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Controlling shareholders' ownership structure, foreign investors' monitoring, and investment efficiency

Abstract

This study examines the effect of control-ownership wedge (the difference between control rights and cash flow rights) on investment efficiency. Subsequently, the authors analyze how the level of foreign investor monitoring influences the association between control-ownership wedge and investment efficiency. The results of the analyses show that investment efficiency deteriorates as control-ownership wedge increases. This, in turn, suggests that when this wedge increases, agency problems and information asymmetry between controlling and minority shareholders become more severe. The authors also perform an analysis by dividing the samples into four groups based on foreign investor ratio from the least to the greatest. The result shows that control-ownership wedge deteriorates investment efficiency in the group with the least foreign investor ratio. The result reveals that foreign investor monitoring is effective corporate governance mechanism to monitor the controlling shareholders' investment decisions. We also find that higher control-ownership wedge with over-investment tendency negatively affects firm performance, which implies an inefficient investment behavior. This result suggests that as controlling shareholders' ownership increases, controlling shareholders becomes more and more reluctant to assume a loss of firm value as a result of reduced investment efficiency. This study provides additional evidence that the greater control-ownership wedge decreases investment efficiency, while recent studies on the relation between control-ownership wedge and investment efficiency suggest mixed evidence. In addition, the results show that foreign investors play an effective monitoring role when controlling shareholders are in position of exercising exclusive power. The results indicate the importance of external investors' monitoring over investment decisions.

Keywords: control-ownership wedge, foreign ownership, investment efficiency, over-investment, under-investment.
JEL Classification: G32, M41.

Introduction

Modigliani and Miller (1958) suggest that firms invest to the point where the marginal benefits of capital investment are equal to the marginal costs of the investment in a perfect capital market. However, in an imperfect capital market where information asymmetry arises between management and investors, managers may make inefficient investment decisions due to market frictions such as moral hazard and adverse selection. Depending on the availability of capital, firms with sufficient capital are more prone to over-invest and firms under financial constraints are more prone to under-invest (Jensen and Meckling, 1976; Jensen, 1986; Myers, 1997; Blanchard et al., 1994).

Most prior studies related to abnormal investments in an imperfect capital market have examined agency problems arising from the conflicts between management and shareholders. However, among East Asian (including Korean) firms, more understanding is required of agency problems caused by the difference between controlling shareholders and minority shareholders. This

difference between control rights and cash flow rights is known as control-ownership wedge. The agency problem between controlling shareholders and minority shareholders diminishes firm value in East Asian firms due to their weak legal and institutional environments in which minority shareholders are poorly defended compared to the situation in strong legal and institutional environments, such as those in firms in Anglo-American countries. In this study, we examine the association between control-ownership wedge and investment efficiency from the perspective of agency problems between controlling shareholders and minority shareholders.

The corporate ownership structure of many East Asian (including Korean) firms is characterized by large stock ownership concentrated in the hands of controlling shareholders who exercise enormous control rights. Especially in countries such as Korea, where institutional environments are weak and protection of minority shareholders is minimal, controlling shareholders use pyramid structures to control decision-making and cross-holdings among firms, overriding the cash flow rights of minority shareholders (La Porta et al., 1999, 2002; Claessens et al., 2000, 2002; Fan and Wong, 2002). Consequently, there is a relatively large difference between cash flow rights and voting rights. This is the source of control-ownership wedge.

Controlling shareholders may gain benefits as a result of their control rights, but may only take risks

in accordance with their cash flow rights. Thus, control-ownership wedge increases the likelihood of managers making inefficient investment decisions, which diminishes firm value (Fan and Wong, 2002). Correspondingly, when control-ownership wedge is large, internal controls and corporate governance are more likely to be ineffective and controlling shareholders are more likely to act opportunistically (Shleifer and Vishny, 1997; La Porta et al., 1999; Johnson et al., 2000). When the interests between controlling shareholders and minority shareholders are misaligned and no financial constraints are imposed over controlling shareholders, over-investment to maximize the private wealth of controlling shareholders is common (Jenson, 1986). In contrast, when strong financial constraints are in place and outside investors observe agency problems within the firm, the cost of capital increases and under-investment becomes more likely (Stiglitz and Weiss, 1981).

Transparent and reliable accounting information reduces information asymmetry between outside investors and management, which increases investment efficiency (Biddle and Hilary, 2006; Bushman et al., 2006; McNichols and Stubben, 2008; Biddle et al., 2009). As the size of control-ownership wedge increases, the transparency and reliability of accounting information decreases, which exacerbates information asymmetry (Fan and Wong, 2002; Kim and Yi, 2006; Shim et al., 2010; Sonu at al., 2010) and indirectly decreases investment efficiency.

On the other hand, foreign investors play an effective monitoring role from an independent position when controlling shareholders exercise exclusive controlling power to justify their self-serving behaviors in every aspect. For instance, foreign investors may press firms to disclose more informative accounting information to decrease information asymmetry with market, which leads to improved accounting transparency (Jiang and Kim, 2002; Jeon, 2003; Ahn et al., 2005). Foreign investors monitor managers' opportunistic behaviors (i.e., an intention to extract private benefits) and support firm value to maximize shareholder benefits, which decreases agency cost and, in turn, improves firm performance and investment efficiency (Park et al., 2004, Park and Kwon, 2012).

