
Δ(Total Assets)^2			8.62e-08 (9.17e-08)	1.91e-07*** (6.04e-08)			9.16e-08 (1.25e-07)	1.04e-07 (1.58e-07)			-1.62e-09 (3.60e-09)	-5.79e-09 (4.95e-09)
Δ(Total Assets)^3				-0 (0)				-0 (0)			0 (0)	0 (0)
ΔDebt Ratio					4.789* (2.731)			10.48 (10.81)				-0.425 (0.739)
ΔGrowth Opportunity						0.910 (1.053)			-0.982 (2.791)			0.116 (0.189)
ΔBoard Independence							-0.0317 (0.0442)		-0.126* (0.0666)			-0.0158** (0.00638)
ΔBoard Ownership							-0.00220 (0.00451)		0.186 (0.164)			0.00572 (0.0109)
ΔOwnership Structure							0.0302 (0.0322)		0.0896 (0.0875)			0.00835 (0.00678)
ΔVolatility							-0.0422 (0.0279)		-0.0175 (0.0670)			-0.00161 (0.00506)
Observations	319	319	319	258	86	86	86	75	86	86	86	75
R-squared	0.397	0.601	0.618	0.679	0.435	0.708	0.737	0.762	0.231	0.233	0.234	0.310
Sample	All Firms				D&O Purchase Firms Only				D&O Purchase Firms Only			

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix

Figure 3.2 D&O insurance coverage in small and large firms by year

In this graph, x-axis represents year and y-axis the amount of D&O insurance coverage in millions of Korean Won.

