Three essays on corporate governance in Korea

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Declaration

This is to verify that the work presented in this doctoral thesis and submitted for examination is mine alone

KeunJung Lee

To my mother (BunJa Choi, 1941-2008) in God

Mom, I love you & I miss you

Acknowledgments

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Abstract

Essay 1: Corporate Governance and Firm Value

This study re-examines how ownership structure and conflicts of interest among shareholders affected corporate valuation under a poor system of corporate governance that offered poor legal shareholder protection prior to the East Asian Economic Crisis. The data is from 1,892 publicly traded firms in the Korean economy, during 1988–1997. Ownership structure is included for unlisted firms in terms of pyramid and cross-holding structures. Higher valuations are not found when the largest shareholder owned more cash flow rights. However, the divergence between cash flow rights and the control rights of ultimate shareholders in pyramid ownership and cross-holding ownership structures is associated with a negative entrenchment effect. The conflicts inherent to this ownership structure that expropriates the minority shareholder and agency cost increased approaching the East Asian crisis year.

Essay 2: Ownership Structure, Investment and Firm Valuation in Korean Companies

There has been a robust debate surrounding the causes of the East Asian Economic Crisis of 1997 and this study develops and builds upon these results. This chapter examines how ownership structures with conflicts of interest among shareholders and under a system of weak corporate governance affects investment, in terms of both capital and research and development (R&D). The sample is from 1,892 publicly trading firms in the Korean Stock Exchange, during the period 1988–1997.

I find that divergence between control rights and cash flow rights is associated with over-investment in capital expenditure. These rights affect innovation in R&D, though the effect on capital expenditure and R&D spending are in opposite directions within Korean firms, prior to the East Asian Economic Crisis. These results imply that the ownership structure in the context of a poor governance system encourages 'empire-building' and the neglect of investment in firm innovation. Furthermore, I find that debt financing is more important than cash flow-investment sensitivity. This affected investment in both affiliated firms and independent firms in the process of financial liberalisation and deregulation during the 10 years prior to the East Asian Economic Crisis.

Essay 3: Ownership Structure, Diversification and Firm Value in Korean Companies
This study analyses the diversification effect of ownership structure and compares the effect of diversification on the performance of Korean affiliated firms (top 30 *Chaebol*) with its effect on independent firms in 10 years of panel data (1988-1997). The divergence between the cash flow rights and the control rights of ultimate shareholders affects firm diversification. Group affiliated firms have stronger a agency cost problem than creating internal capital market during the 10 years sample period but diversification for independent firms create the advantage for internal capital market in less developed capital markets. Additionally, I find the divergence between control rights and cash flow affects the diversification, diversification affects corporate value, but firm value does not affect the ownership structure in a 2SLS test.

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Chapter 1: Corporate Governance and Firm Value

1. Introduction

The focus of this study is the effect of ownership structure on firm valuation when there are agency problems arising from poor corporate governance. I develop and extend the research of recent major articles (Claessens *et al* 2002, Mitton 2002, Lemmon and Lins 2003) that analyse corporate ownership structures in East Asian countries, and focus on the relationship between ownership structure and firm valuation in Korea during its economic development from 1988 to 1997 inclusive.

Corporate governance systems have received an increasing amount of attention from academics, government, the popular press and businesses. Much of this attention has focused on differences between the U.S. and U.K. system, and Germany and Japan among the developed countries before the East Asian Economic Crisis of 1997. The corporate governance system found in both the U.K. and the U.S. is generally characterised as a market-based system. These capital markets are liquid and company ownership is relatively well spread. Managers are supposedly monitored by an external market for corporate control and by boards of directors, of which the majority of members are independent of the company. The German and Japanese governance systems, in contrast, are characterised as bank-based systems: firms have concentrated ownership with relatively illiquid capital markets. Managers in these countries are monitored by a combination of banks, large shareholders and other inter-corporate relationships that are maintained over long periods. An external market for corporate control is small, if not altogether absent (Kaplan 1995).

During the East Asian Economic Crisis period studies (Shleifer and Vishny 1997, La Porta *et al* 1998) began to analyse corporate governance structures around the world. They found that in economies with very good shareholder protection, relatively few of the shares of firms were widely held; a conclusion which was in stark contrast to Berle and Means' (1932) conception of ownership in the modern corporation. Such firms are typically controlled by certain families or the state and equity control by financial institutions or other widely held corporations is less common (La Porta *et al* 1999, Claessens, Djankov and Lang 2000, Denis and McConnell 2003). Faccio and Lang (2002) analyse the ultimate ownership and control of firms in 13 western European countries, distinguishing those that are widely held (36.93%) or family-controlled (44.29%). Widely held firms are more common in the U.K. and Ireland, whereas family-controlled firms are more common in continental Europe. Gadhoum *et al* (2005) further strengthen the point by tracing the controlling shareholders of all U.S.-listed corporations. Their argument illustrates that 'at the 10% control threshold, 59.74% have controlling shareholders; 24.57% are controlled and managed by a family (the same percentage as in Asia), 16.33% are controlled by a widely-held financial institutions (close to the percentage in Europe and Asia), and 13.55% are controlled through family trusts. In the top 30, top 250, top 500 and in every quintile range, the US has more corporations controlled by families than by financial institutions'.[1]

It should be noted that corporate governance mechanisms consist of economic and legal institutions that can be altered through the political process. In particular, the

[1] Gadhoum *et al* (2005: 340)

issue of minority shareholder protection is relevant (Burkart and Panunzi 2006, Claessens and Fan 2003, Doidge *et al* 2004). Burkart *et al* (2006: 2170) insist that 'in the regimes with the strongest legal protection of minority shareholders, the optimal solution for the founder is to hire the best professional manager and sell off the entire firm in the stock market—unless his amenity potential of keeping control in the family is huge. This gives rise to the Anglo-Saxon model, in which the law is the principal constraint on managerial discretion and the agency conflict is between the manager and small minority shareholders. With intermediate protection of minority shareholders, the founder still hires a professional manager, but the law is not strong enough to control managerial discretion, and the founder or his children must stay on as large shareholders to monitor the manager'.

The question that transpires from the current literature is not one of agency conflicts between managers and controlling owners, but rather between the controlling and minority shareholders. Who prevents controlling families from expropriating minority shareholders, especially in countries where minority shareholders have weak legal protections and family control is even more common? Thus, specific questions that can arise are:

1. Who monitors the families?
2. What role is played by the market in countries with concentrated family ownership?

Several studies establish a link between corporate governance systems and firm valuation in contexts with poor corporate governance. In East Asian emerging market

countries, a substantial number of firms are owned and managed by controlling families. Claessens, Djankov and Lang (2000) investigated the separation of ownership and control in publicly traded firms in nine East Asian countries and found that voting rights frequently exceed cash flow rights via pyramid structures and cross-holding. Claessens *et al* (2002) also found that firm value increases with the cash flow ownership of the largest shareholder, but falls when the control rights of the largest shareholder exceed his or her cash flow ownership. Johnson, Boone, Breach and Friedman (2000) found that the effectiveness of protection for minority shareholders in 25 emerging markets explains more of the variation in exchange rate and stock market performance during the East Asian Economic Crisis. Using a sample from five East Asian countries, Mitton (2002) also shows that better stock price performance is associated with firms that have lower inside ownership. Lemmon and Lins (2003) studied firms in eight East Asian countries during the region's financial crisis and found that the crisis period stock returns of firms in which managers had high levels of control rights but had separated their control and cash flow ownership were 10–20 percentage points lower than those of other firms. This empirical evidence demonstrates that there is a significant relationship between controlling family ownership and firm valuation.

However, these existing studies (Claessens *et al* 2002, Mitton 2002, Lemmon and Lins 2003) contain limited information *vis-à-vis* pyramid structures and cross-holdings among firms, because their data cover only listed firms in the sample of East Asian countries.[2] Therefore, estimated data of only listed firms may create a bias in terms of ownership structures and firm valuation. Unlisted firms could have direct

[2] For example, the three biggest business groups in Korea—Hyundai, Samsung, and LG (Lucky Goldstar)—had 46, 55, and 48 affiliated firms at the end of 1996, respectively. Of those, only 16, 14, and 11 were publicly listed, respectively.

and indirect ownership links with listed firms, resulting in a possible underreporting of their measures for ultimate control and ownership, since they assume that someone other than a related shareholder controls the unlisted firms.[3]

Some studies analyse the relationship between controlling shareholder ownership and firm performance in Korea. Joh (2003), using 5,829 Korean firms during 1993–1997, found that the firms with a high disparity between controlling shareholder's control rights and cash flow rights show weak profitability (i.e. operating profit of account), and such negative effects of control-ownership disparity were stronger in publicly traded firms than in privately held ones. Baek, Kang and Park (2004) analyse Korean firm performance during the 1997 financial crisis. They found that *chaebol* firms (Top 30 family group firms) with concentrated ownership, where controlling family shareholders' voting rights exceeded cash flow rights, also had lower returns. Chang (2001) analysed a sample of *chaebol* group affiliated Korean public firms for the period 1986–1996 and shows that performance determines ownership structure, but not vice versa. He provides evidence that controlling shareholders use insider information to increase their number of shares in more profitable firms and transfer profits to other affiliates through related party transactions with affiliated companies.

In contrast, Khanna and Palepu (2000) and Khanna and Rivkin (2001) both found that, on average, firms belonging to a pyramid group in developing countries outperform independent firms. Friedman *et al* (2003) present evidence consistent with transfers of wealth from controlling shareholders, benefiting public shareholders

[3] For example, Samsung Corporation, part of the Samsung Group, is partially owned by Samsung Life Insurance, which is not listed. However, Samsung Life Insurance is controlled by the same family who have a large direct stake in Samsung Corporation which increases the family's overall control stake in Samsung Corporation. Similarly, control for Samsung Electromagnetic is underestimated because it is also partly owned by Samsung Life Insurance (as well as other Samsung corporations).

in pyramid firms. They describe both public shareholders during the East Asian Economic Crisis of the 1990s and econometric results consistent with this occurring on an economically important scale. The results pose the question of why the empirical results of the relationship between ownership structure and firm value are different under a poor governance system. Do the advantages of business groups disappear as the economy develops further and the divergence of cash flow rights and control rights affect firm value in economic development (Claessens *et al* 2002)?

In this study, I test various views of the relationship between ownership structure and firm value before the crisis, with a focus on Korean companies. Focusing on a single nation in this way allows the examination of corporate governance measures at a level of detail that would be difficult to aggregate across countries. This study makes two main contributions to research on corporate governance and firm value in the Korean economy. First, it compares ownership structures, including unlisted Korean firms, to estimate divergence between cash flow rights and control rights in pyramid and cross-holding ownership; in this way it develops the results of other papers (e.g. La Porta *et al* 1999, Claessens *et al* 2002, Mitton 2002, Lemmon and Lins 2003). Second, it extends the empirical analysis of how ownership structure affects firm valuation and the agency problem of minority shareholder expropriation during the economic development (1988–1997) of Korea. This study approaches these questions by investigating the dynamics of the corporate governance system in Korea.

I argue that the relation of ownership structure and corporate value is non-linear in an ordinary least squares (OLS) test, but the divergence between cash flow rights and the control rights of ultimate shareholders through a pyramid ownership structure or a

cross-holding ownership structure is associated with firm value in a linear fashion. The difference in agency cost means that the greater the proportion of the shares owned with cash flow rights of those who ultimately own the corporation, the smaller the value of the firm. This relation holds after controlling for other well-known determinants such as capital expenditure, research and development (R&D), advertising, leverage, firm size. In this study, I test several views and hypotheses of the relationship between ownership structure and firm value before the Asian Crisis, focusing on Korean companies. Restricting to one nation allows the examination of corporate governance measures at a detailed level that would be difficult to aggregate across countries.

The balance of this chapter is organised as follows. In Section 2, I discuss the role of corporate governance and firm valuation with explanatory hypotheses. In Section 3, I explain corporate governance in Korea. In Section 4, I describe the data and measurement methods for empirical testing, and in Section 5, I investigate the ownership structure and control of firms in Korea. Also, I examine the ownership structure and firm valuation, comparing affiliated firms (*Chaebol*) and independent firms. I offer concluding remarks in Section 6.

2. Theoretical background in corporate governance and firm value

2.1 Introduction

This study attempts to define the effects of the corporate ownership structure or governance system on firm value. Certain theories have been selected for use in this study focusing on Korean firms where the governance systems are different from the ownership structure of the U.S or the U.K. firms. First, I analyse the forms of the corporate ownership structure and the corporate governance systems of Korea prior to receiving financial assistance from the IMF in 1998. Particularly, I divide the corporations into large conglomerates (*Chaebol*)[4] and the independent corporations by the corporate structures, and attempt to investigate their corporate ownership structure and firm value issues centring on the agency issue such as pyramidal structure and cross-holding type structure. In this context, I will exam the theoretical relationship in ownership structure and firm valuation.

2.2. Understanding of corporate ownership structure theory

2.2.1 Principles of corporate development

Chandler (1980) terms capitalism up to the pre-Industrial Revolution stage 'family capitalism', capitalism in the initial stage of the Industrial Revolution 'financial capitalism', and capitalism within professional managers' corporation 'managerial capitalism.' Before the Industrial Revolution corporations had been operated, on the

[4] The Korea Fair Trade Commission (KFTC) defines a business group as 'a group of companies, more than 30% of whose shares are owned by the group's controlling shareholder and its affiliated companies'. Each year, the KFTC ranks business groups in terms their total assets and identifies the 30 largest business groups (hereafter called the 'Top 30').
More detail in section 3.1.3.

whole, as small scale and rather as simple businesses. Corporate management decisions were taken exclusively by the corporate owners, or by their family members. The major source of financing of these corporations was limited to the internal financing through cumulative retained earnings produced from the business operation, and corporate ownership was concentrated more or less on an individual or family members. The expansion of the market size after the Industrial Revolution demanded continuous expansion of the corporate size, which consequently required an enormous amount of operating capital that could not be financed solely through the retained earnings. The corporations eventually had to turn to external financing and the rapid growth of the demand for such corporate funds resulted in the drastically expanded roles of banks and other financial institutions.

With the increasing dependence on financial institutions for funds, participation by the financial institutions in corporate management decisions making process started to become a routine. As a result, the corporate management styles have evolved from family-oriented management to including the financial institutions' participation in the management. With the limits of the external financing through financial institutions in sight, direct financing through equity emerged. The direct financing through unspecified individuals led to a reduction of the equity of the corporate owners and also reduced the influence of the owners in management. The complexity of the corporate management brought about by this financing method and technical innovation has given birth to the management profession and the separation of ownership and management. Such wide diversification of the equity shares has made it necessary to redefine the corporate ownership, and "possession of wealth without

governance" and "control of wealth without possession" have emerged as the theoretical conclusion of the development of joint stock companies.

2.2.2 Theory of ownership structure based on theory of agency

In the conventional theory of the corporate ownership structure evolving around the inside shareholders, maximizing dividends to stockholders was assumed as a major management goal. Such an assumption, however, is erroneous given there exist numerous interest groups in corporations: in addition to shareholders and managers these include outside shareholders, creditors, employees, material suppliers and the government. Each group competes against one another in an asymmetrical information system and this result in an oft-ignored conflict of interest. In particular, with public offering of shares expanding and the increasing demand for professional managers resulting in separation of ownership and management, the relationship between shareholders and managers has come to be recognised as an agency contract in current corporate ownership and governance system theory. The methodology of establishing the corporate ownership structure to minimize the agency cost being incurred from such agency contracts has received given much attention.

Jensen & Meckling (1976) and Fama (1980) analysed corporations as organizations bound by contract between principals and agents and maintained if the ratio of the outside shareholder is high or the ratio of external borrowing increases, the following agency costs will incur. First, if their ratio of shareholding for majority stockholders is reduced due to offering stocks to the public, they will incur more expenses to be shared with the outside shareholders, and will therefore strive to maximize their

efficiency through increasing payments of non-salary expenses. These include, but are not limited to, corporate entertainment costs, office supplies expenses and facilities exclusive for managerial use. In addition, the major inside shareholders tend to pursue their benefits through self-dealing and the agency cost of equity, causing the agency cost to be incurred from the high ratio of raising their external equity capital. Second, the shareholders of the joint stock company shall be limitedly liable to the debts to the extent of their respective equity participation, as they prefer high-return-high-risk investment when the debt ratio is high. Consequently they tend to transfer the risk of investment failure to the creditors. Hence, the expenses to be incurred by corporate management in the event that the capital ratio is lowered (by increasing external borrowing) are termed the agency cost of debts.

Third, the professional managers without their own equity need to be careful of initiating new investments, such as Research and Development (R&D) and this will tend to result in under-investment. Furthermore, since their remunerations are determined on the basis of performances attained during their tenure, there is a tendency to focus on short-term performance and neglect long-term investment. The managerial human capital is worthwhile only while the manager maintains his managerial position and this human capital is often firm specific and cannot be easily transferred to another job. Managers tend to avert high-risk investment to secure their positions and, at the same time, tend to expand diversified investments in non-related fields. In other words, they would not divert the free cash flow generated from the line of business to be liquidated into new investment but would rather increase their internal reserve or use the cash to acquire other corporations. Even in the case of

professional managers, effort aversion, short-termism and risk aversion are commonplace.

This theory recognizes corporations not as decision-making entities but as aggregates of interest persons. Corporations enter into contracts with interest persons directly or indirectly and try to sustain efficient relationships. However, the principals and agents are disposed to maximize their own benefits and therefore agency costs are incurred. Jensen and Meckling (1976) explain the corporate ownership structure by examining the possible conflict of interest between inside shareholders and outside shareholders and the resulting agency cost. They argue that since the managers with relatively low portion of equity have to make the decisions aiming to maximize their corporate value, agency problem is bound to occur. They also asserted that as a result, optimum ownership structure of the borrowed external capital (stocks and debts) was formed where the marginal benefits from use of external borrowing and the marginal agency cost coincide. They also explain that with the managers' equity portion increasing and the closed type ownership structure resulted, frequencies of the managers' conflict of interest with shareholders decrease and as the result, the corporate value increases. On the other hand, Fama and Jensen (1983) maintain their positions with respect to all forms of general corporate ownership structures including closed type structure as follows. They classify the managerial decision making phases into development, approval, execution and monitoring, and defined development, with execution phases as decision management, and approval and monitoring phases as decision control. They also opined that it would be difficult to separate ownership in management and control functions if it was difficult to separate decision management and decision control in the corporate decision making systems.

If the effective system to control the working level managers is not well organized, the agency problem will likely be neglected, and the only solution to this problem will be the managers owning the corporation. In conclusion, if the corporate equity ownership structure is to be established as a diversified open type ownership structure, the decision management and decision control should be separate, and then, it can be noted that the corporate decision making structure affects the ownership structure. Therefore, they maintain that the corporate ownership structure is determined in favour of minimizing the agency cost and this can be achieved by the managing of decision making, and integrating and separating of decision control.

Demsetz (1983) maintains that even in consideration of agency cost, theory of ownership decision does not deviate from the frame of Classical Economics, which recognizes corporations as the subject of decision making and assumes profit maximization as the criteria for decision makings. In discussing determination of ownership structures, he confined the agency cost to monitoring expenses involved in controlling managerial unfaithful acts. He maintained that such agency cost could not be understood separately from production related costs. He argues that the cost involved in monitoring managers should be understood as part of the total costs including production costs. Accordingly, he maintained that the optimum capital structure should be determined at the level the total production costs including agency cost would be at the minimum.

2.2.3 Expropriation of minority shareholder in ownership structure

A study was conducted by La Porta, Lopez-de-Silanes and Shleifer (1998) (hereafter referred to as LLS) into the effect the legal and institutional developments of a nation has on corporate ownership structures. In examining the 20 largest corporations in the 27 most affluent countries, they discovered that the corporations with diversified ownerships were most commonplace in countries with well-organized legal systems for protection of minority shareholders. Conversely, countries with poorly organized legal systems for protection of minority shareholders tend to be dominated by corporations that are either family-controlled or state-controlled. In such countries, the controlling shareholders were tending to control the corporations through the pyramidal structure as well as participating in management well in excess of the cash flow rights.

The LLS study's findings can be summarised as follows. In countries where legal protection is ample for the minority shareholders, they are aware of the legal protection from expropriation by controlling shareholders and are willing to purchase stocks even at high prices. When this point is reached the controlling shareholders will attempt to raise funds through equity, which will result in the reduction in their own equity. If legal protection for the shareholders is well organized, even the controlling shareholders would be aware that in the event of losing their control rights, there would be no expropriation and thus would be willing to have their equity reduced. This eventually results in diversified ownership within the corporations. LLS point out that the controlling shareholders expropriate the minority shareholders to excel the cash flow right. In order to remove any conflicts of interest between the controlling shareholders and minority shareholders, it would be very effective to

improving the legal and institutional environments and building an apparatus against expropriation of the minority shareholders.

Quoting the methodology of LLS, Clasessens, Djankov and Lang (1998) studied the corporate ownership structures of 2,980 corporations in nine East Asian countries such as Taiwan, Malaysia, Singapore, Indonesia, Japan, Thailand, the Philippines, Korea and Hong Kong. Their study shows more than half of the corporations in East Asian countries are controlled by single major shareholders. It also reveals that the smaller in size and the older in history the corporations are, the more they tend to be family-controlled. On the other hand, it also shows that the form of corporate ownership by controlling shareholders varies with countries, but generally the more developed in economic and institutional terms the countries are, the more diversified the corporate ownerships are. The controlling shareholders in the majority of countries strengthen their control rights through the pyramid structures and stocks with differentiated voting rights. This gives them more voting rights than the cash flow rights, and, furthermore, with the family members of the controlling shareholders participating in management, ownership and management are almost adjoining. Clasessens, Djankov and Lang(2000) state that wealth is concentrated in a few families in most of the Asian countries and there tends to be close relationships between governments and corporations and this can lead to interference in legal and institutional developments.

2.3 Ownership structure and Firm value

2.3.1 Influence of corporate ownership structure on corporate value

1) Convergence of interest hypothesis (interest alignment hypothesis).[5]

Convergence of interest hypothesis is based on the classical agency theory by Berle-Means (1932) or Jensen-Meckling (1976). It maintains that with the increasing managerial equity ownership ratio, the conflict between the managers and the outside shareholders decreases and their mutual interest converges. This represents an affirmative relationship where increasing managerial equity, the firm valuation will increase due to the decrease in agency cost. According to the hypothesis, therefore, the fittest for increasing the interest of the shareholders will secure control right through the competition for corporate management right in market for corporate control or takeover market, which will help the limited human resources utilized under corporate organizations.

2) Managerial entrenchment hypothesis[6]

Managerial entrenchment hypothesis is the counter-argument to the convergence of interest hypothesis. According to this hypothesis, with increasing managerial equity ownership, the managers tend to act in the interest of their private benefits rather than for maximization of the firm valuation and accordingly the firm valuation will decline. The convergence of interest hypothesis states that since outside control system functions well through the market for corporate control, the managers could

[5] Berle-Means (1932),Jensen-Meckiling (1976), Jensen and Ruback (1983), Demsetz and Lehn (1985), Holderness and Sheehan (1988), Ang,Cole, and Lins (2002), Anderson and Reeb (2002,2003), Cronqvist and Nilsson (2003), Belen Villaonga and Raphael Amit (2006).
[6] Monsen,Chiu and Cooley (1968), Radice (1971), Bothwell (1980), DeAngelo and Rice (1983),Demsetz (1983) and Fama-Jensen (1983).

not deviate from the interest of shareholders. However, the managerial entrenchment hypothesis broadly recognizes the possibility that the managers can violate the shareholders' interest such as perquisites consumption. Increased equity ownership of the managers further firmly guarantees the position of the managers and the managers pursue their interest even at the sacrifice of the shareholders. Therefore there may be a negative correlation between managerial equity ownership and the firm valuation. Jensen-Meckling (1976) maintained that with managerial equity ownership increasing, there is decreasing likelihood of deviation from the goal of maximization of the firm valuation and the cost resulting from the deviation will decrease. With their equity ratio increasing, the portion of the deviation cost the managers will bear will increase and the likelihood of wasting the corporate wealth will decrease. In contrast, Demsetz (1983) and Fama-Jensen (1983) pointed out the offsetting costs significant to managerial equity ownership. When the functions of the managerial equity ownership ratio is low, the market discipline, managerial labour market, product market, and market for corporate control mitigate the opportunistic behaviour of the managers and will force the managers to pursue maximization of the firm valuation. However, the managers with substantial equity ownership will carry enough voting power or influence to protect their own interest, and consequently they may pursue the goals against maximization of the firm valuation.

3) *Eclectic Hypothesis*[7]

The convergence of interest hypothesis and management entrenchment hypothesis has hitherto been considered with regard to the relationship between corporate

[7] Morck-Shleifer-Vishny (1988), Stulz (1988), Wruck (1989), and McConnell-Servaes (1990, 1995).

governance and the value of the corporation. Although a theoretical analysis of this relationship is important, an empirical verification has greater significance. Varying results can be reached depending on the corporate system and capital markets of each country, depending particularly on how effectively the corporate governance market functions. In particular, in the empirical study of the relationship between the ownership and the value of a firm, both positive (+) and negative (-) correlations are seen in the differing equity sections. The results depends on which of the two tendencies of managers is greater, either the tendency to use business resources for their own interests, or the tendency to make the interests of the managers consistent with those of outside shareholders. Therefore the results support both the interests consistency hypothesis and manager entrenchment hypothesis.

Empirical studies that support the eclectic hypothesis are those conducted by Morck-Shleifer-Vishny (1988) and McConnell-Servaes (1990,1995). They demonstrated how the variable that represents the value of the firm (Tobin Q) changes in accordance with the varying types of corporate governance. Morck-Sheliefer and Vishny (1988) examined 371 US public companies listed in Fortune 500 in which the board has more than 0.2% of the shares through piecewise linear regression. The selection of 5% and 25% as the structural classification shares has no theoretical justification. 5% was used by Herman (1981) as the standard in the mandatory disclosure of ownership, while 25% was used when Weston (1979) presented the 20-30% as the threshold where predatory acquisitions would be difficult. In the 0~5% range, the circumstances of the managers to maximize their self-interests have not been formed, and thus the value of the firm (Tobin's Q) and shares have a positive correlation. In the 5~25% range, as the shares increase and in turn the rights of the

manager strengthen, the likelihood of the manager to act for one's self-interest increases, resulting in the decline in firm's value (Tobin's Q). Finally, in the 25% or more range, as the managers' shares increase, one can see that the interests of the managers and the shareholders become the same. In addition, it is often held that if the founder's participation in the board of directors has a long history, then the value of the firm may decline. On contrary, if the founder takes part in a firm that is relatively young, then the value of the firm was shown to increase.

McConnell and Servases (1990) studied companies listed in the New York Stock Exchange (NYSE) and AMX (American Stock Exchange). In 1976 and 1986, 1173 and 1093 companies respectively were sampled for this purpose. For the value of the firm, Tobin's Q was used, which was calculated with the 1987 Compustat tape, while the information on equity was compiled from Value Line Investment Survey. The ownership structure was classified as insider ownership, the outside blockholders and the institutional investors to study the hypothesis that Tobin's Q (representing the value of the company) had a curvilinear relation with the equity of the insider ownership and a positive correlation with the outside blockholders. Also, the institutional investors were to follow Pound's (1988) hypothesis. The other explanatory variables were the same as those used by Morck, Shleifer and Vishny (1988). The results of the curvilinear regression analysis showed that as the percentage of insider ownership increased, the value of the company increased in both 1976 and 1986. However, the relationship had a curvilinear shape and thus the value of the firm reached the ceiling before the equity of internal ownership reached 50%. The maximum value was reached when the equity of insider ownership reached 49.9% in 1976 and 37.6 % in 1986. This outcome was the same as that of Stulz

(1988). When the variables of the institutional investor and the outside blockholder were included, the value of the company increased even more in accordance with the increase in equity of internal ownership. The results of the piecewise regression analysis showed that the relationship between the insider ownership and the value of the company was a positive correlation ranging from 5% to 25%. However, it could not encounter the structural transition point as found in the research of Morck, Shleifer and Vishny (1988). Furthermore, the value of the firm was shown to have a positive correlation with the institutional investors and, in turn, supported the effective monitoring hypothesis of Pound (1988). However, the correlation between the value of the company and the outside blockholders was not statistically significant.

Agrawal and Knoeber (1996) studied the mutual dependency among the monitoring structures to minimize the proxy costs through a sample of 383 US companies, as well as the relationship between the monitoring structures and business profitability. For the monitoring structures, seven factors are taken into consideration: equity of inside managers; equity of institutional investors; equity of outside blockholders and participation of external board members; loan policy; use of external market in selecting managers; and the use of corporate governance market. For internal decision making, the following factors were taken into account: inside management equity; employment of external board members; use of manager market; and the loan policy. For the external decision making such factors as equity of institutional investors, equity of outside blockholders and use of the corporate governance market were employed. In order to study the relationship among the monitoring structures, the 2SLS regression analysis was used. In the case where activities of the corporate

governance market are active, there is relevance between the outside blockholders and equity of the institutional investors. This presents the complementary nature between outside equity and the corporate governance markets. Among various monitoring structures, if participation of the external board members and equity of the inside managers increases, then the pressure for pursuing loans increases, resulting in the reinforcement of internal monitoring through the internal managers or the external board members. In this case, this study mentioned that monitoring by the lender would be most effective. It was also discovered as a result of this study that the equity of inside managers, participation of external board members, loan policy and the activities of the corporate governance market affect the value of the company.

2.3.2 Influence of corporate ownership structure on corporate value under a poor governance. (Expropriation Hypotheses)[8]

Claessens, Djankov, Fan & Lang (2002) studied how the concentration of cash flow rights and control rights affects the value of the company. In this study, the ultimate owner is controlling stockholders that own more than 5% of the control rights, and the companies are divided into five types: family, state, widely-held financial institutions and widely-held corporations in nine East Asian countries (Taiwan, Malaysia, Singapore, Indonesia, Japan, Thailand, Philippines, Korea and Hong Kong) before the East Asian crisis in 1997. According to the results, as the controlling shareholders' cash flow rights increase, the value of the company increases; and as controlling shareholders' control rights increase, the value of the company decreases. Furthermore, the ratio of cash flow rights and control rights, representing the

[8] Classens, Djangkov and Lang (2002), Johnson, Boone, Breach, and Friedman (2000), Mitton (2002), Lemmon and Lins (2003), Joh (2003)

difference between cash flow rights through a use of the graded voting rights stocks, the stock pyramids and cross-ownership of stocks and control rights, had a positive correlation with the value of the company. In short, the value of the company increased as the difference between the cash flow rights and control rights owned by the controlling shareholders declined. It also showed that the difference between the relatively higher control rights lowers the value of the company. This supports the hypothesis that when cash flow rights owned by the controlling shareholders are small and the difference between cash flow rights and control rights are great, then the controlling shareholders exploit the minority shareholders to pursue their self-interests.

According to the relationship between ownership structure and the value of the firm as discussed in Claessens *et al* (2002) and Section 2.2.3, the incentive for the controlling shareholder to exploit the minority shareholders for their self-interests depends on how much cash flow rights they own. When the cash flow rights of the controlling shareholder are low, the incentives and proxy costs increase due to the conflict of interest between controlling shareholders and minority shareholders. Therefore, the lower the cash flow rights of the controlling shareholder, the lower the value of the firm. In contrast, Shleifer and Vishny (1997:754) note that

'Large shareholders thus address the agency problem in that they have both a general interest in profit maximization, and enough control over the assets of the firm to have their interest respected. La Porta *et al, (1999)* and Stijin Claessens *et al*, (2002) describe the positive effect related to the share of cash flow rights held by large

shareholders and argue that the negative entrenchment effect relates to the share of control rights held by large shareholders.'