When controlling shareholders maintain strong controlling power, internal governance mechanisms such as the board of directors, audit committee, or internal controls are likely to be ineffective (Shleifer and Vishny, 1997; La Porta at al., 1999; Johnson et al., 2000). On the other hand, foreign investors are expected to effectively monitor controlling shareholders from an independent position, even

when controlling shareholders have exclusive power upon minor shareholders to extract private benefits. In addition, foreign investors reduce information asymmetry as they monitor internal business decisions, which increase accounting information quality, and, in turn, positively influence investment efficiency (Park and Kwon, 2012).

In this study, the association between control-ownership wedge and investment efficiency is examined from 2006 to 2010 and measured using a conditional model proposed by Biddle at al. (2009)[1]. Our finding is that in firms in which under-investment is likely, the actual level of investment increases, as control-ownership wedge decreases. On the other hand, in firms in which over-investment is likely, the actual level of investment decreases, as control-ownership wedge decreases. These results support our prediction that an increase in control-ownership wedge exacerbates information asymmetry between controlling shareholders and minority shareholders, which decreases investment efficiency. In addition, we divide our samples into four groups based on foreign investor ratio from the least to the greatest. The result shows that control-ownership wedge decreases investment efficiency in the group with the least foreign investor ratio. The result indicates that foreign investor monitoring is an effective corporate governance mechanism to monitor the controlling shareholders investment decision.

Our findings contribute to the existing literature associated with abnormal investments caused by agency problems. This study provides additional evidence that the greater control-ownership wedge decreases investment efficiency, while recent studies on the relation between control-ownership wedge and investment efficiency suggest mixed evidence. In addition, the result shows that foreign investors play an effective monitoring role as an independent party when controlling shareholders are in position of exercising exclusive power. The results indicate the importance of monitoring role by external parties over investment decisions among *Chaebol* groups, since board of directors do not have significant influence on controlling shareholders' investment decisions in such context. Our results extend and contribute to existing

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[1] When conflicts arise between shareholders and management, firms may over-invest or under-invest depending on the availability of capital. When capital is available, management is more likely to over-invest (Jensen and Meckling, 1976). In addition, when outside investors supply capital, the monitoring effect by outside investors is relatively strong, but internal monitoring is relatively weak, which increases the probability of over-investment. When the debt to equity ratio is high, the probability of under-investment increases because of the high principal and interest repayments (Jensen, 1986; Myers, 1977). Thus, Biddle et al. (2009) define ex-ante investment tendencies based on cash and leverage, which represent degrees of financial constraint. Biddle et al. (2009), then, compare ex-ante investment tendencies with the actual level of investment.

literature on investment behaviors in the *Chaebol*, a unique corporate governance structure in Korea.

Our findings have the following implications for regulators, credit rating agencies, and investors. For regulators, the association between control-ownership wedge and investment efficiency may suggest the need to improve the effectiveness of corporate governance structures, especially the *Chaebol*. For credit rating agencies, financial analysts, and general investors, the results may provide useful insights into the relationship between firm attributes and control-ownership wedge, which may be helpful information to have prior to making significant decisions.

The remainder of the paper is organized as follows. Section 1 presents the findings from the relevant literature. Section 2 develops the testable hypothesis based on section 1. Section 3 describes the sample selection and research design. Section 4 reports the empirical results. Final section offers conclusions and implications.

1. Related literature and background

1.1. The literature on control-ownership wedge. The corporate governance structures in most Korean firms provide a weak legal and institutional environment in which minority shareholders have little protection. Thus, controlling shareholders exercise their control rights, which have greater influence than the cash flow rights of minority shareholders, through pyramid structures or cross-holdings among their relatives or affiliates. As the difference between control rights and cash flow rights increases, controlling shareholders tend to make decisions that diminish firm value, which ultimately results in the expropriation of minority shareholders' wealth (Shleifer and Vishny, 1997; La Porta et al., 1999, 2002; Claessens et al., 2000, 2002). In fact, controlling shareholders have no motivation to allocate firm wealth to minority shareholders or to allow them to exercise their cash flow rights. Rather, controlling shareholders attempt to build their personal empires or invest in such a way as to entrench their personal wealth rather than allocating wealth to minority shareholders. Annual mandatory disclosures of control and ownership information about large business groups requested by the Korea Fair Trade Commission (KFTC) support this phenomenon.

Numerous empirical studies in accounting focus on the association between control-ownership wedge and accounting information quality from an earnings management perspective. Fan and Wong (2002) find a negative association between control-ownership wedge and the earnings response coefficient. They assert that outside investors do not trust the earnings reported by controlling shareholders; instead, they perceive the report as reflecting the interests of controlling shareholders. Kim and Yi (2006) document that as control-ownership wedge increases, controlling shareholders tend to act opportunistically by engaging in earnings management to disguise their behaviors and to avoid disciplinary action. Further, they find that affiliations between business groups and controlling shareholders provide more incentives and opportunities for earnings management.

