

Owner-Managers and the Implied Cost of Equity Capital: Evidence from Chaebol Firms*

소유 경영자가 내재 자기자본비용에 미치는 영향: 재벌기업을 중심으로

Soo Yeon Park(First Author)

School of Business Administration, Chung-Ang University
(sooyeonpark@cau.ac.kr)

Hongmin Chun(Corresponding Author)

Department of Business Administration, Sungshin Women's University
(hmchun@sungshin.ac.kr)

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This paper examines whether and how different CEO types affect the implied cost of equity capital in Korean chaebol firms. Using 946 firm-year observations of KOSPI-listed firms for the period 2005–2015, a significant positive correlation was observed between chaebol firms with owner-managers and the implied cost of equity capital. This implies that investors regard the agency problems of Korean chaebol firms that have owner-managers as a risk premium factor that requires a higher cost of capital. Moreover, the positive association between chaebol firms that have owner-managers and the implied cost of equity capital was more pronounced in firms with a low proportion of outside directors and high uncertainty period. This paper has potential implications for related literature in that owner-managers, internal governance, and education level may significantly influence the cost of equity capital in Korean chaebol firms.

Key Words: owner-managers, agency problem, proportion of outside directors, uncertainty period, implied cost of equity capital

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1. Introduction

This paper aims to examine whether and how different CEO types can affect the implied cost of equity capital (ICOE). In particular, this study explores this relationship in

Korean chaebol-affiliated firms, where potential agency problems can arise between the controlling and minority shareholders.

The Korean stock market is viewed as one of the cheapest in the world owing to the country's historically weak corporate governance policies and inefficient capital alloca-

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tion by management teams.¹⁾ Korea's owner-centered and less-advanced governance systems are regarded as the major reason for the continuous undervaluation of its stock market, a condition known as *the Korea Discount* (Black et al. 2015). A Korean "chaebol," referring to a group of companies whose owners and their families exert a dominant influence and control, has a unique corporate structure. It has been steadily pointed out that the owners of family-owned firms tend to prioritize their own interests rather than enhancing shareholder value (Barclay & Holderness, 1989; Villalonga & Amit, 2010). Therefore, there is a possibility that, in chaebols, conflicts of interest that arise between the controlling and external minority shareholders (Type II agency problem) (Bebchuk & Weisbach, 2010) may be more pronounced than the agency problems between shareholders and managers (Type I agency problem) (Jensen & Meckling, 1976) in chaebols.

Meanwhile, whether owner-managers or professional managers are more preferable is an ongoing controversy in Korea. Shareholder capitalism, introduced after the 1997 financial crisis, has led to significant improvements in the ownership structure and corporate governance of several Korean firms and transitioned

the formerly family-owned management system to a professional management system. As of 2020, professional executives accounted for 82.7% of the total representative directors at the 500 largest companies in Korea,²⁾ and this figure shows that the proportion of professional managers has increased significantly over the last decade. The Vice Chairman of Samsung Electronics, Lee Jae-yong, recently declared that he would not hand over management rights of the company to his children, abandoning a fourth-generation management succession.³⁾ While there is a positive view that this is the first step toward creating a company that meets global standards, the controversy regarding which of the two management systems is superior has raised concerns that Samsung could lose its competitiveness in the long run if it does not fully utilize the strengths of owner-managers. Professional managers tend to prioritize their private interests over shareholder wealth, engage in moral hazard, and pursue short-term targets, all of which can cause Type I agency problems. In contrast, for owner-managers, Type II agency problems are more serious compared to Type I agency problems. (Ali et al. 2007). Therefore, the nature of agency costs, determined by CEO types, may not be

1) <http://www.daltoninvestments.com/commentary-finding-value-in-south-korea-despite-korean-discount/>

2) <http://www.hani.co.kr/arti/economy/marketing/916025.html#csidxb84b881ea1d47548e4d45e4796a55e7>

3) https://biz.chosun.com/site/data/html_dir/2020/05/14/2020051403260.html?utm_source=naver&utm_medium=original&utm_campaign=biz

identical, and considering the characteristics of Korean chaebols, it is meaningful to study how different CEO types affect market participants. Typically, shareholders collect additional information to reduce information asymmetry between shareholders and managers and require a premium to be added to the cost of capital to deal with agency problems. The information asymmetry between shareholders and managers when there is a separation of ownership and management increases an entity's information risk. Therefore, to reduce this risk, shareholders collect additional information, which should be reflected in the cost of capital (Barth et al. 2013). Prior literature suggested corporate disclosure (Diamond & Verrecchia 1991), information asymmetry (Easley & O'Hara, 2004), disclosure quality (Botosan & Plumlee 2002; Francis et al. 2005), and managerial ownership (Huang et al. 2009) as the determinants of the cost of capital. However, these prior studies were mainly focused on firms' accounting information and did not reflect differences in agency costs arising from different manager types. Therefore, in this study, agency costs, based on manager type, are presented as a new determinant of the cost of capital and analyzed empirically. This study seeks to examine the impact of different CEO types on the ICOE and empirically analyze whether the investors' demand for risk premiums differ significantly based on CEO type. Utilizing a more nuanced per-