Therefore, the degree of this incentive may change according to the level of ownership. In order to examine this relationship, the following hypothesis has been set up:

Hypothesis 1: *As the cash flow rights of a controlling shareholder increase, the value of the firm increases. Conversely, as the control rights of a controlling shareholder increase, the value of the firm decreases.*

If a controlling shareholder uses a pyramid ownership structure or cross-ownership structure to reinforce their control rights and thus indirectly control the firm, then a difference arises between cash flow rights and control rights of the controlling shareholder.[9] The controlling shareholder tends to own a higher portion of control rights than cash flow rights, and as the difference between these two rights becomes larger, the incentive for the controlling shareholder to exercise their control rights to attain private interests becomes even greater. Claessens *et al* (2002: 2743) state 'Grossman and Hart (1988) and Harris and Raviv (1988) show that separating ownership and control can lower shareholders value and may not be socially optimal.' Shleifer and Vishny (1997:759) argue that ' as ownership gets beyond a certain point, large owners gain nearly full generate private benefits of control that are not shared by minority shareholders.' Bebchuk *et al* (2000) indicate that separating control rights from cash flow rights can create agency costs an order of

[9] La Porta *et al* (1999) and Claessens et al (2002)

magnitude larger than costs associated with a controlling shareholder who also has a majority of the cash flow rights in his or her corporation. Therefore, as this difference becomes greater, the value of the firm declines; while as this difference becomes smaller, the value of the firm increases. In order to corroborate this phenomenon, Hypothesis 2 has been set up:

Hypothesis 2: *As the difference between the cash flow rights and control rights becomes greater, the value of the firm declines.*

3. Corporate governance in Korea

3.1 Economic performance and corporate governance.

3.1.1 Korean economic development

The Korean economy has developed significantly since 1962 with the implementation of the government's Economic Development Plan (Park J.H. Model 1995, Economist). Many of the current dominant Korean companies emerged after the Second World War and were assisted by the reverted enterprises that the Japanese had left and assistance from the USA. Disposal of these resources were preferentially carried out by a small number of privileged people and these companies were able to build up a great wealth. Such parties eventually managed to establish a systematic link with the government institutional framework. Korean companies have grown significantly with a continued adhesion to the government. During the first five years of the Economic Development Plan, raising funds was difficult and government

control of foreign capital meant these were only available for a privileged few. Certain firms would therefore get subsidised access to resources conditional on sustained contribution to national wealth. During this period most firms' external finance was in the form of debt or bank purchased equity; however in a twist from a conventional bank based system, the government had a controlling stake on most major national banks.

The key objectives of Korea's successive five-year plans have changed over time with the changing economic climate. Such changes may be examined in relation to the major government economic functions:[10]

- Creating the economic and legal framework (the constitution, economic law, etc.). The constitution of Korea has been almost totally revised nine times since liberation in 1945.
- Promoting growth.
- Ensuring stability.
- Promoting efficiency including industrial policy, trade policy, agricultural policy, and social infrastructure policy.
- Promoting equity (personal, regional, and industrial).

Appealing to the government to be chosen as a target of promotion became one of the foremost management strategies. It became essential for the development of an enterprise to participate aggressively with the government policy. The objective of

[10] According to Samuelson and Nordhaus (1992: 301-1), the government's proper economic functions are creating an appropriate economic or legal framework, ensuring stability, and promoting efficiency, equity and growth.

the economic plans was to overcome domestic resource deficiency through export promotion, thereby achieving growth and increased employment. By controlling the ownership of banks and financial institutions, the government was able to carry out its policies and selected firms grew. In this process an implicit contractual arrangement was established and a system of firm monitoring by the government was sustained. At the heart of this corporate governance lay the public control of financial institutions and the protection of domestic markets from competition from foreign goods. Under such a system the Korean economy structured its development to pass from agricultural products to light industries (particularly flour, sugar, fibre and textile) to heavy industries, then to automobile and finally arriving at the prevailing dominance of high technology industries.

3.1.2 *Chaebol* and agency problems

Corporate governance mechanisms are often divided between bank-based and market-based. Bank-based mechanism refer to the use of debt as the major source of external finance and is a form most often associated with the German and Japanese economic systems. Market-based mechanism, on the other hand, tends to rely on external equity finance and is associated with U.K. and U.S. economic systems. Granted a significant amount of equity finance can also be found in bank-based system, but the market based mechanism tends to show a much larger share of equity ownership. A common feature of both is leaving the real control of capital to the firm management but differences lie in the method of regulating managerial power and the names refer to the main parties that monitor this possible abuse. This then has the result of creating different incentive structures for managers, which impacts on the

overall behaviour of firms. It has often been argued that close financial ties in the German and Japanese systems 'reduce agency costs and allow investors to monitor managers more effectively than in the U.S.'(Aoki *et al* 1990, 1991, Lipton and Rosenblum 1991, Porter 1991, Prowse 1991). The cost of changing management when it performs poorly is therefore lower, because banks and large shareholders have more power. This can therefore inhibit costly hostile takeovers and proxy fights.

Korean *chaebol*s are often compared to Japanese *keiretsus*[11] as firms belonging to both maintain substantial business ties with other firms in the group and there is a considerably interlocking equity ownership. Nevertheless, several characteristics distinguish an archetypal Korean *chaebol*. First, unlike *keiretsus*, which tend to be controlled by a professional corporate management, *chaebols* are controlled by individual shareholders or their families. Second, *keiretsus*, but not *chaebols*, are concentrated on one large commercial bank that then plays a leading role in the financial activities of the group Finally, *chaebols* maintain a central staff within the group. These play the role of a holding company, exercising substantial control over all group firms.

Member firms within the Top 30 *Chaebols* are interconnected through an extensive network of reciprocal shareholding agreements. Korean banks are expected to play an active monitoring role in a firm's investment decisions as they are allowed to own up to 10% of the equity of firms. In fact, Korean banks provide many firms with

[11] For a discussion of the Japanese governance mechanism, see Aoki (1990), Sheard (1989), Prowse (1990), Hoshi, Kashyap and Scharfstein (1991), Kaplan (1994) and Kang and Shivdasani (1995).

substantial equity and debt financing:[12] For example in 1997 the equity ownership held by Korean banks accounted for 9.42 % of the shares listed on the KSE. Furthermore, the Korean government has often utilised their control of banks to exercise control over many firms. This suggests that Korean banks hold a significant potential for performing the role of an active investor but have traditionally not exercised a role as monitors. First, Korean banks have traditionally held shares primarily to allocate their portfolio assets rather than for the exercise of voting rights. Second, concentrated equity ownership by *chaebol* owners, combined with cross-shareholding practices within *chaebol* firms, effectively prevents banks from playing the monitoring role of a large shareholder. Finally, most bank loans are guaranteed by cross-debt guarantees among *chaebol* member firms. This suggests that banks have little incentive or room to undertake the role of an active monitor (Kang 1998).

There is a tendency for the controlling shareholder to 'tunnel' profits across firms, transferring them from where that shareholder has low cash flow rights to firms where he or she has high cash flow rights.[13] This can usually be accomplished through of the use of pyramid ownership structures and cross-holdings among firms that belong to a business group allows controlling shareholders to exercise full control over a firm despite holding a relatively small portion of its cash flow rights.[14] The disparity between ownership and control raises questions regarding the degree to which the controlling shareholders of a business group can siphon resources from firms to increase their own private wealth. (Johnson *et al* 2000, Bertrand, Mehta and

[12] Under Article 200 of the *Securities Exchange Act* of 1962, which was in effect until March 1997, investors were not allowed to acquire more than 10% of the equity of other firms without the permission of the Korean Securities and Exchange Commission.
[13] Bebchuck *et al* (2000), Wolfenzon (1999) and Shleifer and Wolfenzon (2000) provide theoretical models of various forms of tunnelling.
[14] Greater detail is offered in Section 3.2.

Mullainathan 2002). In the context of Korea, Bae, Kang and Kim (2002) found that while minority shareholders of a firm within a Korean business group that makes an acquisition will ultimately lose, the controlling shareholders benefit as a result of the acquisition loss because it enhances the value of other firms in the group. Bae, Kang and Lee (2006) examine the pricing and valuation effect of equity-linked private securities offerings by Korean firms from 1989 to 2000 and report that *chaebol* issuers involved in intragroup deals set the offering prices in order to benefit their controlling shareholders. They also found that *chaebol* issuers (member acquirers) realised an 8.8% (5.8%) higher (lower) announcement return than other types of issuers (acquirers) if they sell private securities at a premium to other member firms and if the controlling shareholders receive positive net gains from equity ownership in issuers and acquirers. It is a result of this form of trading that owners of business groups are often accused of expropriating minority shareholders, by tunnelling resources from firms where they have low cash flow rights to firms where they have high cash flow rights. This is especially prevalent where regulations that would otherwise protect minority shareholders are poor.

3.2. Characteristics of the corporate ownership in Korea

Who owns the companies in Korea? The existing literature suggests that corporate governance in Korea is similar to that of Japan (La Porta *et al* 1999, Berglof & Perotti 1994). However the evidence is not conclusive and La Porta, Lopez de Silanes & Shleifer (1999) admits that on the issue of ownership, 'for Korea, different sources offer conflicting information on corporate ownership structures of *chaebols*.'

3.2.1 The measurement of the ownership Structure

1) Classification according to ultimate owner

This study employs the methodology of La Porta, Lopez de Silanes & Shleifer (1999) ('LLS') and Claessens *et al* (1998) and examines all ultimate owners with more than 10% of voting rights to study the control patterns of the companies. In examining the corporate governance, the controlling shareholder and family are regarded as one unit. If the shareholders of the sample company are that of a corporation, financial institution or non-profit company, the shareholders were then examined to see whether ultimate owners that controlled the companies existed.

First, at the control levels of 10%, 20%, 30% and 40%, companies were classified as companies with diversified ownership and companies with ultimate owners. The ultimate owners are divided into the following five types.

1) Family;

2) Government;

3) Financial institutions with diversified ownership;

4) Corporations with diversified ownership;

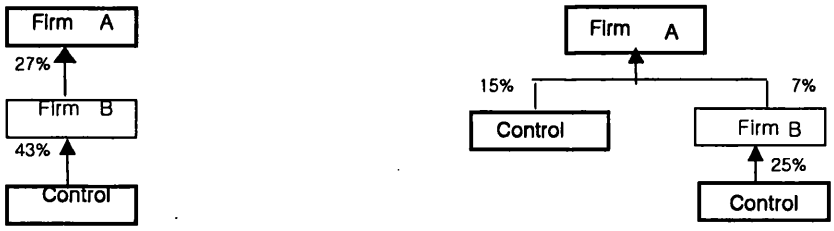
5) Others.

This study of expropriation relies on cash-flow rights opposed to control rights. Suppose, for example, that a family owns 11% of stock of publicly-traded Firm A, which in turn has 21% of the stock of Firm B. It would be logical to say that family controls 11% of Firm A as it is the weakest link in the chain of voting rights. In contrast, here it would be said that the family owns about 2% of the cash flow rights of Firm B, the product of the two ownership stakes along the chain (Claessens *et al*

1998). To make the distinction between cash flow and control rights, pyramiding structures are here documented for each firm with cross-holdings among firms and deviations from one-share-one-vote rules. To better understand the variety of ownership structures that determine the ultimate control of companies, the following example is provided.

According to the LLS methodology, (a) of Figure 1 shows that ultimate owners (control) exist in the levels of 10% and 20% of company A. However in the 30% and 40% levels, firm B only has 27% of the control rights of firm A. Therefore, the ownership of the company is diversified. (b) of Figure 1 shows that the controlling shareholder (control) controls firm B at the 20% level, which goes to show that the controlling shareholder is controlling firm A through firm B. However, in the 30% level, firm A is classified as a diversified ownership company.

<Figure 1> Control rights ownership in level of ultimate owner



2) Control rights and cash flow rights

(1) Direct control

Direct control is defined as the controlling shareholder directly owning his or her equity. In this case, control rights are synonymous with cash flow rights. From (b) in Figure 2, the 15% of the stock of the controlling shareholder is an example of direct control.

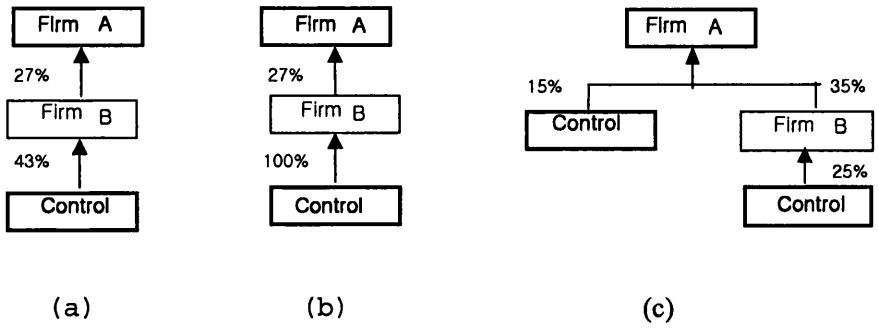
(2) Indirect control

Indirect control occurs when the controlling shareholder uses an intermediate company or a non-profit corporation. There are three types of indirect control: i) stock pyramid, ii) cross-ownership, and iii) equity ownership through non-profit corporations.

i) Indirect control through stock pyramids

Stock pyramids are used when the controlling shareholder exercises his or her control rights through one or more corporations. When a corporation is controlled through these pyramid structures, a difference between control rights and cash flow rights arise. Although controlling shareholders may control a corporation through an intermediary company, it is considered to be direct control when the controlling shareholder controls 100% of the stock of the intermediary company. Figure 2 illustrates the different types of indirect control through such pyramids.

<Figure 2> Pyramids ownership

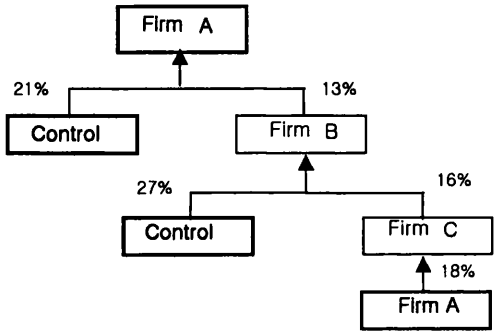


(a) Figure 2 shows a controlling shareholder (control) has a 43% directly of company A and company B control own a 27% stocks of the company A as the intermediary company. I can say that in this case the controlling shareholder (control) has 27% of the control rights and 11.61% (=0.27*0.43) of the cash flow rights for company A. (b) in Figure 2 demonstrates that the controlling shareholder has 100% control of company B's shares and therefore cannot be called a pyramid. In this case, the control rights and cash flow rights are both 27%. Because controlling shareholder have has 27% of cash flow right (0.27*1).

(c) Figure 2 shows a combination of direct control and indirect control through a pyramid by a controlling shareholder (control). In calculating the control rights connected to a pyramid, we consider the smallest control rights to be controlled by the controlling shareholder. Therefore, I assume that 40% of the control rights of company A is held by the controlling shareholder (15% direct control, 25% indirect control). 23.75% (=0.15+0.25*0.35) can be said to be the control of cash flow rights. The above method tends to underestimate the control rights of the controlling

shareholder compared to the method of calculation that assumes voting rights of company B is completely held by the controlling shareholders. [15]

<Figure 3> Cross- holding ownership



ii) Indirect control through cross-ownerships

In Korea, direct cross-ownership where company A owns company B's shares, while company B also owns company A's shares is legally prohibited. However, indirect control of a company occurs through a circulated cross-ownership. In the case of cross-ownerships, as in Figure 3, similar to the case of indirect control through a pyramid, the weakest part of the control chain is assumed to be the equity controlling shareholders, which is 34% (cash flow rights are 24.6%).

iii) Indirect control through non-profit corporations

Claessens, Djankov and Lang (1999) calculated the control rights of the controlling shareholder under the assumption that the non-profit corporation was a 100%

[15] Cash flow rights = $\frac{0.21+0.27\times0.13}{1-0.18\times0.16\times0.13} = 0.2460$, See the appendix for calculations of a cash flow rights.

controlled subsidiary of the controlling shareholders. As has been seen there is no difference here between control rights and cash flow rights. The methodology of Claessens, Djankov and Lang (2000) will be here followed and the control rights of the controlling shareholders are calculated by assuming that controlling shareholders had 100% control of the non-profit corporation.

3.2.2 Who controls firms?

The stocks of Korean companies are mostly in the hands of the family and relatives of the founders of the company, and I cannot see the extent of separation of ownership and management of a company, as is characteristic of Anglo-Saxon management (La Porta *et al* 1999).

The *chaebol* business group, which is characteristic of many major Korean companies, has a number of different forms of stock ownership depending on its scale. A relatively small business group mostly takes a form of ownership, which can be termed 'owner managed style' where the founder or his family directly owns a great amount of stocks in one name. In a larger business group, they take the form of what is called 'cross-holding style' where businesses within one group hold each other's stocks. These two forms share the common feature that the power to control is concentrated in the founder and his or her family. This study classifies companies into diversified ownership companies and ultimate owners at given cut-off levels[16] base on La Porta *et al* (1999) and Claessens, Djankov and Lang (2000). Companies with ultimate owners are again classified into four types: (i) family, (ii) government,

[16] To determine effective control at any intermediate levels as well as the ultimate level, we need to use a cut-off point above which we assume that largest shareholder has effective control over the intermediate and final corporations.(Claessens *et al* 1999).

(iii) financial institutions with diversified owners, and (iv) corporations with diversified owners. This thesis also analyses the difference in the ownership distribution among the independent companies and the business segments of the 30 largest corporate groups. The ownership distribution according to the type of ultimate owner at each cut-off level is shown in Table 1-1, which depicts the frequencies by designating an indicator 1 in the corresponding type of the company and 0 if not.

The status of control right distribution according to the type of ultimate owner shown in this Table 1-1[17] is shows some variation from the results of Claessens, Djankov and Lang (2000). For example, there are more companies dominated by families at the cut-off level, there are a smaller number of companies whose ultimate owners are the government and financial institutions, and more companies with diversified. At first, this difference can be attributed to sampling variation. Furthermore, Claessens, Djankov and Lang (2000) included such companies as banks, merchant banks, insurance companies and security corporations in the realm of financial companies when selecting their sample companies. The present study, however, excluded these companies for limited ownership of financial companies, government regulation of business management and uniqueness of balance sheets. In the case of financial corporations, due to the limitations imposed on ownership, there is a strong possibility the companies themselves will be classified as diversified at each cut-off level. In particular, as there are instances where the government is the controlling shareholder of a bank, there is a greater distribution in relative terms in the study of Claessens, Djankov and Lang (2000).

[17] The data from <Table 1-1> to <Table 1-9> are for 370 out of 760 publicly listed firms in Korea Stock Exchange for 1996. The same conditions for sample selection in Section 4.1.

Table1-1 Control of Publicly Traded Companies in Korea (Year: 1996)

	Widely Held	Family	State	Widely Held Financial	Widely Held Corporate	Others
10% cut-off						
Independent Company	0.0830	0.8906	0.0075	0.0038	0.0075	0.0075
Largest Group 30	0.1810	0.6857	0.0000	0.0190	0.1143	0.0000
All Company	0.1108	0.8324	0.0054	0.0081	0.0378	0.0054
20% cut-off						
Independent Company	0.3019	0.6642	0.0075	0.0000	0.0189	0.0075
Largest Group 30	0.4952	0.3524	0.0000	0.0000	0.1524	0.0000
All Company	0.3568	0.5757	0.0054	0.0000	0.0568	0.0054
30% cut-off						
Independent Company	0.6075	0.3698	0.0075	0.0000	0.0113	0.0038
Largest Group 30	0.8190	0.1238	0.0000	0.0000	0.0571	0.0000
All Company	0.6676	0.3000	0.0054	0.0000	0.0243	0.0027
40% cut-off						
Independent Company	0.8566	0.1358	0.0038	0.0000	0.0038	0.0000
30 Largest Conglomerates	0.9524	0.0190	0.0000	0.0000	0.0286	0.0000
All firms	0.8838	0.1027	0.0027	0.0000	0.0108	0.0000

The control right trends per ultimate owner indicate a difference in the types of ownership between independent firms and businesses belonging to the 30 largest conglomerates. [18] As a whole, there are greater instances where the family owns the independent firms, while businesses belonging to the 30 largest conglomerates show

[18] <Table 1-1> to <Table 1-9> are analysed with Kwang Sun Chung and Park Hong Cheol (2001).

a greater tendency of the ownership to be divided into companies with diversified ownership and ones whose ultimate owners are diversified. At the 20% cut-off level that was used by Lang *et al* (1998) and Stijn, Djankov and Lang (1999), companies with diversified ownership stood at 30.19% for independent firms, companies whose ultimate owners are families were at 66.42%, and those whose ultimate owners are diversified were 1.89%. On the other hand, for the businesses belonging to the 30 largest conglomerates, the figures reached 49.52%, 35.24% and 15.24% respectively. This difference can be attributed to the fact that in the case of large-scale corporate groups, various affiliates own the stocks of the company. Table 1-2 shows the status of stock ownership of large-scaled corporate groups from 1991 to 2000.

Table1-2 The stock distribution of Conglomerate groups in Korea

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Family	13.9	12.8	10.3	9.7	10.5	10.32	8.5	7.9	5.4	4.5
Affiliated Company	33.0	33.4	33.1	33.1	32.8	33.82	34.5	36.6	45.1	38.9
Ratio of Inside share	46.9	46.2	43.4	42.7	43.3	44.14	43.0	44.5	50.5	43.4

Source: *The Fair Trade Commission.*

Table 1-2 shows that in 1996, only 10.32% of the 30 largest conglomerates were directly owned by the family. Businesses belonging to these conglomerates were therefore classified as companies with diversified ownership and the companies with diversified ownership are ultimate owners that applied cut-offs at each level in this study. Examining different types of companies with diversified ownership can support this point. In Table 1-1, at the 10% cut-off level, independent companies and

the 30 largest conglomerates recorded 0.75% and 11.43% respectively, and at the 20% cut-off, they recorded 1.89% and 15.24% respectively. Such results can indirectly explain the existence of pyramid or cross-ownership of stocks. There are only a few cases where ultimate owners are financial institutions with diversified ownership. In the case that the ultimate owner is a financial institution, at the 10% cut-off level the figure was 0.81% (independent firm: 0.38%, 30 largest conglomerates: 1.9%), and at the 20% level the figure was 0%. These suggest that in Korea the main causal feature of ownership patterns was the limitations imposed on stock ownership of other companies by financial institutions.

3.2.3 Corporate governance according to the size of the company

This section will examine further the type of distribution of ultimate control of the company by the size of the company. The total market value and the market value of the company were used as proxy values for the company size. The scale of the company was divided into top 20 companies, mid 50 companies and bottom 50 companies. Table 1-3 and Table 1-4 show the distribution of the controlling shareholders according to corporate size at each cut-off level and show that as the size of the company becomes larger, ownership becomes more diversified. When the size of the company diminishes, there are more companies owned by the family. In particular, when the scale of the company is classified according to total market value, this phenomenon is more prominent. At the 20% cut-off level, diversified ownership of the top 20 companies, mid 50 companies and bottom 50 companies reached 75%, 30% and 20%, respectively. With family ownership, these figures

reached 5%, 64% and 74% respectively, illustrating that the type of ownership differs according to the scale of the company.

Table1-3 The Separation of Ownership and Control Across Type of the Largest Controlling Shareholder and Company Size: Total market value (Year: 1996)

	Widely Held	Family	State	Widely Held Financial	Widely Held Corporate	Others
10% Cut Off						
Largest 20	0.3500	0.4500	0.1000	0.0000	0.1000	0.0000
Middle 50	0.0800	0.8800	0.0000	0.0200	0.0200	0.0000
Smallest 50	0.0600	0.9200	0.0000	0.0000	0.0200	0.0000
All firms	0.1108	0.8324	0.0054	0.0081	0.0378	0.0054
20% Cut Off						
Largest 20	0.7500	0.0500	0.1000	0.0000	0.1000	0.0000
Middle 50	0.3000	0.6400	0.0000	0.0000	0.0600	0.0000
Smallest 50	0.2000	0.7400	0.0000	0.0000	0.0600	0.0000
All firms	0.3568	0.5757	0.0054	0.0000	0.0568	0.0054
30% Cut Off						
Largest 20	0.8500	0.0000	0.1000	0.0000	0.0500	0.0000
Middle 50	0.6400	0.3200	0.0000	0.0000	0.0400	0.0000
Smallest 50	0.6000	0.4000	0.0000	0.0000	0.0000	0.0000
All firms	0.6676	0.3000	0.0054	0.0000	0.0243	0.0027
40% Cut Off						
Largest 20	0.9500	0.0000	0.0500	0.0000	0.0000	0.0000
Middle 50	0.8800	0.1200	0.0000	0.0000	0.0000	0.0000
Smallest 50	0.8600	0.1400	0.0000	0.0000	0.0000	0.0000
All firms	0.8838	0.1027	0.0027	0.0000	0.0108	0.0000

Table1-4 The Separation of Ownership and Control Across Type of the Largest Controlling Shareholder and Company Size: The market value of the company (Year: 1996)

	Widely Held	Family	State	Widely Held Financial	Widely Held Corporate	Others
10% Cut Off						
Largest 20	0.4000	0.4000	0.1000	0.0000	0.1000	0.0000
Middle 50	0.0600	0.9000	0.0000	0.0000	0.0400	0.0000
Smallest 50	0.1000	0.9000	0.0000	0.0000	0.0000	0.0000
All firms	0.1108	0.8324	0.0054	0.0081	0.0378	0.0054
20% Cut Off						
Largest 20	0.7000	0.0500	0.1000	0.0000	0.1500	0.0000
Middle 50	0.3000	0.6200	0.0000	0.0000	0.0800	0.0000
Smallest 50	0.3200	0.6600	0.0000	0.0000	0.0200	0.0000
All firms	0.3568	0.5757	0.0054	0.0000	0.0568	0.0054
30% Cut Off						
Largest 20	0.8500	0.000	0.1000	0.0000	0.0500	0.0000
Middle 50	0.6200	0.3400	0.0000	0.0000	0.0400	0.0000
Smallest 50	0.5800	0.3800	0.0000	0.0000	0.0400	0.0000
All firms	0.6676	0.3000	0.0054	0.0000	0.0243	0.0027
40% Cut Off						
Largest 20	0.9500	0.0000	0.0500	0.0000	0.0000	0.0000
Middle 50	0.8400	0.1400	0.0000	0.0000	0.0200	0.0000
Smallest 50	0.8600	0.1400	0.0000	0.0000	0.0000	0.0000
All firms	0.8838	0.1027	0.0027	0.0000	0.0108	0.0000

In order to conduct a more in-depth study of relationship between ownership types and the scale of the company, this study weights the distribution of the control rights according to the type of controlling shareholder with the total market value of the

company as shown in Table 1-4. A striking difference can be seen between Table 5 and Table 1-1. Diversified ownership types are on the rise, while family ownership is declining, demonstrating that the company size affects the type of ownership of the company. Meanwhile, the reason that there is a sharp increase of government ownership is attributable to two companies KEPCO and POSCO, which account for the top two companies in terms of total market value in Korea.

Table1-5 The distribution of Control Right Across The Type Ultimate Ownership: Total market value (Year: 1996)

	Widely Held	Family	State	Widely Held Financial	Widely Held Corporate	Others
10% cut-off						
Independent Company	0.1040	0.3803	0.5035	0.0013	0.0041	0.0068
Largest Group 30	0.2470	0.6178	0.0000	0.0087	0.1265	0.0000
All Company	0.1692	0.4886	0.2739	0.0047	0.0599	0.0037
20% cut-off						
Independent Company	0.1961	0.2870	0.5035	0.0000	0.0066	0.0068
Largest Group 30	0.7091	0.1579	0.0000	0.0000	0.1330	0.0000
All Company	0.4300	0.2282	0.2739	0.0000	0.0642	0.0037
30% cut- off						
Independent Company	0.3285	0.1628	0.5035	0.0000	0.0016	0.0035
Largest Group 30	0.8821	0.0494	0.0000	0.0000	0.0685	0.0000
All Company	0.5810	0.1111	0.2739	0.0000	0.0321	0.0019
40% cut- off						
Independent Company	0.5387	0.0483	0.4121	0.0000	0.0009	0.0000
Largest Group 30	0.9810	0.0121	0.0000	0.0000	0.0069	0.0000
All Company	0.7404	0.0318	0.2241	0.0000	0.0037	0.0000

3.2.4 How are firms owned?

In the Korean *chaebol* business group, the cultural importance of blood relations is apparent. As a result, when the owner remains in active service as the owning manager, he will appoint his blood relatives (such as his sons or brothers) as officials of the business concern and will usually assign a blood relative to be registered owners of the stocks. Furthermore, in the change of generations, in most cases he will have his eldest son take over the business under a Confucian tradition that the eldest child has special authority to the inheritance. That does not exclude other sons, however, and he will find an appropriate source of revenue and divide it among them. In addition, his finances could be extended to relatives of the paternal line and other in-laws.[19]

1) Means of reinforcing control rights

This study, with the view of examining which means reinforce the control rights of the controlling shareholder, examines the degree of indirect control of firms by such means as pyramid structure, cross-ownership of stocks and non-profit companies at the 20% cut-off level. Furthermore, this study examines whether there are shareholders that own more than 10% of the voting rights (apart from the controlling shareholders) and whether the controlling shareholders are partaking in management. Table 1-6 shows that the controlling shareholder reinforces the control rights.

[19]In a Korean *chaebol* business group where the management owner and his family posses everything, a non-family employee narrows his chances for promotion as his position becomes higher.

Table1-6 The Type of Controlling Shareholder Reinforces the Control Rights (Year: 1996)

	Pyramid	Cross-Holding	Non-profit corporation	Single shareholder	executive
Independent Company	0.1514	0.0324	0.1081	0.9351	0.8811
Largest Group 30	0.5094	0.0943	0.1887	0.8868	0.4717
All Company	0.2311	0.0462	0.1261	0.9244	0.7899

* shown only if ultimate owner exist in 20% cut-off

Table 1-6 illustrates how much of the pyramid structure is employed to reinforce the control rights of the controlling shareholder. The table suggests that 23.11% of the sample group is using the pyramid structure. In the case of independent companies and the 30 largest conglomerates, 15.14% and 50.94%, respectively, use the pyramid structure. In sum, the 30 largest conglomerates use the pyramid structure three times more than the independent companies. Only 4.62% of the sample companies use cross-ownership of stocks. This number can be broken down to 3.24% and 9.43% of independent firms and 30 largest conglomerates respectively, which is less than the use of stock pyramid structure. Also, the table shows that 12.61% of sample firms, 10.81% of independent companies, and 18.87% of the 30 largest conglomerates reinforce control rights of the controlling shareholder by using non-profit organizations.

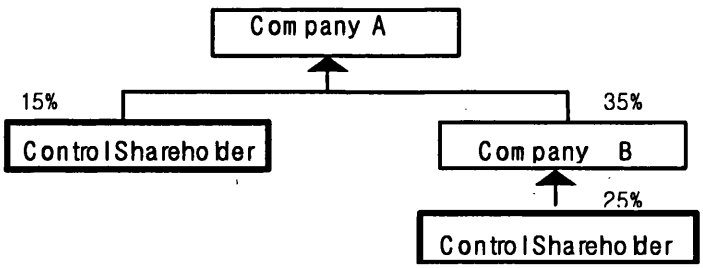
Table 1-6 also shows whether there was another stockholder to restrain the controlling shareholder and also whether this shareholder was included in

management as to reinforce his or her control rights. To this end, the study first examined the other shareholders with more than 10% of equity. This is an important factor because such other shareholders can become an obstacle for the controlling shareholder in influencing management. Table 1-6 reports that 92.44% of the companies did not have other major shareholders. A breakdown of this figure shows that 93.51% of independent firms and 88.68% of 30 largest conglomerates did not have other major shareholders.

2) Focusing of control rights and cash flow rights

Next is an examination of the degree of the control rights and cash flow rights, focusing on the controlling shareholder. This study calculates the control rights of the ultimate owners by using the methodology of Claessens, Djankov and Lang (1999). This is slightly different from the calculations methods used previously, as illustrated by figure 4.