1.2. The literature on foreign investors' monitoring. As institutional investors, foreign investors have relatively more options to choose markets where they invest (Tesar et al., 1995) despite of informational disadvantage (i.e., an understanding of specific foreign market and stocks) compared to that of local investors (Choe et al., 2005). In addition, La Porta at al.(1999) find that foreign investors are attracted to firms with sound corporate disclosure rules and investor protection policies. As prior studies indicate, foreign investors tend to avoid investing in an unfamiliar market and in firms with low foreign investor ownership, where they expect excessive information cost and monitoring cost which result in inefficient corporate governance (Cooper and Kaplanis, 2000).

Foreign investors are usually blockholders as a form of institutional investors rather than minority shareholders a form of individual investors. Thus, foreign investors have strong incentives to maximize firm value subject to their investments by actively participating in operation. A number of literature find that foreign investors play an effective internal monitoring role in business decisions, which decrease information asymmetry and increase accounting information quality (Jiang and Kim, 2002; Ahn at al., 2005; Oh and Sohn, 2006; Kim and Kim, 2007).

Recent literature reports that high foreign investor ownership leads to effective monitoring over firms' internal business decision such as investments decisions. Park and Kwon (2012) find when foreign investor ownership increases (decreases), it reduces firms' tendency to over-investment (under-investment). Such result indicates that foreign investors increase investment efficiency by monitoring managers' investment decisions.

1.3. The literature on investment efficiency. Modigliani and Miller (1958) argue that investments, the cost of capital, and dividend payment decisions are independent from each other in a perfectly competitive market. However, in reality, corporate investment activities are dependent on various economic factors, and occur in an imperfect capital market. Information asymmetry

among stakeholders and corresponding agency problems are two factors affecting the imperfect capital market in the investment decision-making context. Some researchers have studied the probability of suboptimal investment decision-making resulting in over- or under-investment. For example, prior studies describe the effects of information asymmetry between managers and outside capital suppliers, which influences capital investment efficiency and motivates two fundamental imperfections: moral hazard and adverse selection (Jensen and Meckling, 1976; Jensen, 1986; Myers, 1977; Blanchard et al., 1994; Baker et al., 2003).

Recent accounting studies examine investment efficiency and the role of accounting information from the perspectives of moral hazard and adverse selection caused by information asymmetry among stakeholders. In prior studies, the authors propose that higher-quality financial reporting may mitigate information asymmetry caused by economic frictions such as moral hazard and adverse selection, which ultimately enhances investment efficiency (e.g., Leuz and Verrecchia, 2000; Bushman and Smith, 2001; Verrecchia, 2001). Higher-quality financial reporting heightens shareholders' ability to monitor investment activities made by managers. In addition, high-quality financial reporting is associated with investment efficiency, because it reduces moral hazard. Also, high-quality financial reporting reduces the cost associated with adverse selection, which increases investment efficiency by reducing external financing costs and the likelihood of obtaining excess funds caused by temporary mispricing. On the other hand, low-quality accounting information increases information asymmetry caused by earnings management and decreases investment efficiency (Biddle and Hilary, 2006; Bushman et al., 2006; McNichols and Stubben, 2008; Biddle et al., 2009). For example, Biddle and Hilary (2006) and Biddle at al. (2009) document that accounting earnings quality (as measured using accruals quality) is associated with investment efficiency. Transparent accounting information reduces information asymmetry and agency costs, which, in turn, increases investment efficiency. Several studies also examine the association between control-ownership wedge and investment efficiency. Using a sample of U.S. dual-class companies, Masulis at al.(2009) find that firms with greater divergence between insider voting and cash flow rights often result value-destroying investments, and exhibit low capital expenditure investment. Jiang at al.(2011) examine the association between control-ownership wedge and investment sensitivity to stock prices using one year (1996) of comprehensive data from companies in

East Asian and European countries. The authors find a strong negative association between control-ownership wedge and investment-q sensitivity. Controlling shareholders are motivated to pursue their own private interests, and they lack consideration about the market reaction when they make investment decisions. However, the samples used in the study of Jiang at al. (2011) are based on one year (1996) of comprehensive data from companies in East Asian and European countries. Over the years since then, Korea reformed its disclosure and accounting policies pertaining to corporate governance structures and introduced the Securities-Related Class Action Law in an effort to provide a method by which minority shareholders could monitor controlling shareholders' actions. In our study, we make an additional contribution in that we use multi-period Korean samples, incorporating these improvements in the legal and institutional environment.

2. Hypotheses development

According to La Porta at al. (1999, 2002), in East Asian (including Korean) firms, ownership is concentrated on certain individuals who exercise enormous control rights over their firms. Especially in countries with weak institutional environments and poor protection of minority shareholders such as Korea, the influence of controlling shareholders is increased even further through pyramid structures and cross-holdings among firms; these easily exceed the cash flow rights of minority shareholders (La Porta et al., 1999, 2002; Claessens et al., 2000, 2002; Fan and Wong, 2002). Therefore, control-ownership wedge is evident in companies with relatively high voting rights compared to cash flow rights.