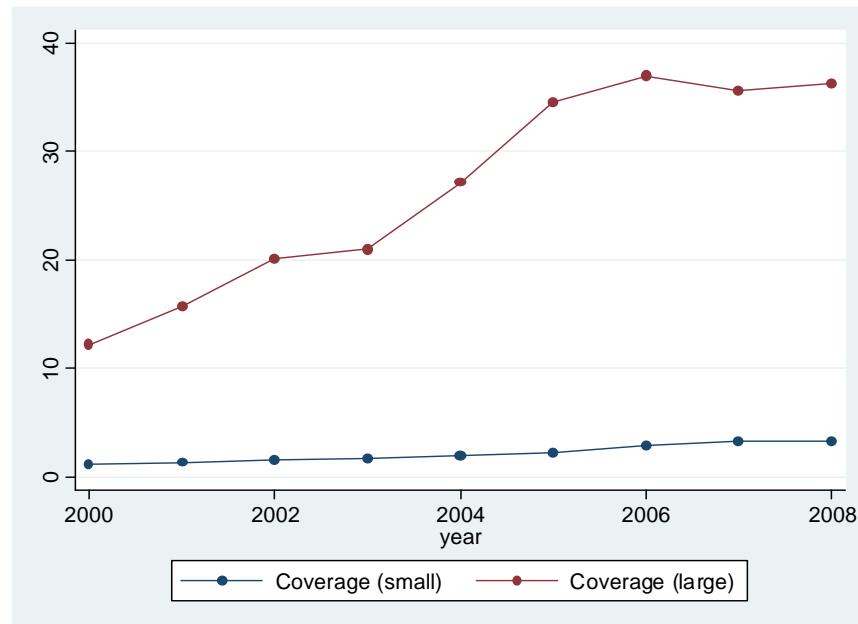


Figure 3.3 Percentage Change of D&O insurance coverage from previous year

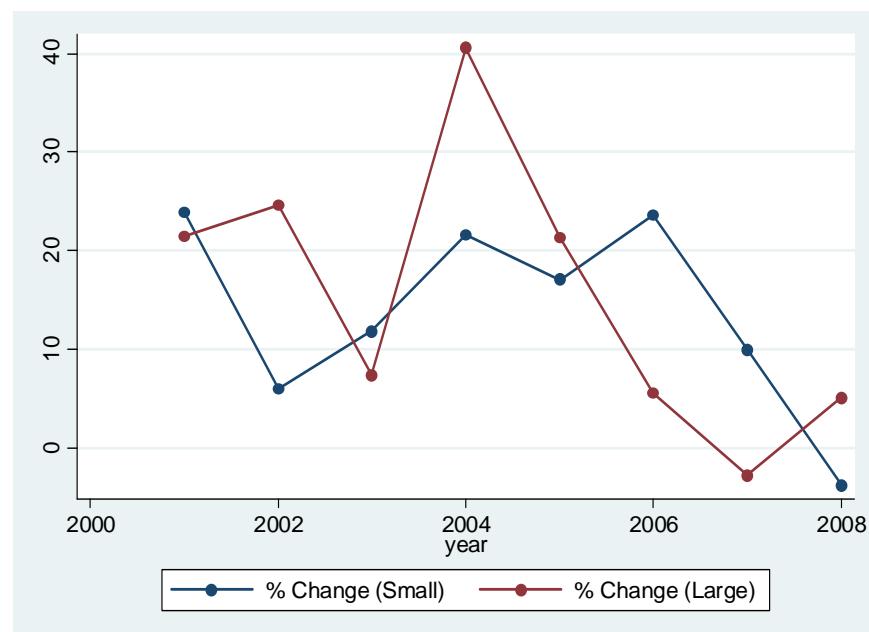


Table 3.7 Class action law and D&O insurance demand: 3 year windows pre- and post-law using scaled insurance coverage

In this table, I replicate the analysis of Table 33 with 3 year windows pre- and post-law. Pre-law period is 2001-2003 and post-law period is 2004-2006.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coverage/Total Assets in All Firms				Coverage/Total Assets in D&O Purchasing firms			
Over2tn	0.506 (0.490)	0.830 (0.528)	1.082 (0.665)	2.201*** (0.792)	0.473 (0.754)	0.983 (0.811)	2.227** (0.938)	3.234** (1.490)
ΔTotal Assets		-0.000218* (0.000132)	-0.000785 (0.000768)	-0.00181*** (0.000628)		-0.000314* (0.000162)	-0.00281*** (0.000668)	-0.00265*** (0.000951)
Δ(Total Assets)^2			2.14e-08 (1.81e-08)	3.97e-08** (1.56e-08)			7.05e-08*** (1.67e-08)	6.18e-08** (2.46e-08)
Δ(Total Assets)^3			-0 (0)	-0** (0)			-0*** (0)	-0** (0)
ΔDebt Ratio				-1.378 (3.271)				-4.363 (5.839)
ΔGrowth Opportunity				-0.0564 (1.173)				-0.604 (1.754)
ΔBoard Independence				-0.0602* (0.0346)				-0.0947* (0.0543)
ΔBoard Ownership				0.00227 (0.00292)				0.102 (0.0724)
ΔOwnership Structure				0.0610* (0.0320)				0.0159 (0.0433)
ΔVolatility				0.00271 (0.0272)				0.0633 (0.0459)
Observations	319	319	319	251	102	102	102	86
R-squared	0.002	0.004	0.006	0.054	0.003	0.024	0.095	0.166
Sample	All Firms				D&O Purchase Firms Only			

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.8 Class action law and D&O insurance demand: 4 year windows pre- and post-law using scaled insurance coverage