<Figure 4> Control right of controlling shareholder



Previously it was assumed Firm B had a special relationship with the controlling shareholder, and thus added equity of Firm B with the equity of one major shareholder. According to this method, the equity of the controlling shareholder would amount to 50%. However, now, only a small degree of equity connected with Firm B is added to equity of one major shareholder. If this method were to be applied, then the equity of the controlling shareholder would be 40% by adding the direct ownership of stocks (15%) with the stocks that are indirectly controlled by pyramids (25%). Table 7 shows the control rights of the controlling shareholder calculated using the Claessens, Djankov & Lang (1999) methodology.

Table1-7 Statistic Distribution in Control Right of Controlling Shareholder (Year: 1996)

	Mean	Standard Deviation	Median	Quartile	3rd Quartile
Independent firms					
Direct Control Rights	0.2460	0.1247	0.2399	0.1557	0.3287
Indirect Control rights	0.0276	0.0691	0.0000	0.0000	0.0000
Control rights	0.2736	0.1207	0.2720	0.1869	0.3561
Largest Group 30					
Direct Control Rights	0.1084	0.1152	0.0700	0.0000	0.2040
Indirect Control rights	0.1086	0.1108	0.0861	0.0000	0.1818
Control rights	0.2170	0.1111	0.1982	0.1423	0.2893
All Firms					
Direct Control Rights	0.2091	0.1364	0.2078	0.1041	0.3022
Indirect Control rights	0.0493	0.0897	0.0000	0.0000	0.0716
Control rights	0.2584	0.1207	0.2499	0.1663	0.3349

As a whole, the average control rights of the controlling shareholders were 25.84%. For the independent firms and the 30 largest firms, this figured amounted to 27.36% and 21.70% respectively. Only 2.76% of the equity of independent companies is owned through an indirect method such as the pyramid structure, cross-ownership of the stocks and non-profit firms. This figure for the companies belonging to the 30 largest conglomerates is four times that of the independent firms, amounting up to 10.86%. On the other hand, as mentioned earlier, Table 1-7 shows that the ownership of controlling shareholders is under-reported in comparison to the previous study. To examine the extent of under-reporting of ownership, I have used the previous method by simply adding equity of the corporations that have a special relationship with the major shareholders to the equity of the major shareholders to calculate equity owned by the major shareholders in the 30 largest conglomerates. The results are shown in Table 1-8. The variation resulting from the different methods employed by Table 1-7 and Table 1-8 is approximately 3%.

Table1-8 Ownership of 30 Largest Conglomerates (Year: 1996)

	Total1)	Publicly Traded Companies 2)			All Firms3)	
		Mean	Standard Deviation	Median	Mean	Standard Deviation
Family	10.32	9.74	11.63	5.3	10.84	11.52
Affiliated firms	33.82	15.21	14.54	12.95	13.74	13.54
Inside shareholders	44.14	24.95	13.75	14.54	24.58	11.34

Notes: 1) Inside ownership of total affiliated companies in 30 largest conglomerates.
2) The manufacture companies among publicly listed 30 largest conglomerates.
3) The sample companies among 30 largest conglomerates.

Next, Table 1-9 reports how much of the cash flow rights the controlling shareholders own and the difference between the cash flow rights and the control rights. The difference between the cash flow rights and control rights was calculated by using the ratio of cash flow to voting rights.

Table1-9 Focusing of Cash flow rights and Control rights (Year: 1996)

	Number of firms	Mean	Standard Deviation	Median	Quartile	3rd Quartile
Cash Flow Rights						
Independent Company	257	0.2601	0.1216	0.2601	0.1705	0.3360
Largest Group 30	94	0.1379	0.1110	0.1078	0.0387	0.2132
All Firms	351	0.2273	0.1304	0.2232	0.1214	0.3155
Control Rights						
Independent Company	257	0.2736	0.1207	0.2720	0.1869	0.3561
Largest Group 30	94	0.2170	0.1111	0.1982	0.1423	0.2893
All Firms	351	0.2584	0.1207	0.2499	0.1663	0.3349
Cash flow rights/ control rights						
Independent Company	257	0.9474	0.1573	1.0000	1.0000	1.0000
Largest Group 30	94	0.6103	0.3668	0.6007	0.2501	1.0000
All Firms	351	0.8571	0.2760	1.0000	0.8881	1.0000

Theory suggests that both cash flow and voting rights are important and the incentives to expropriate vary with cash-flow rights (Jensen and Meckling 1976). Table 1-9 shows descriptive statistics on the separation of ultimate cash-flow and

control rights in the hands of the largest controlling holder has at least 5% of the vote. The cash flow rights owned by controlling shareholders amount to an average of 22.73% and the concentration of control rights in the hands of the largest block-holder is 25.84%. The ratio of cash flow rights to control rights is 85.71% on average. The separation of ownership and control is independent firms are higher than largest group 30 (0.94%: 0.61%). For example, the typical large control holder in independent firm has 10 ultimate votes for each 9.5 direct shares that he or she holds. In contrast, the typical largest group 30 control holder has 10 ultimate votes for each 6 shares that he or she holds. This demonstrates that the controlling shareholder owns lower cash flow rights compared to his or her control rights.

4. The data and measurement

The objective of this section is to describe the method of sample selection to be used for my empirical analysis of relation ownership and firm valuation and to discuss the procedures to be employed for empirical tests of the model based on two hypotheses.

4.1 Sample selection

For the empirical analysis, I select 370 out of 760 publicly listed companies (as of the end of 1996) for the corporate governance analysis of section 2, and 1,892 companies that have been publicly listed in the Korea Stock Exchange for the period of 1988 – 1997. The information on stock ownership of public companies was acquired from the database of the Korea Listed Companies Association (KLCA). The corresponding information of ownership structure for non-public companies was acquired from the

database of Korea Investors Service (KIS) and the National Information and Credit Evaluation (NICE) for calculating pyramids and cross-holding ownership structure. The KIS/FAS software of the Korea Investors' Services was used to find financial information of public companies to calculate the variables and carry out the regression analysis.

In order to compose research materials out of the 760 public companies during 1988 to 1997, I selected 1,892 sample companies that meet the following conditions:

- Companies that were public for less than 5 years were excluded from the sample.
- Companies whose day of settlement is not in December were excluded from the sample.
- Financial institutions were excluded from the sample because of the limitation on corporate governance, government regulation of their business activities, and their unique balance sheet.
- Companies with insufficient information on financial information and ownership were excluded from the sample.

4.2 The measurement of the firm valuation

4.2.1 Assessment of corporate value

1) Corporate value

Tobin's Q is the ratio between the market value of assets and its substituted value. If a corporation has outstanding investment opportunities, investments in R&D for future development, investments in advertisements, exceptional managerial

executives, and many intangible assets, then the market value of the corporation as well as Tobin's q will become higher. Tobin's q ratio is widely known for its characteristics and usefulness in corporate value assessment and is used widely. However, not only is it difficult to gather the various data that are needed for calculating the q ratio, because there is a high possibility of error in estimating the replacement cost of equity, many scholars have a heightened level of interest in developing a substitution index for the q ratio.[20] In Korea, there are many errors in finding the q ratio because the replacement cost or market value must be estimated by each researcher under given assumptions. Lindenberg Ross (1981) modified Tobin's Q ratio and the market to book value ratio (M/B) was presented as the substitution variable for the q ratio. In addition, as substitution for corporate value, industry the Tobin's Q is based on Berger Ofek (1995: 47). Industry the Tobin's Q (Industry-M/B) is defined as the log of the ratio between firm's actual performance (true q) and its imputed q. Imputed q is the asset weighted average of theoretical q of each segment. Theoretical q is the industry average using stand alone firms in same industry. This study examining corporate value (Tobin's Q) will use both the market to book value ratio (M/B) and industry market to book value ration (Industry-M/B). If a corporation has outstanding investment opportunities, investments in R&D for future development, investments in advertisements, exceptional managerial executives, and many intangible assets, then the market value of the corporation as well as Tobin's q will increase.

[20] In U.K or the United States, fundamental data for calculating the Q ratio of each corporation is being systematically provided in databases such as compustat and are actively used in studies.

4. 2. 2 Control variables

(1) Company size (SIZE)

A natural logarithm applied to the size of the assets is used to measure the size of the company. The company scale is expected to have an influential relationship with other variables in the following ways.

Larger firms have better disclosure, more liquid trading, more attention from analysts, and more diversified activities leading to lower risk of financial distress (Claessens *et al* 2002). Furthermore, In East Asia, smaller firms may be less diversified, leading to smaller discounts (Claessens *et al* 1999). Jensen, Solberg and Zorn (1992) argued that the factors that influence insider ownership were the percentage of liability, characteristics of dividend, managerial risk, R&D, the number of agencies, and the company scale. Using these factors, a transactional analysis was carried out to show that the company scale had a significant relationship: Demsetz and Lehn (1985) as well as McConnell and Servaes (1990) claimed that the bigger the company scale, the lower the equity of the major stockholders due to the restrictions on the wealth of the major stockholder and a decline in the equity for control. In addition, the larger the scale of a company, the equity of the major shareholders will decrease owing to the risk-averse traits of the major stockholders. On the other hand, in the case of Korea, where institutional investors and foreigners who clearly favour blue-chip shares hold external majority shares, a positive relationship is expected between external majority shares and the company scale. In addition, the bigger the company scale, the company will have greater ability to cover liability, which in turn will raise the leverage ratio. There is also the possibility that

the more years have passed after the company has been established, the scale of the company will be greater.

(2) Affiliated Company.

In order to control the affiliated company effect, if the affiliate belongs to the 30 largest conglomerates, as designated by the Fair Trade Commission in terms of total assets in April of the year the analysis, then '1' was added to the dummy variable. Companies belonging to corporate groups are expected to be extensively diversified and the scale of the company to be large. This is due to the fact that an internal capital market is formulated within the company, and thus external capital can be easily raised on the basis of a relatively high credibility.

(3) Other variables.

Capital expenditure (CES) is change in the gross capital expenditure for sum of individual tangible fixed assts such as property, plant and equipment divided by the previous year-end's capital stock. Research and development (R&D) is change in the gross intangible assets for experimental and research expense divided by the previous year-end's capital stock. Advertising ratio (ADR) is defined advertising expenditure over total assets.

4.3 Descriptive statistics on the concentration of cash flow rights and control rights of Korean corporations.

Table 1-10 reports descriptive statistics on the concentration of ultimate cash-flow rights of Korean corporations in the hands of the largest controlling holder. In the case of concentration of cash flow rights, during the entire period of 1988 – 1997, the

average was 23.3% and a quarter of cash flow rights was found to be greater than 31%. Annually, a trend of gradual decrease from an average of 26.4% in 1988 to 22.7% in 1996 was found followed by an increase to 23.3% in 1997. In the 3rd quartile, cash flow rights also showed a decrease from 33.6% in 1988 to 30.9% in 1996, then again a slightly increase to 31.9% in 1997.

Table1-10 Descriptive Statistics for Concentration of Cash-Flow Rights in 1988-1997.

Year	Number of Corporations	Mean	Standard Deviation	Median	1st Quartile	3rd Quartile
1988	122	0.264	0.167	0.252	0.153	0.336
1989	148	0.242	0.130	0.247	0.146	0.313
1990	181	0.247	0.135	0.248	0.143	0.329
1991	204	0.259	0.140	0.247	0.167	0.345
1992	109	0.189	0.155	0.15	0.079	0.261
1993	222	0.237	0.138	0.227	0.143	0.328
1994	238	0.226	0.127	0.217	0.126	0.312
1995	235	0.219	0.126	0.219	0.117	0.308
1996	211	0.218	0.146	0.217	0.106	0.309
1997	222	0.227	0.135	0.239	0.116	0.322
Total	1892	0.233	0.139	0.230	0.128	0.319

As reported in Table 1-11, the concentration of control rights in the hands of the ultimate ownership is similar to the concentration of cash flow rights. The average during the period from 1988–1997 was 27.4% and a quarter of control rights was 35%. Annually, we observe a trend of a gradual decease from an average of 30.3% in 1988 to an average of 26.0% in 1996, followed by an increase to 28.1% in 1997. In

the 3rd quartile, cash flow rights also showed a decrease from 33.6% in 1988 to 33.4% in 1996, then an increase to 36.4% in 1997.

Table1-11 Descriptive Statistics for Concentration of Control rights in 1988-1997.

Year	Number of Corporations	Mean	Standard Deviation	Median	1st Quartile	3rd Quartile
1988	122	0.303	0.156	0.252	0.153	0.336
1989	148	0.280	0.122	0.268	0.205	0.352
1990	181	0.282	0.129	0.269	0.192	0.348
1991	204	0.291	0.132	0.277	0.200	0.369
1992	109	0.189	0.155	0.160	0.079	0.261
1993	222	0.281	0.132	0.279	0.130	0.329
1994	238	0.267	0.124	0.261	0.178	0.345
1995	235	0.263	0.118	0.247	0.184	0.345
1996	211	0.263	0.136	0.251	0.173	0.334
1997	222	0.281	0.128	0.275	0.196	0.364
Total	1892	0.274	0.132	0.266	0.187	0.350

Table 1-12 reports the ratio of cash flow to control rights and the mean from 1988 to 1997 was found to be 84%. When analyzed by year, with 85.7% in 1988, 85.2% in 1992 and 80% in 1997, a continuous dissociation between the cash flow rights and control rights can be observed.

Table1-12 Descriptive Statistics for Ratio of Cash-Flow Rights to Control Right in 1988-1997.

Year	Number of Corporations	Mean	Standard Deviation	Median	1st Quartile	3rd Quartile
1988	122	0.857	0.287	1	0.934	1
1989	148	0.866	0.281	1	0.921	1
1990	181	0.880	0.271	1	0.901	1
1991	204	0.880	0.263	1	0.908	1
1992	109	0.852	0.291	1	0.897	1
1993	222	0.838	0.290	1	0.766	1
1994	238	0.841	0.288	1	0.829	1
1995	235	0.830	0.297	1	0.823	1
1996	211	0.819	0.311	1	0.783	1
1997	222	0.800	0.302	1	0.684	1
Total	1892	0.844	0.289	1	0.842	1

Given these results, an evaluation was made to determine whether it is possible to analyse the relationship between the corporate value and ownership structure (the cash flow rights, the control rights) using a nonlinear relationship analysis with the points of structural changes.

5. Empirical test

The OLS model is based on the cross section that can occur when using the panel data collected for 10 years from 1988 to 1997. There is a cause for concern that there may be a biased estimate because it violates an important fundamental assumption in establishing the regression analysis of independent variable and the assumption of exogenous independent variables. In order to resolve this issue, a within estimate

technique is used in which individual (firm- specific) effects and time effects were restricted using the fixed effects and all assumptions are verified.

5.1 Test results of Hypothesis 1 on the relation between firm value and ultimate ownership

According to the relationship between ownership structure and the value of the firm as discussed in section 2, the incentive for the controlling shareholder to expropriate the minority shareholders for their self-interests depends on how much cash flow rights they own. When the cash flow rights of the controlling shareholder are low, then such incentives and proxy costs increase due to the conflict of interest between controlling shareholders and minority shareholders. Therefore, the lower the cash flow rights of the controlling shareholder, the lower the value of the firm.

Table1-13 Regressions of Cash-Flow Rights and Firm Value

	M/B		Industry-M/B	
	Model (1)	Model (2)	Model (3)	Model (4)
Intercept	0.6482***	1.0851***	0.0356*	0.1568*
	(2.19)	(2.42)	(2.06)	(1.33)
Cash ≤ 0.14	0.0411*	0.0496**	0.0930	0.1228
	(2.02)	(2..49)	(0.66)	(1.06)
0.14 < *Cash* ≤ 0.24	-0.4787**	-0.6199***	-0.0974	-0.0642
	(-2.37)	(-3.12)	(0.66)	(0.44)
0.24 < *Cash* ≤ 0.50	0.3251	0.3218	0.0824	0.1404
	(1.26)	(1.27)	(0.76)	(1.29)
0.50 < *Cash*	0.0597	0.1093	0.0459	0.0632
	(0.18)	(0.34)	(0.22)	(0.31)
RD		1.9574***		1.598**
		(3.75)		(2.04)
ADR		1.0748		-0.9994
		(-0.57)		(-0.60)
CES		0.0376***		0.0412**
		(3.45)		(2.34)
DRC		0.2288***		0.1445***
		(4.24)		(4.57)

SIZE		-0.0436*** (-4.78)		-0.0143** (-2.64)
Adjusted R^2	0.0280	0.0209	0.0098	0.0096
No of Observation	1892	1892	1892	1892

Piecewise linear ordinary least-squares regressions analysis of firm value in Tobin'q (M/B), and firm value in Industry-Tobin'q (Industry-M/B), on cash flow rights and control variables. The firm value on ownership structure model is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. The Research and development (RD) and Advertising (ADR), Capital expenditure (CES), Financial leverage (DRC), Firm size (SIZE) are included as control variable. The dependent variable is the share of cash flow rights held by the largest shareholder (ownership). Numbers in parentheses are t-statistics. Asterisks denote the level of significance:***1%,**5%,*10%.
$Cash \leq 0.14$ = cash flow rights if cash flow rights < 0.14, = 0.14 if cash flow rights ≥ 0.14.
$0.14 < Cash \leq 0.24$ = 0 if cash flow rights < 0.14, = cash flow rights – 0.14 if 0.14 ≤ cash flow rights < 0.24, = 0.24 if cash flow rights ≥ 0.24.
$0.24 < Cash \leq 0.50$ = 0 if cash flow rights < 0.24, = cash flow rights-0.24 if 0.24 ≤ cash flow rights < 0.50, = 0.50 if cash flow rights ≥ 0.50.
$0.50 < Cash$ = 0 if cash flow rights of ultimate owner < 0.50, = cash flow rights – 0.50 if cash flow rights ≥ 0.50.

As reported in Table 1-13, in the case of the Tobin's Q variable, with intervals of cash flow rights less than 14%, the regression coefficient in model (1) is estimated at 0.0411 (t=2.02) for the whole period.[21] On the other hand, with intervals of cash flow rights between 14% and 24%, the regression coefficient is –0.4787(t=-2.37) respectively. Here as cash flow rights increases, firm value decreases. In industry Tobin's Q, intervals of cash flow rights less than 14%, the regression coefficient in model(3) is estimated at 0.0930 (t=0.66) for the whole period. On the other hand, in the intervals of cash flow rights between 24% and 50%, the regression coefficient is –0.0824(t=-0.76). Here as the cash flow rights increases, the firm value decreases.

[21] The Piecewise regression model normally chooses two methods to adapt structural break points. The first method is try to find structural break points to best fitness of the model or explanation for statistical significant through continuously simulation. The second method is to try the Piecewise regression in structural break points which are decided in advance, based on a theoretical background. This study uses the first method. Alternately, I test linear relation between cash flow rights and firm value, consistent with Claessens *et al* (2002) and curvilinear regression analysis, consistent with McConnell and Servases (1990). I do not find that the coefficient of cash flow rights and firm value is statically significant in both linear and curvilinear models. These statistical results are not presented in this study.

When observing results of model (3) and model (4), there are no significant differences in the relationship between cash flow rights and firm value regardless of whether control variables were included or excluded. These results are inconsistent with Claessens *et al* (2002), and provide empirical evidence that cash flow rights held by controlling shareholders are positively related to Tobin's Q with statistical significance. The less cash flow rights of controlling shareholders, the more conflict of interests between the controlling shareholders and minority shareholders. Again, here controlling shareholders are inclined to expropriate minority shareholders, thus creating agency costs and reducing firm value.

However, as seen in Table 1-13, cash flow rights and corporate performance of Korean corporations showed positive (+) relationships in the segment for 14% or less, which supports the convergence of interest hypothesis.[22] This shows that agency costs can decrease as ultimate owner's shares increase. Segments of cash flow greater than 14% to less than 24%, and the segment of cash flow greater than 25% to less than 50% showed a negative (-) relationship. This shows a managerial entrenchment[23] in which an administrator decision to increase in his own equity corresponds to his private wealth and therefore decreases firm valuation. This is in concurrence with claim made by Stultz (1988) that when equity of the administrator reaches 50%, the possibility of corporate take-over is zero and firm value also reaches its minimum level. However, a result of empirical analysis in Table 1-13, intervals of cash flow rights more than 50% is positively related to firm value (Tobin's Q), but the results are statistically insignificance. This supports the argument of Morck-Shleifer-Vishny (1988) that the relation between shareholding

[22] See Section 2 for convergence of interest hypothesis,
[23] See Section 2 for managerial entrenchment hypothesis.

and firm value is expressed as a different mixture of the conflict of interest alignment and management entrenchment for each interval. Finally, the results confirm the fact that there are both positive and negative of firm value associated with increased ownership concentration. For ownership concentration levels between 14% and 24% the relationship is negative and statistically significant. This is consistent with the cash flow right of ultimate owner range is due to managerial entrenchment problems and expropriation of minority shareholders.

Table1-14 Regressions of Control Rights and Firm Value

	M/B		Industry M/B	
	Model (1)	Model (2)	Model (3)	Model (4)
Intercept	0.5668 (1.04)	0.0006 (1.49)	0.0799*** (2,60)	0.1208 (1.03)
Control≤ 0.15	0.1422** (2.81)	0.1284** (2.56)	0.5867** (2.00)	0.5363* (1.84)
0.15 < *Control* ≤ 0.24	-0.2746* (-1.98)	-0.2325 (-1.54)	-0.0580 (-0.66)	-0.4118 (-0.46)
0.24 < *Control* ≤ 0.50	-0.1667 (-0.76)	-0.2619 (-1.22)	0.1168 (0.93)	-0.0484 (0.38)
0.50 < *Control*	-0.2316 (-1.11)	-0.2687 (-1.31)	-0.0510 (-2.60)	-0.0553 (-0.46)
RD		1.8609 (1.69)		1.4849* (1.90)
ADR		-0.9610 (-0.51)		-0.9376 (-0.54)
CES		0.0361** (3.31)		0.0380** (2.16)
DRC		0.2207*** (4.08)		0.1416*** (4.48)
SIZE		-0.0427*** (-4.70)		-0.0141** (-2.16)
Adjusted R^2	0.0232	0.0192	0.0113	0.0138
Number of Observation	1892	1892	1892	1892

Piecewise linear ordinary least-squares regressions analysis of firm value in Tobin's q (M/B), and firm value in Industry-Tobin's q (Industry-M/B), on control rights and control variables. The firm value on ownership structure model is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. The Research and development (RD) and Advertising (ADR), Capital expenditure (CES),

Financial leverage (DRC), Firm size (SIZE) are included as control variable. The dependent variable is the share of cash flow rights held by the largest shareholder (ownership). Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.
Control ≤ 0.15 = control rights if control rights < 0.15, = 0.15 if control rights of ultimate owner $\geq$ 0.15.
$0.15 <$ *Control* ≤ 0.24 = 0 if control rights < 0.15, = control rights – 0.15 if 0.15 $\leq$ control rights < 0.24, = 0.24 if control rights $\geq$ 0.24.
$0.24 <$ *Control* ≤ 0.50 = 0 if control rights < 0.24, = control rights-0.24 if 0.24 $\leq$ control rights < 0.50, = 0.50 if control rights $\geq$ 0.50.
$0.50 <$ *Control* = 0 if control rights of ultimate owner < 0.50, = control rights – 0.50 if control rights $\geq$ 0.50.

As reported in Table 1-14,[24] the intervals of control rights being less than 15%, regression coefficient (b) is positive and statistically significant, which supports the convergence of interest hypothesis, for the whole period (1988-1997). On the other hand, in the intervals of control rights being between 15% and 24%, and 24% and 50%, regression coefficient is –0.2746 (t=-1.98) and –0.1667 (t=-0.76) respectively. Here as control rights increases, firm value decreases. Also, in the intervals of cash flow rights being more than 50% where agency costs are higher, but statistically insignificant. These results support the argument of Shleifer and Vishny (1997) that large shareholders address the agency problem of not having enough control over the assets of the firm to have their private interests respected. However, I do not find that the relationship between control rights and firm value is negative and linear, a result that is consistent with Claessens *et al* (2002). Therefore, these results are similar with Table 1-3, and are related with cash flow rights and the firm value. The relationship between control rights of shareholding and firm value is manifested as a different

[24] This table uses the Piecewise regression model to find structural break points to best fit the model or explanation for statistical significant through continuous simulation. Also, I test linear relation between control rights and firm value, consistent with Claessen *et al* (2002) and curvilinear regression analysis, consistent with McConnell and Servases (1990). I do not find that the coefficient of control rights and firm value is statically significant in both linear and curvilinear models. I do not present these statistical results in this study.

mixture of the conflict of interest alignment and management entrenchment for each interval.

5.3 Hypothesis 2 on the relation between the divergence between the cash flow rights and control rights of controlling shareholders affects firm value.

In hypothesis 2, I try to identify how the divergence between the cash flow rights and the control rights of the ultimate shareholders affects the firm value. The coefficient of Cash/Control, indicating the divergence between the two factors, was estimated to be a positive number with statistical significance. Cash/Control will be closer to zero as the divergence between cash flow rights and control rights become larger. By contrast, when the divergence between the two does not exist, namely, when the controlling shareholders directly control firms instead of holding through pyramids or cross shareholding, then the value is near one. These results are consistent with the hypothesis that as the divergence between cash flow rights and control rights of controlling shareholders becomes greater, there is incentive to expropriate minority shareholders, reducing firm value.

However, the variable "Cash/Control" only denotes the divergence between cash flow and control rights and does not reflect how much control rights are held by controlling shareholders. Regardless of the size of the divergence between cash and control rights, the extent of control rights held by controlling shareholders could affect firm value. Hence I add the variable "(Cash/Control)*HiControl" to measure how the divergence between cash flow rights and control rights affects firm value when controlling shareholders possess relatively high control rights.

Table 1-15 Cash-flow Right, Control Rights, and Corporate Valuation

Explanatory Variable	Model (1)	Model (2)	Model (3)	Model (4)
	M/B		Industry M/B	
Intercept	0.8528*** (4.93)	0.8495*** (4.96)	0.0888 (0.28)	0.7198*** (3.92)
Cash	-0.1358 (-1.07)		-0.53641 (-1.21)	
Cash/Control	0.1148** (2.34)	0.0854* (1.88)	0.4111 (0.038)	0.0726 (-1.16)
Cash/control *HiControl		0.0738 (1.74)		0.08763 (1.65)
RD	1.8797*** (4.65)	1.5455*** (3.78)	1.2249** (2.85)	0.2234** (2.27)
ADR	-0.919 (-0.44)	-0.07171 (-0.93)	-0.0392 (-0.00)	-0.2209 (-0.98)
CES	0.0363 (0.33)	-1.3032 (-0.77)	0.0117 (0.12)	-1.2842 (-0.76)
DRC	0.2164*** (4.00)	0.1988*** (3.54)	0.7659*** (4.48)	0.6877*** (4.35)
SIZE	-0.0387*** (-4.23)	-0.7004*** (-5.40)	-1.6900*** (-4.47)	-0.6999*** (-5.40)
Adjusted R^2	0.0226	0.0236	0.2240	0.2255
Number of observation	1892	1892	1892	1892

This table present ordinary least-squares regressions analysis of firm value in Tobin's Q (M/B), and firm value in Industry-Tobin's Q (Industry-M/B), on divergence between cash flow rights and control rights and control variables. The firm value on ownership structure model is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. Numbers in parentheses are t-statistics. The dependent variable is divergence between cash flow rights and control rights held by the largest shareholder (Cash/Control) and Hi is a dummy variable indicating high control range. Hi equals one if control rights are greater than 30 percent, otherwise zero. Cash is the share of cash flow rights held by ultimate owner, The research and development (RD) and Advertising (ADR), Capital expenditure (CES), Financial leverage (DRC), Firm size (SIZE) are included as control variable. Asterisks denote the level of significance: ***1%, **5%, *10%.

Table 1-15 shows that regression coefficients Cash/Control and (Cash/Control)*HiControl are positive, but the coefficient for (Cash/Control)*HiControl does not have statistical significance. This outcome suggests that regardless of how much control rights are held by controlling

shareholders, when cash flow rights are less than control rights, controlling shareholders tend to increase their own private interests by expropriating the riches of minority shareholders. This results in reducing the firm value.

5.4 Comparative result with group affiliated firms and independent firms

As reported in Table 1-16, I estimated that control rights of less 15% by group affiliated firms are positively associated with corporate valuation and that control rights of more than 15% are negatively associated with valuation. The magnitude of the coefficient on the Industry M/B (model 2) is less than for the Tobin's Q model (model 1). Also, the magnitude of the coefficient on the control rights is somewhat more than that for independent companies. I find further evidence of expropriation as the coefficient on Cash/Control by Group-affiliated companies is positive and significant, and the coefficient for the interactive variable for high control stakes is also positive but not statistically significant. The magnitude of the coefficient on the Cash/Control variable is significantly greater than for independent companies, suggesting expropriation by group-affiliated companies is more than that by independent companies.

Table1-16 Regression with group affiliate firms and Independent firms

	Group-affiliated firms		Independent firms	
	M/B (1)	Industry M/B (2)	M/B (1)	Industry M/B (2)
Intercept	1.50279** (3.71)	1.5329* (5.79)	1.0338* (3.90)	1.0344* (3.93)
Control≤ 0.15	1.2003** (2.83)	1.2209** (2.87)	0.5891 (0.90)	0.5902 (0.92)
0.15 < *Control* ≤ 0.24	-0.0088 (-0.03)	-0.1050 (-0.29)	-0.02089 (-0.47)	-0.02421 (-0.39)

0.24 < *Control* ≤ 0.50	-0.3896**	-0.4802**	-0.3972**	-0.4027**
	(-2.47)	(-2.67)	(-2.26)	(-2.45)
0.50 < *Control*	0.2087	0.2944	0.2172	0.2242
	(0.92)	(0.96)	(0.39)	(0.42)
Cash/Control	0.2087***	0.2301***	-0.0386	-0.1993
	(3.81)	(4.98)	(0.73)	(-1.64)
Cash/control* HiControl		0.0362		0.0007
		(1.06)		(0.3)
RD	2.9528***	2.9852***	1.8735***	0.9267**
	(4.04)	(4.06)	(3.70)	(2.74)
ADR	0.2224	0.0831	-1.7666	-1.4995
	(0.08)	(0.03)	(-0.70)	(-0.60)
CES	-0.0143	-0.0127	0.0346**	0.0366**
	(-0.36)	(-0.32)	(2.79)	(2.94)
DRC	-0.0457	-0.0494*	0.3952***	0.3777***
	(-0.66)	(-0.72)	(2.79)	(4.95)
SIZE	-0.0589	-0.0599***	-0.0284**	-0.0278**
	(-4.90)	(-4.97)	(-2.22)	(-2.18)
Adjusted R^2	0.0059	0.0047	0.0480	0.0244

Piecewise linear ordinary least-squares regressions analysis of firm value in Tobin's Q (M/B) and firm value in Industry-Tobin's Q (Industry-M/B) on control rights and control variables. The firm value on ownership structure model is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. The Research and development (RD) and Advertising (ADR), Capital expenditure (CES), Financial leverage (DRC), Firm size (SIZE) are included as control variable. The dependent variable is the share of control rights held by the largest shareholder (Control), divergence between cash flow rights and control rights held by the largest shareholder (Cash/Control) and Hi is a dummy variable indicating high control range. Hi equals one if control rights are greater than 30 percent, otherwise zero. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%, *10%.

Control ≤ 0.15 = control rights if control rights < 0.15, = 0.15 if control rights of ultimate owner ≥ 0.15.

0.15 < *Control* ≤ 0.24 = 0 if control rights < 0.15, = control rights – 0.15 if 0.15 ≤ control rights < 0.24, = 0.24 if control rights ≥ 0.24.

0.24 < *Control* ≤ 0.50 = 0 if control rights < 0.24, = control rights-0.24 if 0.24 ≤ control rights < 0.50, = 0.50 if control rights ≥ 0.50.

0.50 < *Control* = 0 if control rights of ultimate owner < 0.50, = control rights – 0.50 if control rights ≥ 0.50.