When the disparity between control rights and cash flow rights becomes greater, controlling shareholders gain benefits according to their control rights, yet they take risks according to their cash flow rights. Thus, the likelihood that management will make investment decisions against firm value increases, as the wedge increases (Fan and Wong, 2002). For example, controlling shareholders may reduce dividend payments for minority shareholders or transfer wealth to other firms under their control in such a way as to sacrifice minority shareholders' wealth and to pursue their own private interests (Shleifer and Vishny, 1997; Claessens et al., 2000; Johnson et al., 2000). In addition, when controlling shareholders maintain strong controlling power, monitoring by the board of directors, audit committee, or internal controls are likely to be ineffective (Shleifer and Vishny, 1997; La Porta et al., 1999; Johnson et al., 2000). When control-ownership wedge is large, the possibility increases

for controlling shareholders to make investment decisions that decrease firm value and have adverse impacts on minority shareholders' wealth (the entrenchment effect). As such, when the interests of controlling shareholders and minority shareholders are misaligned and monitoring over controlling shareholders is weak, controlling shareholders of firms lacking in financial constraints are more likely to over-invest to maximize their private wealth (Jenson, 1986; Blanchard et al., 1994). However, if outside investors are aware of internal agency problems, the cost of capital increases; as a result, they may choose to under-invest (Stiglitz and Weiss, 1981; Lambert et al., 2007).

As control-ownership wedge increases, controlling shareholders have incentives to pursue their own private interests, which increases the possibility of earnings management, which, in turn, decreases accounting information credibility (Fan and Wong, 2002; Kim and Yi, 2006). In addition, as control-ownership wedge increases, controlling shareholders tend not to disclose critical information that would prevent them from pursuing their own private interests, which ultimately reduces accounting information transparency (Shim et al., 2010; Sonu et al., 2010). An increase in control-ownership wedge, therefore, decreases credibility and transparency of accounting information, exacerbates information asymmetry, and causes investment inefficiency (Biddle and Hilary, 2006; Biddle et al., 2009).

Consistent with prior research in this area, we expect that an increase in control-ownership wedge will increase agency problems and information asymmetry among stakeholders, which ultimately decreases investment efficiency. This expectation leads to the following hypothesis 1, which is the focus of this study:

Hypothesis 1: An increase in control-ownership wedge is negatively associated with investment efficiency.

Foreign investors prefer firms with lower information asymmetry since information asymmetry causes higher transaction costs and increases the level of uncertainty (Kang and Stultz, 1997; Dahlquist and Robertsson, 2001; Lin and Shiu, 2003). In addition, foreign investors remain strong and independent when controlling shareholders exercise exclusive controlling power. Foreign investors are able to monitor controlling shareholders' self-serving behaviors in every aspect, and exert pressure upon firms to disclose informative accounting disclosures, which decreases information asymmetry to improve accounting transparency (Jiang and Kim, 2002; Jeon, 2003; Ahn et al., 2005). Foreign investors curtail managers' opportunistic behaviors such as

extraction of private benefits and monitor firms to maximize shareholder benefits, which decreases agency cost caused by managers' opportunistic behaviors and, in turn, improves firm performance and investment efficiency (Park et al., 2004, Park and Kwon, 2012).

When controlling shareholders maintain strong controlling power, internal monitoring mechanism such as the board of directors, audit committee, or internal controls are likely to be ineffective (Shleifer and Vishny, 1997; La Porta et al., 1999; Johnson et al., 2000). On the other hand, foreign investors are expected to play an effective monitoring role over controlling shareholders from an independent position, even when controlling shareholders exercise exclusive power upon minor shareholders to extract private benefits. In addition, foreign investors reduce information asymmetry as they monitor internal business decisions, accounting information quality is increased and, in turn, it positively influences investment efficiency (Park and Kwon, 2012).

As discussed above, we hypothesize that higher foreign investor ownership leads to effective monitoring over firms' internal business decision, and it alleviates the negative association between control-ownership wedge and investment efficiency. This expectation leads to the following hypothesis 2.

Hypothesis 2: The negative association between control-ownership wedge and investment efficiency is weakened (strengthened) when foreign investor ownership is higher (lower).

3. Sample selection and research design

3.1. Sample selection. In this study of cash flow rights, control rights, and control-ownership wedge, the dataset was exclusively obtained from the Korea Fair Trade Commission (KFTC hereafter), and includes detailed information on large business conglomerates from 2006 to 2010. The data used in the analysis pertain to conglomerates and their affiliates available from the KFTC's information disclosure system that satisfies following conditions:

a) firms listed in the Korea Stock Exchange and the Korea Securities Dealers Automated Quotation;
b) firms not in financial industries;
c) firms with December 31 fiscal year-end;
d) firms whose financial data are available in the KISVALUE database provided by NICE Credit Evaluation, Inc.

We limit our sample to listed firms, using the market value of listed firms as a control variable. We include non-financial firms in our sample, because the format and nature of accounts on the financial statements in financial firms differ from those of other firms, making it challenging to

perform an industry analysis. Lastly, we select firms with a December 31 fiscal year-end to facilitate comparison.

3.2. Measurement of control-ownership wedge. Cash flow rights, control rights, and control-

ownership wedge are defined as follows. In this context, a controlling shareholder is defined as a person (or a firm) who wields the true extent of control over a firm, and who is indicated as the founder in the large business conglomerates disclosure system, according to the KFTC.

$$\text{Control rights} = \frac{\begin{array}{c}\text{Controlling shareholder's direct share ownership} + \text{Controlling shareholder's family ownership} + \\ \text{Affiliate's direct share ownership} + \text{Directors' share ownerhsip} + \text{Not} - \text{for profit organizations' share ownership}\end{array}}{\text{Number of common stock} - \text{Treasure stock}}$$

$$\text{Cash flow rights} = \frac{\text{Controlling shareholder's direct share ownership} + \text{Controlling shareholder's family ownership}}{\text{Number of common stock} - \text{Treasury stock}}$$

$$\text{Control} - \text{ownership wedge} = \text{Control rights} - \text{Cash flow rights}$$

3.3. Measurement of investment efficiency. This study defines investment efficiency using a conditional model proposed by Biddle at al. (2009) as the difference between *ex-ante* firm-specific characteristics of the likelihood of over- or under-investment and actual investment level.