In this table, I replicate the analysis of Table 3.3 with 4 year windows pre- and post-law. Pre-law period is 2000-2003 and post-law period is 2004-2007.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coverage/Total Assets in All Firms				Coverage/Total Assets in D&O Purchasing firms			
Over2tn	-0.0618 (0.646)	0.384 (0.685)	0.845 (0.775)	0.702 (1.234)	0.648 (0.914)	1.143 (0.981)	2.422** (1.141)	3.391* (1.833)
ΔTotal Assets		-0.000250** (0.000122)	-0.00113* (0.000612)	-0.00139** (0.000676)		-0.000241* (0.000127)	-0.00285*** (0.000728)	-0.00240* (0.00129)
Δ(Total Assets)^2			3.34e-08** (1.57e-08)	2.93e-08 (1.86e-08)			8.71e-08*** (2.43e-08)	5.91e-08 (3.87e-08)
Δ(Total Assets)^3			-0** (0)	-0 (0)			-0*** (0)	-0 (0)
ΔDebt Ratio				-5.274 (4.247)				-5.029 (7.496)
ΔGrowth Opportunity				6.075* (3.316)				-0.690 (1.991)
ΔBoard Independence				-0.0123 (0.0534)				-0.128* (0.0695)
ΔBoard Ownership				0.00877 (0.00650)				0.0473 (0.0920)
ΔOwnership Structure				0.138* (0.0801)				0.0352 (0.0667)
ΔVolatility				-0.0415 (0.0480)				0.0870 (0.0623)
Observations	319	319	319	258	86	86	86	75
R-squared	0.000	0.002	0.006	0.134	0.005	0.022	0.099	0.189
Sample	All Firms				D&O Purchase Firms Only			

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.9 Class action law and D&O insurance demand: 3 year windows pre- and post-law using regression discontinuity model

In this table, I replicate the analysis of Table 3.4 with 3 year windows pre- and post-law. Pre-law period is 2001-2003 and post-law period is 2004-2006.

	(1)	(2)	(3) Coverage	(4)	(5)	(6)	(7) Coverage	(8)	(9)	(10)	(11) Coverage	(12)	
Over2tn	10.40*** (2.516)	10.40*** (2.604)	11.64*** (3.109)	13.83*** (4.691)	8.723*** (2.370)	8.760*** (2.498)	9.985*** (3.038)	10.80** (4.431)	9.319*** (2.077)	9.339*** (2.211)	9.893*** (2.441)	10.74*** (3.237)	
ΔTotal Assets		1.44e-05 (0.00225)	0.0251 (0.0278)	0.0336 (0.0451)		-0.000327 (0.00196)	0.0223 (0.0257)	0.0214 (0.0402)		-0.000136 (0.00183)	0.0111 (0.0139)	0.00994 (0.0205)	
Δ(Total Assets)^2			-1.52e-05 (1.77e-05)	-2.04e-05 (2.76e-05)			-1.39e-05 (1.67e-05)	-1.59e-05 (2.55e-05)			-7.09e-06 (9.25e-06)	-7.79e-06 (1.32e-05)	
Δ(Total Assets)^3				2.74e-09 (3.41e-09)	3.67e-09 (5.03e-09)			2.51e-09 (3.25e-09)	3.09e-09 (4.76e-09)			1.32e-09 (1.91e-09)	1.56e-09 (2.54e-09)
ΔDebt Ratio					-4.478 (15.91)			-1.049 (12.23)				0.262 (7.693)	
ΔGrowth Opportunity						-2.490 (6.264)		-1.240 (3.840)				0.638 (2.920)	
ΔBoard Independence							-0.0603 (0.171)		-0.00734 (0.0873)			-0.0334 (0.0612)	
ΔBoard Ownership							-0.121 (0.150)		-0.164 (0.166)			-0.163 (0.131)	
ΔOwnership Structure							0.139 (0.214)		0.136 (0.103)			0.0693 (0.0665)	
ΔVolatility							0.138 (0.157)		0.0198 (0.0729)			-0.0227 (0.0433)	
Observations	38	38	38	33	51	51	51	44	67	67	67	58	
R-squared	0.426	0.426	0.444	0.495	0.340	0.340	0.356	0.378	0.392	0.392	0.399	0.416	
Sample	Assets 2tn +/- 40%				Assets 2tn +/- 50%				Assets 2tn +/- 60%				

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.10 Class action law and D&O insurance demand: 4 year windows pre- and post-law using regression discontinuity model

In this table, I replicate the analysis of Table 3.4 with 4 year windows pre- and post-law. Pre-law period is 2000-2003 and post-law period is 2004-2007.