Overall, when the relationship between corporate performance of Korean corporations and ownership are observed, the powerful influence of conglomerates can be seen. In particular, the top 30 *Chaebol* employ the pyramidal structure for increased control rights and cross-holding structure. It was found that dissociation

between control rights and cash flower rights influence corporate performance. This is an important support for hypothesis 2 because it reveals that affiliated companies have a significant effect. Evaluation control variables and corporate performance variables are as follows. Debt ratio also has some relationship to firm value. As in Table 1-13 to Table 1-17, there is a statistically significant positive relationship between leverage and corporate performance for whole firms, independent firms, and large firms. The positive relationship between debt ratio and corporate performance can be made only when the high leverage creates favourable outcomes, i.e. reducing agency costs associated with excessive investment. However, independent (non-*chaebol*) firms of Korea seem to be able to increase their corporate performances through higher leverage since they were constantly short of capital. On the other hand, reckless expansion through leverage or agency costs associated with under-investment due to leverage, will cause unfavourable effects on corporate performance.

In case of independent companies, Investment expenditures have a statistically significant positive relationship with corporate performance. Investment decisions themselves, either for affiliated companies (*chaebol*) or independent companies, contribute to increasing corporate performance. McConnell & Muscarella (1985) have empirically established that the more investments companies make, the more opportunities for growth, and thus the higher Tobin's q through higher share prices. As for the ratio of intangible assets, as is in theoretical predictions, the more advertisement costs and R&D spending, the higher firm value. In particular, R&D spending shows very high statistically significance. However, since the scale of

companies is inversely related to corporate performance, companies seeking to maximize their scales result in excessive investment at the expense of profitability.

5.5 The divergence between the cash flow rights and control rights of controlling shareholders affects firm value with years

Table 1-17 analyzes the corporate value and relationship between divergence of control rights and cash flow rights during 1988 – 1997. Correlation coefficients of Cash/Control were found to be 0.0726 for 1989, 0.2123 for 1993, 0.2216 for 1996, and 0.0803 for 1997. This shows that the relationship between Cash/Control and corporate performance of Korean firms for 10 years slightly increased. But the sudden drop in the correlation coefficient in 1997 can be seen. Stock values fell drastically with sudden collapse of Korean economy and many firms were withdrawn from the stock market. This can be seen as the reason for difference compared to other years.

Table1-17 The divergence between the cash flow rights and control rights of controlling shareholders affects firm value with years.

	Total (1988-1997)	1989	1993	1996	1997
Intercept	0.7198*** (3.92)	1.0528** (2.57)	0.1840 (1.25)	0.1181 (1.41)	0.2378 (1.07)
Cash/Control	0.0726** (1.16)	0.1681** (2.02)	0.2123* (1.83)	0.2216* (1.85)	0.0803* (1.78)
Cash/Control *Hi	0.08763 (1.95)	0.1070* (1.74)	0.0697 (0.70)	0.1158** (2.49)	0.0570 (1.53)
RD	1.8234 (4.27)	1.7146*** (3.35)	1.9391*** (2.42)	1.3932*** (2.59)	1.3821*** (2.88)
ADR	-0.2209 (0.98)	-0.3948* (-1.77)	-0.2744 (-1.16)	-0.2777 (0.93)	-0.1505 (-0.97)
CES	-1.2842 (-0.76)	-0.2422* (-1.75)	-0.2529 (-0.75)	0.4881*** (3.54)	0.0121*** (2.40)
DRC	0.6999*** (3.40)	0.3096** (2.81)	0.8508** (2.58)	0.6193** (2.37)	0.7549** (2.43)

SIZE	-0.0413*** (-4.93)	-0.0160 (-0.87)	-1.8600 (-0.09)	-1.0300 (-1.31)	-0.0207* (-2.21)
GROUP	0.1093*** (3.54)	0.0329 (0.68)	0.0810** (1.27)	0.0742** (2.41)	0.0186 (0.70)
Adjusted R^2	0.2255	0.2531	0.2718	0.2665	0.2053

Piecewise linear ordinary least-squares regressions analysis of firm value in Tobin's Q (M/B) and firm value in Industry-Tobin's Q (Industry-M/B) on control rights and control variables. The firm value on ownership structure model is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. The Research and development (RD) and Advertising (ADR), Capital expenditure (CES), Financial leverage (DRC), Firm size (SIZE) are included as control variable. The dependent variable is divergence between cash flow rights and control rights held by the largest shareholder (Cash/Control) and Hi is a dummy variable indicating high control range. Hi equals one if control rights are greater than 30 percent, otherwise zero. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%, *10%.

These results imply that the pattern of conflicted ownership structure increased and expropriates the minority shareholder with consequent agency cost during the decade before the East Asian Crisis. I remain the question that why the conflicted is related to more negative firm value in economy development.

Overinvestment is often point out as on of the fundamental causes which is agency cost problem can explain this value reduction and brought about the Asia economic crisis. Ryou and Kim (2003) find that overinvestment is most frequently for *chaebol* firms. They (2003: 36) note 'over investment by *chaebols* supports the view that loosening strict restrictions on lending in the financial sector to *chaebols* backfired. Under the catchphrase of "globalization", the Korean government allowed greater freedom in investment decision for conglomerates.' I would expect the effect of investment behaviour of divergence between cash flow rights and control rights of ultimate owner on firm value are negative. I hence will investigate this issue in Chapter 2.

On the other hand, Denis *et al* (1997), Rajan *et al* (2000) Lins and Sevaes (2002) show that firm diversification reduce value, and agency problems between shareholders and managers are the cause of value-reducing diversification. Claeseens *et al* (1988) show that firm diversification in more economic development among East Asia reduce value, and that agency problems can explain this value reduction. If the degree of diversification represents the seriousness of agency problems reflecting controlling shareholders' desire to diversify without considering minority shareholder's interests. I would expect negative relation between firm value and the degree of diversification. I hence will investigate this issue in Chapter 3.

6 Conclusion

This study has attempted to define the effects of corporate ownership structure or corporate governance system on corporate performance. Targeting Korean corporations of which the governance systems are different from the ownership structure of the corporations in either the United States or the U.K., certain theories have been selected for use in this research. First of all, I analysed the forms of the corporate ownership structure and the corporate governance systems of Korea prior to receiving financial assistance from the IMF in 1998. In particular, I divided the corporations into independent corporations and the large conglomerates (Top 30 *Chaebol*) characteristic of Korean corporate structures, and investigated corporate ownership structure and corporate value issues centring around agency issues arising from the pyramidal structure and the cross-holding structure of ownership.

This study made efforts to first minimize temporal errors and errors in company characteristics using 10 years of panel data from 1988 to 1997. When calculating the ownership structure of large companies, even data on the shareholding ratio of unlisted subsidiaries was included to maximize data use. Most robust studies (Classens, Djangkov and Lang (2000, 2002), Boone, Breach, and Friedman (2000), Mitton (2002), Lemmon and Lins (2003), Joh (2003)) do not include unlisted subsidiaries for calculating the ownership ratio of pyramidal and the cross-holding structure. However, the database on the stock equity of non-public companies provided by Korea Investors' Service (KIS) and the National Information and Credit Evaluation Inc. (NICE) provides information on the equity of the registered corporations. Some of this information has been omitted and because ownership information of non-public companies is not widely known, they have been excluded from the sample group in most cases. Hence, owing to the lack of information, there is a possibility that there may be some under-reporting, mostly on the account of the independent companies. Therefore, it is assumed that a greater number of companies are employing the pyramid structure and it is possible that the gap between the independent companies and the 30 largest companies in such employment will probably be smaller.

In this framework, there is an incentive for the managers to adopt investment and financing polices that benefit themselves, but reduce the payoff to outside stockholder or minority shareholder. Thus, the value of the firm depends on the fraction of ultimate ownership. This study empirically tested for relations of ownership structure and corporate value. I provided evidence on the agency cost hypothesis by examining (i) the cash flow rights, the control rights, and the

divergence between the cash flow rights and the control rights of ultimate owner (ii) firm valuation efficiency on ownership structure, and (iii) changes of corporate value for panel data (1988-1997) in the sample of Korean listed manufacturing companies.

The results are as follows;

(1) The relation of ownership structure (the cash flow rights, the control rights) and the corporate value is non-linear in OLS test.

(2) The divergence between the cash flow rights and the control rights of ultimate shareholders affects the firm value.

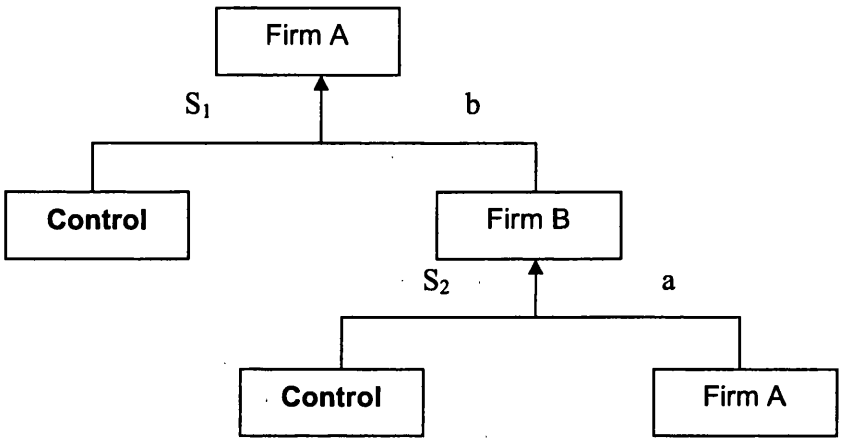
(3) The divergence between the cash flow rights and the control rights of ultimate shareholders which creates a conflicted ownership structure increased to expropriate the minority shareholder and agency cost during the 10 year period before East Asia crisis.

Appendix A

(1) Direct cross-holding ownership

Figure A1 shows direct cross ownership of shares in which corporation A owns shares of corporation B and corporation B owns shares of corporation A.

<Figure A1> Direct cross-holding ownership



$S_1$and S_2 show the equity ratio of the controlling shareholder in each corporation A and B signify equity ratio of corporation A and B each own. From the above the cash flow rights of the controlling stockholders possess can be shown using sum of the following infinite geometric sequence.

$$S_1 + S_2 b + S_1 ab + S_2 bab + S_1 abab + S_2 babab + \cdots + \infty$$

When the above equation is arranged, it can be shown as equation 1-(1), and further arrangement yields equation 1-(3).

$$S_1[1 + ab + \cdots + (ab)^{n-1}] + S_2 b\,[1 + ab + \cdots + (ab)^{n-1}] \quad 1\text{-}(1)$$

$$= \lim_{n\to\infty} \frac{S_1(1 - ab^{n-1})}{ab - 1} + \lim_{n\to\infty} \frac{S_2 b\,(1 - ab^{n-1})}{ab - 1} \quad 1\text{-}(2)$$

$$= \frac{S_1}{1 - ab} + \frac{S_2 b}{1 - ab} = \frac{S_1 + S_2 b}{1 - ab} \quad 1\text{-}(3)$$

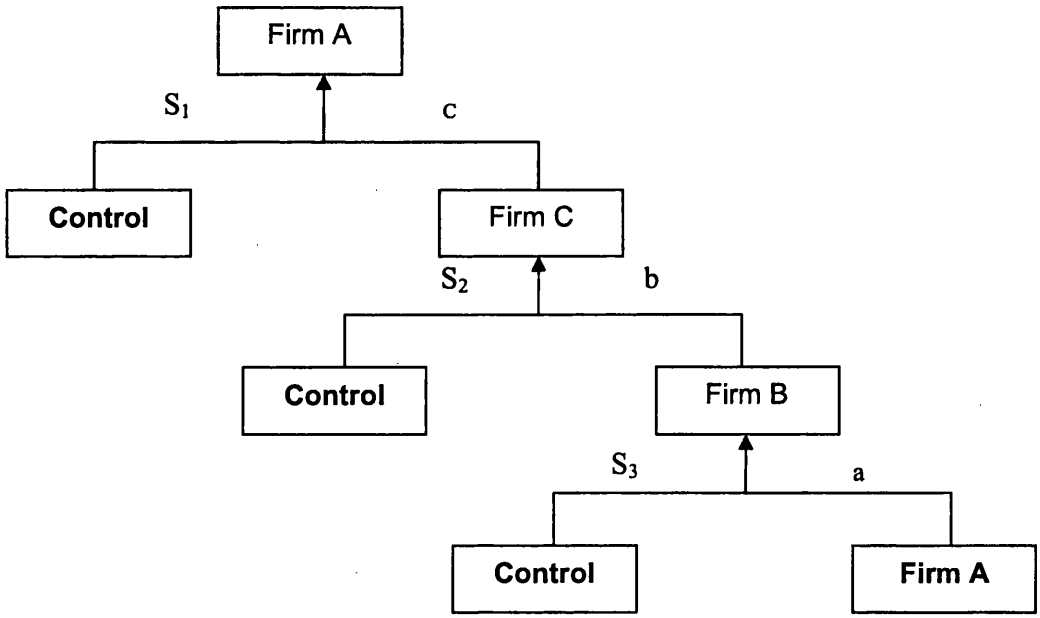
Therefore, in direct cross ownership of shares as in Figure A1 the cash flow rights of each controlling shareholder possesses can be expressed as follows

$$CFR = \frac{S_1 + S_2 b}{1 - ab}$$

(2) Cyclic cross-holding ownership

In Korea, direct cross ownership of shares is prohibited by law therefore corporations who use cross ownership of shares use cyclic cross ownership of shares as shown in Figure A2.

<Figure A2> Cyclic cross-holding ownership



Here, S_1, S_2, S_3 signify direct ownership of each controlling shareholders and a, b, and c signify the equity ratio of corporations A, B, and C. In this case, similar to

the above, cash flow rights of each controlling shareholder can be shown as the sum of the infinite geometric sequence shown below.

$$S_1 + S_2c + S_3bc + S_1abc + S_2cabc + S_3bcabc + \cdots + \infty$$

Arrangement of the above equation yields the following.

$$S_1[1 + abc + \cdots + (abc)^{n-1}] + S_2c[1 + abc + \cdots + (abc)^{n-1}]$$
$$+ S_3bc[1 + abc + \cdots + (abc)^{n-1}] \qquad 2\text{-(1)}$$

$$= \lim_{n\to\infty}\left[\frac{S_1(1 - abc^{n-1})}{1-abc}\right] + \lim_{n\to\infty}\left[\frac{S_2c(1 - abc^{n-1})}{1-abc}\right]$$
$$+ \lim_{n\to\infty}\left[\frac{S_3bc(1 - abc^{n-1})}{1-abc}\right] \qquad 2\text{-(2)}$$

$$= \frac{S_1}{1-abc} + \frac{S_2c}{1-abc} + \frac{S_3bc}{1-abc} = \frac{S_1 + S_2c + S_3bc}{1-abc} \qquad 2\text{-(3)}$$

Therefore, the cash flow rights each controlling shareholder posses in cyclic cross ownership of shares as in Figure A2 can be expressed as follows.

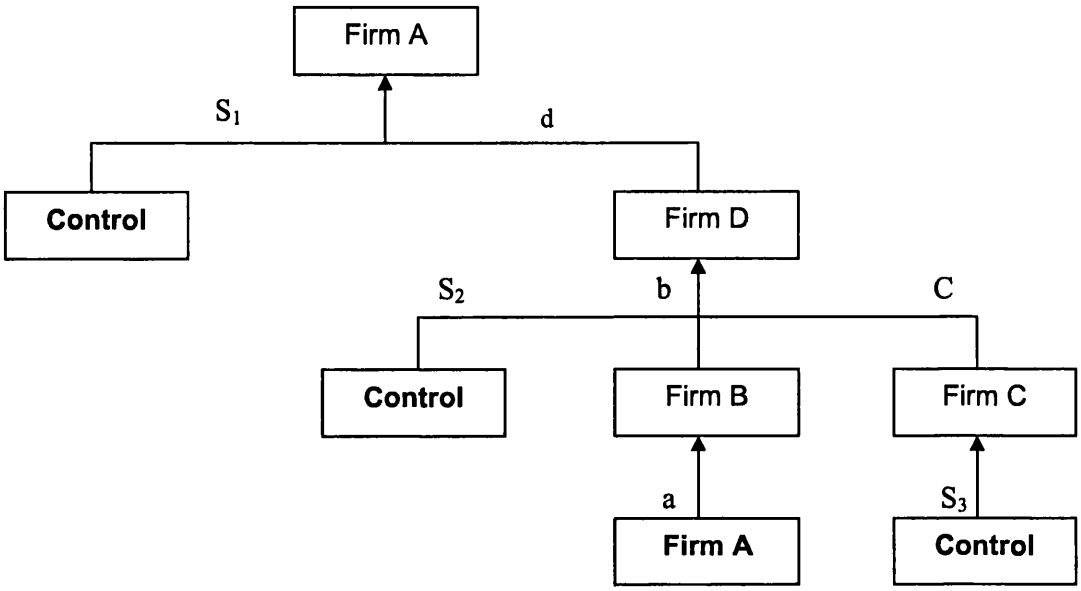
$$CFR = \frac{S_1 + S_2c + S_3bc}{1 - abc}$$

On one hand, when the above equation is examined, numerator $S_1 + S_2c + S_3bc$ if the cash flow of controlling shareholder that is calculated using the pyramid after one cycle, and abc in the denominator 1-abc is the product of percent ownership that is linked through the cycle.

(3) Application and demonstration of the simplified equation

Let us calculate the cash flow rights of controlling shareholders using the simplified equation found above. Figure A3 shows the structure of cyclic cross ownership of shares.

<Figure A3> Cross-holding – The simplified equation



First, cash flow rights of controlling shareholder connected through the pyramid, namely the equation that will be used as the numerator is $S_1 + S_2d + S_3cd$.

On the other hand, because the part that is continuously connected through the cycle is abd, 1-abc is the denominator. Therefore, cash flow rights of controlling shareholders from above can be expressed as follows.

$$CFR = \frac{S_1 + S_2d + S_3cd}{1 - abd}$$

Now, to check the validity of the equation that is calculated using the simplified equation above, let us unfold the equation through its steps. Right of cash flow the controlling shareholders possess in cross ownership of shares can be expressed as follows.

$$[S_1 + S_2 d + S_3 cd] + [S_1 abd + S_2 dabd + S_3 cdabd]$$
$$+ [S_1 abdabd + S_2 dabadabd + S_3 cdabdabd] + \cdots + \infty$$

Arrangement of the above equation yields equation 3-(2).

$$S_1[1+(abd)+\cdots+(abd)^{n-1}] + S_2 d[1+(abd)+\cdots+(abd)^{n-1}]$$
$$+ S_3 cd[1+(abd)+\cdots+(abd)^{n-1}] \qquad 3\text{-}(1)$$

$$= \frac{S_1}{1-abd} + \frac{S_2 d}{1-abd} + \frac{S_3 cd}{1-abd} = \frac{S_1 + S_2 d + S_3 cd}{1-abd} \qquad 3\text{-}(2)$$

Therefore, right of cash flow the controlling shareholder has in figure A3 is as follows.

$$CFR = \frac{S_1 + S_2 d + S_3 cd}{1-abd}$$

Because the above equation equals the right of cash flow calculated using the simplified equation, right of cash flow of controlling shareholder can be easily calculated by applying the simplified equation in the first cycle.

Reference: La Porta *et al* (1999), Claessens (2000)

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Chapter 2: Ownership Structure, Investment and Firm Valuation in Korean Companies

1. Introduction

The causes of the East Asian Economic Crisis of 1997 have engendered much discussion and this study aims to analyse and develop the debate. This study focuses primarily on the effect of firm valuation on investment behaviour in a context where there are agency problems with divergence between cash flow rights and control rights arising from poor corporate governance. During the crisis of 1997, Korea was offered International Monetary Fund (IMF) loans on the condition that Korea would improve its system of corporate governance. This was an exceptional and unprecedented demand; conditions previously imposed upon other countries by the IMF have only demanded the restructuring of specific financial institutions rather than the entire system of corporate governance.

A fundamental cause of the East Asian Economic crisis has often been considered to be patterns of overinvestment by Korean firms. Multiple theories have been modelled to explain and describe the causes of the crisis. At the macroeconomic level, key reasons are thought to include the ambiguity surrounding implicit and explicit government guarantees for bad loans; financial liberalization policies; a shift from a sector-specific industrial policy to functional intervention;[25] and the prevalence of soft-budget constraints. At the firm level key sources of overinvestment included

[25] See Chapter 1, Section 3.1.1.

problems of agency cost between managers and shareholders; misallocating capital owing to poorly planned diversification;[26] and the tendency towards the allocation of capital through internal capital markets.

First, I need to examine how an ownership structure, combined with systems of poor governance, can affect investment through misallocations of resources or capital. It will also be debated whether firm performance or value can be negatively affected by overinvestment combined with a divergence between control rights and cash flow rights. Bebchuk *et al* (2000) and Almeida *et al* (2006) both argue that the spreading of the cost of overinvestment between shareholders in a business group creates significant incentives to over invest in firms that have pyramidal ownership structures. This scenario is more likely to occur when the group's retained earnings are very large. The use of pyramid structures, therefore, might inadvertently destroy the value of a firm if too much cash is made available to the family. This is the setting in which a variation on the oft-cited 'free cash' problem is played out.

According to Jensen (1986, 1993), the private benefits from controlling more assets lead managers to take on wasteful, negative net present value (NPV) investment projects. This is known as overinvestment or 'empire-building'. Conversely, the private costs of additional investment may result in managers foregoing some positive NPV investment projects. Managers tend to display a preference for diminishing their workload; in plain words they are inclined to shirk. As investing requires more time to be spent overseeing a firm's activities, the trend will be for

[26] More details are in Chapter 3, 'Corporate governance, diversification and firm value'.

managers to under-invest.[27] Two very different types of investment behaviour are engendered by these two agency problems. As a result, the different investment behaviours tend to distinguish between the tangible expenditures of fixed capital and research and the intangible expenditures of Research and Development (R&D). Outcomes of R&D are uncertain or unpredictable and most of this type of expenditure goes towards human resources.

It is therefore assumed that the existence of a controlling ownership leads to a different pattern of investment decision-making which results in a characteristic investment pattern. In such contexts, I can measure of the extent to which ownership structure influences investment behaviour; the study will also explore some comparable issues in Korean firms' investment practices pre-East Asian Economic Crisis. Examination of the context of agency problems arising from poor corporate governance will help to explain how ownership structure affects investment behaviour in terms of capital and R&D expenditures.

Chapter 1 of this study comprises a discussion of ownership structure and firm value in Korean companies; it also includes evidence to support the agency-cost hypothesis and examines how the divergence between cash flow rights and control rights affects firm value. The relationships within ownership structures, in terms of cash flow and control rights, are demonstrated to be non-linear with the Ordinary Least Squares (OLS) test. The divergence between the cash flow rights and the control rights of the ultimate shareholders also affects firm value. This pattern holds true even after other

[27] Generally, I consider underinvestment a situation in which shareholders do not undertake a positive NPV project and overinvestment a situation in which they undertake a negative NPV project (Harris and Raviv, 1991; Parrino and Weisbach, 1999).

variables are considered and controlled for, such as capital expenditure, leverage, R&D, advertising or firm size.

Cho (1998) argues in this context that Jensen and Meckling (1976) and Stultz (1988) found a relationship between ownership structure and firm value. Jensen and Meckling (1976) state that ownership structure is strongly related to firm value as a result of its effect on investment. Cho (1998) explain the relationship as a two-stage process. First, ownership structure affects investment patterns, which then leads to a subsequent impact on firm value. This argument is adopted here and will be tested by using the case of Korea prior to the East Asian Economic Crisis. In addition, the study will examine how ownership structure in systems with poor governance affected investment behaviour in and during Korea's period of financial liberalization (1988–1998).

The focus of this study is to examine how a 'pyramid' ownership structure involving cross-holdings can affect two main types of capital expenditure investment and R&D, and how this consequently affects firm value. Jensen and Meckling (1976) argue that the ownership structure of a firm affects its corporate value because it acts as a significant variable on investment level. Despite ongoing debate about this subject, much of the analysis remains theoretical and few empirical studies have been conducted to test the validity of models and confirm the posited theory of overinvestment. Furthermore, few studies have explored the relationship between investment behaviours as seen within the framework of how both capital expenditure and R&D relate to ownership structure. The present study aims to fill this gap; it also investigates the relationship between investment behaviour and debt policy in

ultimate ownership structures (*chaebol* and non-*chaebol*) during financial deregulation and liberalization. Overinvestment is strongly related to over-borrowing from banks and traditionally Korean banks have lacked a strong and efficient system for monitoring debt-holders.

Section 2 includes a review of the theoretical and empirical literature on investment, ownership and value relationships. Section 3 focuses on agency cost, corporate governance and financial liberalization policies. Within this context, I develop hypotheses regarding the effect of corporate governance, as well as investment and debt policies, on investment behaviour. Section 4 outlines the methodology used to calculate investment, including both capital expenditure and R&D expenditure, and the use of control variables. In Section 5, equations are constructed to represent the investment patterns of Korean firms; these will incorporate quantitative variables, such as market value, debt ratio and cash flows and will include simultaneous equation regression (2SLS) analyses. A brief summary concludes the section.

2. Theoretical background

2.1 Fixed capital expenditure, agency cost and firm value

Overinvestment in cash flow, investment and investment opportunity has been the focus of several studies of agency cost. According to Modigliani and Miller (1958), firm-level investment should not be related to internally generated cash flows. In a theoretical scenario, with perfect capital markets and perfect information, no relationship would exist between investment activities at the firm level and internally

generated cash flows. If additional cash were required by a firm to fund investment activity, it could be simply raised from external capital markets. Conversely, if excess cash were available beyond that needed to fund available positive NPV projects, a firm would then distribute the cash flow to external markets. There is inevitably a disparity between this perfect world and the ways in which firms actually operate; in fact, a variety of hindrances inhibit the raising of cash from external capital markets. Additionally, significant transaction costs are associated with monitoring management to ensure that any free cash flow reaches external capital markets. Such capital market frictions can serve collectively to support a positive relationship between a firm's investment activities and its internally generated cash flow.

Several studies, however, have shown the existence of a positive relationship between investment expenditure and cash flow (e.g. Hubbard, 1998). There are two ways of explaining the dependent variables behind this relationship. First, I can see this as an agency problem, where managers engage in wasteful expenditure in firms with free cash flows (Jensen, 1986; Stultz, 1990). An agency cost explanation has been put forward by Jensen (1986) and Stultz (1990); this suggests that difficulties associated with monitoring expenditure create the potential for management to spend the excess cash flow on projects that are of benefit from a management perspective, but which prove costly from a shareholder perspective. The crux of the free cash flow hypothesis is that when managers' aims are different from shareholders' the potential exists for the squandering of any internally generated cash flow that is in excess of that required to maintain existing assets and finance new positive NPV projects. Second, it has been argued that the existence of a positive relationship reflects imperfections in the capital market: costly external financing creates the potential for

internally generated cash flows to increase in response to feasible investment opportunities (e.g. Fazzari, Hubbard and Petersen, 1988; Hubbard, 1998).

The implications of the free cash flow hypothesis on firm investment activity have been investigated in a number of papers. Lamont (1997) and Berger and Hann (2003) offer evidence that supports the hypothesis of cash-rich segments cross-subsidising the less profitable segments in diversified firms. They do not argue, however, that the evidence provided by these papers could also be seen as consistent with the theory that market frictions inhibit the ability of a firm to raise capital externally. Therefore, their evidence may not indicate overinvestment. Similar evidence is also provide by Harford (1999) and Opler, Pinkowitz, Stultz and Williamson (1999). The Harford sample consists of 487 takeover bids, and attempts to document that firms that are cash-rich tend to make more acquisitions; the authors suggest that these 'cash-rich' acquisitions tend to be followed by declining operating performance. Opler *et al* (1999) argued that companies holding excess cash tend to have higher capital expenditures, spending more on acquisitions even when faced with poor investment opportunities. However, what appears to be perhaps the most convincing evidence of the overinvestment of free cash flow is found in Blanchard, Lopez-di-Silanes and Vishny (1994). This study found that eleven firms that received unanticipated cash from legal settlements then went on to indulge in wasteful expenditure.

All the prior research agrees on the common ground of an agency-based explanation supporting a positive association between investment and internally generated cash flow. The drawback of such studies, however, is their use of relatively small sample populations, and lack of any direct measurement of overinvestment or free cash flow.

As a result, such findings may not necessarily be reliably extrapolated to larger sample populations, nor can they be held to be directly and unarguably explained by the agency-cost thesis. It can be further posited that a positive association suggested by their data may merely indicate that cash flows can be used as a proxy for investment opportunities (e.g., Alti, 2003).

Agency-based theories are not the only explanations put forward for the link between firm-level investment and internally generated free cash flow. A significant amount of research has been devoted to examining the role of financing constraints (Fazzari, Hubbard and Petersen, 1988; Hoshi, Kashyap and Scharfstein, 1991; Fazzari and Petersen, 1993; Whited, 1992; Hubbard, 1998). Another study, (Myers and Majluf, 1984) describes the central role of information asymmetries in increasing the capital cost for firms which find themselves forced to raise external finances, resulting in a reduction in feasible investment. When internally generated cash flow is made available, in conjunction with a lower cost of capital, such firms will then invest more.

Other work focuses on the sensitivity of investment to cash flow by comparing high dividend-paying firms with their obverse counterparts. Fazzari, Hubbard and Petersen (1988), Whited (1992) and Hoshi, Kashyap and Scharfstein (1991), for example, compare a range of organisational structures with various abilities to raise external finance, and examine how they relate to debt constraints. Their results found evidence of greater investment sensitivity to cash flow for firms that appear to be financially constrained, such as low dividend-paying firms, firms holding high levels of debt, and firms with limited resources. More recent research, however, casts doubt

on those earlier results: Kaplan and Zingales (1997, 2000), found such sensitivity of investment to cash flow persists even for firms who do not face financing constraints. A measure was constructed, using *ex ante* financing constraints, from a small sample of firms and this found a negative relationship between the sensitivity of investment to cash flow. This finding makes the financing constraint hypothesis less clear-cut and more doubtful.

2.2 Investment by Korean *chaebols*

Investment decisions by *chaebols* are the focus of several studies; (as opposed to concentrating more generally on ownership structure). Shin and Park (1999) and Kim (2002) completed studies demonstrating that *chaebols*, in contrast to standalone firms, tend to have an average lower Tobin q but higher ratios of investment. While keeping variables for the number of investment opportunities constant, they found that *chaebols* tend to invest more. However, this conclusion is also subject to the reservation mentioned above, where the results may, in fact, represent a disparity between too much investment by *chaebols* or too little investment by standalone firms.

In examining cases of internal market reallocation, Shin and Park (1999) argue that there are no significant differences among *chaebols* between investments by high-q and low-q firms; however, high-q firms are the higher investors by a significant margin among standalones. *Chaebol*-affiliated firms with good investment opportunities tend to invest less than standalone firms according to Kim (2002); conversely, *chaebol* affiliates with poor investment opportunities tend to invest more

than comparable standalone firms. Hahn (1999) argues that in Korea prior to the crisis of 1997, the top five *chaebols* tended to invest more in high-risk subsidiaries. Ueda (1999) focuses on the subset of the Korean heavy machinery and chemical industries during 1970–1990 in his study of investment behaviour and attempts to illustrate patterns of over- or underinvestment in the anticipated marginal products of capital. His method was to take cases where the anticipated marginal products of capital for a specific industry were lower than the average and interpret this as evidence of overinvestment in that industry.

Diversification is often associated with a misallocation of capital investment towards less profitable and more high-risk business sectors, which therefore tends to lead to patterns of overinvestment and inhibits innovation. Claessens *et al* (1998) examined the misallocation of capital hypothesis, finding that firms in Indonesia, Korea, Taiwan and Thailand appeared to have experienced a decline in short-term performance as a result of vertical integration. This suggests the possibility that a main cause of the East Asian Economic Crisis of 1997 was overinvestment.[28]

2.3 Ownership structure, R&D and firm value

R&D expenditure represents a special type of investment where results are neither immediate nor definite. Holmstrom (1989) identifies five major characteristics of innovation (and by extension R&D). First, the existence of a long-term project; second, a high probability of failure; third, an unpredictable outcome; fourth, labour-intensivity; and fifth, idiosyncratic R&D expenditure, may therefore be entirely

[28] More detail is found in Chapter 3, 'Ownership structure, diversification and firm value in Korean companies.'

unproductive, or at least may only translate into profits after many years. Such uncertainty and lack of quantitative measurements create difficulties for investors wishing to know the value of R&D expenditures. However, despite this, investment in R&D is essential for both the growth and survival of firms, especially in sectors such as pharmaceuticals and technology. In terms of innovation, therefore, decisions regarding the extent of R&D expenditure become very important for corporations and are usually made at the discretion of the management. Therefore, it can be seen that a separation of ownership and control in the firm causes agency-cost problems resulting from the information asymmetries between owners and managers. This can have a significant negative impact on the firm's decision-making processes and, in particular, on decisions concerning investment in the firm's growth.