spective, we explored the potential impact of different CEO types on the ICOE, specifically incorporating various types of agency problems. We posit that, for chaebols with ownermanagers, the ICOE may be higher since investors tend to associate such firms with higher risk. This is because the Type II agency costs of these firms are more likely to be maximized compared to firms with professional managers, thus requiring additional risk premiums. Additionally, information asymmetry issues arising from Type I agency problems can be resolved since controlling shareholders can easily request for information from professional managers (Shleifer & Vishny 1986; Hill & Snell 1989). Therefore, in the case of companies with professional managers, the premium demanded by market participants is lower, resulting in a lower ICOE. While most previous studies focused on exploring how different CEO types affect corporate decision-making (Welsh & Zellweger, 2010), CEO tenure, or corporate performance (Salancik & Pfeffer, 1980), little attention has been paid to the risks that market participants perceive from different CEO types. This study aims to fill this gap in literature by empirically analyzing the differences of capital costs based on CEO types of chaebols. Using publicly available archival data, this study explores the little-examined issue of whether different CEO types influence the cost of capital in Korean chaebol firms.

Additionally, we examined how the relation-

ship between different CEO types and the ICOE is affected by the proportion of outside directors in the board, which is one of the main internal corporate governance mechanisms according to agency theory. Outside directors are an integral part of corporate governance (Bushman et al., 2004; Cai et al., 2009; Armstrong et al., 2010; Krishnan et al., 2011) who support and keep managers' decision-making activities in check. Superior corporate governance reduces capital costs by inducing rational decision-making by managers through effective monitoring and supervision, thus mitigating the information risk and agency costs borne by shareholders (Ashbaugh et al., 2004; Byun et al., 2008). If outside directors' independent supervision and monitoring can alleviate the adverse effects of voluntary disclosure and limit managers' pursuit of their private interests, thereby reducing information asymmetry may be mitigated by proportion of outside directors in the board of directors through effective governance. In contrast, for certain Korean chaebols with controlling shareholders (La Porta et al., 2000), it is important to consider the fact that controlling shareholders tend to appoint outside directors who act in their interests. Several studies have stated that the outside-director system does not have a significant impact on improving corporate value and performance, and some have even suggested that it has negative consequences (Agrawal & Knoeber,

2001; Bhagat & Jefferis, 2002; Yermack, 1996). Therefore, it is possible that the proportion of outside directors on the board may not affect the ICOE depending on the type of CEO.

We examined 946 firm-year observations of KOSPI-listed firms for the period 2005 - 2015 and found a significant positive correlation between chaebol firms with owner-managers and the ICOE. This implies that investors regard the agency problems of Korean chaebol firms with owner-managers as a risk premium factor, which leads to a higher cost of capital. Moreover, the positive association between chaebol firms with owner-managers and the ICOE was more activated in firms with a low outside-director ratio, high uncertainty period and when managers held non-MBA degrees or undergraduate degrees with a non-technology major.

This study makes several contributions to current literature. First, to our knowledge, this study is the first to directly investigate the association between the different types of CEOs and firms' ICOE using the setting of chaebols in Korea, an emerging market with immature and weak legal protection for minority shareholders. Therefore, the empirical results of this study, based on agency theory framework, can shed light on how the different types of inherent agency problems associated with owner-managers and professional managers influence the ICOE, which is an important risk attribute of equity for market

participants. Our findings concerning the ICOE are important for investors because the ICOE can significantly affect investor welfare and capital allocation. Second, the current study extends previous research on the determinants of ICOE with the empirical finding that chaebol firms with owner-managers increase the ICOE due to exaggerated Type II agency problems. In particular, this study differs from prior studies in that it considers the effect of different CEO types, which is one of the internal factors affecting ICOE. Thus, this paper complements the evidence of previous Korean research on ICOE. Third, this study contributes to the fast-growing literature on Korean chaebol firms. We believe that the empirical results of this research could deepen the understanding of chaebol firms in emerging markets with low investor protection, high information asymmetry, and high ownership concentration, which can affect firms' ICOE.

II. Literature Review and Hypotheses Development

According to the classical perspective of agency theory, information asymmetry exists between shareholders and managers due to the separation of ownership and management and can motivate managers to act in their

own interests rather than to maximize shareholder wealth (Jensen & Meckling, 1976; La Porta et al., 2000b). Meanwhile, for entities wherein ownership and management are not clearly distinguished, conflicts of interest between the controlling and minority shareholders may be more serious than those between the management and shareholders (Shleifer & Vishny, 1997). According to previous studies (Villalonga & Amit, 2006), these two types of agency problems are each referred to as Type I and Type II agency problems.

Many Korean chaebols tend to have a centralized ownership structure with a small number of controlling shareholders and suffer from Type II agency problems wherein controlling shareholders take advantage of their monopolistic status and infringe on minority shareholders' wealth, a phenomenon known as "tunneling" in which controlling shareholders transfer the wealth of minority shareholders into their own (Shleifer & Vishny, 1997; Allen et al., 2005; Firth et al., 2007b). Additionally, Korea has relatively weak law enforcement and minority shareholder protection compared with other advanced countries.

Corporate managers can be broadly divided into: (1) owner-managers who both own and manage a company and (2) professional managers with specialized knowledge. In Korea, before the 1997 financial crisis, most manager types were owner-managers. However, since lax corporate management was cited as one

of the causes of the 1997 foreign exchange crisis, a greater emphasis was placed on the separation of ownership and management, leading to the emergence of the professional management system.