Biddle at al.(2009) identify *ex-ante* firm-investment characteristics based on financial constraints, cash flow, and leverage to determine the likelihood of over-investment or under-investment[2]. In this study, we make similar assumptions about firm-investment characteristics as follows: (1) firms with high cash balances and low leverage are more likely to over-invest, and (2) firms with low cash balances and high leverage are more likely to under-invest. The variable labeled *Cash* is a measure of the amount of cash and cash equivalents scaled by total assets. The variable labeled *Leverage* is a measure of short-term borrowings, short-term bonds, long-term borrowings, long-term bonds, and capital lease liabilities scaled by total assets.

We, first, rank firms into ten deciles according to their cash and leverage balances. At this time, we multiply the value for *Leverage* by minus one to align with *Cash* to show that an increase in value indicates over-investment. We, then, re-scale ten deciles to establish ranges for both cash balance and leverage balance between zero and one. Subsequently, we compute the average of the ranked values for the *Cash* and *Leverage* variables. When

the average is between zero and one as cash increases and leverage decreases, over-investment is more likely. When the reverse is true, under-investment is more likely. The two composite score measures are used in this study as proxies for over-investment (under-investment).

3.4. Research design. We construct a model to examine the effect of controlling shareholders' ownership structure on investment efficiency, as outlined in equation (1) below:

$$\begin{aligned}Invest_{i,t+1} = {}& \beta_0 + \beta_1 Wedge_{i,t} + \beta_2 Wedge_{i,t} \times Over_{i,t+1} + \\ & + \beta_3 Over_{i,t+1} + \beta_4 Size_{i,t} + \beta_5 MB_{i,t} + \beta_6 Zscore_{i,t} + \beta_7 Tangibility_{i,t} + \\ & + \beta_8 Ind.K - structure_{i,t} + \beta_9 Age_{i,t} + \\ & + \beta_{10} OperatingCycle_{i,t} + \beta_{11} Loss_{i,t} + \\ & + \beta_{12} std(CFO)_{i,t} + \beta_{13} std(Sales)_{i,t} + \\ & + \beta_{14} std(Invest)_{i,t} + \sum IND + \sum YEAR + \epsilon_{i,t}.\end{aligned} \quad (1)$$

The dependent variable *Invest* is total investments scaled by total assets in the next year; it includes both capital expenditure and R&D expenditure. *Wedge* is a variable which represents the difference between cash flow rights and control rights. *Over* is the likelihood of a firm to over-invest, which has a value between zero and one. As the value gets closer to one, over-investment becomes more likely. As the value approaches zero, under-investment becomes more likely. The estimated coefficient ($\beta_1 + \beta_2 Over$) of *Wedge* is the main variable of interest. When *Over* = 0, β_1 shows an association between control-ownership wedge and actual investment, then, a firm tends to under-invest. We expect $\beta_1 < 0$ when a firm tends to under-invest based on our hypothesis that actual investment increases, as the control-ownership difference decreases. Additionally, when *Over* = 1, the coefficients ($\beta_1 + \beta_2$) show the association between control-ownership wedge and actual investment when a firm is more likely to over-invest. We expect that ($\beta_1 + \beta_2$) > 0 as the control-ownership difference decreases and actual investment decreases when a firm is more likely to over-invest.

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[2] When conflicts arise between shareholders and management, firms may over-invest or under-invest depending on the availability of capital. When capital is available, management is more likely to over-invest (Jensen and Meckling, 1976). In other words, cash-rich firms tend to over-invest (Jensen, 1986; Blanchard et al., 1994). In addition, when capital is supplied by outside investors, there may be a monitoring effect; however, the internal monitoring may be relatively weak, which increases the probability of over-investment. When the debt-to-equity ratio is high, there is a probability of under-investment due to high principal and interest repayments (Jensen, 1986; Myers, 1977). Thus, Biddle et al. (2009) define the tendency toward *ex-ante* investment based on cash and leverage, which represents the degree of financial constraint. They, therefore, analyze the *ex-ante* investment tendency based on the actual level of investment.

When the coefficients of the main variables ($\beta_1 < 0$, ($\beta_1 + \beta_2$) > 0) are satisfied, the control-ownership difference decreases, and the actual level of investment increases in firms with under-investment characteristics. At the same time, when the control-ownership difference decreases, the actual level of investment decreases in firms with over-investment characteristics. As a result, as the control-ownership difference decreases, investment efficiency increases.