The causes of information asymmetry are the managers' inability to provide information about their firms and the reluctance of many investors to examine firm activities. Understanding information asymmetry between managers and shareholders is vital for comprehending how incentives exist for managers to over- or under-invest in R&D. This is the key for understanding the relationship between different types of ownership and innovation. Even without agency problems, asymmetric information could result in firms under-investing which would be a significant source of inefficiency (Myers and Majluf, 1984). The more information provided for the shareholder the easier it becomes to place a value on R&D investments. If a firm has a large proportion of shareholders who actively seek information, the lower the information asymmetry in the firm and thus the lower the potential for managers to be subjected to short-term pressures.

Large shareholders have more at stake and therefore a greater incentive than smaller shareholders to obtain detailed information. Concentrated ownership can often result in liquidity problems for shareholders as large shareholders or 'blockholders' cannot sell significantly large holdings in a company without a proportional lowering of its stock price. Investors therefore are mutually dependent on managers to create value and turn over profits, while managers strongly depend on investors' confidence in the firm. This dependence therefore results in a long-term relationship between investors and managers and increases incentives to reduce information asymmetry among investors. It is not surprising, therefore, that several studies have demonstrated the existence of a positive association between the level of stock concentration and R&D investments in firms in the United States (e.g. Hansen and Hill, 1991; Hill and Snell, 1989). As a result, in a context where managers' and owners' interests have already been aligned, such as firms where owners are stewards, the influence of large investors should not affect R&D investment.

Little empirical research has been conducted into the relationship between agency cost and innovation. Here, this relationship will be examined and explained, drawing on both management strategy studies and finance studies. Hill and Snell (1989) and Hansen and Hill (1991), in their studies of U.S. firms, demonstrate a positive relationship between the level of stock concentration and R&D investments. Love *et al* (1996) in studying Scottish firms, posits that foreign ownership of companies results in a greater likelihood of product innovation. However, Dixon and Seddi (1996) suggest that whether ownership is domestic or foreign does not significantly impact on R&D activities. Francis and Smith (1995) use U.S. data to argue that diffusely held firms show less tendency towards innovation than closely held firms

(firms with either a high concentration of management ownership or with a significant equity block held by an outside investor). Using the Morck, Shleifer and Vishny (1988) approach to examine the relationship between insider ownership and Tobin's q for high R&D firms, Cui and Mak (2002) describe an N-shaped relationship. They go on to argue that higher levels of ownership can substitute for poor board governance in such firms. Lee and O'Neill (2003) compared relationships between ownership concentration and R&D activity in both Japan and the United States. They reported that although ownership concentration is positively associated with R&D in the United States, no such relationship exists in Japan. However, in a study of Japanese and U.S. firms, Lee (2005) reports the opposite result: that stock concentration is positively related to innovation with a low level of R&D investment, but negatively related to innovation at higher levels, in the U.S and Japan. Using R&D expenditure data Jensen (1993) demonstrates the ineffectiveness of internal corporate governance control mechanisms, but Chung, Wright and Kedia (2003) report that the type of corporate governance is a significant dependent variable in modelling the relationship between firm value (measured by Tobin's q[29]) and R&D. For firms with a greater proportion of external directors and greater access to analysis it seems that the valuation effect of R&D is greater.

Such results suggest that concentrated ownership and shareholder monitoring are an effective combination in alleviating high agency and contracting costs associated with innovation. As a result, a company's management and the organisation of innovation activities depend on the type of company ownership structure, or the legalities of corporate governance. Research has shown significant market responses

[29] See Section 4.

to announcements of increases in R&D expenditures (Chan *et al*, 2001). Such reactions vary according to the industry; the reaction can be significantly positive for high-technology firms but markedly negative for low-technology firms.[30] This implies an investment opportunity hypothesis (using Tobin's q), whereby firms with promising growth opportunities find R&D investments worthwhile, whereas other firms might find such investments wasteful.

Szewczyk *et al* (1996) examines the effect that free cash flow (financial constraints) can have on cross-sectional differences in market responses to R&D. Jensen (1986) reports that free cash flow tends to result in wasteful investments by managers rather than any distribution to shareholders. For firms with a high free cash flow, R&D investments carry an arguably higher cost. Conversely, R&D investments by firms with a low free cash flow increase the probability of the firm seeking new external financing. A firm's willingness to undergo the potential agency cost of external financing may be a favourable signal to investors. As a result, any announcement-period with abnormal returns for increases in R&D will be inversely related to free cash flow. Any free cash flow may result from the firm's investment opportunities.

Debt and dividend policy are much less important variables for constraining R&D-induced agency problems. Jensen (1986, 1989) defines agency problem as a dispute about free cash flow and it seems that such mechanisms are not well-suited to managing the agency problems induced by R&D. Dittmar, Mahrt-Smith and Servaes (2003) used R&D to measure asymmetric information and found that agency problems are a prime cause of increased cash holdings, concluding that high levels of

[30] Chan *et al* (2001)

R&D are associated with higher cash levels. It seems plausible, however, that many firms engaging in R&D maintain higher cash levels to self-finance R&D activities. Firms cannot pay out cash when involved in high levels of R&D activity. It seems the solution is not higher dividends; it is widely understood that firms with high growth options (e.g. a typical high-R&D firm) will have a lower dividend payout ratio (La Porta *et al*, 2000).

Galende and Fuente (2003) and Ortega-Argiles *et al* (2005) examine some samples of Spanish manufacturing industries for 2001 in terms of their financing mechanism. They found that a high level of debt in a company suggests that incremental innovations are being generated as opposed to radical innovations. The intangibility of many radical technological investments results in increased transaction costs and information asymmetries. Both of these factors can dissuade a firm from debt financing, whereas the availability of internal funds may mean that the greater risks involved with radical innovations can be more effectively confronted.

Ortega-Argiles *et al* (2005) demonstrates that the relationship between a high degree of ownership concentration and the use of debt financing (which can dissuade a firm from incurring R&D expenditure), is not a significant variable in the creation of R&D output. Debt financing, therefore, can inhibit innovative activities, because of the high specificity of many technological investments, activities incurring high risk, and pre-existing information asymmetries. However, there are more complex issues related to debt policy: following the Myers-Majluf 'pecking order' theory, R&D could be expected to be financed by retained earnings rather than by debt. However, Titman and Wessels (1988) argue that having 'unique' assets tends to be associated

with lower debt levels: consumers will buy unique products only if they are confident that the firm will survive to provide after-sales service. They also note that the lack of a secondary market and non-collaterability are both factors that serve to mitigate debt-financed R&D activity. Furthermore, Shi (2003) also indicates that R&D activity, which increases the market value of equity, also has an impact in increasing bond default risk and risk premium to debt. *Ceteris paribus*, bond holders may therefore be unwilling to bear the increased risks related to greater R&D activity. However, Zantout (1997) reports that shareholder gains from R&D announcements are not always associated with bondholder losses, which would seem to indicate that debt can even be valuable to R&D-intensive firms. Galende and De la Fuente (2003) discuss some significant effects of business financing mechanisms; they argue that high financial debt leads to the generation of incremental innovations rather than radical innovations. Bah and Dumontier (2001), however, report that R&D-intensive firms hold lower levels of debt than comparable non-R&D-intensive firms. Generally, it is accepted that R&D is associated with less debt in the firm's capital structure.

2.3 Investment (fixed capital and R&D) and firm value in expropriating minority shareholders

Most previous studies (Hoshi and Kasyhap, 1990; Hoshi *et al*, 1991; Lamont, 1997; Shin and Stultz, 1998) ignore R&D expenditure and only one empirical study is available examining the relationship between pyramid ownership and innovation in Canadian firms. A study by Morck *et al* (1998) shows a lack of support by established firms for radical innovations. Indeed, entrenched managers can even be seen as holding a vested interest in blocking innovation (Act *et al*, 1995). Morck *et al*

(1998) found that heir-controlled[31] firms do appear to be less innovative than entrepreneur-controlled firms or widely held firms. A comparison between different countries supports this by demonstrating that countries with extensive inherited wealth have less aggregate private-sector spending on innovation.

Morck *et al* (1998) posits that heir-controlled Canadian firms show low industry-adjusted financial performance, labour capital ratios and R&D spending when compared with firms of the same age and size. They argue that the share price of heir-controlled Canadian firms fell relative to those of comparable firms, on receipt of the news of the ratification of the North American Free Trade Agreement (NAFTA): capital market openness is a key provision of the treaty. Under NAFTA, heir-controlled Canadian firms' labour capital ratios increased, while the level of heir-control fell. This suggests that openness, especially of capital markets, may mitigate the ill effects of concentrated shareholder or heir control. If this is true, capital market openness matters for more reasons than usually stated in standard international trade and finance models.

2.4 Financial liberalization in corporate governance

Another source of overinvestment is financial liberalization. McKinnon and Pill (1996) also assert that many liberalizing economies have suffered from the over-borrowing that has resulted directly from over-consumption and overinvestment. Chang *et al* (1998) argue that excessive investments in the private sector in Korea led

[31] Morck *et al* divide billionaires who are not self-made into different categories. Heirs who control firms indicate that they are clearly not billionaires because of their entrepreneurial talents; these heirs include those to great business fortunes and political dynasties. There are also heir-entrepreneurs, who have both inherited and greatly increased substantial fortunes.

to the crisis of 1997 and this had been made possible by a policy of rapid and ill-designed financial liberalization.

Member firms within the Top 30 *Chaebols* are interconnected through an extensive network of reciprocal shareholding agreements. Korean banks are expected to play an active monitoring role in a firm's investment decisions as they are allowed to own up to 10% of the equity of firms. In fact, Korean banks provide many firms with substantial equity and debt financing.[32] For example, in 1997 the equity ownership held by Korean banks accounted for 9.42% of the shares listed on the KSE. Furthermore, the Korean government has often used its control of banks to exercise control over firms. This suggests that Korean banks have a significant potential for performing the role of an active investor but have traditionally not exercised a monitoring role. One reason for this is that Korean banks have traditionally held shares primarily to allocate their portfolio assets rather than to exercise voting rights. Second, concentrated equity ownership by *chaebol* owners, combined with cross-shareholding practices within *chaebol* firms, effectively prevents banks from playing the monitoring role of a large shareholder. Finally, most bank loans are guaranteed by cross-debt guarantees among *chaebol* member firms. This suggests that banks have little incentive or room to undertake the role of an active monitor (Bae *et al*, 2002).

Ryou and Kim (2003) demonstrate three ways that capital account liberalization affected capital inflows in the 1990s: first, there was an aggressive search for higher returns on capital by banks and financial institutions in developed countries where growth levels were slow and domestic markets were highly competitive. This was the

[32] Under Article 200 of the *Securities Exchange Act* of 1962, which was in effect until March 1997, investors were not allowed to acquire more than 10% of the equity of other firms without the permission of the Korean Securities and Exchange Commission.

major cause of the expansion of private capital flow to the developing countries, especially in the mid-1990s when Japanese banks followed their corporate foreign investors in lending much of their short-term capital to East Asian countries. Second, a large differential between domestic and foreign interest rates resulted in incentives for Korean banks to accommodate local lending by borrowing abroad. Third, the increase in the mid-1990s of the credit ratings of Korean banks and corporations in the international financial market meant that they could enjoy easier access to investment funds from abroad.[33] It can be argued therefore that the consequence of financial liberalization during the 1990s was an increase in capital inflows to the Korean economy. The capital account surplus and rising bank borrowing from abroad in the 1994–1996 period can therefore be better explained by 'push' rather than 'pull' factors.

3. Developing a testable hypothesis

Theoretically, the impact of ownership structure on firm investment could be explained in two ways. Under the incentive alignment hypothesis,[34] high ownership could reduce the incentive for the largest shareholder to expropriation. On the other hand, under the entrenchment hypothesis,[35] ultimate owners gain nearly full control

[33] Capital flow and interest rates (US$ billion and %)

Variable (year)	89	90	91	92	93	94	95	96	97
Capital account balance %	-2.9	2.6	6.4	6.6	2.7	10.3	16.8	23.3	1.3
Bank's borrowings	0.6	2.1	3.9	1.6	0.5	7.6	10.6	9.7	-9.7
Loan rates of Korea %	10.0	10.0	10.0	8.5	8.5	8.5	9.0	11.0	15.32
Prime rates of Japan %	5.75	8.25	6.63	4.50	3.30	3.00	1.63*	1.63*	1.63*
Euro dollar Libor	8.25	7.56	4.13	3.31	3.38	6.50	5.81	5.56	5.81

Source: Ryou and Kim (2003), Bank of Korea, Monthly Statistics, various issues. IMF, International Financial Statistics, various issues. * This table indicates that the gap between Korea and Japanese loan rates grew extensively from 1995.

[34] Jensen and Meckling (1976) and greater detail in Chapter 1.

[35] Shleifer and Vishny (1997), Morck, Shleifer, and Vishny (1988) and greater detail in Chapter 1

of the firm and use it to generate private control benefits that are not shared by minority shareholders. Pyramid and cross-holding structures allow a separation of their control rights from cash flow rights and serve to expropriate minority shareholders.

Different investment behaviours tend to distinguish between the tangible expenditures of fixed capital and the intangible expenditures of R&D. Returns on R&D are uncertain or unpredictable, and most of its expenditure goes towards human resources (personnel expenses). Under the overinvestment hypothesis, the private benefits from controlling more assets lead managers to take on wasteful, negative net present value (NPV) investment projects (empire building). Conversely, under the underinvestment hypothesis, the private costs of additional investment may result in managers foregoing some positive NPV investment projects.

Let us assume that entrenched controlling shareholders or managers could expect better returns and private benefits from tangible assets than intangible ones. I could also expect some divergence between control rights and the cash flow rights of ultimate owners when increasing capital expenditure in the context of poor investment opportunities. In the same way, managers or owners could be expected to be reluctant to invest in R&D in an environment of good investment opportunities. The degree of this incentive may change according to the level of ownership. In order to examine this relationship, the following hypothesis is constructed:

Hypothesis 1: *If the ultimate or entrenched manager has higher private benefit or interest from investing in capital expenditure when compared to R&D, then it is expected they will follow strategies to maximise this private benefit. This means that they may choose to invest inefficiently in fixed assets when it is not optimal to do so, from a firm value perspective.*

I discuss the effect of debt ratios on overinvestment in the context of capital market opening and financial liberalization in Section 2.4.[36] Corsetti *et al* (1999) argue that moral hazard jointly determines investment, excessive borrowing and current account deficit in an economy with a poorly supervised and regulated financial sector. Demetriades and Fattouch (2001) showed that the volume of unproductive credit increased sharply during the 1993-1996 period.

I also investigated the link between investment behaviours and debt ratio[37], comparing group-affiliated firms and independent firms. The following hypothesis is developed in order to examine this relationship:

Hypothesis 2: *In the context of a poor monitoring system of banks, the debt policy of firms influences investment behaviour. It is expected that this relation changes with*

[36] Agency problems between shareholders and bondholders (there are two types of under the weak monitoring system for bondholder or bank agency cost of debt: underinvestment problems (i.e. debt overhang problems, Myers, 1997) and asset substitution effects (i.e. overinvestment problem, Jensen and Meckling, 1976).

[37] See section 2.4 In an alternative explanation, Litov (2006) studies how improved governance mechanisms affect firm financing. He points out that, paradoxically, managers' endogenous choices in favour of riskier investment policy can serve to indicate the strength of the corporate governance in place. He notes (2006, page 2) 'Well-monitored (or well–governed) managers are more likely to undertake risky (and value-enhancing) projects because it is easier to distinguish between "bad" managerial luck and "bad" managerial judgment in a monitored environment. Firms with riskier investment policies would have lower levels of debt compared to firms with safer investment policies. In equilibrium better governed firms would choose lower debt levels compared to badly governed firms'.

the degree of financial liberalization. In a climate of higher liberalization, over-borrowing is expected, leading to an overinvestment problem.

4. Data and methodology

This study uses data from the Korean Investors Service Line (KIS-LINE, which is a Korean financial database for publicly traded companies). The sample includes 1892 non-financial Korean companies trading in the Korea Stock Exchange from 1988 to 1997.[38] The combination of the 1,892 companies with a 10 year period of analysis forms an unbalanced panel in accordance with the appropriate panel data methodology (Verbeek and Nijman, 1992).

I use the Fair Trade Commission's annual report to identify which firms are affiliated with a *chaebol* and which are independent.[39] Firms affiliated with the top 30 *chaebol* are designated by 'affiliated firms' and firms not associated with these *chaebol* 'independent'.

Following chapter 1, I suggest a piecewise linear regression of firm value on cash flow rights of ownership structure and OLS linear regression of firm value on divergence between cash flow rights and control rights of ownership structure. The results show that the relation of control ownership and firm value is non-linear, a result similar to that of Morck et al (1988) and that the divergence between the cash flow rights and the control rights of ultimate shareholders affects negatively the firm

[38] More detail in Section 4.1, Chapter 1.

[39] KFTC legitimately defines a business group as " a group of companies, more than 30 percent of whose shares are owned by some individuals or by companies controlled by those individuals" The KFTC identifies business groups and announces them every year.

value. This relation holds after controlling for other well-known determinants of firm value such as capital investment research and development, advertising, leverage, firm age, firm size in a fixed effect model.

I estimate the following models of the investment to investigate whether ownership structure affects investment.

INV (CES, RD) = F (TOBINQ, CFREE, RISK, CFCR, OWN1 OWN2 OWN3 OWN4, SIZE)

INV (CES): The ratio of capital expenditure to fixed assets.[40]

INV (RD): The ratio of research and development to fixed assets.

TOBINQ: The firm's market to book ratio.

CFREE: Cash flow to the beginning of the total asset ratio.

RISK: Standard deviation in changes in profit rate.

CFCR: Divergence between cash flow rights and control rights.

OWN1-OWN4: Cash flow rights in ownership structure.

SIZE: Logarithm of the total asset.

Capital expenditure (CES) is the change in the gross capital stock over a year. The gross capital expenditure is the sum of individual tangible fixed assts such as property, plant and equipment divided by the previous year-end's capital stock. Research and development (R&D) is the change in the gross intangible assets for experimental and research expenses divided by the previous year-end's capital stock. In the case of cash flow rights[41], following chapter 1, I undertake a piecewise analysis by defining some significant break-points or thresholds. Hence, I have

[40] The measure of investment is the same as in Hoshi and Kasyhap (1990) and Hoshi *et al.* (1991).
[41] More detail is in Chapter 1.

defined four variables (OWN1, OWN2, OWN3, Own 4) aimed to reflect the different influence of ownership structure depending on the level of cash flow rights of ultimate ownership. OWN1 equals the percentage of cash flow rights of ultimate owners having lower than 14%. The level of cash flow rights chosen as breakpoints is 14% and 24%. OWN2 is defined as the percentage of cash flow right ownership minus 14% provided that ultimate owner does not have more than 24% of the shares. OWN3 is defined as the percentage of cash flow right ownership minus 24% provided that ultimate owner do not have more than 50% of the shares. OWN4 equals a percentage of cash flow rights of ultimate owner having higher than 50%.

Cash-flow (CFREE) is used to take into account the financing problems that are encountered in an imperfect finance market. This means, as is suggested by the Modigliani and Miller theory, that investment is independent of the financing methods if the cost of using the cash-flow is the same as using external finance. However, there is an agency problem between creditors and debtors as suggested by Jensen and Meckling (1976) where the type of investment is influenced by the cash-flow as it costs less than other financing methods. As a result, firms that have different levels of cash flows must have corresponding different scales of investment. This idea was first formulated by Fazzari, Hubbard and Petersen (1988), who analyze the correlation between funds constraints and investment. They find that the cost of funds varies according to the type of financing used and as a result firms use the cheapest first, which leads to what is known as 'Financing Hierarchies.' Using cash

flow, which tends to be regarded as the cheapest fund, definitely affects the level of investment.[42]

Growth or investment opportunity is measured by Tobin's Q (TOBINQ). The firm's market to book ratio is used to measure Tobin's Q as in (Smith and Watts 1992), i.e. (the firm's book value of total assets + market value of outstanding shares- book value of equity)/firm's book value of total assets. Chan, Martin, and Kensinger (1990) and Zantout and Testsekos (1994) analyse proxy growth opportunities using a binary (high, low) technology variable. Firm size (SIZE) may be positively related to investments because of economies of scale and scope.

I link this approach with the ownership structure factor to investigate the correlation between ownership structure and the internal financing constraints of investment from the standpoint of the relationship between cash-flow-investment sensitivity in investment opportunities. I also include debt ratio in the model in order to analysis investment behaviour in the financial liberalization period (1988-997). It is argued that a high debt ratio involves a high credit risk, and makes it difficult for firms to access external finance and, therefore, may constrain the investment. Next, I test whether the ownership structure affects investment, and explore the relationship between corporate governance, investment and the value of the company.

Cho (1998) focuses on whether the ownership structure affects investment, and explains the relationship between corporate governance, investment and the value of

[42] Hoshi et al. (1991) investigate empirically Japanese firms based on the same approach, and show that compared with independent firms. Keiretsu firms have lower sensitivity of investment to cash flow.

the company. Cho (1998) describes how corporate governance impacts on investment and in its turns how investment affects the value of the company. Cho (1998) also examines the possibility that the ownership structure, investment and the value of the company are endogenous rather than exogenous factors. The simultaneous regression analysis shows that the endogenous traits of the ownership structure affected this assumption and that investment affects the value of the company and that the value of the firm affects the ownership structure. Therefore, I conduct a simultaneous equation analysis of ultimate ownership, corporate value, and investment for Korean companies in 1988-1997, using a 2SLS method to estimate the parameters in the following equation:

Ownership structure = FA (Corporate value (TOBINQ), Investment (INV),
Volatility of earnings (RISK), Cash free (CFREE), Asset size (SIZE)) (1-1)

Corporate value = FB (Ultimate ownership (CF, CFCR), Investment (INV),
Financial leverage, (DRC), Asset size (SIZE)) (1-2)

Investment = FC (Ultimate ownership (CF, CFCR), Corporate value (TOBINQ),
Volatility of earnings (RISK), Cash free (CFREE)) (1-3)

These equations are similar to the one estimated by Demsetz and Lehn (1985) and Cho (1998). I estimate investment separating capital expenditures and R&D, and insider ownership is cash flow rights of ultimate ownership and divergence between cash flow rights and control rights. Volatility can be measured by looking at the standard deviation in changes in the profit rate over the most recent five year period.

Profit rate is defined as profits made without any extraordinary items, divided by total assets. Debt can negatively affect the rate of investment if it prevents firms from raising necessary funds (Long & Ravenscraft 1993; Myers 1977) or curtails overinvestment by compounding agency problems between managers and shareholders (Jensen 1989). Leverage is defined following Froot, Scharfstein, & Stein, (1994) and Myers & Majiluf (1984) and R&D intensity and advertising intensity are used as proxies for intangible knowledge-based resources. (Chatterjee & Wernerfelt 1991).

5. Empirical results

5.1 Ownership structure and investment

5.1.1 Analysis of the variables influencing ownership structure and investment patterns

Average values for the rate of investment and its determinants are summarized in Table 2-1. The sample period is set between 1988 and 1997, years that well illustrate the volatile changes in investment occurring in the late 1980s. The overall fixed capital investment (CES) rate is 9%, and the R&D rate is 0.6%. As expected, rates of investment in fixed CES and R&D show that the affiliated firms invested more than the independent firms. The level of divergence between cash flow rights and control rights may be defined as follows. Low divergences show a higher-than-mean cash flow rights minus control rights, and high divergences show lower-than-mean cash flow rights minus control rights.

Growth opportunities measured by Tobin's q were greater for independent firms (non-30 top *chaebol*) than for affiliated firms (top 30 *chaebol*) and greater in situations of low divergence between cash flow rights and control rights. The lower Tobin's q result of affiliated firms compared to independent firms is similar to the findings of Lang and Stultz (1994) and Shin and Park (1999). The debt/asset ratio between the two types of firms also showed a marked difference during the period from 1988 to 1997. However, the volatility of return measured by the standard deviation of profit was greater for independent firms than for affiliated firms. Descriptive statistics indicate that, on average, affiliated firms had lower growth opportunities and lower cash flow than independent firms but were highly leveraged and invested more heavily.

Table 2-1 Summary statistics for variables used in econometric analyses for Sample 1892 of Korean companies (Mean, 1988-1997)

Variable	All	Affiliated firms	Independent firms	Low divergence	High divergence
CES	0.0987	0.0973	0.0875	0.0984	0.0954
RD	0.0062	0.0075	0.0051	0.0067	0.0060
TOBINQ	1.0699	1.0497	1.0825	1.0322	0.9840
DRC	0.7197	0.7672	0.6831	0.7255	0.7179
CFREE	0.0178	0.0144	0.0224	0.0170	0.0186
RISK	0.0233	0.0200	0.0257	0.0201	0.02426

This table present means of variables for Top 30 *chaebols* (Affiliated firms) and non – *chaebols* (Independent firms), and level of divergence of cash flow rights and control rights (Low divergence define higher than mean of cash flow rights minus control rights, High divergence define lower than mean of cash flow rights minus control rights). The sample is comprised of 1892 firms observed in any year between 1988 and 1997. Capital expenditure (CES) is change in the gross capital stock over a year. The gross capital expenditure for sum of individual tangible fixed assts such as property, plant and equipment divided by the previous year-end's capital stock. Research and development (R&D) is change in the gross

intangible assets for experimental and research expense divided by the previous year-end's capital stock. Firm value or investment opportunity measured by Tobin's q (TOBINQ), that is, (firm's book value of total assets + market value of outstanding shares- book value of equity)/firm's book value of total assets. Debt ratio (DRC) defines total debt divided by total assets. Free cash flow (CFREE) defines cash flow to the beginning of the total asset ratio. Volatility of return (RISK) is standard deviation in changes in profit rate during the past five years. Profit rate is defined as profit before extraordinary items divided by total assets.

5.1.2 Results for Hypothesis I on the relationship between ultimate ownership and investment

The results in Table 2-1 suggest that affiliated firms with high divergence between cash flow rights and control rights ownership (CFCR) (hereafter referred to as 'high divergence ownership') have poorer investment opportunities, but have higher capital expenditure ratios and lower R/D ratios than independent firms. The Tobin's q investment model suggests that a value-maximising firm will invest as long as the market value of the firm is greater than the book value of the firm. As discussed in Section 2, when poor investment opportunity (lower Tobin's q) is linked with a higher rate of cash investment, this will result in overinvestment. Correspondingly, higher investment opportunity (higher Tobin's q) linked with lower investment will result in underinvestment.

Table 2-2 Regressions Relating Investment and ownership (1988-1997)

	Capital expenditure		R&D expenditure	
	(1)	(2)	(3)	(4)
OWN1	0.1114	0.1317	-0.0136*	-0.0135*
	(0.40)	(0.47)	(-1.75)	(-1.75)
OWN2	0.2469*	0.2510*	-0.0073*	-0.0149**
	(1.88)	(1.90)	(-2.01)	(-2.16)
OWN3	0.1173	0.0966	-0.0022	-0.0016
	(0.74)	(0.61)	(-0.51)	(-0.38)
OWN4	-0.0487	-0.0109	0.002	0.0404
	(-0.24)	(-0.31)	(0.43)	(0.79)
CFCR	-0.1291***	-0.1364***	0.011	0.0013
	(-2.94)	(-3.04)	(0.97)	(1.07)
TOBINQ		-0.0140		0.0408**
		(-1.33)		(2.49)
RISK		0.1918		0.0084
		(1.00)		(1.60)
CFREE		0.1063*		-0.0047***
		(1.94)		(-3.17)
SIZE		0.0685***		0.0010***
		(3.70)		(5.94)
Adj. R^2	0.0108	0.0157	0.0111	0.0264

Piecewise linear ordinary least-squares regressions analysis of investment to capital expenditure and investment to research and development (R&D) expenditure, on cash flow rights and control variables. The total number of observation is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. Firm value (Tobin's q), risk (RISK), Cash flow (CFREE) and Firm size (SIZE) are included as control variable. The independent variable is the share of cash flow rights held by the largest shareholder (OWN) and divergence between cash flow rights and control rights (CFCR). Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

OWN1: $Cash \leq 0.14$ = cash flow rights if cash flow rights < 0.14, = 0.14 if cash flow rights of ultimate owner $\geq$ 0.14.

OWN2: $0.14 < Cash \leq 0.24$ = 0 if cash flow rights < 0.14, = cash flow rights – 0.14 if 0.14 $\leq$ cash flow rights < 0.24, = 0.24 if cash flow rights $\geq$ 0.24.

OWN3: $0.24 < Cash \leq 0.50$ = 0 if cash flow rights < 0.24, = cash flow rights-0.24 if 0.24 $\leq$ cash flow rights < 0.50, = 0.50 if cash flow rights $\geq$ 0.50.

OWN4: $0.50 < Cash$ = 0 if cash flow rights of ultimate owner < 0.50, = cash flow rights – 0.50 if cash flow rights $\geq$ 0.50.

This study found (Chapter 1) that when the interval of cash flow rights is between 14% and 24% (OWN2) the regression coefficient and divergence between cash flow rights and control rights (CFCR), and firm value is significantly negative. As reported in Table 2-2, the coefficient OWN2 are significantly positive for capital

expenditure, but significantly negative for R&D expenditure. The divergence between cash flow rights and control rights of shareholders (CFCR) is significantly negative for capital expenditure, but insignificantly positive for R&D expenditure.

These results are consistent with the hypothesis that as the divergence between cash flow rights and control rights of shareholders increases, there is an incentive to expropriate minority shareholders (agency problem) leading to a reduction in firm value.[43] Jensen and Meckling (1976) argue that ownership structure affects corporate value because of its effect on investment, and Jenson (1986, 1993) argues that managers adopt wasteful, negative net present value investment projects because they gain private benefits from controlling more assets. My results imply that large agency costs do affect investment behaviour between capital expenditure and R&D expenditure. I also found that divergence between cash rights and control rights affected investment behaviour when comparing capital expenditure with R&D expenditure.

Table 2-3 shows investment levels in capital expenditure and R&D for both affiliated and independent firms in the pooled sample. The coefficient of Tobin's q is positive and statistically significant for both types of firms. Overall, firm investment behaviour was significantly dependent on its internal source of funds and with the firm's growth opportunity. I have therefore shown that there is a relationship between internal cash flow and investment for both the affiliated firms (*chaebol*) and the independent firms.

[43] More detailed account in Chapter 1.