Several researchers observed a significant positive relationship between owner-managers and financial performance, and that Type I agency problems occur less frequently due to the effective monitoring of owner-managers. Demsetz and Lehn (1985) stated that family shareholders of a family-controlled firm have economic incentive to maximize firm value and they tend to monitor managers directly, which contributes to the lower occurrence of Type I agency problems. Anderson and Reeb (2003) found that companies wherein members of the controlling shareholder's family served as CEOs recorded better performance compared to those with professional managers because the former were able to benefit from effective monitoring based on their in-depth knowledge about the firm, leading to a decrease in Type I agency problems.

In contrast, other studies argued that family ownership may potentially lead to more severe Type II agency problems since controlling shareholders may pursue their own benefit by expropriating minority shareholders. In fact, most previous studies showed that owner-managers are motivated to be opportunistic and pursue personal gains at the expense of minority shareholders' wealth by taking ad-

vantage of their position and control, leading to more severe Type II agency problems. (Morck & Yeung, 2003; Demsetz, 1983; Morck, Shleifer, & Vishny, 1988; Gilson & Gordon, 2003). Many prior Korean Chaebol related literatures showed empirical evidence that ownermanagers' expropriation of the minority shareholders by means of tunneling results in lower returns for family firms under family-controlled pyramid structures from mergers and acquisitions (Bae et al. 2002), private security offerings (Baek et al. 2006) circumstance. Further recent studies suggest that the business group use trade credit financing (Chong and Im 2020), corporate philanthropy (Kim et al. 2019) or brand royalty within large business groups (Cho et al. 2021) for the means of tunneling. So we verify that controlling shareholders "tunneling" not only through financial transactions but also brand royalty (corporate philanthropy).

The severity of Type I and Type II agency problems can affect various firm activities such as financial reporting quality, earnings management, corporate disclosure, and corporate performance. Meanwhile, to our best knowledge, there is no study that directly focuses on how investors regard the impact of CEO types on agency costs as a risk factor in terms of the cost of capital in Korean chaebol firms. Thus, this study is differentiated from prior studies by focusing on CEO types as a determinant influencing the cost of capital.

Several studies that investigated the determinants of equity costs reported that information asymmetry, voluntary disclosure, disclosure quality, and managerial ownership can affect equity costs. Diamond and Verrecchia (1991) suggested that active disclosure reduces information asymmetry between information users and increases the liquidity of shares, which in turn reduces the cost of equity (COE). Easley and O'Hara (2004) stated that information asymmetry occurs between investors who acquire private information and those who do not, and the latter demands additional risk premiums, which leads to increased capital costs. Francis et al. (2004) found that entities with better attributes in terms of accounting profit have lower capital costs. Huang et al. (2009) suggested that managerial ownership influenced COE capital and that increasing owner-managers' ability to make decisions that maximize shareholder wealth would reduce information asymmetry and eventually, equity costs. While many previous studies explored the effect of capital costs on the level of individual accounting information; however, none of them considered differences in agency costs caused due to manager types. Hence, this paper aims to examine whether owner-manager and professional-manager firms have different impact on such ICOE.

Previous studies explored the effect of capital costs on the level of individual accounting information, however, none of them considered

differences in agency costs caused due to manager types. Thus, this study focuses on CEO types as a determinant influencing the cost of capital. Considering the unique corporate structure of Korean chaebols that allows certain owners and their families to exert dominant influence over their entities, it is hard to assume that these firms would be free of agency problems, especially Type II agency problems. In particular, if there is an owner-manager who causes additional Type II agency problems in a company that is already experiencing a strong Type II agency problem, the company's agency problem issue will be aggravated. Considering the aforementioned literature, it was reasonable to posit that Type II agency problems related to owner-managers of chaebol firms pursuing their own private interests are recognized as a risk factor, and shareholders and investors (i.e., market participants) demand additional compensation in exchange for this risk, which ultimately affects the ICOE. We expected that Korean chaebol firms with owner-managers would be associated with higher ICOE costs. Therefore, we proposed the following hypothesis:

H1: Korean chaebol firms with owner-managers are positively associated with the implied cost of equity capital.

Additionally, this study also seeks to demonstrate the effect of corporate governance

on the relationship between management types and equity costs. Particularly, we focused on the proportion of outside directors on the board of directors, one of the main internal governance mechanisms that directly monitor managers.

Most recent empirical studies suggested that, if outside directors perform their supervision and monitoring functions efficiently, the cost of capital can be reduced by lowering information asymmetry. Botosan (1997) reported that the higher the level of governance, including outside directors, the lower the COE. Ashbaugh et al. (2004) suggested that an entity's governance structure is a relevant factor in terms of both equity and other capital costs, and the quality of information disclosure is also an important factor for the COE. Thus, we expected that the positive relationship between owner-managers and COE capital can be mitigated if outside directors play an effective corporate governance role in reducing information asymmetry.

However, there is a possibility that the outside-director system may not have a significant impact on the relationship between owner-managers and the COE capital if outside directors fail to perform their monitoring functions effectively (Agrawal & Knoeber, 2001; Bhagat & Jefferis, 2002; Yermack,

1996).

Given these opposing views, we posed the following empirical questions in this study: Does the board of directors perform a corporate governance role and how does such a role affect the association between CEO types and ICOE? Accordingly, we established the following null hypothesis:

H2: The proportion of board of directors has an impact on the association between CEO types and firms' implied cost of equity capital.