	(1)	(2)	(3) Coverage	(4)	(5)	(6)	(7) Coverage	(8)	(9)	(10)	(11) Coverage	(12)	
Over2tn	11.76*** (2.899)	11.76*** (2.945)	12.78*** (3.291)	15.91*** (5.486)	9.781*** (2.756)	9.805*** (2.864)	10.87*** (3.160)	12.56** (5.072)	10.62*** (2.416)	10.63*** (2.535)	11.26*** (2.726)	12.39*** (3.486)	
ΔTotal Assets		1.20e-05 (0.00192)	0.0185 (0.0210)	0.0461 (0.0389)		-0.000261 (0.00159)	0.0179 (0.0181)	0.0278 (0.0278)		-5.20e-05 (0.00150)	0.0104 (0.0125)	0.0151 (0.0166)	
Δ(Total Assets)^2			-9.64e-06 (1.18e-05)	-2.52e-05 (2.12e-05)			-1.04e-05 (1.03e-05)	-1.74e-05 (1.63e-05)			-6.10e-06 (7.28e-06)	-9.04e-06 (9.80e-06)	
Δ(Total Assets)^3				1.47e-09 (2.01e-09)	4.07e-09 (3.46e-09)			1.70e-09 (1.72e-09)	3.02e-09 (2.79e-09)			1.01e-09 (1.27e-09)	1.57e-09 (1.71e-09)
ΔDebt Ratio					-1.074 (14.40)				1.118 (11.78)			-0.805 (9.151)	
ΔGrowth Opportunity						4.152 (6.447)			3.591 (5.385)			3.722 (3.835)	
ΔBoard Independence							0.0716 (0.206)		0.00621 (0.107)			-0.0218 (0.0874)	
ΔBoard Ownership							-0.184 (0.226)		-0.197 (0.219)			-0.0843 (0.190)	
ΔOwnership Structure							0.130 (0.209)		0.175 (0.154)			0.0900 (0.110)	
ΔVolatility							0.0263 (0.153)		-0.00207 (0.0951)			-0.0265 (0.0701)	
Observations	38	38	38	33	51	51	51	44	67	67	67	58	
R-squared	0.406	0.406	0.419	0.455	0.313	0.313	0.328	0.355	0.368	0.368	0.375	0.384	
Sample	Assets 2tn +/- 40%				Assets 2tn +/- 50%				Assets 2tn +/- 60%				

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Conclusion

This thesis consists of three self-contained empirical essays on related aspects of corporate governance concerning employees, managers and shareholders in the Republic of Korea. In contrast to the Anglo-Saxon countries, which have provided the basis for the great majority of empirical studies, Korean firms tend to have heavily concentrated ownership and the blockholders, who are founders or close family of founders, are usually very influential actors in corporate management, as in many East Asian countries. By studying three different aspects of Korean firms, this thesis aimed to add knowledge to the understanding of firms with strong owner-managers and how they relate to employees and to shareholders, which is an under-studied topic in corporate governance literature. The three chapters have examined employee influence on executive pay and the use of professional liability insurance to protect the interests of shareholders and other stakeholders.

Chapter 1 examined one aspect of the shares of company revenues going to employees and top managers. Specifically, it empirically tested organized employees' influence over the level and structure of executive compensation in Korean firms. Employee voice and power are measured by the presence of labor union and unionization rates. Due to the presence of strong and active labor unions in Korean firms and the general tendency that employees prefer equity at work, it was hypothesized that executive compensation would be lower if employees had an established voice mechanism and labor union, and if that union achieved high rate of membership among employees. Additionally, the negative correlation was expected to be stronger than in the US or other Western countries because of the paternalistic employment relationship that stems from the family firm tradition as well as the collectivistic culture that emphasizes emotional solidarity more than individual achievement.