Table 2-3 Regressions Relating Investment and ownership in Affiliated firm and Independent Firm (1988-1997)

	Capital expenditure		R&D expenditure	
	Affiliated Firms (1)	Independent Firms (2)	Affiliated Firms (3)	Independent Firms (4)
OWN1	0.3134	-0.1756	-0.0164	-0.0147
	(0.93)	(-0.33)	(-1.54)	(-1.13)
OWN2	0.2045	0.3199*	-0.01078*	-0.0059
	(1.03)	(1.71)	(-1.72)	(-1.30)
OWN3	0.3526	0.0952	-0.1261	0.0018
	(1.29)	(0.48)	(-1.44)	(0.698)
OWN4	0.0914	0.2405	0.049*	0.0353
	(1.01)	(1.03)	(1.94)	(0.35)
CFCR	-0.1419***	-0.0191	0.2604**	0.0018
	(- 2.84)	(-0.18)	(2.92)	(0.39)
TOBINQ	0.0339*	0.0648*	0.0032**	0.0007**
	(1.85)	(1.93)	(2.30)	(2.20)
RISK	-3.0294***	0.4118*	0.0670**	0.0057
	(-4.18)	(1.99)	(2.91)	(1.15)
CFREE	0.0952	0.0818**	-0.0002	-0.0042***
	(0.91)	(2.62)	(-0.06)	(-2.61)
SIZE	0.0299***	0.0841**	0.0017***	0.0007***
	(2.39)	(2.99)	(5.17)	(3.79)
Adj. R^2	0.0156	0.0173	0.0560	0.0457

Piecewise linear ordinary least-squares regressions analysis of investment to capital expenditure and investment to research and development (R&D) expenditure, on cash flow rights and control variables for comparing between affiliated firms and independent firms. The total number of observation is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. Firm value (Tobin's q), risk (RISK), Cash flow (CFREE) and Firm size (SIZE) are included as control variable. The independent variable is the share of cash flow rights held by the largest shareholder (OWN) and divergence between cash flow rights and control rights (CFCR). Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

OWN1: $Cash \leq 0.14$ = cash flow rights if cash flow rights < 0.14, = 0.14 if cash flow rights of ultimate owner $\geq$ 0.14.

OWN2: $0.14 < Cash \leq 0.24$ = 0 if cash flow rights < 0.14, = cash flow rights – 0.14 if 0.14 $\leq$ cash flow rights < 0.24, = 0.24 if cash flow rights $\geq$ 0.24.

OWN3: $0.24 < Cash \leq 0.50$ = 0 if cash flow rights < 0.24, = cash flow rights-0.24 if 0.24 $\leq$ cash flow rights < 0.50, = 0.50 if cash flow rights $\geq$ 0.50.

OWN4: $0.50 < Cash$ = 0 if cash flow rights of ultimate owner < 0.50, = cash flow rights – 0.50 if cash flow rights $\geq$ 0.50.

As illustrated in Table 2-3, the correlation coefficient between capital expenditure and free cash flow is not statistically significant for *chaebol* firms. However, the

correlation between capital expenditure and market-to-book ratio (investment opportunity) is positive and significant for both affiliated and independent firms at the 10% level. However, the *chaebol* firms have a lower Tobin's q (investment opportunity) than the independent firms.

This result suggests that the investment behaviour of independent firms is financially constrained. The affiliated (*chaebol*) firms can be related not only to their growth opportunity but also cash flow from external sources such as borrowing from other financial institutions or other affiliated *chaebol* firms. *Chaebol* firms are restricted from financing other companies' projects freely as they are independent legal entities. However, they can contribute to other firms' financing of projects or obtain bank loans through cross-payment guarantees (Shin and Park, 1999).

As shown in the first and third regression analysis of Table 2-3, the coefficient of divergence between CFCR for affiliated firms is significantly positive for the capital expenditure model and significantly negative for the R&D expenditure model. In contrast, the evidence of expropriation as the coefficient for CFCR by group-affiliated firms is positive and significant (see Table 1-16, Chapter 1). These results imply that divergence between cash rights and control rights has the opposite effect on investment behaviour in terms of capital expenditure and R&D expenditure. I explored the divergence between CFCR in situations where the controlling ownership led to overinvestment in capital expenditure and underinvestment in R&D expenditure. However, the coefficient of divergence for CFCR is insignificant for both capital expenditure and R&D expenditure in independent firms. This is because independent firms (non-top 30 *chaebol)* do not have a large disparity between cash flow rights and control rights.

5.1.3 The results of Hypothesis II regarding ownership structure and investment in times of financial liberalization

The liberalization of financial accounting in the 1990s lowered financial costs of firms in general. At the same time, the banking sector increased its local loans through borrowing in the international capital market. In addition, a boom in the stock market that followed the opening up of markets to foreign investment helped in the direct financing of the listed firms. In this context, I investigated the relationship between ultimate ownership structure (*chaebo*l and non-*chaebol*)[44] and investment behaviour in a period of financial liberalization. The sample periods were chosen to give the same number of years for two sub-periods—before and after financial liberalization—1988–1992 and 1993–1997.[45]

Table 2-4 Statistics comparing means of affiliated firms and independent firms

	Affiliated Firms		Independent Firms	
	1988–1992	1993–1997	1988–1992	1993–1997
CES	0.0825	0.1062	0.1052	0.0650
R&D	0.0050	0.0070	0.0032	0.0040
TOBINQ	1.0018	1.0867	1.0752	1.0800
LDRC	0.4470	0.4587	0.3968	0.4139
SDRC	0.2953	0.3127	0.2509	0.2735
CFREE	0.0072	0.0059	0.0270	0.0021
RISK	0.0234	0.0189	0.0274	0.0273

[44] Korean business groups, *chaebols,* are known to have weaker corporate governance structures than non-*chaebol* firms (See also Chapter 1).

[45] See more detail in Appendix B: Capital market opening; foreign investors are allowed to invest directly in Korean stock markets with ownership ceilings (1992)

This table present means of variables for Top 30 *chaebols* (Affiliated firms) and non–*chaebol* (Independent firms). The sample is comprised of 1892 firms observed in any year between 1988 and 1997. Capital expenditure (CES) is change in the gross capital stock over a year. The gross capital expenditure for sum of individual tangible fixed assets divided by the previous year-end's capital stock. Research and development (R&D) is change in the gross intangible assets for experimental and research expense divided by the previous year-end's capital stock. Firm value or investment opportunity measured by Tobin's q (TOBINQ), that is, (firm's book value of total assets + market value of outstanding shares- book value of equity)/firm's book value of total assets. Long term debt ratio (LDRC) defines long term debt divided by total assets. Short term debt ratio (SDRC) defines short term debt divided by total assets. Free cash flow (CFREE) defines cash flow to the beginning of the total asset ratio. Volatility of return (RISK) is standard deviation in changes in profit rate during the past five years. Profit rate is defined as profit before extraordinary items divided by total assets.

Table 2-4 presents a statistical summary of means for the main variables: the capital expenditure ratio, R&D ratio, Tobin's q, debt ratio and cash flow, for both affiliated and independent firms, and for both before and after the period of financial liberalization. These statistics indicate that affiliated firms increased their investment in both CES and R&D after financial liberalization. For independent firms, CES dropped from 0.1052 before financial liberalization to 0.0650 afterwards, but R&D expenditure slightly increased from 0.0032 to 0.0040. Tobin's q ratios were higher in both groups: the mean value increased from 1.0018 to 1.0867 for the affiliated firms and from 1.0750 to 1.0800 for the independent firms. In the period after financial liberalization, the affiliated firms on average had a higher investment ratio than the independent firms, even if the Tobin's q of the affiliated firms remained similar to that of independent firms. This may suggest that the problem of overinvestment by *Chaebol* (the affiliated firms) remained after financial liberalization. The debt/asset ratio (both long-term and short-term) exhibited marked differences between affiliated firms and independent firms both before and after periods of financial liberalization. The mean value of the debt/asset ratio (both long-term and short-term) for the affiliated firms was higher than that of the independent firms in the period before financial liberalization (long-term debt: 0.4470 versus 0.3968, short-term debt:

0.2953 versus 0.2509), as well as after financial liberalization (long-term debt: 0.4587 versus 0.4139, short-term debt: 0.3127 versus 0.2735). In both groups, the debt/asset ratio increased significantly after financial liberalization. If I assume that the problem of overinvestment by *Chaebol* existed after financial liberalization, I could further suggest that the debt ratio was also related to investment behaviour for those firms.

Table 2-5 Regressions Relating Investment in 1988-1992

	Capital expenditure			R&D expenditure		
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	All	Affiliated firm	Independent firm	All	Affiliated firm	Independent firm
TOBIN Q	-0.0047 (-0.37)	0.0195 (0.88)	-0.0086 (-0.53)	0.0002 (0.81)	0.0006 (0.80)	-0.0001 (-0.12)
CFREE	-0.0971 (-0.81)	-0.0787 (-0.04)	-0.0835 (-.0.55)	-0.0018 (-0.36)	0.0023 (0.36)	-0.0083 (-1.81)
RISK	-2.6456*** (-4.37)	-3.0564*** (-3.43)	-2.4482** (-3.03)	0.0327** (2.61)	0.0583* (1.66)	0.0675*** (3.04)
LDRC	-0.4002*** (-4.29)	-0.0144 (-0.11)	-0.4498** (-3.04)	0.0041** (2.16)	0.0128** (2.60)	-0.0067 (-1.56)
SDRC	-0.5837*** (-5.11)	0.0179 (0.10)	-0.7441*** (-5.05)	-0.0051 (-0.57)	0.0090 (1.29)	-0.0108** (-2.27)
SIZE	-0.0271 (-0.34)	0.1205* (1.82)	-0.2470 (-1.60)	0.0180* (1.90)	0.0053** (2.04)	-0.0003 (-0.10)
Adj. R^2	0.0790	0.0782	0.1100	0.045	0.1413	0.0665

Ordinary least-squares regressions analysis of investment to capital expenditure and investment to research and development (R&D) expenditure, on debt ratio (long term debt (LDRC) and short term debt (SDRC)) and control variables for comparing between affiliated firms and independent firms. The total number of observation is based on data for 1892 firms from 1988 to 1992. The regressions are performed using a fixed- effects (time and industry) specification. Firm value (Tobin's q), risk (RISK), Cash flow (CFREE) and Firm size (SIZE) are included as control variable. Numbers in parentheses are t-statistics. Asterisks denote the level of significance; ***1%, **5%,*10%.

Table 2-5 shows that the effect of cash flow on investment patterns for Korean firms is not statistically significant, but investment in capital expenditure does have an effect on the debt ratio (long- and short-term) in all samples. However, although the

coefficient of investment in capital expenditure and the debt ratio for independent firms is negative and statistically significant, it is insignificant for affiliated firms in the period 1988–1992. R&D expenditure shows a positive relationship with long-term debt in affiliated firms and a negative relationship with short-term debt in independent firms during periods of less financial liberalisation. The regression results in Table 2-5 suggest that the investment in capital expenditure of independent firms affects the debt ratio (both short-term and long-term). The resulting debt-servicing obligations help to discourage overinvestment of free cash flow by entrenched managers. However, for the affiliated firms the relationship of investment and the debt ratio is insignificant.

Table 2-6 Regressions Relating Investment in 1993-1997

	Capital expenditure			R&D expenditure		
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	All	Affiliated firm	Independent firm	All	Affiliated firm	Independent firm
TOBINQ	0.0148 (0.41)	0.0141 (0.62)	-0.0067 (-0.22)	0.0004 (0.12)	0.0001 (0.11)	0.0001 (0.35)
CFREE	1.9407*** (2.54)	-0.0814 (-0.74)	2.5094*** (3.15)	-0.0001 (-0.03)	0.0003 (0.07)	-0.007 (-0.38)
RISK	-2.4625*** (-3.17)	-3.5141*** (-4.61)	-2.9132*** (-3.42)	0.0282* (1.70)	0.0644* (1.67)	0.0106 (0.60)
LDRC	0.9655*** (2.66)	-0.0196 (-0.17)	1.2026*** (3.39)	0.0032* (1.77)	0.0023 (0.69)	0.0036* (1.75)
SDRC	1.7761*** (3.95)	-0.2408 (-1.47)	2.6852*** (4.89)	0.0020 (0.86)	-0.0008 (-0.67)	0.0044** (1.84)
SIZE	0.0621 (0.43)	0.1050* (2.14)	-0.005 (-0.03)	0.0007 (0.57)	0.0253* (1.91)	-0.0038 (-1.48)
Adj. R^2	0.4766	0.4729	0.4341	0.0219	0.0215	0.0273

Ordinary least-squares regressions analysis of investment to capital expenditure and investment to research and development (R&D) expenditure, on debt ratio (long term debt (LDRC) and short term debt (SDRC)) and control variables for comparing between affiliated firms and independent firms. The total number of observation is based on data for 1892 firms from 1993 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. Firm value (Tobin's Q), risk (RISK), Cash flow (CFREE) and Firm size (SIZE) are included as control variable. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

Table 2-6 results show positive relationship between investment (capital expenditure) and cash flow after a period of financial liberalization. Investment in capital expenditure has a positive relationship with the debt ratio (long- and short-term). This is statistically significant in all samples. Table 2-5 shows the opposite result, with the investment–debt ratio in a negative relationship. The coefficient of the debt ratio and investment in capital expenditure for independent firms is positive and statistically significant, but for affiliated firms it is statistically insignificant for the years 1993 to1997. R&D has a positive relationship with both long-term and short-term debt in independent firms, but this relationship does not hold for the affiliated firms.
The regression results shown in Table 2-6 suggest that the investment in capital expenditure and R&D of independent firms is positively related to the debt ratio.

For independent (non-*chaebol)* firms the relationship between both short-term and long-term leverage and investment changed from negative before financial liberalization to positive after financial liberalization. The positive aspect of leverage is its disciplinary role in reducing free cash flow problems (Jensen, 1986) after financial liberalization. However, the results suggest that the relatively high cost of external finance leads to investment that is largely limited to internal funding. This holds even if Korean firms could enjoy easier and cheaper access to investment funds after a period of financial liberalization.[46] For *chaebol* firms leverage is less

[46] See Section 2.4

important, particularly in the long term, which might be due to the existence of the internal capital market as illustrated by Park and Shin (1999).[47]

However, a firm's debt policy might adopt a different role depending on its maturities: short-term debt may be more useful in reducing free cash flow problems, and because the practice of rolling over short-term debts will put the firm under more frequent scrutiny of the capital market (Flannery, 1986; Diamond, 1991), it could raise the firm's standing with external investor. On the other hand, short-term debt can cause a serious liquidity problem, especially when the economy is in financial distress. Kim and Lee (2003) argue that if there is economy-wide financial stress, credit rationing is likely to occur, resulting in a liquidity crisis. The positive role of leverage is thus less likely to be effective during a crisis. Therefore, the role of leverage in the performance of Korean firms during the East Asian crisis may be consistent with the agency-based theory.[48] *Chaebol* firms typically have a higher leverage, both short-term and long-term, than non-*chaebol* firms. This is consistent with Choi *et al* (2000), who argue that a high incidence of short-term leverage was one of the major causes of the Korean financial crisis.

[47] Shin and Park (1999, pp. 172-173) note 'The cross-payment guarantee among affiliated firms helps *chaebols* to finance through bank loan and corporate bounds. The cross-payment guarantees, with cross share-holdings, link member firms to each other and reduce the member firms' risk of financial distress and bankruptcy by creating an internal capital market among the *chaebol* firms. To facilitate the internal capital markets, *chaebol* firms also increased their ownership of non-bank financial intermediaries in the 1980s when the government liberalized the financial markets'.

[48] Jensen and Meckling (1976) argue that financial distress can intensify the conflicts of interests between bondholders and shareholders. Kim and Lee (2003, page 343) note 'The stock market pays a lot of attention to the firm's ability to repay loans, especially short-term loans, when most financial institutions are not willing to renew short-term credit due to their own liquidity problems in economy-wide financial distress. This might lead to very poor performance of the firms with very high leverage, especially those with very high short-term leverage'.

5.2 Ownership structure and investment in firm valuation

This section analyses the effect of ownership structures on the firm value through investment decision making. Using 2SLS statistical analysis, I address whether the ownership structures function as endogenous rather than exogenous variables; to achieve this I analyse how the ownership structure affects investment. Demsetz (1983) and Demsetz and Lehn (1985) raise the issue of endogeneity of ownership structure, and many subsequent studies (Cho, 1998; Himmelberg, Hubbard and Palia, 1999; Demsetz and Villalonga, 2001; McConnell, Servaes and Lins, 2003) all show that firm value affects ownership structure. One of the factors that determine family ownership is firm performance. Much of the existing literature shows that firms with greater controlling family ownership perform well because family interests are more vested in those firms; other studies, however, argue that that causality runs in the other direction, from firm performance to family ownership (Cho, 1998; Himmelberg *et al,* 1999). This makes sense in firms in which the controlling family has ultimate control; those who have 'inside information' may decide to own more shares in firms that are performing well, while they let their affiliated companies own the poorly performing firms. Given the mixed empirical results on bilateral causality between ownership and firm valuation, this study addresses the issue of causality by exploring how the determinants of ownership structure are affected by firm valuation.

Table 2-7 shows the 2SLS estimation results of the simultaneous regression in which the cash flow rights of the ultimate ownership is used for both the corporate value and investment regressions for the whole period (1988–1997). The first three columns of Tables 2-7 and 2-8 contain the regression estimates obtained by using capital expenditures as a measure of investment. The last three columns of Tables 2-7

and 2-8 contain regression estimates obtained by using R&D expenditures as a measure of investment.

Table 2-7 Simultaneous equation analysis of cash flow rights, corporate value, and investment (1988-1997)

Variable	Capital expenditures model			R&D expenditure model		
	Ultimate Ownership	Corporate value	Investment	Ultimate Ownership	Corporate value	Investment
CONS	0.39*** (2.99)	-0.52 (-0.73)	1.29*** (2.70)	1.16 (0.88)	-2.67 (-0.76)	0.032*** (3.43)
TOBINQ	-0.01 (-1.12)		1.12*** (3.98)	-0.13 (0.54)		0.03** (2.11)
RISK	0.11 (0.13)		-0.60*** (4.06)	0.06 (0.33)		-0.003 (-0.56)
CFREE	0.03 (0.99)		1.89*** (3.05)	0.05 (0.46)		-0.002* (-1.78)
CF		0.70** (2.11)	0.49** (2.58)		0.05 (1.06)	-0.04*** (-3.21)
DRC		0.76*** (2.99)			0.250*** (3.14)	
ADR		-1.01 (-0.40)			0.07 (0.14)	
INV	-0.02 (-1.05)	0.01 (0.49)		0.54 (0.47)	0.34* (1.97)	
SIZE	-0.31*** (-3.63)	0.002 (0.12)	0.07*** (3.10)	-0.05 (-0.66)	0.06 (0.57)	0.06* (1.90)
Adj. R^2	0.0018	0.0732	0.0417	0.0122	0.0165	0.0619

This table present simultaneous equation analysis of ultimate ownership, firm value, and investment 1892 published Korean companies from1988 to1997, using the two-stage least squares method to estimate the flowing equation: Ownership structure = F (Corporate value (TOBINQ), Investment (INV), Volatility of earnings (RISK), Cash free (CFREE), Asset size (SIZE)). Corporate value = G (Ultimate ownership (CF), Investment (INV), Financial leverage (DRC), Asset size (SIZE)). Investment =H (Ultimate ownership (CF), Corporate value (TOBINQ), Volatility of earnings (RISK), Cash free (CFREE)). In the above equation, ultimate ownership is measured as cash flow rights of largest shareholder. Two measures of investment are used and the model is repeated to use first, capital expenditures, and second, research and development (R&D) expenditure to measure investment. The regressions are performed using a fixed- effects (time and industry) specification. Firm value (Tobin's Q), risk (RISK), Cash flow (CFREE) and Firm size (SIZE) are included as control variable. Numbers in parentheses are t-statistics Asterisks denote the level of significance: ***1%, **5%,*10%.

As evidenced in Table 2-7, Tobin's q is not an important determinant of cash flow rights of ultimate ownership. This result does not imply that the managers in firms

with higher corporate values or with better investment opportunities hold a larger fraction of their firm's shares.

If a firm is less financially constrained, it can invest more when it has good opportunity because it can finance good (positive) projects using either internal cash flows or external funds. I find that capital expenditure is sensitive to market-to-book ratio (as a Tobin's q proxy) which represents growth opportunity as perceived by the market. Also, the cash flow rights of the ultimate owner and corporate performance are statistically positive and significant. However, I do not find a significant relationship between capital expenditure and corporate performance.

The coefficients of R&D in investment and corporate performance models are positive and statistically significant. The cash flow rights of the ultimate ownership structure affects corporate value, a finding that is different from the OLS corporate value regression results reported in Chapter 1. The coefficient of the cash flow rights and the corporate value are in positive linear relation with statistical significance, similar to the results of Claessens, Djankov and Lang (2002). Also, the ownership regression analysis does not show any cause-and-effect relationship between corporate value and the cash flow rights of ultimate ownership. This conclusion is not consistent with Cho (1989).

Table 2-8 Simultaneous equation analysis of the divergence between cash flow rights and control rights, investment and corporate value (1988-1997)

Variable	Capital expenditures model			R&D expenditure model		
	Ultimate Ownership	Corporate value	Investment	Ultimate Ownership	Corporate value	Investment
CONS	-0.03 (-1.28)	-0.94 (-1.53)	-0.91*** (-5.76)	0.030 (1.09)	-0.13 (1.47)	0.03*** (3.25)
TOBIN Q	0.02 (1.59)		2.07** (2.99)	-0.18 (0.45)		0.304** (2.27)
RISK	0.05 (0.35)		-2.43*** (3.02)	0.17 (0.61)		-0.003 (-0.62)
CFREE	0.09 (1.60)		1.91*** (3.31)	0.11 (0.58)		-0.012 (-1.67)
CFCR		0.70* (1.91)	0.27** (2.18)		0.10* (1.95)	-0.001 (-1.61)
DRC		0.67*** (4.12)			0.67*** (4.32)	
ADR		0.078 (0.20)			0.072 (1.92)	
INV	-0.03 (-1.28)	0.04* (1.78)		0.048 (0.48)	0.74*** (3.34)	
SIZE	-0.32*** (-4.63)	0.05 (1.04)	0.0485** (2.23)	-0.08 (-0.67)	0.03 (0.01)	0.0585*** (2.90)
Adj. R^2	0.1025	0.0650	0.0453	0.0104	0.0138	0.0570

This table present simultaneous equation analysis of ultimate ownership, firm value, and investment 1892 published Korean firms from1988 to1997, using the two-stage least squares method to estimate the flowing equation: Ownership structure = F (Corporate value (TOBINQ), Investment (INV), Volatility of earnings (RISK), Cash free (CFREE), Asset size (SIZE)). Corporate value = G (Ultimate ownership (CFCR), Investment (INV), Financial leverage (DRC), Asset size (SIZE)). Investment =H (Ultimate ownership (CFCR), Corporate value (TOBINQ), Volatility of earnings (RISK), Cash free (CFREE)). In the above equation, ultimate ownership is measured as divergence between cash flow rights and control rights of largest shareholder .Two measures of investment are used and the model is repeated to use first, capital expenditures, and second, research and development (R&D) expenditure to measure investment. The regressions are performed using a fixed- effects (time and industry) specification. Firm value or investment opportunity (Tobin's Q), risk of firm (RISK), Cash flow (CFREE) and Firm size (SIZE) are included as control variable. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

Table 2-8 shows results of the simultaneous regression in which divergence between the cash flow rights and the control rights is used for both the corporate value and investment models in the two-stage least squares estimation. As reported here, the corporate value is not an important determinant of divergence between cash flow

rights and control rights. There is a significant positive relationship between the effect of both R&D and capital expenditure on firm value. Consistent with Fazzari *et al* (1988), the regression results indicate that liquidity and corporate value positively affect capital expenditure. In conclusion, the findings in this section suggest that the cash flow rights of the ultimate ownership structure affect the investment, investment affects corporate value, and ownership directly affects firm value, but the corporate value does not affect the ownership structure. However, in the R&D expenditure model, the impact of divergence is statistically insignificant. These statistical results are due to the specific characteristics of the Korean manufacturing industry. According to agency theory, R&D is regarded as a strategy to maximize company profitability, so firms are naturally assumed to be pursuing R&D strategy to maximize stockholder profit. However, the samples of this study show that the ratio of Korean manufacturing sales to average research development funds was in reality a mere 0.62%. This could be interpreted as showing that Korean manufacturers have tended to expand competitively through raising market control, rather than by providing higher quality goods through R&D endeavours.

In other words, the Korean manufacturing industry before the Asian crisis may be characterized as an organization-led developing industry. These specific characteristics reflect its interlocking with foreign trade policy, based on prime costs; its leaning towards efficiency rather than the achievement of goals; and prime cost superiority strategies rather than differentiation strategies. Also, the relationship between company value and advertising expenditure was not confirmed by the statistics. This effect could have been caused by the samples used in the study. In the firms sampled, advertisement expenses show considerable variations due to the grouping of very different industry groups into the same broad classification of

manufacturers. For example, heavy chemical industries and food industries were placed in the same category, although they had very different characteristics and business strategies.

6 Conclusion

This study examined how the separation of ownership and control in business group firms and independent firms affects investment (both capital expenditure and R&D) and firm value. I considered two alternatives of the principal-agent problem. In the first alternative, the ultimate owners receive private benefits from investment in capital expenditure and this can lead to overinvestment. In the second alternative, the ultimate owner invests privately in R&D, and this can lead to underinvestment. I showed that these alternative behaviours of the ultimate owner were often criticised as being one of the main problems leading to the Korean financial crisis in 1997. Additionally, I tested the relationship between corporate leverage, ultimate corporate ownership structure and investment during a period of financial liberalization. I used the data on investment and its determinants for listed manufacturing Korean firms for the ten years from 1988 to 1997. I also performed robustness checks, using both OLS and 2SLS estimation techniques.

The major findings of this study may be summarised as follows:

(1) Divergence between cash flow rights and control rights has an opposite impact on investment behaviour in terms of capital expenditure and R&D expenditure. I confirmed that investment in independent companies (non-*chaebol*) is more cash

flow sensitive. For these firms, I find a stronger positive relationship between cash flow and investment opportunities than for affiliated firms (Top 30-*chaebol*) for both capital expenditure and R&D.

(2) Investment does not affect growth opportunities (Tobin's q) for both affiliated firms and independent firms, but investment has a strong influence on corporate leverage, when comparing the 1988–1992 and 1993–1998 periods of differing financial liberalization. I found that the coefficient of investment and debt ratio among the sample of independent firms was negative before financial liberalization (1988–1992) but became positive after financial liberalization (1993–1998). However, for affiliated firms, the relationship of investment and debt ratio was insignificant.

(3) The cash flow rights in ultimate ownership structure and the divergence between cash flow rights and control rights both affect investment. Investment affects corporate value, but corporate value does not affect the ownership structure in a 2SLS test.

Appendix B

Major Financial Liberalization Measures in Korea during the 1990s

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1) **Interest rates deregulation** (in four stages: 1991 to July 1997)
- By 1997, all lending and borrowing rates, except demand deposit rates, were liberalised

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2) **More managerial autonomy for the banks and lower entry barriers to financial activities**
- Freedom for banks to increase capital, to establish branches, and to determine dividend payments (1994)
- Enlargement of business scope for financial institutions (1993)
: continuous expansion of the securities business of deposit money banks (1990, 1993, 1994, 1995)
: freedom for banks and life insurance companies to sell government and public bonds overthe-counter (1995)
: permission for securities companies to handle foreign exchange business (1995)
- Abolition of the limits on maximum maturities for loans and deposits of banks (1996)

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3) **Foreign exchange liberalisation**
- Adoption of the Market-Average Foreign Exchange Rate System (1990)
- Easing of the requirement for documentation proving "real" (i.e., non-financial) demand in foreign exchange transactions (1991)
- Setting up of foreign currency call markets
- Revision of the Foreign Exchange Management Act (1991)
: changing the basis for regulation from a positive system to a negative system
- Introduction of 'free Won' accounts for non-residents (1993)
- Allowance of partial Won settlements for the export or import of visible items (1993)
- Foreign Exchange Reform Plan (1994)
: a detailed schedule for the reform of the foreign exchange market structure
- A very significant relaxation of the Foreign Exchange Concentration System (1995)

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4) Capital market opening
- Foreign investors are allowed to invest directly in Korean stock markets with ownership ceilings (1992)
- Foreigners are allowed to purchase government and public bonds issued at international interest rates (1994), equity-linked bonds issued by small and medium-sized firms (1994), non-guaranteed long-term bonds issued by small and medium-sized firms (Jan. 1997), and non-guaranteed convertible bonds issued by large companies (Jan. 1997)
- Residents are allowed to invest in overseas securities via beneficiary certificates (1993)
- Abolition of the ceiling on the domestic institutional investors' overseas portfolio investment (1995)
- Foreign commercial loans are allowed without government approval in so far as they meet the guideline established in May 1995

- Private companies engaged in major infrastructure projects are allowed to borrow overseas to pay for domestic construction cost (Jan. 1997)
- Liberalisation of borrowings related to foreign direct investments related (Jan. 1997)

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5) Policy loans & credit control

- A planned termination of all policy loans by 1997 is announced (1993)
:a step-wise reduction in policy loans to specific sectors (e.g., export industries and small and medium-sized firms)
- Simplifying and slimming down the controls on the share of bank's loans to major conglomerates in its total loans

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Source: Chang et al. (1998)

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Chapter 3: Ownership Structure, Diversification and Firm Value in Korean Companies

1 Introduction

The focus of this study is firstly the relationship between ownership structure and firm diversification when there are expropriated minority shareholders causing agency problems; and secondly, the relationship between firm diversification and firm valuation, particularly regarding the ability of internal capital markets to leverage economic development. I re-examine and extend the scope of recent papers (Claessens *et al*, 1999, 2002; Lins and Servaes, 2002; Fauver *et al*, 2007) that analyse the value of firm diversification, to focus closely on the ownership structure, firm diversification and firm valuation in Korea during its period of pre-crisis economic development from 1988 to 1997.

Many studies have examined the valuation effects of corporate diversification in both developed and developing countries. At the heart of the debate lies the question of whether diversification destroys the value of firms in the United States.[49] If so, it would seem to be a questionable course of action for managers or ultimate owners. However, in developing countries, firm diversification has been shown to increase firm performance, although many studies show it has mixed benefits in an international context.[50]

[49] See Lang and Stultz (1994), Comment and Jarrell (1995), Berger and Ofek (1995), Servaes (1996), Scharfstein and Stein (1997), Denis, Denis and Sarin (1997) and Rajan, Servaes and Zingales (1999).
[50] Fauver *et al* (2007), Lins and Servaes (1999, 2002), Claessens *et al* (1999, 2002)

Regarding the diversification discount, in their U.S.-based theory and empirical results, Denis *et al* (1997) argue that agency cost[51] is related to the level of firm diversification. They dismiss the linkage between value loss and firm diversification and find that in U.S. firms the effects are lessened by higher managerial and blockholder ownership. Lang and Stultz (1994), Berger and Ofek (1995), and Servaes (1996) find that diversified firms trade at an average discount relative to single-segment firms. This finding has often been interpreted as evidence that diversification destroys value. Johnson *et al* (2000) finds that controlling shareholders in European business groups have strong incentives to siphon resources from member firms to increase their private wealth. Berger and Ofek (1995) find that during 1986–1991 the average diversified firm destroyed about 15% of the value of any lines of business they would have had, had they operated as standalone businesses.

Also, Claessens *et al* 's (1999, 2002) research, based on East Asian countries (including Korea), indicated that the group-affiliated firms showed lower profitability than the independent firms, and that group-affiliated firms' diversification performance was poorer than that of the independent firms. When diversification levels are measured by multi-segment dummy variables, Claessens *et al* (1999) find that the diversified firms discount around 5% compared to single-segment firms, and Lins and Servaes (2002) find this discount is approximately 7% in East Asia. Bertrand *et al* (2002) also find that the ultimate owners of the Indian pyramid firms have strong incentives to divert resources from firms low down in the pyramid towards ones higher up. Bae, Kang and Kim (2002) find that although minority

[51] The agency cost hypothesis is that the managers or ultimate owners obtain private benefits from diversification that exceed private costs.

shareholders of firms within the top 30 Korean *chaebols* typically lose out from their acquisitions, the controlling shareholders gain from the same deals.

On the other hand, firms can accrue benefits from diversification through the creation of internal capital markets, which are more cost-effective in allocating resources compared to external capital markets.[52] Khanna and Palepu (2000) compare the profitability of Indian firms which belong to industrial groups to that of independent Indian firms, and find that value is added by diversified business groups. Lins and Servaes (2002) argue that firm diversification is more valuable in emerging markets than in developed economies in internal capital markets. Claessens *et al* (1999, 2002b) find the discount of firm diversification is less pronounced in diversified firms in the poorer economies. Shin and Park (1999) find that Korean firms which belonging to the top 30 business groups are subject to fewer financing constraints than other Korean firms. Hoshi *et al* (1991) also investigate the sensitivity of Japanese firms' investment expenditure to liquidity and find that it is lower for firms within bank-oriented keiretsu. Fauver *et al* (2007) contribute to the debate by looking at the influence of capital market development and legal system integration on the value of corporate diversification in a cross–country analysis. They find that, among high-income countries, where capital markets are well-developed and integrated, there is a significant diversification discount. By contrast, for the lower income and segmented countries, they find that there is either no diversification discount or, in some cases, a diversification premium.