The following control variables are included according to the protocol in prior studies (Richardson, 2006; Biddle and Hilary, 2006; Biddle et al., 2009). In a large firm size (*Size*) with many investment opportunities (*MB*) and low bankruptcy possibilities (*Z-score*), we expect to see sufficient capital availability, which leads to high investment. In addition, we include the ratio of PPE (property, plant, and equipment) subject to depreciation (*Tangibility*) in the model with the expectation that firms with tendencies toward high investment in the past will have the same tendencies in the current year as well. We control for firms reporting *Loss* since such firms tend to under-invest compared to those that have not reported *Loss*. We also include *Age* to control for the longevity of established firms, which tend to under-invest. Additionally, we include *Operating Cycle*, *Ind. K-structure*, *std (CFO)*, *std (Sales)*, and *std (Invest)*, variables which influence investment behaviors, based on prior studies. Lastly,

year dummies ($\sum YEAR$) and industry dummies ($\sum IND$) are controlled.

4. Empirical results

4.1. Descriptive statistics and Pearson's correlation. The sample includes 551 firm-year observations. Details of the main variables are shown in Table 1. We winsorize continuous values among the independent variables and dependent variables at the 1% and 99% levels to mitigate the effects of outliers. The mean of the dependent valuable, *Invest*, is 0.06, which implies that annual total investments (including capital expenditures and R&D expenditures) scaled by total assets is 6%. The minimum value of *Invest* is −20.19, which implies that the firms in the sample have greater cash inflow than cash outflow due to investment activities.

The mean and median of *Wedge* are both 0.28. This implies that the control rights of controlling shareholders are greater by 28% on average compared to cash flow rights, which is consistent with the results from a prior study (Lee et al., 2012). The minimum and maximum values of *Wedge* are 0 and 0.94, respectively, which indicates that control-ownership wedge ranges from 0% to 94%. *Over* is a ranked variable which distinguishes firms in 10 deciles according to cash balance and leverage balance. *Over* has a value between 0 and 1. The mean of *Foreigner* is 0.13, which indicates that foreign investors own 13% of total ownership.

Table 1. Descriptive statistics

Variables	N	Mean	Standard deviation	Min	Median	Max
Invest $_{i,t+1}$	551	0.06	0.07	−0.20	0.04	0.58
Wedge $_{i,t}$	551	0.28	0.21	0	0.28	0.94
Over $_{i,t+1}$	551	0.44	0.23	0	0.5	1
Foreigner $_{i,t}$	551	0.13	0.15	0	0.07	0.64
Size $_{i,t}$	551	28.32	1.48	24.18	28.4	30.78
MB $_{i,t}$	551	1.47	1.16	0.12	1.14	5.41
Z-score $_{i,t}$	551	−2.68	1.75	−6.21	−2.83	6.92
Tangibility $_{i,t}$	551	0.35	0.19	0.01	0.34	0.79
Ind. K-structure $_{i,t}$	551	0.34	0.09	0.24	0.32	0.54
Age $_{i,t}$	551	21.26	11.81	0	21	55
Operating Cycle $_{i,t}$	551	4.37	0.62	1.14	4.47	6.03
Loss $_{i,t}$	551	0.15	0.36	0	0	1
std (CFO) $_{i,t}$	551	0.05	0.04	0.01	0.05	0.24
std (Sales) $_{i,t}$	551	0.17	0.16	0.02	0.13	1.04
std (Invest) $_{i,t}$	551	3.69	3.79	0.21	2.23	24.96
<The variable definitions>						
Invest is total investment scaled by total assets;						
Wedge is control-ownership wedge (= control rights - cash flow rights);						
Over is over- (under-) investment measured using cash and leverage ratios; *Foreigner* is foreign investor ownership;						
Size is the natural logarithm of total assets;						
MB is the ratio of the market value to the book value of total assets;						
Z score is the bankruptcy model (−5.3693 − 19.860 ×(net earnings)/(total assets) + 4.9834 × (total liabilities)/(total assets) + 0.6594 × (current assets)/(current liabilities));						

Table 1 (cont.). Descriptive statistics

Variables	N	Mean	Standard deviation	Min	Median	Max
Tangibility is the ratio of PPE to total assets;						
Ind. K-structure is the mean K-structure for firms in the same industry group (the ratio of long-term debt to the sum of long-term debt to the market value of equity);						
Age is the difference between the first year when the firm was listed and the current year;						
Operating Cycle is the operating cycle (log[360 × (receivables/sales + inventory/COGS);						
Loss is an indicator variable that takes a value of one if net loss is incurred in a given year, and zero otherwise;						
std(CFO) is the standard deviation of the cash flow from operations deflated by average total assets from year t−5 to t−1;						
std(Sales) is the standard deviation of the sales deflated by average total assets from t−5 to t−1, and						
std(Invest) is the standard deviation of total investments from year t−5 to t−1.						

Table 2 presents the Pearson's correlation coefficients among the main variables. In general, the results show a significant association between control variables and *Invest*, which is consistent with prior studies (Biddle and Hilary, 2006; Biddle et al., 2009). *Foreigner* is positively and significantly associated with *Invest* at the 1% level and *Wedge* is negatively and significantly associated with *Invest* at the 1% level. The results indicate that the amount of total investment increases when foreign investor ownership is higher, but wedge decreases when foreign investor ownership is lower.