III. Research Methodology

3.1 Regression Models

To test our research question, we regressed the average of the ex-ante COE capital (Gebhardt et al. 2001; Ohlson & Juettner-Nauroth, 2005) on the independent variable, owner-managers (Lins et al. 2013; Jo et al. 2019) in Equation (1) focusing on Korean Business groups.⁴⁾ More detailed information regarding each COE capital calculation and the models used can be found in Rhee and Chun (2018). To estimate the owner-manager

4) This paper use COE capital by implied cost of equity capital approach. Then implied cost of equity capital requires future analyst earnings forecast.

variable, we handcollected owner-manager variable to enhance its accuracy. Thus, *OWNER* is one if a firm has owner-managers, and zero if a firm with professional-managers. A firm with owner-manager refers to whether a firm has ultimate controlling shareholders and if so, whether such shareholders are listed as management members following Lins et al. (2013) and Joe et al. (2019). All variables are described in Appendix.

$$\begin{aligned} COE_{i,t} = & \beta_0 + \beta_1 OWNER_{i,t} + \beta_2 LNSIZE_{i,t} \\ & + \beta_3 BM_{i,t} + \beta_4 LNDM_{i,t} + \beta_5 BETA_{i,t} \\ & + \beta_6 OIVOL_{i,t} + \beta_7 IDRISK_{i,t} + \beta_8 EDISP_{i,t} \\ & + \beta_9 GROWTH_{i,t} + \beta_{10} LNCEOAGE_{i,t} \\ & + \beta_{11} FO_{i,t} + \text{Industry \& Year Fixed Effects} \\ & + \varepsilon \end{aligned} \quad (1)$$

It should be noted that COE capital is largely affected by various risk proxies, such as a firm's size and book-to-market ratio, and other risk variables. Therefore, we used common control variables, such as firm size (*LNSIZE*), book-to-market ratio (*BM*), leverage ratio (*LNDM*), systematic risk (*BETA*), operating income volatility (*OIVOL*), unsystematic risk (*IDRISK*), analyst earnings dispersion (*EDISP*), analyst earnings forecast growth (*GROWTH*), CEO age (*LNCEOAGE*), and foreign ownership ratio (*FO*), following previous studies (Claus & Thomas, 2001; Gebhardt et

al., 2001; Rhee & Chun, 2018; Saidu, 2019). We included industry (two-digit SIC) and year dummies with firm-level clustering.

IV. Empirical Results

4.1 Sample Selection

We obtained financial and analysts' earnings forecasts data from the Fn-guide database. We obtained owner-manager data from annual reports to verify whether CEOs and their relatives were the ultimate controlling shareholders of their firms. Moreover, we collected data regarding the CEOs' education levels such as an MBA degree or an undergraduate degree in engineering. We selected chaebol firms belonging to the top-thirty business groups which is annually disclosed by the Korea Trade Commission. We finalized a final sample of 946 annual firm-year observations from chaebol-affiliated listed companies for the period 2005-2015.⁵⁾

4.2 Descriptive Statistics

Table 1 shows the descriptive statistics for COE capital, owner-manager, and various risk proxies. The mean (median) value of ex-ante

5) To alleviate potential outlier problems, we winsorized all continuous variables at the 1% and 99% levels.

〈Table 1〉 Descriptive Statistics

Variable	N. of Obs.	Mean	Std.	Min	25%	Median	75%	Max
<i>COE</i>	946	0.116	0.037	0.033	0.091	0.111	0.136	0.319
<i>COE_{RIVI}</i>	946	0.101	0.042	0.029	0.071	0.096	0.124	0.367
<i>COE_{RIVC}</i>	946	0.112	0.033	0.042	0.090	0.111	0.133	0.225
<i>COE_{OJ}</i>	946	0.134	0.062	0.028	0.093	0.125	0.168	0.370
<i>OWNER</i>	946	0.347	0.476	0.000	0.000	0.000	1.000	1.000
<i>LNSIZE</i>	946	28.756	1.543	24.233	27.686	28.865	29.822	31.665
<i>BM</i>	946	0.894	0.619	0.013	0.488	0.781	1.151	8.914
<i>LNDM</i>	946	-0.312	1.109	-3.695	-1.074	-0.356	0.508	2.126
<i>BETA</i>	946	1.045	0.462	0.003	0.731	1.058	1.360	2.232
<i>OIVOL</i>	946	0.027	0.024	0.003	0.012	0.020	0.034	0.148
<i>IDRISK</i>	946	0.014	0.012	0.004	0.007	0.010	0.015	0.104
<i>EDISP</i>	946	0.166	0.210	0.000	0.055	0.108	0.192	1.175
<i>GROWTH</i>	946	0.296	0.501	-0.290	0.091	0.168	0.315	3.429
<i>LNCEOAGE</i>	946	4.221	0.174	3.829	4.143	4.220	4.290	6.529
<i>FO</i>	946	0.210	0.157	0.000	0.084	0.170	0.319	0.652
<i>CEO MBA</i>	946	0.240	0.427	0.000	0.000	0.000	0.000	1.000
<i>CEO TECH</i>	946	0.244	0.430	0.000	0.000	0.000	0.000	1.000
<i>EPU</i>	946	118.40	33.49	68.64	82.57	128.25	147.08	167.03
<i>LNEPU</i>	946	4.731	0.301	4.229	4.414	4.854	4.991	5.118
<i>GFC</i>	946	0.207	0.406	0.000	0.000	0.000	0.000	1.000
<i>OUTRATE</i>	946	0.466	0.165	0.000	0.333	0.545	0.571	1.000

COE capital values was 11.6% (11.1%). The mean value of owner-managers (*OWNER*) was 34.7%. The mean (median) and distribution of the risk proxies (*LNSIZE*, *BM*, *LNDM*, *BETA*, *OIVOL*, *EDISP*, *IDRISK*, *GROWTH*, and *FO*) were generally consistent with prior Korean evidence (Rhee and Chun 2018).