[52] Khanna and Palepu (1997) and Claessens *et al* (1999) use the term 'internal factor market or internal market' more broadly to capture intra-firm markets for raw materials, labor, and financial capital, rather than internal market for financial capital (Lamont, 1997; Stein, 1997; Scharfstein and Stein, 1997; Shin and Stultz, 1998). This is discussed in greater detail in Section 2.

Campa and Kedia (2002) and Villalonga (2004) find that diversifying and non-diversifying firms differ systematically in multiple ways, and results can be skewed by the fact that diversified firms often trade at a discount prior to diversifying. When this selection bias is corrected for, the diversification discount disappears or becomes a premium. These results are supported by research conducted by Graham, Lemmon and Wolf (2002). However, results of such studies suggest that diversification in itself does not destroy value. Many econometric studies, including Lang (2002), have replicated Lang and Stultz (1994) and Berger and Ofek's (1995) findings, but there is disagreement as to whether this can be interpreted as evidence of value destruction. Abadie and Imbens (2002), Campa and Kedia (2002) and Villalonga (2004) argue that this debate exemplifies the 'treatment effects' literature that seeks to establish causation from non-experimental data. Several studies have shown that the discount is produced simply by sample selection biases.[53] This issue will be examined further below by using recent econometric techniques.

I suggest that three causes lie behind the varied results for the diversification effect in the above empirical tests:

1) Differing efficiency levels of internal capital markets in economies
2) Whether or not agency costs are considered
3) Use of different econometric methods.

The present study considers these three issues. Because our focus is on ownership structure and corporate diversification, the study will analyse how these factors

[53] Villalonga (2005) finds a diversification premium using the Business Information Tracking Series (BITS) (a new census database that covers the whole U.S. economy at the establishment level).

influence corporate valuation from the perspectives of the agency problem and the internal capital market. In this context, the motive of Korean companies' diversification pertains to private benefit of the executives or the owners, under the set conditions of the ownership structure. The corporate governance system regulates the ultimate owner or manager and hence reduces the agency problem. In the situation that the corporate governance system does not reduce agency problems, ownership structure can act as an important variable in company value. My research seeks to analyse empirically how firm performance or firm valuation are influenced by ownership structures and by the company's chosen method of diversification.

The results show that the relationship of ownership structure and the corporate value is nonlinear. In Chapter 1 it was demonstrated that the divergence between the cash flow rights and the control rights of ultimate shareholders shows a negative relationship with firm value. If the ownership structure of a firm has an effect on firm value, it may also affect the value of corporate diversification. Furthermore, I go on to examine whether the efficiency of internal capital markets creates a diversification premium in the Korean economy. The main hypothesis can be summarised as three questions:

(1) What are the effects of ownership concentration and type on the level of firm diversification?

(2) Does the use of internal capital markets lead to higher values for diversified firms?

(3) Can the effects of ownership concentration on diversified firm value and minority shareholders be more easily expropriated in a diversified firm structure, with an implied a lower valuation?

The results of the analysis are summarised as follows:

(1) The divergence between the cash flow rights and the control rights of the ultimate shareholders does have an effect on firm diversification.

(2) Group-affiliated firms show poorer performance after diversification than independent firms. Diversification discounts reported for the whole sample can be attributed to group-affiliated firms. This is partly because group-affiliation amplifies the negative effects of firm-level diversification on firm valuation (see 1, above).

(3) The diversification performance of group-affiliated firms is related to agency cost. In contrast, the benefits of diversification for independent firms appear to offset the agency costs of diversification in less developed capital markets and economies.

(4) Additionally, I analyse whether the ownership structures function as endogenous rather than exogenous variables. Therefore, the divergence between control rights and cash flow affects the diversification, and diversification in turn affects corporate value. However, corporate value does not affect ownership structure.

This chapter is organised as follows. Section 2 briefly discusses diversification, agency cost and how diversification and firm valuation operate within internal capital

market theory. In Section 3, my hypotheses illustrate the effect of corporate governance on the level of corporate diversification; further my hypotheses test the effects of diversification on firm valuation. In Section 4, I describe the methodology used to calculate values of firm diversification and control variables, and statistics are presented (mean estimates) to clarify the relationship between ownership structure and firm valuation. In Section 5, I test and explain the results of the various hypotheses, including simultaneous equation regression (2SLS) analyses. A brief summary concludes the section 6.

2. Theoretical background

2.1 Motivation of firm diversification

The motivation behind firm diversification has been discussed theoretically from many points of view (Montgomery, 1994). The traditional stance is known as the market power view, which states that the motive behind diversification is to increase market dominance.[54] An alternative notion is known as the transaction cost view.[55] Like the traditional view, it also perceives the goal of firms as maximising profits, but further believes that the motive behind diversification is to use surplus resources efficiently to reduce transaction costs. A third view on diversification is related to the internal capital markets. When external capital markets are costly to use, firms allocate their capital internally through diversification.[56] Finally, one can cite the

[54] Perry and Porter (1985), Deneckere and Davidson (1985), Salinger (1988), Hubbard and Palia (1999).
[55] Constantinides (1986), Magill and Constantinides (1976).
[56] Williamson (1971), Gertner, Scharfstein and Stein (1994), Lamont (1997), Stein (1997), Scharfstein

coinsurance effect hypothesis. By integrating lines of business with different earning streams and by reducing earning variability, diversified corporations have more debt-servicing capability than individual firms of a similar size.[57] Such an increased debt-servicing capability can increase a firm's value through a tax-shielding effect.[58] However, this is insufficient to define the causes of the negative relationship between firm diversification and firm value. Therefore, the effect of corporate ownership structure on firm diversification is explained with the agency cost theory. Also, the effect of diversification on firm value in internal capital markets will be examined in the light of this theory, using the cases of some Korean companies.

2.2 Effect of corporate ownership structure on firm diversification

The agency problem, which appears in the pursuit of corporate diversification, leads to a number of phenomena. Even though a diversification strategy may reduce firm value, managers may still pursue diversification to increase their own wealth, because such strategies can accrue them more private benefits. The potential private benefits of managers are as follows. Firstly, through expansion of the firm size, managers can enhance their managerial power and prestige and anticipate higher managerial pay along with an increasing size of their corporations. Secondly, managers can defend the value of their human capital through diversification and can reduce, through diversification, the risk of their personal portfolio over and above the risk reduction

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(1998).

[57] Lewellen (1971).

[58] Therefore, in the event one or two business lines of a diversified corporation record loss in a certain fiscal year, the separate business lines combined into one corporation will pay less tax than the aggregate of the individual taxes paid by each individual business line. In other words, business lines have separate earning or loss streams and these bring about a tax-shielding effect after combining the profits and losses of all the business lines.

process for capital investments.[59] Even though shareholders can reduce their portfolio risk efficiently through diversified investments, managers can also use diversification incentives as a device to efficiently reduce their employment risk. Thirdly, managers can render themselves more valuable to the corporations by diversifying into lines of business which increase the corporate demand for their specialist skills.[60] The agency hypothesis can explain the three agency costs mentioned above. According to the agency cost hypothesis, the following relationship between equity and diversification can be derived from various levels of inside ownership and levels of diversification. With increasing equity of inside shareholders, the inside shareholders have a greater burden from reduced firm value and for this reason they would be reluctant to adopt policies which reduce shareholder wealth. Therefore, if diversification were to reduce shareholder wealth, a negative relationship between equity ratio of inside shareholders, or ultimate owner, and level of diversification would be predicted by the agency cost hypothesis. Such a relationship, based on the agency cost hypothesis, however, would be established on the assumption that the managerial private benefits resulting from the diversification have nothing to do with ratio of ownership equity. However, it can be argued that if the private benefits such as the manager's private risk reduction should increase with the equity ownership ratio, the relationships between owner-managers, the equity ratio of the firm and corporate diversification may not be so clear.

Claessens *et al* (2002) examined the structure of the cash-flow rights and control rights held by ultimate owners and their correlation with the level of diversification. Public firms in East Asia are characterised by deviations of control from cash flow

[59] Amihud and Lev (1981).
[60] Shleifer and Vishny (1988).

rights caused by cross-shareholdings, stock pyramids and multiple-class stocks. Such practices allow owners to gain effective control of their firms with a minimum amount of cash investment, making it less necessary to reduce risk through firm diversification. There is therefore a weaker link between firms' performance and owners' wealth, and more opportunity and incentives for expropriation through diversification increases. Claessens *et al* (2002) found that these conflicting interests become stronger at higher levels of control and a larger divergence between control and cash-flow rights is associated with more diversification, especially at high control levels. They reject risk reduction as the reason for diversification and therefore support the expropriation hypothesis.

On the other hand, according to the efficient monitoring hypothesis wherein the outside block shareholders may efficiently monitor managerial operations, a negative relationship can be predicted between the existence of outside blockholders and the level of diversification. According to the conflict-of-interest hypothesis, or strategic alignment hypothesis, the outside blockholders comply with managerial decisions and their existence does not affect the level of corporate diversification. There is therefore no clear-cut relationship established between the outside blockholders and diversification levels.

2.3 Effect of diversification on firm value

Corporate diversification has double-edged characteristics of generating both benefits and costs.

If diversification increases firm valuation, the operational efficiency hypothesis argues that diversification increases corporate value.[61] Diversified corporations can improve on their operational efficiency through integration and harmony of specialised lines of business; this is more efficient and profitable than when such specialised lines of business are independently operated.

A superior allocation is feasible where an internal capital market exists, as resources can be allocated more efficiently than in the external capital market. As underinvestment problems are resolved, more resources can be invested in investment options with net present values higher than zero. This is a much higher ratio compared to the resources available to single-business corporations. According to the internal capital market hypothesis, diversification is an efficient response to misrepresentation in the external environments or weak external financial markets.[62] However, as argued by Shin and Stultz (1996), internal capital markets may lead to misallocation of capital due to the heterogeneous and complex investment opportunities across the firms' various segments. Fauver *et al* (2007) show that in countries where there is less shareholder protection, internal capital markets generated through corporate diversification are more valuable. Johnson *et al* (2000) and Fauver *et al* (2007) also argue that in situations where capital markets and legal systems are less developed, diversified firms perform better. Claessens *et al* (2002) test this thesis by examining how East Asian firms diversify, and find that group affiliation serves as an alternative method of firm-level diversification. Lins and Servaes (2002) use data from 1995 to investigate the value of firm diversification for

[61] Berger and Ofek (1995).
[62] Claessens *et al* (1999), Johnson, La Porta, Lopez-de-Silances and Shleifer (2000), Fauver, Houston and Naranjo (1998).

seven Asian emerging market countries[63] and note a significant diversification discount for firms with management ownership concentration between 10% and 30% and those belonging to industrial groups. However, in contrast, Khanna and Palepu (2000) contest that diversification may actually be more valuable in emerging markets than in more developed economies. Their thesis focuses on diversified business groups in India and argues that the larger diversified groups are in a better position to tap external capital. This study does offer some indirect support for the hypothesis that the value of diversification depends on the significant variables of the level of capital market development and integration.

A potential problem with the conclusions that have been discussed hitherto is that the variables of agency costs might be associated with ownership concentration. Agency problems can occur when the firm diversifies in order to benefit the manager or ultimate owner. This can lead to reduced corporate value in various ways. First, the overinvestment problem states that a discretionary allocation of resources aimed at negative investment options may lead to reduction in corporate value. The more diversified a corporation becomes, the more likely it can use its increased borrowing capability and free cash flow to over-invest in investment options with negative net present value.[64] Second, the cross-subsidization problem states that in the event that resources are transferred between the different lines of business to support one with poor business performance, this cross-subsidization can delay the exit of the failing business segment and the corporate value will be reduced. If the failing business segment were to be managed independently, the segment cannot have a corporate value less than zero, but if the failing segment is part of the diversified corporation

[63] Pooling together Hong Kong, India, Indonesia, Malaysia, Singapore, South Korea and Thailand.
[64] Jensen and Meckling (1976). This issue is discussed in greater detail in Chapter 2.

the exit of the failing segment is delayed and can only add negative value.[65] Third, the information asymmetry cost states that if harmonious management should not be attained (as in the case of information asymmetry between the central manager and divisional resources), costs are incurred.[66] Since information tends to be dispersed more in the centralised corporations than in diversified ones, costs of information asymmetry are more conspicuous in the diversified corporation. If costs of diversification should stem from the agency problem, corporations with a higher managerial equity ratio would have no incentive to diversify, but corporations with lower managerial equity ratio would push for corporate diversification, resulting in a reduction in corporate value (because the managers' own private benefits would exceed the loss). Accordingly, corporations with a lower inside equity ratio will suffer a greater reduction in the firm value through diversification, but the corporations with a higher inside equity ratio will witness relatively lower reductions in the firm value due to non-negative effects.

Financial, legal and regulatory environments all influence the value of diversification according to Fauver *et al* (2007). Optimal organizational structure and corporate governance may differ significantly for firms operating in emerging markets in comparison to firms operating in more developed and integrated countries. They find a significant diversification discount in high-income countries that have well-developed and integrated capital markets. In contrast, they find that there is either no diversification discount or a diversification premium for the lower income and segmented countries. For such firms, benefits accrued from diversification tend to balance agency costs.

[65] Berger and Ofek (1995).
[66] Berger and Ofek (1995).

3. Formulation of hypotheses for empirical analysis

3.1 Introduction

This section presents empirically testable hypotheses about the effect of ownership structure on the value of the firm and the level of corporate diversification. I examine whether firm diversification in Korean companies can be attributed to cash flow rights of the largest shareholder, control rights of the largest shareholder and divergence between the ultimate owner's control rights and cash flow rights, caused by cross-shareholdings or stock pyramids. To test the hypotheses I follow the methods of Claessens *et al* (1999, 2002), Lins and Servaes (2002) and Fauver *et al* (2007).

3.2 Hypotheses on the effects of ownership structure and diversification on firm valuation

3.2.1 Hypothesis on the effect of corporate governance on levels of corporate diversification

As managerial ownership increases, the interests of managers and shareholders are better aligned; managers are less likely to pursue any policy that reduces firm value. If diversification reduces the wealth of the shareholder, then a negative correlation between the level of diversification and managerial ownership is expected, according to the agency cost hypothesis. The following hypothesis has been designed to investigate the variables affecting the relationship between corporate governance and firm diversification:

Hypothesis 1: *As the cash flow rights of the ultimate owner decreases, the level of diversification increases. In contrast, as the control rights of the ultimate owner increases, diversification increases.* [67]

If the controlling shareholder uses the pyramid structure and cross-ownership to reinforce his control rights, then conflict arises in terms of cash flow rights versus control rights.[68] As a result of this structure, the controlling shareholder tends to have higher control rights than cash flow rights. As this difference increases, the incentive for the controlling shareholder to exercise their control rights to pursue private interests becomes greater. Therefore, if diversification decreases the wealth of the shareholder or does not clearly lead to an increase in firm value, but is instead used to fund the controlling shareholder's private interests, then, the level of diversification should increase in proportion to the widening gap between these two rights. The second hypothesis examines the relationship between the level of diversification and the difference between cash flow rights and voting rights of the ultimate owner:

Hypothesis 2: *As the difference between cash flow rights and voting rights increases, the level of diversification increases.*

3.2.2 Hypothesis about the effect of corporate diversification on the value of the firm

Considering that ownership structure affects firm diversification, it is also likely to affect the value of a diversified firm. This may be particularly relevant if there is a

[67] Claessens *et al* (2002, p.2742) and La Porta *et al* (1999) indicate the positive incentive effect related to the share of cash flow rights held by large shareholders and that the negative entrenchment effect relates to the share of control rights held by large shareholders.
[68] La Porta *et al* (1999), Claessens *et al* (2002, p.2742), and see greater detail in Chapter 1.

strong link between ownership concentration and firm diversification and if firm diversification has an impact on firm valuation.

Under the convergence-of-interest hypothesis,[69] ultimate owners are more likely to make efficient choices with respect to firm diversification. Conversely, under the entrenchment hypothesis,[70] with increasing managerial ownership, ultimate owners tend to act in the interest of their private benefits rather than for maximisation of firm value. If ultimate owners and their families use pyramid ownership structures to separate their control rights from the cash flow, minority shareholders are more likely to be exploited. Entrenched managers may choose to run a diversified firm for their own personal interest and benefit. As a consequence, companies with low cash flow rights of ultimate ownership or with a major divergence between control rights and cash flow rights are predicted to have severe loss of value due to diversification, while companies with high cash flow rights or low divergence between cash flow rights and control rights can expect non-negative effects on their value.

Hypothesis 3: *Diversification is likely to decrease firm value because managers or the ultimate owners are expected to pursue private benefits.*

It has been suggested in section 2.3 that due to the greater efficiency of internal capital markets the benefit of diversification is to increase firm value. The superior allocation is permitted where resources can be allocated more efficiently than in the external capital market.

[69] Jensen and Meckling (1976) and greater detail in Chapter 1.
[70] Shleifer and Vishny (1997), Morck, Shleifer and Vishny (1988) and greater detail in Chapter 1.

Hypothesis 4: *The level of diversification is positively correlated to firm value when internal capital markets are more efficient than external ones.*

Firm diversification appears to be more beneficial or at least less costly for firms that are headquartered in countries where capital markets are more segmented and less developed, and it is expensive to obtain external capital (Fauver *et al*, 2007).[71] According to this argument, the value of diversification in Korean companies is expected to decline over time as capital markets become more developed and integrated.[72]

Hypothesis 5: *The extent to which diversification affects the value of a firm depends on the level of economic development.*

4. Sample selection and data description

4.1 Sample selection and dependent variable

This study uses data for over 2,000 companies from the KIS-LINE database[73] for Korean companies. The sample has been restricted to firms with sufficient segments of firm diversification level and financial data to construct empirical measures. Of the

[71] Hubbard and Palia (1999) show the value of diversification in the United States during the conglomerate wave of the 1960s for this issue.
[72] More detailed Appendix B in Chapter 2. Also Bekaert and Harvey's (1995) measure captures the time-varying nature of integration, whereas Edison and Warnock's (2001) measure provides information on the extent of initial openings as well as the evolution of liberalization over time.
[73] The KIS-LINE of the Korea Investors' Services was used to find financial information of public companies, to calculate the variables, and carry out the regression analysis. The KIS/FAS is the leading provider of credit related information and services for financial and commercial business transactions among corporations and consumer individuals in Korea.

2,980 firms with complete ownership data, 2,187 firms have one or several years of the necessary segment and financial data. This sample consists of 9,559 firm-years spanning 1988 to 1997. I define the diversification level of a firm as the number of industries in which the firm operates. This number count reasonably captures the breadth of the firm. 1892 companies are examined from the 2187 published firms in the Korea Stock Exchange during ten years from 1988 to 1997. Also I use the Korea fair Trade Commission (KFTC)'s annual report and Financial Supervisory Commission's 1988-1997 guideline to identify whether firms are affiliated with *chaebol* or not.[74]

Both Tobin's Q and excess value are measured for corporate valuation.

Tobin's Q is the ratio between the market value of assets and its replacement value. The market to book value ratio (M/B, measured as the sum of market equity and book debt divided by book assets) is presented as the substitution variable for Tobin's q ratio according to Chapter 1 and Chapter 2. The Tobin's q ratio provides the opportunity to partially examine profit or loss that results due to diversification. If diversification has an influence on the value of a business division, the Tobin's q ratio of diversified corporations may be greater or smaller than the sum of all q ratios of each business division (Lang and Stultz, 1994). Excess value of diversification (Excess) uses the assessment method of Berger and Ofek (1995). Excess value of diversification is defined as the log of the ratio between firm's actual performance (true Q) and its imputed Q. Imputed Q is the asset weighted average of theoretical Q

[74] KFTC legitimately defines a business group as " a group of companies, more than 30 percent of whose shares are owned by some individuals or by companies controlled by those individuals" The KFTC identifies business groups and announces them every year.

of each segment. Theoretical Q is the industry average using stand alone firms in same industry.[75]

In order to measure the level of corporate diversification, three types of substitutions are used: These three types are Herfindahl Index (HI), multi-segments (DIV_D) and the number of segments (SEG_D).

The Herfindahl Index (HI) is the main index for measuring the level of diversification of corporations. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. In the current study, HI is computed using the sales proportion of business divisions. In the case of Korean corporations, I use sales based HI because the sales scope by business divisions of independent corporations can be understood to a certain degree using disclosed material, but the scope of assets by business divisions is difficult to understand. The Multi-Segment (DIV_D), following Lins and Servaes (2001), Fauver *et al*, (1998) and Claessens *et al* (1999, 2002), classify firms as single-segment if at least 90 percent of their total sales are derived from one two-digit SIC segment. Firms are classified as multi-segment if they operate in more than one two-digit SIC industries and none of their two-digit SIC segments accounts for more than 90 percent of total firm sales. Also, I measure a firm's diversification level as the number of its segments (SEG_NO) defined at the three-digit SIC level. The ownership structure is defined separately to examine the cash flow rights of large shareholder, control rights of large shareholder and the divergence between cash flow

[75] Total corporate value is calculated by taking the sum of market value of common stock and book value of total debt. Market value of common stock is calculated by multiplying the year end price per share by the number of shares outstanding in the year of analysis and the book value of debt is the amount of total debt recorded in the ledger at closing of accounts.

rights and control rights of large shareholders. Comparisons are made between group affiliated firms and independent firms. The Group affiliated firms is used to reflect such traits as internal transactions among the 30 largest companies and examine cross funding, and financial benefits accruing to affiliates.

I use ownership structure to capture the degree of potential agency issues for each firm. Cash is defined as the cash flow rights of ultimate owner. Control is defined as the voting rights of the largest ultimate owner. CFCR is the defined as the difference between shares of the cash flow rights of ultimate owner and control (voting) rights of ultimate owner.[76]

4.2 Data description

Table 3-1 displays the relationship of the level of diversification to cash flow rights. Here, cash flow rights are negatively associated with the level of diversification. That is, overall, the lower the cash flow rights, the higher the diversification level. Conversely the higher the cash flow rights, the lower the diversification level. Looking at the period as a whole, where cash flow rights are less than 10%, the percentage of firms with more than two segments (DIV_D) among the whole sample decreases from 76.7% to 41%. The Herfindal index (DIV_H) increases from 10% cash flow rights up to 50% level but it decreases again for cash flow rights over 50%.

[76] Ownership structure is consistent with chapter 1 and chapter 2

The number of segments (SEG_NO) based on the 3-digit SIC standard decreased for cash flow rights between 2.17 and 1.48, suggesting that the lower the cash flow rights, the great the level of diversification. Nevertheless, when analyzing individual years, the data do not demonstrate consistent changes in diversification as cash flow rights decrease. In 1997, when cash flow rights are between 10% and 20%, 20% and 30%, the diversifications levels show a momentary increase but shortly after, they decrease again. Similarly, in 1993, when cash flow rights are between 20% and 30%, the diversification levels show a slight increase but then they decreases again, suggesting that the diversification level and cash flow rights are not related by a simple negative relationship.

For the ultimate owners in Korea, the higher the cash flow rights, the more burden they experience for any given reduction in firm value. Unless diversification leads to a tangible increase in value, they would not adopt any diversification strategy. On the other hand, when they have lower cash flow rights, they tend to try to increase their own private interests such as power and prestige that they can capture by increasing the scale of firms through diversification.

Table 3-1 Descriptive Statistics on the Relationship between the Cash Flow Rights and Firm Diversification

		0%<CA SH<10%	10%<CA SH<20%	20%<CA SH<30%	30%<CA SH<40%	40%<CA SH<50%	50%<CA SH
Total year	No.firms	351	442	520	374	147	58
	DIV_H	0.75	0.78	0.83	0.88	0.91	0.86
	SEG_NO	2.17	1.94	1.90	1.48	1.49	1.60
	DIV_D	76.7	65.4	58	48.6	41.2	41
1988	No.firms	21	21	40	19	12	9
	DIV_H	0.82	0.73	0.86	0.90	0.85	0.95
	SEG_NO	1.71	2.09	1.53	1.26	1.58	1.22
	DIV_D	83.3	53.2	58	49.2	41.3	40.5
1990	No.firms	25	45	47	42	18	4
	DIV_H	0.81	0.75	0.81	0.83	0.91	0.87
	SEG_NO	2.04	2.00	1.87	1.55	1.33	1.50
	DIV_D	64.8	63.7	53.8	50.7	41.3	40.6
1993	No.firms	38	54	61	42	17	10
	DIV_H	0.72	0.81	0.80	0.86	0.91	0.88
	SEG_NO	2.23	1.89	2.05	1.57	1.50	1.70
	DIV_D	77.6	70.4	62.3	48.5	43	42.5
1997	No.firms	46	48	59	43	23	3
	DIV_H	0.76	0.76	0.81	0.90	0.92	0.78
	SEG_NO	1.89	2.04	2.03	1.42	1.48	2
	DIV_D	85.4	67.1	58.2	53.2	43.6	28.8

This table presents the mean diversification levels of Korean firms across difference level of ultimate owner's the cash flow rights. The diversification level is measured by three methods: DIV_H is mean of Herfindal Index. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. SEG_NO is mean of the number of firm segments DIV_D is percentage of firms with multiple segments. This table present cut off 10% level of cash flow rights of ultimate owners (CASH). Total year is from 1988 to 1997.

Table 3-2 Descriptive Statistics on the relationship between the Control Rights and Firm Diversification.

		0%<Con <10%	10%<Con <20%	20%<Con <30%	30%<Con <40%	40%<Con <50%	50%<Con
Total Year	No.firms	156	394	604	444	216	78
	DIV_H	0.72	0.77	0.82	0.84	0.89	0.88
	SEG_NO	2.15	2	2.1	1.61	1.65	1.60
	DIV_D	0.74	0.77	0.82	0.80	0.88	0.87
1988	No.firms	9	21	40	27	14	11
	DIV_H	0.75	0.77	0.83	0.91	0.83	0.96
	SEG_NO	1.89	2	1.62	1.33	1.57	1.18
	DIV_D	0.73	56.5	0.83	0.81	0.87	0.88
1990	No.firms	8	40	57	47	22	7
	DIV_H	0.76	0.80	0.79	0.81	0.89	0.86
	SEG_NO	2.25	1.73	2	1.66	1.5	1.71
	DIV_D	0.75	0.76	0.81	0.79	0.88	0.87
1993	No.firms	17	44	67	59	23	12
	DIV_H	0.78	0.74	0.78	0.87	0.90	0.90
	SEG_NO	2.12	2.02	2.21	1.60	1.52	1.58
	DIV_D	0.71	0.75	0.81	0.80	0.87	0.88
1997	No.firms	18	39	74	52	32	7
	DIV_H	0.68	0.74	0.82	0.86	0.90	0.88
	SEG_NO	2.06	2.12	2.20	1.69	1.56	1.57
	DIV_D	0.74	0.76	0.82	0.81	0.89	0.87

This table presents the mean diversification levels of Korean firms across difference level of the ultimate owner's control rights. The diversification level is measured by three methods: DIV_H is mean of Herfindal Index. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. SEG_NO is mean of the number of firm segments DIV_D is percentage of firms with multiple segments. This table present cut off 10 % level of control rights of ultimate owners (CON). Total year is from 1988 to 1997.

Table 3-2 shows the level of diversification for the different degrees of control rights[77]. Control rights are partially negatively related to the percentage of firms with multi-segments (DIV_D) and the number of segments (SEG_NO). That implies that the lower control rights, the higher the level of diversification. However, when the control right ranges from 20% to 40%, the level of diversification (SEG-NO or DIV-D) decreases slightly but after a while it begins to increase again. This suggests that the diversification level is not uniformly associated with control rights. In an experiment where the number of segments (SEG_NO) and Herfindal index (DIV_H) are employed as measures of diversification, similar results are found. The analysis of the whole period shows that the percentage of firms with more than two segments (DIV-D) increased from 74% for control rights of less than 10%, to 87% for control right of over 50%. The Herfindal index (DIV_H) increases from 72%, but begins to decrease again for the control rights over 50%. The number of segments increases from 2.15 to 1.60, indicating that the higher the control rights, the lower the diversification level. However, for the year 1993, when the control rights lie between 20% and 30%, the diversification level moderately rises, but again falls, suggesting that the diversification level is not uniformly related to control rights.

Additionally I examine how Korean firms' diversification patterns correlate with their ultimate owners' control level, comparing between group members (top 30 *chaebol* firms and Independent firms.

[77] For examples and definitions, see Chapter 1 (Corporate Governance and Firm Value).

Table 3- 3 Descriptive Statistics on the Diversification and Ultimate Ownership

Control level	All firms	Group member firms		Independent firms	
Panel A : Average number of segment					
10%	2.15	90	2.58	64	1.73
20%	2	198	2.37	196	1.62
30%	2.1	237	2.39	362	1.79
40%	1.61	141	1.66	300	1.55
50%	1.65	64	1.75	152	1.44
50% or above	1.60	22	1.68	56	1.52
Panel B: Fraction of firms with multiple segment					
10%	0.74	90	0.64	64	0.83
20%	0.77	198	0.69	196	0.85
30%	0.82	237	0.76	362	0.85
40%	0.80	141	0.87	300	0.74
50%	0.88	64	0.87	152	0.90
50% or above	0.87	22	0.85	56	0.89

This table presents the mean diversification level of Korea firms across difference level of ultimate owners' control. A comparison between multi- and single- segment firms is also presented. The diversification level is measured by the number of firms segment (Panel A) and a dummy variable equal to one if firm has multiple- segments, and otherwise zeros (Panel B). The control level is measured by the percentage of control rights of the firm's largest ultimate owners. The ownership of group member firms and independent firms' data are in 10 years (1988-1997)

As reported in Table 3-3, I report mean diversification statistics across different levels of ultimate owners' control for widely-held firms, the average segment number is 1.85 (Panel A). Panel B reports the fraction of firms with multiple segments across control levels. The multi-segment fraction initially increase from 0.74 at the widely-held level to 0.82 at the 20% level, then begins to decrease and increase to 0.88 at the 40% level. Group member firms are more diversification than independent firms.

The evidence presented by Tables 3-1 to Table 3-3 is consistent with agency cost (the expropriation hypothesis) with partial differences expressed by the ownership

structure. The simple comparisons across control levels do not account, however, for the possibility of divergence between cash flow rights and control rights. If they exist, such divergence may explain the pattern of diversification.

5. Empirical Analysis

5.1 Test results of Hypotheses 1 on firm diversification and ownership structure of Korean companies

In order to analyse the relation between the ownership structure and diversification level, using panel data (1988-1997) of Korean firms, I estimate the interval of ownership structure (cash flow rights and control rights) according to the result reported in Chapter 1.

Ownership structure (cash flow rights and control rights) is regressed against the diversification level (number of firm segment).[78] As reported in Table 3-4, in case of the number of firm segment (SEG_NO), for the intervals of cash flow rights more than 24%, the coefficient is negative. Here as cash flow rights increases, the level of diversification increases. For the intervals of cash flow rights between 14% and 24%, coefficient is positive and statistically significant. This result imply that the higher level of firm diversification is driven by firms with cash flow rights of ultimate owner range between 14% and 24%, where I find that the likelihood of being entrenched is highest and expropriation of minority shareholders. In chapter 1, the

[78] This table use the Piecewise regression model is try to find structural break points to best fitness of the model or explanation for statistical significant through continuously simulation according to segments of cash flow rights and control rights in Chapter 1.

ownership concentration level between 14 and 24 percent on firm value is negative and statistically significant.