Table 2. Pearson's correlation

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Invest$_{t+1}$	−0.026 (0.5423)	0.052 (0.2205)	0.137 (0.0005)	0.121 (0.0045)	0.225 (<.0001)	−0.238 (<.0001)	0.280 (<.0001)	−0.254 (<.0001)	−0.124 (0.0035)	0.119 (0.005)	−0.116 (0.0066)	0.035 (0.4099)	−0.099 (0.0202)	0.224 (<.0001)
2. Wedge$_t$		−0.008 (0.8425)	−0.279 (<.0001)	0.272 (<.0001)	0.125 (0.0034)	−0.073 (0.0872)	−0.104 (0.0144)	0.025 (0.5622)	0.036 (0.4045)	−0.030 (0.4839)	−0.064 (0.134)	−0.029 (0.4944)	−0.011 (0.7961)	0.008 (0.843)
3. Over$_{t+1}$			0.179 (<.0001)	−0.056 (0.1926)	0.102 (0.0168)	−0.393 (<.0001)	−0.231 (<.0001)	0.008 (0.855)	−0.144 (0.0007)	−0.032 (0.4528)	−0.300 (<.0001)	0.025 (0.5648)	0.047 (0.2721)	−0.061 (0.1551)
4. Foreigner$_t$				0.419 (<.0001)	0.247 (<.0001)	−0.325 (<.0001)	−0.025 (0.5202)	−0.089 (0.024)	−0.052 (0.1865)	−0.018 (0.6406)	−0.197 (<.0001)	−0.022 (0.5712)	−0.101 (0.0106)	−0.088 (0.0262)
5. Size$_t$					0.083 (0.052)	−0.030 (0.4823)	−0.051 (0.2312)	0.070 (0.1026)	0.066 (0.1224)	−0.187 (<.0001)	−0.057 (0.1853)	−0.016 (0.7165)	−0.186 (<.0001)	−0.124 (0.0035)
6. MB$_t$						−0.154 (0.0003)	−0.140 (0.001)	−0.144 (0.0007)	−0.226 (<.0001)	0.031 (0.4726)	−0.141 (0.0009)	0.182 (<.0001)	0.056 (0.1924)	−0.025 (0.5506)
7. Zscore$_t$							−0.086 (0.0425)	0.235 (<.0001)	0.100 (0.0194)	−0.027 (0.5255)	0.607 (<.0001)	0.076 (0.0743)	0.010 (0.8115)	0.007 (0.8655)
8.Tangibility$_t$								−0.124 (0.0037)	−0.066 (0.1238)	0.002 (0.956)	0.100 (0.0188)	−0.170 (<.0001)	−0.204 (<.0001)	0.176 (<.0001)
9. Ind. K-structure$_t$									0.056 (0.1888)	−0.341 (<.0001)	0.060 (0.1627)	−0.041 (0.3421)	−0.084 (0.0493)	−0.077 (0.0698)
10. Age$_t$										−0.072 (0.093)	0.041 (0.3383)	−0.120 (0.0049)	−0.073 (0.0872)	−0.047 (0.2664)
11. Operating Cycle$_t$											0.010 (0.8236)	−0.069 (0.1042)	−0.154 (0.0003)	−0.010 (0.8231)
12. Loss$_t$												0.019 (0.6591)	−0.060 (0.1616)	0.138 (0.0012)
13. std(CFO)$_t$													0.261 (<.0001)	0.163 (0.0001)
14. std(Sales)$_t$														0.039 (0.3586)
15. std(Invest)$_t$														

Notes: Variable definitions: refer to Table 1; values in parentheses are p-values.

4.2. Multivariate regression analysis. Table 3 reports the results of the analysis of hypothesis 1. We report t-statistics that are adjusted using robust standard errors clustered at the firm-level to alleviate potential serial correlation concern in the data through this paper (Petersen, 2009). The coefficient of *Wedge* is statistically significant at the 10% level ($\beta_1 = -5.379$, $t = -1.93$), which provides support for our hypothesis. As control-ownership wedge decreases, the actual level of investment increases in firms with under-investment characteristics. In addition, the sum of the coefficients for *Wedge* and *Over × Wedge* ($\beta_1 + \beta_2$) is 6.914, with an F-value of 4.85 and a p-value of 0.02, which implies that in firms with over-investment characteristics, the actual level of investment decreases when control-ownership wedge decreases. These findings provide consistent support for our hypothesis 1 that an increase in control-ownership wedge reduces investment efficiency.

Table 3. The effect of controlling shareholders' ownership on investment efficiency

Variables	Exp. sign	Dependent variable = $Invest_{t+1}$	
		coeff.	t-stat
Intercept		−19.619	-2.1**
$Wedge_t$	-	−5.379	-1.93*
$Wedge_t \times Over_{t+1}$	+	12.293	2.19**
$Over_{t+1}$	+	−1.727	-0.67
$Size_t$	+	0.666	2.28**
MB_t	+	1.041	2.39**
$Zscore_t$	-	−0.508	-2.16**
$Tangibility_t$	+	10.432	5.08***
$Ind. K\text{-}structure_t$	-	−9.903	-1.38
Age_t	-	−0.019	-0.41
$Operating\ Cycle_t$	+ / -	0.943	1.86*
$Loss_t$	-	−0.924	-0.85
$std(CFO)_t$	+ / -	2.334	-0.03
$std(Sales)_t$	+ / -	0.529	0.72
$std(Invest)_t$	+ / -	0.305	2.79***
Industry Dummies	N/A	Included	
Year Dummies	N/A	Included	
F-value		14.04***	
Adj R²		0.30	
Sample Size		551	

Notes: ***, **, and * represent significance at the 1, 5, and 10 percent levels, respectively; variable definitions: refer to Table 1.