Table 2 provides the Pearson correlations among COE capital, owner-managers, and risk proxies. The results show that the main variable in this study, owner-managers, was significantly and positively correlated with

COE capital. Based on the correlation analysis, we found that owner-manager CEOs could lead to higher COE capital. COE capital was positively correlated with *BM*, *LNDM*, *BETA*, *OIVOL*, *IDRISK*, *EDISP*, *GROWTH*, and *LNCEOAGE*, and negatively correlated with *FO*.

Table 3 reports the differences in COE capital based on whether the CEO is an owner-manager or professional manager. The univariate test suggests that the mean and median values for owner-manager CEOs and

〈Table 2〉 Pearson Correlation among Main Variables

	COE	OWNER	LNSIZE	BM	LNDM	BETA	OIVOL	IDRISK	EDISP	GROWTH	LNCEOAGE
OWNER	0.135										
LNSIZE	0.043	0.080									
BM	0.418	0.126	0.204								
LNDM	0.420	0.085	0.384	0.579							
BETA	0.253	0.221	0.035	0.047	0.225						
OIVOL	0.116	-0.005	-0.175	-0.199	-0.260	0.188					
IDRISK	0.165	-0.040	-0.381	-0.114	-0.033	0.230	0.293				
EDISP	0.091	0.066	0.173	0.110	0.267	0.163	0.010	-0.054			
GROWTH	0.294	-0.015	0.014	0.060	0.158	0.127	0.040	0.053	0.637		
LNCEOAGE	0.138	0.061	0.160	0.043	0.142	0.109	-0.015	-0.001	0.038	-0.028	
FO	-0.117	0.020	0.446	-0.115	-0.215	-0.257	-0.022	-0.369	-0.140	-0.135	0.017

Note: Bold numbers indicate significance at 5% percent levels or better (two-tailed).

〈Table 3〉 Univariate Tests

	Owner-manager (N=328)	Professional Manager (N=618)		
	T-test			
COE	(1) Mean	(2) Mean	Difference (1)-(2)	P-Value
	0.122	0.112	0.010	<0.01
	Wilcoxon test			
COE	(1) Median	(2) Median	Difference (1)-(2)	P-Value
	0.117	0.108	0.009	<0.01

Note: T-test is the mean difference t-test and Wilcoxon test is the Wilcoxon rank sum (Mann-Whitney) test.

COE capital was significantly higher than that for professional managers and COE capital. These univariate test results suggest that firms with ownermanagers have a higher COE capital. However owner-managers are also significantly associated with other risk proxies. Therefore, in the next section, multivariate regression analyses are conducted

to examine the overall association between owner-managers and COE capital with various risk proxies.

4.3 Multivariate Analysis

Table 4 presents the results of the regression of COE capital on owner-managers.

(Table 4) Owner-managers and the Implied Cost of Equity Capital

VARIABLES	(1) <i>COE</i>	(2) <i>COE</i>	(3) <i>COE</i>	(4) <i>COE</i>
<i>OWNER</i>	0.010*** [4.354]	0.008*** [3.904]	0.007** [2.228]	0.008*** [3.011]
<i>LNSIZE</i>		-0.003*** [-3.792]	0.005* [1.734]	-0.003** [-2.157]
<i>BM</i>		0.015*** [8.438]	0.012*** [5.831]	0.015*** [5.628]
<i>LNDM</i>		0.012*** [10.050]	0.010*** [6.122]	0.012*** [6.840]
<i>BETA</i>		0.003 [1.193]	0.003 [1.161]	0.003 [0.935]
<i>OIVOL</i>		0.207*** [4.923]	0.121** [2.477]	0.207*** [3.986]
<i>IDRISK</i>		0.241*** [2.801]	0.188* [1.873]	0.241* [1.914]
<i>EDISP</i>		-0.036*** [-6.044]	-0.033*** [-5.458]	-0.036*** [-3.443]
<i>GROWTH</i>		0.025*** [11.022]	0.029*** [12.645]	0.025*** [4.513]
<i>LNCEOAGE</i>		0.012** [2.300]	-0.003 [-0.528]	0.012 [1.646]
<i>FO</i>		0.020** [2.556]	0.032** [2.347]	0.020* [1.836]
Constant	0.092*** [17.185]	0.120*** [3.910]	-0.033 [-0.398]	0.120** [2.520]
Industry Fixed Effect	Yes	Yes	No	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Firm Cluster	No	No	No	Yes
Firm Fixed Effect	No	No	Yes	No
Observations	946	946	946	946
R-squared	0.266	0.558	0.471	0.558