Table 3-4 Regression between the Level of Diversification and Ultimate Ownership

	SEG_NO			
	Cash flow rights		Control rights	
	Model (1)	Model (2)	Model (3)	Model (4)
Constant	1.9078***	-1.0716*	01.7620**	-1.2260**
	(21.88)	(-1.87)	(15.46)	(-2.14)
OWN 1	-0.4358	-0.6200	1.0791	0.9530
	(0.53)	(0.76)	(1.14)	(1.02)
OWN 2	1.6646	1.5937**	-1.0836	-1.1265
	(0.021)	(2.25)	(-1.37)	(-1.44)
OWN 3	-0.5071	-0.3564	-0.1306	0.0026
	(-1.32)	(-0.94)	(0.39)	(0.01)
OWN 4	-1.9078*	-1.0113*	0.7167	0.8510*
	(-1.80)	(-1.84)	(1.49)	(1.71)
PRO		-0.7555***		-0.7677***
		(-3.02)		(-3.07)
DRC		-0.2092**		-0.2031**
		(-2.13)		(-2.07)
SIZE		0.1322***		0.1382***
		(6.12)		(6.42)
Adjust R^2	0.0297	0.1352	0.0128	0.1313

1) The dependent variable (SEG_NO) in all models is the number of firm segment. Control variables are short-term profitability, operating income over sales (PRO), total debt to assets (DRC), and the natural logarithm of firm assets (SIZE).
2) Cash flow rights:
OWN1= cash flow rights ≤ 0.14 OWN2= $0.14 <$ cash flow rights ≤ 0.24
OWN3= $0.24 <$ cash flow rights ≤ 0.50 OWN 4= $0.50 <$ cash flow rights
3) Control rights:
OWN1= control rights ≤ 0.15 OWN2= $0.15 <$ control rights ≤ 0.24
OWN3= $0.24 <$ control rights ≤ 0.50 OWN4= $0.50 <$ control rights
4) The total number of observation is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

The related control rights and the level of firm diversification for the intervals of control rights less than 50% (OWN1-OWN3) is statistically insignificant. But for the

intervals of control rights more than 50% (OWN4) in Model (4), the coefficient is positive and statistically significant. Especially high control level of ultimate owner implies that the opportunities and incentives for expropriation through diversification increases.[79]

5.2 Test results of Hypotheses 2 on the relation between the level of diversification and the divergence between the cash flow and control rights of ultimate owner.

These results in Hypothesis 2 are in line with the agency costs hypothesis. To examine the outcome of controlling other factors that can explain the negative relation between ownership percentage (divergence between cash flow rights and control rights) and diversification level, I test with reference to diversification, suggesting that diversification is a means for the ultimate owners to expropriate wealth from minority shareholders. Greater divergence also implies that the opportunity and incentives for expropriation though diversification increases, because of the weaker link between firms' performance and owners' wealth. These conflicting interests become stronger at higher levels of control. Claessens *et al*,(1999) find that larger divergence between control and cash flow rights is associated with an increase in diversification, especially at high control levels.

[79] According to managerial entrenchment hypothesis, with increasing managerial equity ownership, the managers tend to act in the interest of their private benefits rather than for maximization of the firm value and accordingly the firm value will decline.

Table 3-5 Regression between the Level of Diversification and the Divergence between the Cash Flow and Control Rights of Ultimate Ownership

	SEG_NO		
	Model (1)	Model (2)	Model (3)
Constant	-0.0883 (-0.02)	-0.0813 (-0.18)	-0.1220 (-0.26)
CONTROL		-0.0391 (-0.20)	-0.4286 (-1.96)
CASH/CONTROL	-0.4341*** (-3.72)	-0.4126*** (-3.41)	-0.3716* (-2.04)
(CASH/CONTROL)* HI			-0.0816 (-1.43)
PRO	-0.7514*** (-3.02)	-0.7436** (-2.98)	-0.9036*** (-3.58)
DRC	-0.1919* (-1.97)	-0.1921* (-1.97)	-0.2160* (-2.45)
Log(SIZE)	0.1281*** (5.96)	0.1282*** (5.94)	0.1286*** (5.60)
Adjusted R^2	0.2094	0.2078	0.2032

The dependent variable (SEG_NO) in all models is the number of firm segment. The diversification on ownership structure model is based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. The dependent variable is divergence between cash flow rights and control rights held by the largest shareholder (Cash/Control), is control rights minus cash flow rights and HI is a dummy variable indicating high control range. Hi equals one if control rights are greater than 30 percent, otherwise zero. CONTROL is the share of control rights held by ultimate owner. Control variables are short-term profitability, operating income over sales (PRO), total debt to assets (DRC), and the natural logarithm of firm assets (SIZE). Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

As shown in Table 3-5, I perform regression analysis using fixed effects and employing the number of segments as a measure of the diversification level (dependent variable). As a result, the estimated coefficient for CASH/CONTROL is negative and significant at the one-percent level, suggesting that a lower divergence of cash flows and control rights is associated with less diversification.

This result is consistent with the agency cost hypothesis that the ultimate owners with large divergence between cash flow rights and control rights seek a diversification strategy to satisfy their own private interest and expropriate to minority shareholders. In model (3) in Table 3-5, the effects of divergence at higher levels of control rights

are tested. I define a dummy variable HI equal to 1 if the owner's control is greater than the sample median, and otherwise 0. When HI is defined above the median level (model (3)), the coefficient of CASH/CONTROL is negative and significant but the interaction term (CASH/CONTROL)*HI is negative and statistically insignificant.[80]

Table 3-6 Regression between the Level of Diversification and Ultimate Ownership in group-affiliated firms and independent firms (1988-1997)

	GROUP-AFFILIATED			INDEPENDENT		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Constant	0.2053 (0.23)	0.0699 (0.07)	0.4673 (0.55)	0.2819 (0.06)	0.6111 (0.17)	0.1924 (0.03)
CONTROL		0.4940 (0.13)	0.7517 (0.18)		-0.4015 (-0.18)	0.2947 (0.10)
CASH/CONTROL	-0.5551** (-2.12)	-0.5597* (-1.98)	-0.4883* (-1.82)	-0.4296 (0.24)	0.3948 (0.21)	0.3161 (0.25)
(CASH/CONTROL)*HI			-0.6512*** (4.37)			0.0078 (0.01)
PRO	-0.1106** (-2.18)	-0.1303** (-2.21)	-0.2179** (-0.22)	0.0914 (0.19)	0.0846 (0.13)	-0.1038 (-0.25)
DRC	0.0304 (0.09)	0.0397 (0.12)	0.6413 (0.23)	-0.2097 (-0.23)	-0.2147 (-0.24)	0.0854 (0.08)
SIZE	0.1203** (2.08)	0.0699** (2.07)	0.1849*** (3.27)	0.1314*** (2.57)	0.1242*** (2.53)	0.0821*** (2.32)
R^2	0.0753	0.0385	0.0319	0.0593	0.0631	0.0218

The dependent variable (SEG_NO) in all models is the number of firm segment. The diversification on ownership structure model is comparing between group affiliated firms (GROUP-AFFILIATED) and independent firms (INDEPENDENT), based on data for 1892 from 1988 to 1997. The regressions are performed using a fixed- effects (time and industry) specification. The dependent variable is divergence between cash flow rights and control rights held by the largest shareholder (Cash/Control), is control rights minus cash flow rights and Hi is a dummy variable indicating high control range. HI equals one if control rights are greater than the median of samples, otherwise zero. CONTOL is the share of control rights held by ultimate owner. Control variables are short-term profitability, operating income over sales (PRO), total debt to assets (DRC), and the natural logarithm of firm assets (SIZE). Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

[80] Alterably, I test the (CASH/CONTROL)*HI ,Hi equals one if control rights are greater than 30 percent, otherwise zero, consistent with Claessens *et al,* (1999).It is the same result that (CASH/CONTROL)*HI is negative and insignificant.

As reported Table 3-6, comparing between group affiliated firms (GROUP-AFFILIATED) and independent firms (INDEPENDENT) in order to examine the effect of cash-control rights divergence separately for each class of firms. CASH/CONTROL for group affiliated firms are negatively related and statistically significant. But CASH/CONTROL for independent firms are statistically insignificant.

Comparing model (3) and model (6) in Table 3-6, the coefficient of (CASH/CONTROL)*HI is negative and statistically significant for the affiliated and the coefficient of (CASH/CONTROL)*HI is statistically insignificant for the independent firms. The group affiliated firms, the evidence from model (1) and model (3) is consistent with the notion that ultimate owners use diversification to accrue private gains at the cost of minority shareholders. In chapter 1, I test the relationship between firm valuation and ownership structure in Korean firms and find that divergence between cash flow rights and control rights of ultimate owner is related to the agency cost or expropriation for minority shareholders.

5.3 The evidence on firm diversification and firm valuation of Korean Companies

5.3.1 The test result of Hypothesis 3 and Hypothesis 4 on firm diversification and firm valuation of Korean Companies

Here Korean firms' diversification patterns will be examined and the extent to which they are related to firm valuation. Firm value will be assumed to be having a negative effect on the level of firm diversification. It will be seen as the significant variable for agency cost as suggested by hypothesis 3. The efficiency of internal markets will also be examined to see the extent to which firm value and diversification are positively related (hypothesis 4). I estimated both Tobin's Q model (Tobin's Q) and excess value model (Excess) using the valuation approach proposed by Berger and Ofek (1995), on the diversification level (SEG_NO, DIV_H, DIV_D). In models (1) and (4) in Table 3-7, SEG_NO is the number of firm segments. In models (2) and (5), DIV_H is Herfindal Index. In models (3) and (6), DIV_D is a dummy variable equal to one if the firm has a multiple number of segments, and zero if otherwise. Control variables are total debt to assets (DRC), advertisement to assets (ADR), research and development (RD), capital expenditure to assets (CES) and the natural logarithm of firm assets of (SIZE).[81]

[81] These variables are consistent with Chapter 1.

Table 3-7 Regression between the Level of Diversification and Firm Valuation of Korean Companies (1988-1997)

	Tobin's Q			Excess		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Constant	1.0416*** (6.54)	1.0112** (6.30)	1.38*** (7.89)	0.1528* (1.54)	0.4220* (1.94)	0.3945* (1.49)
SEG_NO	-0.0171* (-1.81)			-0.0097 (-1.69)		
DIV_H		0.0369 (0.19)			0.0637* (1.94)	
DIV_D			-0.10*** (4.09)			-0.0468* (1.81)
DRC	0.697*** (19.24)	0.7046*** (18.64)	0.7277** (19.12)	0.2241*** (9.67)	0.0993** (3.08)	0.0024 (0.04)
RD	7.2829*** (5.97)	7.4043*** (6.08)	7.8024*** (7.02)	0.8511 (1.12)	1.225 (1.58)	3.4246** (2.01)
ADR	-0.4890 (-0.32)	-0.4780 (-0.27)	-0.5328 (-0.31)	-3.5723*** (-3.33)	-3.5781*** (-3.25)	-3.9971*** (-3.40)
CES	0.0228** (2.24)	0.0227** (2.23)	0.0230** (2.25)	0.0500** (2.96)	0.0408** (2.35)	-0.0017 (0.12)
SIZE	-0.473*** (-5.65)	-0.0451** (-5.42)	-0.0401** (-5.38)	-0.0160** (-3.05)	-0.0146** (-2.73)	-0.0079 (0.500)
R^2	0.4019	0.4180	0.3515	0.2418	0.2770	0.2079

This table report the OLS regression with time and industry effects result of the relations between the Korean firms' diversification levels and their performance in period of 10 years (1988-1997). The dependent variables are Tobin's Q, from model (1) to model (3) and Excess value, from model (4) to model (6). The diversification level is measured by three methods: DIV_H is mean of Herfindal Index. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. SEG_NO is mean of the number of firm segments DIV_D is Percentage of firms with multiple segments. Control variables are total debt to assets (DRC), advertisement to assets (ADR), R&D (RD), capital expenditure to assets (CES) and the natural logarithm of firm assets (SIZE). Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%; **5%; *10%.

Table 3-7 presents the results of the regression analysis which supports hypothesis 3, hat the value of the firm is negatively related to the degree of diversification level in Korean companies. Regarding the results of "Excess", the estimated coefficients of DIV_D is negative and statistically significant. DIV_H shows a positive coefficient, which is significant at the ten-percent level, suggesting that diversification by Korean firms is, on average, associated with value discounts. When diversification level

(DIV_D) is measured by the multi-segment dummy variable, this result is similar to Claessens *et al* (1999). As present in the Tobin's Q model, the estimated coefficient of the multi-segment dummy variable (DIV_D) is negative and significant at the 1% level. The magnitude of the discount is comparable to those reported in prior studies (Lins and Servaes 1998, and Claessens *et al* 1998). Therefore, I find support for the agency cost hypothesis (hypothesis 3) but not for the efficient internal capital markets hypothesis (hypothesis 4).

I next investigate whether Korean firms' diversification patterns are related to the firm valuation between group affiliated firms and independent firms.

One cause behind the high proportion of business groups in Korea or East Asia is the creation of internal factor markets for capital (Coase 1973, Williamson 1985, Claessens *et al* 1999, Khanna and Palepu 2000*)*. Following this argument, group affiliation of firms could be a substitute for firm-level diversification in creating internal capital markets.

Table 3-8 Regression between the Level of Diversification and Firm Valuation of Group Affiliated Firms in Korea (1988-1997)

	Tobin's Q			Excess		
	Model (1	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Constant	0.6636**	0.6465**	0.6454**	0.0498	-1.0801**	0.0271
	(3.12)	(3.04)	(3.04)	(0.38)	(-2.17)	(0.21)
SEG_NO	0.0240			-0.01725*		
	(1.53)			(1.81)		
DIV_H		-2.8102			0.0976**	
		(0.14)			(2.17)	
DIV_D			0.0457			-0.0025
			(1.53)			(-1.23)
DRC	0.7422***	0.7368***	0.7328***	0.2130***	0.2103***	0.2198***
	(7.15)	(7.06)	(6.96)	(8.05)	(7.93)	(8.49)

RD	6.8894*** (3.67)	7.0189*** (3.73)	6.9777*** (3.72)	0.6630 (0.55)	0.6890 (0.57)	0.5920 (0.49)
ADR	-1.5586 (-0.70)	-1.5379 (-0.69)	-1.4337 (-0.64)	-4.7906*** (-3.48)	-4.7858*** (-3.48)	-4.8927*** (-3.55)
CES	0.0197 (1.75)	0.0200 (1.77)	0.0201 (1.78)	0.0470** (2.08)	0.0496** (2.19)	0.0493** (2.18)
SIZE	-0.0284** (2.47)	-0.0252** (2.23)	-0.0285** (2.48)	-0.0089 (1.25)	-0.0091 (1.29)	-0.0094 (1.32)
R^2	0.2993	0.3057	0.3063	0.2249	0.2127	0.2247

This table report the OLS regression with time and industry effects result of the relations between the Korean firms' diversification levels and their performance in independent firm in period of 10 years (1988-1997). The dependent variables are Tobin's Q, from model (1) to model (3) and Excess value, from model (4) to model (6). The diversification level is measured by three methods: DIV_H is mean of Herfindal Index. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. SEG_NO is mean of the number of firm segments DIV_D is Percentage of firms with multiple segments. Control variables are total debt to assets (DRC), advertisement to assets (ADR), R&D (RD), capital expenditure to assets (CES) and the natural logarithm of firm assets (SIZE). The inclusion of the latter five variables is to control for the effects of short-term profitability, leverage, advertisement, investment and firm size on firm value. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%;**5%;*10%

As reported in Table 3-8, the results indicate that diversification is largely the result of group-affiliated firms. Initially I focus on the results of "Excess". The estimated coefficients for group-affiliated firms are negative and are statistically significant in model (4) and (5). In contrast, as reported in Table 3-9, the results indicate that the independent firms are diversification premiums or no diversification discount. With respect to the result of both "Excess" and Tobin's Q, the estimated coefficients of SEG_NO and DIV_H are both statistically insignificant. When diversification level (DIV_D) is measured by the multi-segment dummy variable, DIV_D is positive and statistically significant. Suggesting that diversification by independent firms is, on average, creating the internal capital market or not relating expropriation for minority shareholders.

Table 3-9 Regression between the Level of Diversification and Firm Valuation of Independent Firms in Korea (1988-1997)

	Tobin's Q			Excess		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Constant	2.0591*** (8.87)	2.0988*** (8.43)	2.0009*** (8.67)	0.4858** (3.08)	0.5386*** (3.23)	0.3327** (2.14)
SEG_NO	-0.0172 (-1.60)			-0.0045 (-0.64)		
DIV_H		-0.1181 (-1.65)			-0.0413 (-0.88)	
DIV_D			0.1022*** (3.21)			0.0583* (1.85)
DRC	-0.1001 (1.44)	-0.0494 (0.71)	-0.0909 (1.31)	-0.0171 (0.37)	-0.0180 (0.39)	0.2849*** (4.86)
RD	8.7980*** (5.59)	8.7613*** (5.91)	8.9458*** (6.09)	1.5091 (1.55)	1.4034 (1.44)	1.1744 (1.24)
ADR	0.18451 (0.07)	0.2704 (0.10)	-0.0650 (0.02)	-1.8309 (-1.02)	-1.9764 (-1.10)	-1.5684 (-0.89)
CES	-0.0199 (-0.51)	-0.0242 (-0.62)	-0.0209 (-0.54)	0.0412 (1.59)	0.0422 (1.63)	0.0508** (2.00)
Size	-0.0723*** (-6.14)	-0.0716*** (-6.10)	-0.0756*** (-6,44)	-0.0250** (-3,13)	-0.0265** (-3.33)	-0.0321** (-4.07)
R^2	0.0384	0.0394	0.0174	0.0124	0.01297	0.1266

This table report the OLS regression with time and industry effects result of the relations between the Korean firms' diversification levels and their performance in group affiliated firm in period of 10 years (1988-1997). The dependent variables are Tobin's Q, from model (1) to model (3) and Excess value, from model (4) to model (6). The diversification level is measured by three methods: DIV_H is mean of Herfindal Index. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. SEG_NO is mean of the number of firm segments DIV_D is Percentage of firms with multiple segments. Control variables are total debt to assets (DRC), advertisement to assets (ADR), R&D (RD), capital expenditure to assets (CES) and the natural logarithm of firm assets (SIZE). The inclusion of the latter five variables is to control for the effects of short-term profitability, leverage, advertisement, investment and firm size on firm value. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%;**5%;*10%.

The results indicate that group-affiliated firms tend to have a diversification discount. Those affiliated with the business groups have a poorer diversification performance in comparison to independent firms. Group affiliated firms are driven less by the ultimate owner's aim for an efficient internal market but by the external capital market. This is consistent with the notion that group affiliated firms tend to use diversification to accrue private gains at of the cost of the minority shareholders. In

contrast, Independent firms show either no diversification discount or a diversification premium. The benefits of diversification for such firms appear to balance and offset agency costs of diversification. Therefore, this data supports the expropriation hypothesis (hypothesis 3) but does not lend support to the efficient internal capital markets hypothesis (hypothesis 4) for group affiliated firms. However, it shows the opposite result for the independent firms.

5.3.2 The test results of Hypotheses 5 on the relation between the level of diversification and firm Valuation of Korean Companies.

As shown above, there is variable support for the expropriation and the efficient internal capital markets hypotheses. In particular it is not clear why independent firms demonstrate a positive correlation between diversification and firm value. Claessens *et al* (1999, 2002), Lins and Servaes (2002) argue that the internal capital market hypothesis would suggest diversification to show greater benefit in less developed economies. External markets are subject to more distortions and hence the risks render them more costly. Such factors might influence results as the prevalence of the diversification discount might be stronger in more developed capital markets. Claessens *et al* (1999, 2002) find that group-affiliated firms contribute positively to diversification performance than independent firms in less developed economies. Lins and Servaes (2002) show in their research that a diversification discount was statistically significant on a country by country basis. Fauver et al (2007) find a significant diversification discount among high-income countries with well-developed and integrated capital markets. In contrast, for the lower income and

segmented countries, their findings are reversed and they discern either no diversification discount or even a diversification premium.[82]

I show in Chapter 2 that the capital market opening and financial liberalization process for the Korean economy developed over time during the sample period from 1988-1997.[83] Therefore, I directly investigate the link between the value of firm diversification and internal capital market according to economic and capital market development to further examine Hypothesis 4. I examine how the level of capital market development affects the diversification performance of group-affiliated and independent firms. As before, I estimate both Tobin's Q and Excess Tobin's Q on level of diversification in group-affiliated and independent firms. Claessens *et al* (1999) and Fauver *et al* (2007) have used per-capita GNP and legal origin indicator variables as proxies for capital market development and the legal environment.

In this study, I investigate how the level of capital market development (per-capita GNP and financial liberalization)[84] affects the diversification performance of group-affiliated and independent firms. I again control for the effects of total debt to assets

[82]Fauver *et al* (2007) use data from more than 8,000 firms from 35 countries over a period of five years from 1991 to 1995 to test the value of diversification is related to the degree of country's capital market development, integration, and legal system. However it is not clear for Korean case because it is included as an Upper-middle income category with a German-origin legal system. Capital market integration show an average intensity of 1.00, which are same as most developed countries (USA, UK, Germany, Switzerland etc.).

[83] More detailed information contained in appendix B in Chapter 2. Also Bekaert and Harvey's (1995) measure captures the time-varying nature of integration, whereas Edison and Warnock's (2003) measure provides information on the extent of initial openings as well as the evolution of liberalization over time.

[84] GNP Per Capita for Korea (Source : World Bank official communication; *International Financial Statistics*. Unit: US$)

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
GNP Per Capita	4279	5199	5875	6752	7003	7508	8505	10056	10553	9507

(DRC), advertisement to assets (ADR), R&D (RD), capital expenditure to assets (CES) and the natural logarithm of firm assets (SIZE).

Table 3-10 Regression between the Level of Diversification and Firm Valuation of Korean Companies in 1997

	Tobin's Q			Excess		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
SEG_NO	-0.014 (-1.40)			-0.1 (-0.44)		
DIV_H		0.06 (1.34)			0.05 (0.41)	
DIV_D			-0.05** (-1.90)			-0.07 (-1.05)
R^2	0.5864	0.5873	0.5903	0.2675	0.2448	0.2884
Affiliated Firms						
SEG_NO	-0.02 (-1.04)			-0.00 (-0.08)		
DIV_H		0.13 (1.32)			0.03 (0.31)	
DIV_D			-0.09** (-2.00)			-0.50* (-1.97)
R^2	0.1317	0.1381	0.1557	0.0874	0.0884	0.1081
Independent Firms						
SEG_NO	-0.02 (-0.90)			-0.016 (-0.86)		
DIV_H		0.18* (1.88)			0.17* (1.82)	
DIV_D			-0.04 (-1.07)			-0.06 (-1.51)
R^2	0.4181	0.4630	0.4198	0.1126	0.1816	0.1242

This table report the OLS regression with time and industry effects result of the relations between the Korean firms' diversification levels and their performance in 1997. The dependent variables are Tobin's Q, from model (1) to model (3) and Excess value, from model (4) to model (6). The diversification level is measured by three methods: DIV_H is mean of Herfindal Index. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. SEG_NO is mean of the number of firm segments DIV_D is Percentage of firms with multiple segments. Control variables are total debt to assets (DRC), advertisement to assets (ADR), R&D (RD), capital expenditure to assets (CES) and the natural logarithm of firm assets (SIZE). The inclusion of the latter five variables is to control for the effects of short-term profitability, leverage, advertisement, investment and firm size on firm value. But this table does not present for control variable. Numbers in parentheses are t-statistics Asterisks denote the level of significance: ***1%;**5%;*10%.

The results of the comparison between year 1989 and 1997 are presented in Table 3-10 and Table 3-11. As reported in Table 3-10, regression between the level of diversification and firm valuation of Korean Companies in 1997, the estimated coefficients for group-affiliated firms are both negative and statistically significant in model (3) and (6). The value of diversification for Independent firms is negative and statistically significant in model (2) and (5).

Table 3-11 Regression between the Level of Diversification and Firm Valuation of Korean Companies in 1989

	Tobin's Q			Excess		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
SEG_NO	-0.01 (-0.26)			-0.03* (-1.94)		
DIV_H		-2.28 (-1.19)			1.38 (1.15)	
DIV_D			0.002 (0.23)			-0.019 (-0.73)
R^2	0.2283	0.2358	0.2133	0.2292	0.2159	0.2109
Affiliated Firms						
SEG_NO	-0.01 (-0.36)			-0.03* (1.85)		
DIV_H		0.01 (0.08)			0.10 (1.25)	
DIV_D			-0.01 (0.18)			-0.08 (-1.96)
R^2	0.4230	0.4216	0.4219	0.2879	0.2597	0.2935
Independent Firms						
SEG_NO	-0.00 (-0.04)			-0.01 (0.62)		
DIV_H		-2.34** (-2.10)			1.38 (1.09)	
DIV_D			0.01 (0.03)			0.02 (0.50)
R^2	0.1250	0.1376	0.1250	0.1545	0.1630	0.1531

This table report the OLS regression with time and industry effects result of the relations between the Korean firms' diversification levels and their performance in 1989. The

dependent variables are Tobin's Q, from model (1) to model (3) and Excess value, from model (4) to model (6). The diversification level is measured by three methods: DIV_H is mean of Herfindal Index. The Herfindahl Index becomes 1/N when the scope of all business divisions are identical, and is equal to 1 when it is a single business corporation. SEG_NO is mean of the number of firm segments DIV_D is Percentage of firms with multiple segments. Control variables are total debt to assets (DRC), advertisement to assets (ADR), R&D (RD), capital expenditure to assets (CES) and the natural logarithm of firm assets (SIZE). The inclusion of the latter five variables is to control for the effects of short-term profitability, leverage, advertisement, investment and firm size on firm value. But this table does not present for control variable. Numbers in parentheses are t-statistics Asterisks denote the level of significance: ***1%;**5%;*10%.

In contrast, as reported in Table 3-11, results indicate that the independent firms have diversification premiums or at least accrue no diversification discount. With respect to the result of both Excess and Tobin's Q, the estimated coefficients of SEG_NO and DIV_D are both statistically insignificant. When diversification level (DIV_H) is measured by the Herfindal index, DIV_H is negative and statistically significant. This suggests that diversification by independent firms is creating the internal capital market, or not related to expropriation of minority shareholders in 1989. The results indicate that diversification is attributable to group-affiliated firms in 1989; however, the diversification discount is weaker than the result for 1997.

These results imply diversification has a negative effect on firm value, where this relationship is affected by capital market and economic development. Agency problems of group affiliated firms are responsible for firms maintaining diversification strategies. For independent firms, I find that there is either no diversification discount or a diversification premium when capital markets are less developed based on 1989 data. However for these firms, the benefits of diversification appear to offset the agency costs of diversification in under more developed capital markets, based on 1997 data.

5.4 Simultaneous equation regression analysis on ownership structure, diversification and corporate valuation

So far it has been assumed that diversification policies and ownership structures are exogenous variables and analysis has focused on their influence on firm valuation. Here I combine the results and models by taking into account firm ownership structure and its diversification policies while correlating the decision-making and firm valuation. This is implemented using a two simultaneous equation model. The analyses in section 5.1-5.3 included assumptions that the descriptive variables in the model were exogenous by applying the normal ordinary least squares methods (OLS). This ignored or glossed over the fact that the determination of many of these variables is simultaneous. As a result, a model that takes the correlation between variables into account is therefore required. One significant problem of applying the OLS method to a structural model is the point that simultaneous equation biases occur. This study uses a two-stage least squares (2SLS) in order to correct for this type of problem. To address the potential endogenous effect, I estimate a simultaneous equations system of ownership structure, level of diversification, and corporate value using the two-stage least squares (2SLS). Using the same data as in section 5.1-5.4 as a basis I estimate the following simultaneous equation system:

Ownership Structure = FA (Firm value, Investment, Firm profit, Volatility of Earnings, Diversification, Asset Size) (1-1)

Firm Value=FB (Ultimate Ownership, Diversification, Investment, Financial leverage, Asset Size) (1-2)

Firm Diversification=FC (Ultimate Ownership, Firm value, Firm Profit, Financial leverage, Asset Size) (1-3)

Table 3-12 Simultaneous Regression analysis of the Firm value, Diversification, and Divergence between Control rights and Cash flow rights (1988-1997)

	Ownership	Firm value	Diversification
CONS	1.15***	-3.18	-1.42
	(6.91)	(-1.38)	(-0.74)
VALUE	0.03		1.62
	(1.49)		(0.74)
RISK	0.129		
	(0.41)		
CRCFR		3.20*	-0.56**
		(1.73)	(-2.53)
CES	-0.38	3.13***	
	(-0.41)	(3.26)	
PRO	1.99**		-0.43
	(2.43)		(-0.38)
DIV	-0.04	-0.08*	
	(-0.42)	(-1.94)	
DRC		0.68***	-0.07
		(3.37)	(0.90)
SIZE	-0.03*	-0.13	0.19**
	(-1.80)	(-0.19)	(2.04)
R^2	0.0558	0.0119	0.0100

This table present simultaneous equation analysis of ultimate ownership, firm value, and diversification 1892 published Korean firms from1988 to1997. Ultimate ownership (CRCFR) is measured as divergence between cash flow rights and control rights of largest shareholder. Level of diversification (DIV) measures number of segment. Firm value is measured as Tobin's Q. Firm value or investment opportunity (VALUE), standard deviation of profit (RISK), Capital expenditure ratio (CES), operating income over sales (PRO), Debt ratio (DRC) and Firm size (SIZE) and Firm age (AGE) are included as control variable. The regressions are performed using a fixed- effects with time and industry specification. Numbers in parentheses are t-statistics. Asterisks denote the level of significance: ***1%, **5%,*10%.

As reported in Table 3-12, corporate value and diversifications are not an important determinant of divergence between the cash flow rights and control rights of ultimate ownership. The divergence between control rights and cash flow rights affects both firm value and firm diversification; a finding that is similar to that using the OLS corporate value regression result in chapter 1. The regression results indicate that the divergence between control rights and cash flow rights negatively affect diversification. Thus, divergence between control rights and cash flow rights affects the diversification, which in turn affects the corporate value yet the corporate value does not affect the ownership structure.

6. Conclusion

I have examined empirically the relationship between the ownership structure and firm diversification, addressing issues arising from the agency problems and the relationship between firm diversification and valuation in Korea 1988 to 1997.

The results demonstrate that the relationship between the insider ownership and the level of firm diversification is non-linear. In particular, the divergence between the cash flow rights and the control rights is positive. Stockholders are divided into two groups: an inside shareholder (ultimate owner) who manages the firm and has exclusive voting rights; and outside shareholders (minority shareholder) who have no voting rights in firm policy. Both classes of security holders are entitled to the same

dividends per share. The inside shareholders, however, are able to augment the stream of cash flow by consuming additional non-marketable benefits.

Secondly, the insider ownership may affect the valuation consequence of diversification. If value-reducing diversification stems from agency problems, firms with high managerial ownership are less likely to diversify. If the shareholder cost of diversification exceeds its benefits, firms with low managerial ownership may engage in value-reducing diversification because managers derive private benefits that exceed their private costs. On average, I would then expect to observe negative valuation consequences from diversification in lower ownership firms, and non-negative effects in higher ownership firms.

I further compare the diversification patterns and performance between group affiliated and independent firms. The analysis indicates that group-affiliated firms' diversification performance is poorer than that of independent firms. Group-affiliated firms are more likely to diversify than independent firms. Diversification discounts reported for the whole sample can be attributed to group-affiliated firms. This is in part because group affiliation amplifies the negative effects of firm-level diversification on firm valuation. I find that the benefits of diversification for independent firms appear to offset the agency costs of diversification in less developed capital markets and economies.

Finally, using the method of simultaneous equation regression, I find the divergence between control rights and cash flow affects both the firm diversification and value.

Firm diversification affects directly firm value, but firm value does not affect the ownership structure.

Overall, these findings suggest that (i) excessively diversified ownership can reduce firm value; (ii) agency problems are responsible for firms maintaining diversification strategies; and (iii) group affiliated firms have a greater agency cost problem which exceeds the benefits of creating a internal capital market in both 1989 and 1997. However, diversification for independent firms created an advantage in terms of internal capital markets in 1989.

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