Table 4 presents the results of hypothesis 2. We, first, divide our samples into four groups based on foreign investor ratio from the least to the greatest. We, then, regress the group with the greatest foreign investor ratio and the group with the least foreign investor ratio. In the least foreign investor ratio group, the coefficient of *Wedge* is negative and significant at the 5% level ($\beta_1 = -9.884$, $t = -2.05$). The result indicates that as control-ownership wedge decreases, the actual level of investment increases in firms with under-investment characteristics for the group with the least foreign investor ratio. In addition, the addition of coefficients for *Wedge* and *Over × Wedge* ($\beta_1 + \beta_2$) is 10.473, and the coefficient is significant at the 5% level. The result indicates that in firms with over-investment characteristics, the actual level of investment decreases when control-ownership wedge decreases. On the other hand, there is no significant relation between control-ownership wedge and investment in the group with the greatest foreign investor ratio. The result suggests that the negative association between control-ownership wedge and investment efficiency is aggravated only when foreign investor ownership is low, which implies that foreign investor ownership takes an effective monitoring role to reduce inefficient investment by control-ownership wedge. Therefore, the result supports hypothesis 2.

Table 4. The effect of controlling shareholders' ownership with foreign ownership on investment efficiency

Variables	Exp. sign	Dependent variable = $Invest_t + 1$			
		Foreigner$_{i,t}$ Quartile 1Q		*Foreigner$_{i,t}$* Quartile 4Q	
		coeff.	t−stat	coeff.	t−stat
Intercept$_{t+1}$		-18.491	-1.14	17.881	1.57
Wedge$_t$	-	-9.884	-2.05**	2.799	0.56
Wedge$_t$×Over$_{t+1}$	+	20.531	1.96*	-6.244	-0.58
Over$_{t+1}$	+ / -	-8.095	-2.35**	3.939	0.88
Size$_t$	+	0.233	0.56	0.037	0.11
MB$_t$	+	1.519	3.51***	0.463	0.9
Z-score$_t$	-	-0.873	-2.08**	0.440	1.05
Tangibility$_t$	+	15.422	5.4***	10.560	3.38***
Ind. K-structure$_t$	-	5.144	0.27	-28.199	-2.61**
Age$_t$	-	0.042	0.97	-0.039	-1.03
Operating Cycle$_t$	+ / -	1.226	1.18	-0.432	-0.48
Loss$_t$	-	1.000	0.58	-4.421	-2.8***
std(CFO)$_t$	+ / -	-4.067	-0.25	-8.963	-0.59
std(Sales)$_t$	+ / -	1.296	0.65	0.576	0.23
std(Invest)$_t$	+ / -	0.166	1.06	-0.049	-0.36
Industry Dummies	N/A	Included			
Year Dummies	N/A	Included			
F-value		3.67***		2.09***	
Adj R²		0.31		0.16	
Sample Size		138		137	

Notes: ***, **, and * represent significance at the 1, 5, and 10 percent levels, respectively; variable definitions: refer to Table 1.

Conclusion

In this study, we examine the effect of controlling shareholders' ownership structure on investment efficiency with consideration of agency problems between controlling shareholders and minority shareholders. Specifically, we examine the relation between control-ownership wedge and conditional capital investment (i.e., over- or under-investing behaviors). Subsequently, we analyze the association between control-ownership wedge and investment efficiency moderated by the level of foreign investor monitoring.

Our results demonstrate that an increase in control-ownership wedge decreases investment efficiency. Specifically, a low control-ownership wedge is associated with low investment levels among cash-rich and unleveraged firms and is also associated with high investment levels among cash-constrained and highly leveraged firms. These results are consistent with our hypothesis 1 that an increase in control-ownership wedge intensifies agency problems between controlling shareholders and minority shareholders, which, in turn, reduces investment efficiency. We also perform an analysis

by dividing our samples into four groups based on foreign investor ratio from the least to the greatest. The result shows that control-ownership wedge decreases investment efficiency in the group with the least foreign investor ratio. The result indicates that foreign investor monitoring is an effective corporate governance mechanism to watch over the controlling shareholders' investment decisions which support hypothesis 2.

This study has the following contributions. This study provides additional evidence that the greater control-ownership wedge deteriorates investment efficiency, while recent studies on the relation between control-ownership wedge and investment efficiency suggest mixed evidence. In addition, the result shows that foreign investors play an effective monitoring role from an independent position when controlling shareholders are in position of exercising exclusive power. The results indicate the importance of monitoring role by external monitoring parties over investment decision among *Chaebol* groups since board of directors do not have much influence on controlling shareholders' investment decision. The results of this study are expected to provide

useful insights and understanding of the unique corporate governance structure of *Chaebol* groups and their investment behaviors in Korea. Additionally, the results of this study have useful implications for regulators, credit rating agencies, and investors. For regulators, the association between control-ownership wedge and investment efficiency may suggest the need to improve corporate governance structures, especially those associated with *Chaebols*. For credit rating agencies, financial analysts and general investors, the results may help in understanding firm attributes and their relationship with control-ownership wedge prior to making significant decisions.

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