Column 1 and Column 2 of Table 4 shows that the coefficient of OWNER was statistically significant when the control variables were included or not. Column 3 and 4 of

Table 4 shows that the coefficient of OWNER was statistically significant when the control variables were included in the firm-year fixed effect model and in the industry-year

fixed effect model with firm-level clustering regression.⁶⁾ These empirical results show that, owner-managers are one of determinants of COE capital in Korea and can be regarded as risk premium factor in Korean chaebol firms.⁷⁾

Bammens et al. (2008) showed that, outside directors can effectively govern entrenched CEOs, based on evidence from U.S. firms. However, in Korean chaebol firms, the CEO's power may be stronger than that of the CEOs of U.S. firms and outside directors may be more closely related to CEOs in terms of education, origin country, and blood ties. Therefore, the analysis in this study may provide different results regarding whether outside directors can effectively monitor CEOs in Korean chaebol firms. We specifically investigate the role of outside directors in the association between CEO types and COE capital by dividing our sample firms into two subsamples by median value of outside-director ratio. As shown in Table 5, OWNER is only positively associated with COE capital in firms with a low outside-director ratio. Based on this result, it can be concluded that outside directors can effec-

tively monitor owner-managers entrenched in Korean chaebol firms. This finding is consistent with those of previous studies (Bhagat & Jefferis, 2002; Bammens et al. 2008).

4.4 Cross-sectional Analysis

We conducted a cross-sectional analysis to determine whether CEOs' education level had an effect on the association between OWNER and ICOE capital in our sample. A high level of education helps to raise managers' power, thus enabling them to make better decisions (Certo, 2003; Saidu, 2019). In line with this research, Kokeno & Muturi (2016) found that CEO education had positive and significant effect on firm performance. First, we used the CEO MBA variable to represent that a CEO has a graduate degree in business (MBA). If this is the case, he/she might know more about various business cases and have more valuable insights into business decision-making. Huang (2013) found that the consistency of CSR rankings is closely related to whether the CEO has an MBA degree or not. Thus, as

6) We conduct additional tests focusing on the owner-manager firms to investigate the incremental effect of owner-managers' ownership on the COE capital in this sample. However, the coefficient of the owner-manager ownership and the interaction term of the owner-manager ownership and outside director ratio variable presents statistically insignificant. This indicates that in the process of firm valuation by investors, especially in the case of chaebol companies, the type of managers (owner-managers vs. professional managers) have a significant impact on the cost of equity capital whereas the ownership level of owner-managers may not have an incremental effect on the COE capital within owner-manager firms sample.

7) In the additional analysis of focusing on non-chaebol companies, there was statistically insignificant relationship between owner-managers and COE capital. These results can be interpreted as asking for a higher discount rate because investors are concerned about the tunnelling effect, especially in chaebol companies and when the owners are conducting business which compare to Non-Chaebol companies.

〈Table 5〉 Owner-managers, Outside-Director Ratio and Implied Cost of Equity Capital

VARIABLES	(1)	(2)
	<i>COE</i> OUTRATE Low(Median (0.54)	<i>COE</i> OUTRATE High/Median (0.54)
<i>OWNER</i>	0.011*** [2.651]	0.005 [1.583]
<i>LNSIZE</i>	-0.007*** [-3.144]	0.002 [0.975]
<i>BM</i>	0.012** [2.464]	0.018*** [5.893]
<i>LNDM</i>	0.015*** [5.934]	0.008*** [3.851]
<i>BETA</i>	0.005 [1.363]	0.006 [1.542]
<i>OIVOL</i>	0.154** [2.218]	0.166** [2.414]
<i>IDRISK</i>	0.168 [1.193]	0.309** [2.004]
<i>EDISP</i>	-0.016 [-1.270]	-0.055*** [-5.904]
<i>GROWTH</i>	0.013** [2.037]	0.037*** [9.662]
<i>LNCEOAGE</i>	0.020 [1.334]	0.005 [1.304]
<i>FO</i>	0.009 [0.650]	0.031*** [2.927]
Constant	0.189** [2.358]	-0.004 [-0.069]
Industry Fixed Effect	Yes	Yes
Year Fixed Effect	Yes	Yes
Firm Cluster	Yes	Yes
Observations	450	496
R-squared	0.610	0.657

expected, the positive association between OWNER and COE capital was more pronounced in the non-MBA CEO group. If a CEO is an MBA graduate, then he/she might be better

equipped to overcome business crisis situations. Second, technology might be a pertinent factor for the firms' growth in nowadays (Koyuncu et al., 2010). Then CEO undergraduate major

might be the important determinant to understand more about the high technology industry and its application nowadays. Moreover,

Koyuncu et al. (2010) reported that firms managed by a CEO with an engineering-based background had better firm performance

〈Table 6〉 Owner-managers and Implied Cost of Equity Capital according to CEO's Education Level (CEO MBA Degree or Tech Undergraduate)