In regression analyses, I first showed that labor union existence and rate were both negatively associated with cash compensation. Additionally, I found that such negative association is progressively stronger with executive pay at the upper percentile, which means that labor unions play a role in compressing the range of executive cash compensation and maintaining a higher level of equality with employee payments. Secondly, I found that labor union existence has a strong negative correlation with stock option use in executive compensation, but union rate does not. It implies that union existence is a more critical determinant than how strong the union is and, by the fact that a firm has an organized union, it may become more difficult for it to adopt executive stock option schemes. In conclusion, employees play a role in reducing total executive compensation when they are organized in labor unions, and they can effectively suppress the introduction of new methods of payment, such as executive stock options, achieving greater equality in pay. The degree and extent of employee influence over executive pay were found to be stronger than in US firms as was predicted based on the institutional traits of Korean firms.

This chapter expanded the scope of the standard agency theory, by suggesting that the interests of other stakeholders than shareholders may need to be incorporated in executive compensation study. To date, executive compensation research has heavily focused on the relationship between shareholder and executives. This chapter contributes to an increasing number of studies that consider a wider range of stakeholders, and their influence on executive compensation decisions. This chapter was motivated by the question as to whether one of the important groups of stakeholders, namely employees, could play such a role in executive compensation decisions, and it provided empirical evidence in response to the question. This chapter also provided useful knowledge to the ongoing discussion of employee representation on executive compensation committees. There are prevalent discussions from the 2008 financial crisis: whether it is fair that executives receive such

high compensation while their employees suffer from layoffs and wage concessions. Regarding the issue, several think tanks (Carley, 2011; High Pay Commission, 2011; PIRC, 2013) insist that employee representation is required on compensation committees to constrain executive pay. However, the findings in this study question if such regulatory enforcement of employee representation is strictly required while autonomous employee action can influence executive compensation. By testing that stakeholders other than shareholders can influence executive compensation, this study invites further research on other stakeholders that have not drawn much attention so far, such as government or media.

In Chapter 2, I examined one aspect of the protection of shareholders by testing whether the corporate demand for directors' professional liability insurance, D&O insurance, would be lower in owner-managed firms. Because the D&O insurance premium is paid by the corporation (shareholders) not by directors and officers, even though it primarily protects these people, other corporate-governance related benefits that shareholders can draw from this insurance were frequently discussed in previous studies. Many of them concerned its usefulness as a tool to reduce agency costs under the condition of the separation of ownership and management, incentivizing managers to be more risk-taking, attracting highly qualified managers and protecting shareholders from information asymmetry *ex post*. The discussions are heavily reliant on the assumption that there is a known gap between the interests of shareholders and managers.

I hypothesized that, because such functions of D&O insurance other than pure litigation coverage are less useful in cases where there are few interest conflicts, firms that rarely suffer from agency issues should demand the insurance less. I focused on owner-manager firms where one of the largest shareholders undertakes the role of CEO, considering that there is little agency issue and tested the hypothesis. As noted earlier, because Korea has a strong owner-manager tradition even in very large firms and business groups, the data from

Korean firms offer an appropriate sample to test this hypothesis. I found that the insurance demand was negatively correlated with the presence of an owner-manager. Both the probability of purchase and the size of insurance coverage were lower in owner-managed firms. The price of insurance measured by the ratio of insurance premium to coverage also showed negative coefficient to the presence of an owner-manager, implying that owner-ownership signals lower litigation risks.

This chapter focused on the fact that the use of D&O insurance may be different in owner-managed firms compared with that in the firms under separated ownership and control, and tested it empirically. There have been doubts about the monitoring ability of blockholders because they can also suffer from free-riding issues among them, despite the high incentive to monitor management. The results in this chapter imply that blockholders' monitoring might be effectively activated in cases where the blockholders also have managerial authority, as in many East Asian countries. They also imply that there are fewer agency conflicts between shareholders and executives in owner-managed firms, as predicted, and therefore these firms demand less of an expensive tool meant to help to monitor or incentivize management. This also suggests that the standard setup in agency theory, namely information-lacking shareholders and powerful executives, is not an appropriate basis for analysis of concentrated ownership firms that are controlled by major shareholders. This is a valuable finding given that ownership structure and corporate governance of firms in a majority of the countries are closer to the concentrated ownership firm model than to the Anglo-Saxon model.