VARIABLES	(1)	(2)	(3)	(4)
	<i>COE</i> CEO MBA	<i>COE</i> Non-CEO MBA	<i>COE</i> CEO Tech	<i>COE</i> Non-CEO Tech
<i>OWNER</i>	0.006 [0.846]	0.008** [2.446]	0.006 [0.987]	0.010*** [3.014]
<i>LNSIZE</i>	-0.002 [-0.740]	-0.005** [-2.544]	-0.006** [-2.234]	-0.003* [-1.875]
<i>BM</i>	0.008 [0.918]	0.016*** [5.697]	0.011* [1.819]	0.016*** [5.203]
<i>LNDM</i>	0.013*** [4.670]	0.013*** [6.675]	0.014*** [4.289]	0.012*** [5.779]
<i>BETA</i>	-0.001 [-0.151]	0.002 [0.776]	0.005 [0.791]	0.002 [0.711]
<i>OIVOL</i>	0.281* [2.003]	0.191*** [3.427]	0.202 [1.625]	0.213*** [3.762]
<i>IDRISK</i>	-0.067 [-0.172]	0.262** [2.228]	0.223 [0.844]	0.223* [1.697]
<i>EDISP</i>	-0.020 [-1.479]	-0.041*** [-3.352]	-0.023 [-1.020]	-0.041*** [-4.183]
<i>GROWTH</i>	0.020*** [2.804]	0.027*** [4.474]	0.019* [1.874]	0.027*** [5.287]
<i>LNCEOAGE</i>	0.039 [1.270]	0.007 [1.157]	0.002 [0.312]	0.039*** [2.916]
<i>FO</i>	0.010 [0.439]	0.027** [2.212]	0.047** [2.462]	0.017 [1.369]
Constant	-0.021 [-0.164]	0.177*** [3.578]	0.223*** [3.253]	0.005 [0.067]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Firm Cluster	Yes	Yes	Yes	Yes
Observations	227	719	231	715
R-squared	0.612	0.572	0.583	0.569

than those with CEOs from other educational backgrounds. Thus, we divided the sample firms into two groups based on whether their CEO had an undergraduate degree with an engineering major or not. As shown in Columns 3 and 4 of Table 6, only the non-tech CEO group showed a positive association between OWNER and COE capital. As predicted in the previous section, a CEO's education level may be an important factor for firms' risk perspective in that CEOs with an MBA degree or undergraduate degree in engineering would have an advantage in managing the rapidly changing business environment and technology applications. Thus, investors will

value CEOs with an MBA degree or undergraduate degree in engineering, especially investors of Korean chaebol firms.

In this section, we posit that economic policy uncertainty might be the one of possible factor to affect firm' COE capital. Then we use Baker et al. (2016)' economic policy uncertainty measure as our primary measure to capture firms' economic policy uncertainty in a given year. Also we divide our sample into two groups by EPU_High and EPU_Low by the median value of economic policy uncertainty. Then there is positive and significant association between OWNER and COE capital in EPU_High group. Then we interpret that high un-

〈Table 7〉 Owner-managers, Uncertainty (Economic Policy Uncertainty, Global Financial Crisis) and Implied Cost of Equity Capital

VARIABLES	(1)	(2)	(3)	(4)
	<i>COE</i>	<i>COE</i>	<i>COE</i>	<i>COE</i>
	Uncertainty High		Uncertainty Low	
	EPU_High	GFC (2008~2009)	EPU_Low	Non-GFC
<i>OWNER</i>	0.010*** [3.162]	0.018*** [2.958]	0.004 [1.097]	0.006** [2.139]
Control Variable Included	Yes	Yes	Yes	Yes
Constant	0.152*** [2.999]	0.169* [1.861]	0.100 [1.478]	0.093* [1.897]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Firm Cluster	Yes	Yes	Yes	Yes
Observations	556	196	390	750
R-squared	0.580	0.519	0.572	0.586

Note: EPU_High is the dummy variable if the EPU is above median value of the sample, EPU_Low is the dummy variable if the EPU is under median value of the sample.

〈Table 8〉 Robustness Tests: Endogeneity Tests

VARIABLES	(1) <i>COE</i>	(2) <i>Owner</i>	(3) <i>COE</i>
	PSM	Two-stage least square regression	
OWNER	0.009*** [3.346]		
<i>PREOWNER</i>			0.007* [1.919]
<i>Co-CEO</i>		0.532*** [18.935]	
<i>LNSIZE</i>	-0.002 [-1.259]	-0.019 [-1.518]	-0.003*** [-3.730]
<i>BM</i>	0.017*** [4.062]	0.061** [2.360]	0.015*** [8.274]
<i>LNDM</i>	0.009*** [4.022]	-0.026 [-1.490]	0.012*** [9.937]
<i>BETA</i>	0.005 [1.567]	0.149*** [4.549]	0.003 [1.180]
<i>OIVOL</i>	0.146** [2.225]	0.648 [1.069]	0.207*** [4.892]
<i>IDRISK</i>	0.587*** [4.271]	-2.239* [-1.811]	0.240*** [2.769]
<i>EDISP</i>	-0.053*** [-7.019]	0.211** [2.468]	-0.036*** [-5.955]
<i>GROWTH</i>	0.035*** [9.028]	-0.05 [-1.544]	0.025*** [10.926]
<i>LNCEOAGE</i>	0.009 [1.630]	0.006 [0.078]	0.012** [2.287]
<i>FO</i>	0.020* [1.961]	-0.023 [-0.203]	0.020** [2.546]
Constant	0.077 [1.606]	0.476 [1.063]	0.120*** [3.856]
Industry fixed	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes
Observations	656	946	946
R-squared	0.605	0.437	0.552

Note: PSM refers to the one-on-one propensity score matching approach. Co-CEO is the dummy variable whose value is one if there is more than one CEO and zero otherwise. ***, **, and * indicate significance at the 1%, 5%, and 10% (or higher) levels.

certainty period, positive association is more pronounced. Also we divide our sample into two groups by global financial crisis period (year 2008 to 2009), GFC period and Non-GFC period, respectively. In GFC period, effect of owner manager toward on COE capital would be more increasing.

4.5 Robustness Tests

To mitigate endogeneity concerns, we employed the propensity score matching approach by conducting one-to-one matching of firms to the owner-manager group and the professional manager group. As shown in Column 1 of Table 8, a consistently positive association was observed between OWNER and COE capital. Furthermore, we employed a two-stage regression model to mitigate potential reverse causality concerns in this study. Although the results of the ordinary least squares regression suggest that owner-managers pay a higher COE capital, it is also possible that a higher COE capital firms can utilize owner-managers. We reduced this concern using a two-stage least squares estimation as shown in Table 8. We used a co-CEO dummy variable as an instrumental variable following Kim & An (2019). The results in Table 8 show that, in the first-stage regression, co-CEO was statistically significant at the one percent level with OWNER. The fitted value of the first-stage regression, named PREOWNER,

was used in the second-stage regression. Column 3 of Table 8 shows that PREOWNER positive and significantly associated with the COE capital in the full sample. Therefore, we concluded that additional empirical results obtained from the propensity score matching (PSM) and 2SLS approaches corroborate the main results specified in Table 4.

V. Conclusion

This paper examined the association between owner-managers and firms' COE capital, focusing on Korean chaebol firms. The findings suggest that when chaebol firms have owner-managers, the COE capital increases, supporting the agency cost theory perspective. Further, positive association between owner-managers and ICOE is more pronounced in high uncertainty period as well as when managers held non-MBA degrees or undergraduate degrees with a non-technology major. Endogeneity tests, such as PSM or 2SLS regression, corroborated our empirical results. These empirical results imply that ownermanagers must be monitored internally or externally to reduce agency costs. Moreover, professional managers may be a feasible solution for reducing chaebol firms' agency costs. Therefore, chaebol firms' must change their governance structures to lower their equity financing needs. Despite the con-

troversty over which CEO type, i.e., owner-managers or professional managers, can help to reduce equity financing in Korea, especially in chaebol firms, this paper could serve as a cornerstone in providing empirical evidence that, at least from an equity financing perspective, owner-managers may be a risk-promoting factor in Korean chaebol firms. It would be also meaningful to extend our research topic to the family-controlled firms using Korean evidence for the future research. This study also has potential implications for related literature in that ownermanagers and their education level may play a significant role in determining the COE capital in Korea. Therefore, it is a need to promote professional managers as the new CEO type for Korean chaebol firms from an equity financing perspective.

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- The author Soo Yeon Park is currently an assistant professor at School of Business Administration, Chung-Ang University. Her recent research interests are stock price crash risk, family-controlled firms, CEO types and characteristics, ESG, etc. Her papers have been published or forthcoming in many SSCI and SCOPUS journals such as Sustainability, Managerial Auditing Journal, Emerging Markets Finance and Trade, etc.
 - The author Hongmin Chun is currently an associate professor at Department of Business Administration, Sungshin Women's University. His main research topic including audit effort, cost of capital, ESG and published 10 SSCI indexed journals such as Managerial Auditing Journal, Applied Economics, Business Ethics: A European Review etc.

〈Appendix〉 Definition of Variables

Variable	Definition
<i>COE</i>	= Implied cost of equity capital
<i>OWNER</i>	= Whether a firm has ultimate controlling shareholders and if so, whether these shareholders are listed as management members. Specifically, the owner-manager variable derives its value from the percentage of shares held by the largest shareholders and their relatives, if he/she participates and is enlisted in the “reported manager group” of the firm’s annual financial reports following Lins et al. (2013). Hence, <i>OWNER</i> is one if listed on the report, and zero otherwise
<i>LNSIZE</i>	= Logarithmic value of total assets
<i>BM</i>	= Book-to-market ratio
<i>LNDM</i>	= Logarithmic value of debt-to-market ratio
<i>BETA</i>	= Systematic risk
<i>OIVOL</i>	= Operating income volatility
<i>EDISP</i>	= Dispersion of analysts’ earnings forecasts
<i>GROWTH</i>	= Three-year-ahead analysts’ earnings forecasts minus two-year-ahead analysts’ earnings forecasts, scaled by two-year-ahead analysts’ earnings forecasts
<i>LNCEOAGE</i>	= Natural log of CEO’s age. If the CEO has more than two people, then we select the most high position person’s CEO age
<i>IDRISK</i>	= Idiosyncratic risk
<i>OUTRATE</i>	= Outside-director ratio, i.e., outside directors divided by total directors
<i>FO</i>	= Foreign ownership
<i>CEO MBA</i>	= One if the CEO graduated from master of business administration degree locally or overseas (graduate business school); otherwise, zero
<i>CEO TECH</i>	= One if the CEO graduated from an undergraduate degree with an engineering major; otherwise, zero
<i>EPU</i>	= The past twelve month’s arithmetic average of economic policy uncertainty in Korea by Baker et al. (2016).
<i>GFC</i>	= The global financial crisis which is one if the year is belong 2008 to 2009 then one, zero otherwise.