In Chapter 3, I examined whether Korean firms demand higher corporate insurance to lower expected costs of risk and to protect themselves when corporate risk goes up. Chapter 2 implicitly assumed that insurance is purchased partly due to risks in owner-managed firms, and I investigated this more thoroughly in this chapter. Increased firm risks threatens firms'

growth, performance or even survival, therefore all types of stakeholders have to face higher risk. Therefore, for firms, as legal entities, it might be optimal to increase the demand for insurance if risk is the source of insurance demand. Especially in Korean firms, if corporate decisions reflect the preference of founding family, it is likely to show increase in insurance demand because owners cannot easily exit from their ownership. I ran a natural experiment using the Korean Government's legislative change as an exogenous shock to corporate risk, and provided empirical evidence that firms increase their insurance demand when they are exposed to increased risks. More specifically, in a differences-in-differences model, I found that the firms that were subject to the law between 2005 and 2007 increased the insurance demand significantly during the period compared with the firms that were free from class action law. The result is statistically significant and robust in various econometric specifications.

Given the design of the experiment in this chapter, the findings can be generalized further to understand the source of firms' demand for insurance. There is an extensive discussion in insurance research on the motivation of corporate insurance purchase. It suggests various reasons, such as tax concerns and corporate finance structure issues, and argues that, unlike for individuals, risks may not be the main source of corporate insurance demand for firms. However, the results in this study clearly show that, at least in Korea, firms are indeed motivated to buy insurance due to their risks. It provides an answer to the fundamental question in corporate insurance research: does the risk that companies face increase corporate insurance demand? To the best of my knowledge, my study provides the first empirical evidence that increased risk results in increased insurance demand by firms, which may be the main contribution of this chapter. This finding has value because it does not appear to be the result of the most likely data limitations for which I tested. The causal

relationship shown in the natural experiment was made possible by the unique Korean firm data and the Korean Government's regulatory change.

This thesis studied three aspects of Korean firms: employees' influence over managerial pay, presence of owner-manager and demand for corporate insurance, and corporate insurance demand and company risk. Overall, I showed that stakeholders in Korean firms interact with each other and react to given circumstances in a way that theoretically developed hypotheses predict, implying that they behave more or less efficiently in their own way. They reacted to employees' requests for the feeling of equity at work by reducing executive compensation, which might be optimal given the strong union and paternalistic employment relations. They also adjusted their demand for a costly monitoring and incentivizing tool based on their monitoring ability, and reacted to increased risk by increasing insurance demand. The hypotheses in this thesis were constructed based on the idea of agency theory; however, it required some conceptual transformation. In the first chapter, I introduced a third party, employees, to the much discussed dyadic shareholder-manager relationship. In the second, I separated the role of owner-managers from that of other types of blockholders. In the third, I showed that an issue that has been considered deeply related to agency costs could be the result of issues other than agency problems. It required some degree of understanding of the institutional background in the country and suggests further need to create research designs that are suitable to each country's business environment.

In all studies based on data from a single country, one has to ask whether the findings can be generalized to other countries. Part of the motivation for looking at the Korean case was that certain institutional features of corporate governance in many Korean firms differ from those common in Anglo-Saxon economies. This suggests that care is needed when seeking to generalize to other countries. Nevertheless, although this was not an international comparative study, its results show the theoretical and empirical importance of these

institutional variables, notably employee influence and ownership structure. These would need to be taken into account in such a study. It should also be added that Korea is an important OECD economy and that several of the institutional differences with respect to Anglo-Saxon economies are also features of other major Asian economies.

All of the studies in this thesis rely on the data set from KOSPI 200 companies during the period between 1998 and 2010. The contributions made by the three chapters rely heavily on this unique data set. I constructed the longest panel data on Korean public firms' executive compensation, labor unions and D&O insurance purchase. All of the main variables related to the three topics were collected from the time-consuming manual work of examining each firm's annual report for each year and locating and collecting the numbers. This dissertation's contribution may also reside in the potential of this data set's further use in future research.

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