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The Effect of the Owner CEO on the Relation between CEO Compensation and Firm Performance: Korean Case

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ABSTRACT

In the study, we examine whether the owner CEO affects the relation between CEO compensation and firm performance. There is a positive relation between CEO compensation and firm performance in general. More in-depth analysis shows, however, that such positive relation diminishes in the owner CEO firms, specifically when the CEO is the largest owner. Firm performance also improves as the level of CEO ownership increases in the non-owner CEO firms; no significant results are found in the owner CEO firms. We conclude that the convergence-of-interests effect dominates in the non-owner CEO firms, the entrenchment effect dominates in the largest CEO firms, and both the convergence-of-interests and the conflict-of-interest effects exist together in the family CEO firms.

Keywords: Owner CEO; Largest CEO; Family CEO; CEO compensation; Ownership; Firm performance

I. INTRODUCTION

Prior studies show a positive relationship between CEO compensation and firm performance (Hall & Liebman 1988; Rose & Shepard 1997; Luo & Jackson 2012) and between CEO compensation and the power of CEO (Holderness and Sheehan 1988; Lambert et al. 1993; Core et al. 1999; Ashbaugh et al. 2006). Core et al. (1999) and Brick et al. (2006) find that a CEO who is also a board chairman receives

overcompensation because of the conflict-of-interests. The conflict-of-interests hypothesis argues that insider managers are likely to act for themselves not for benefits of outsider shareholders (Jensen and Meckling 1976; McConnell and Servaes 1990; Cho & Lee 2017). Other studies, however, document that CEO compensation is a decreasing function of CEO ownership even though CEO's power is greater as CEO ownership increases (Allen 1981; Lambert et al. 1993; Core et al. 1999; Brick et al. 2006; Li et al. 2014) because of the convergence-of-interests. CEO compensation and/or ownership affects firm performance. For example, Core et al. (1999) and Brick et al. (2006) find that the overcompensation of CEO who is a board chairman adversely relates to the firm's future performance. Other studies show a nonlinear relation between CEO

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ownership and firm performance (Morck et al. 1988; McConnell & Servaes 1990; Hermlin & Weisbach 1991; Tong 2008; Fong et al. 2015). Morck et al. (1988), for example, find a non-monotonic relationship between inside ownership and firm performance. They argue that in the positive relationship, the managers are likely to pay more attention to value-maximization for shareholders as management ownership increases (convergence-of-interests effect) but in the negative relationship, corporate assets can be less valuable when they are managed by individuals who are free from checks on their control (the entrenchment effect) (Jensen & Meckling 1976; Morck et al. 1988; Ryu et al. 2017). Tong (2008) also explains that deviations on both sides of optimal CEO ownership are consistent with transaction cost theory on the relation between CEO ownership and firm performance. According to Tong (2008), transaction cost theory means that the adjustment cost is neither too large nor too small so that firms conduct periodical re-contracting only.

The study tries to fill the literature gap by investigating the impacts of various types of CEOs. First, we divide CEOs by ownership (i.e., owner CEO vs. non-owner CEO) rather than a certain point of ownership because CEO ownership influences on CEOs' management styles (i.e., management strategies) and philosophies (i.e., values of the firm) (Mullins and Schoar 2016). Second, we divide the owner CEO into the largest CEO and the family CEO¹⁾ because the family CEO firms tend to decrease agency cost due to the separation of ownership and management but at the same time are more likely to increase agency cost due to the separation of controlling and non-controlling shareholders (Gilson and Gordon 2003). We also investigate the relation between CEO ownership and firm performance since there was no consensus regarding a turning point and the reason of a nonlinear relation. For empirical analysis, we use firms listed in Korea Stock Exchange due to the following reasons. First, a new revised Korean Capital Market Act (2013) requires CEO compensation over 500 million Korean

won (approximately \$500,000) should be disclosed in the business reports which allows us to analyze CEO compensation using individual level. Second, there is considerably high percentage of the owner CEO firms (approximate 58 percent firms used for the study are the owner CEO firms) in Korean listed firms which allows us to investigate the difference between the effect of owner CEO and non-owner CEO on the relation between CEO compensation and firm performance.

The results of our study are as follows. First, we find a positive relationship between CEO compensation and firm performance. This positive relation, however, diminishes when the CEO is the largest CEO. Second, we find a positive relationship between the level of CEO ownership and firm performance. This relationship, however, is valid only when the CEO is the non-owner CEO. Specifically, an entrenchment effect dominates when the ownership is over 5 percent in the largest CEO firms and the convergence-of-interests effect dominates when the ownership is below 5 percent in the non-owner CEO firms. Both the convergence-of-interests effect and the conflict-of-interests effect exist when the ownership is between 0 and 20 percent in the family CEO firms.

The remainder of the paper is organized as follows. We review the prior research and develop hypotheses in the following section. Then, we discuss research methods including samples and the empirical models. Finally, we show the results and conclude.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

A. CEO Compensation, CEO Power and Firm Performance

Previous studies show the positive relation between CEO compensation and firm performance (Hall & Liebman 1988; Rose & Shepard 1997). Rose and Shepard (1997) show the positive relation between CEO compensation and current as well as previous

1) The largest CEO is defined when CEO is the largest shareholder and the family CEO is defined when CEO is the largest shareholder's family.

performance, which suggests that CEO compensation is an increasing function of firm performance including previous performance.

Lambert et al. (1993) also show the relation between CEO compensation and CEO power. They find that CEO compensation is an increasing function of CEO power²⁾ but a decreasing function of large external shareholders, and argue that CEO power has two distinctly different aspects. One aspect is that CEO can boost his/her compensation by influencing decisions of the board of directors; An alternative aspect is that shareholders are willing to take CEO power and pay more because they are convinced that the agency problems with their CEO are few.

Other studies, however, show an inverse relationship between CEO compensation and future performance. For example, Core et al. (1999) find that CEO compensation is higher when the function of board of directors becomes weaker and CEO overcompensation is negatively related to the future performance. They conclude that firms with weak governance which means that CEO is board chairman, or the great number of outside directors appointed by CEO, or the great number of interlocked outside directors, etc. are likely to have greater agency problems, CEOs in the weak governance firms are likely to receive overcompensation, and such overcompensation adversely affects the future performance. Ashbaugh et al. (2006) and Brick et al. (2006) find similar results. Taken together, CEO power is likely to make the positive relation between CEO compensation and firm performance weak or inverse because CEO is likely to be overpaid when he/she has a great managerial power.

Holderness and Sheehan (1988) investigate the difference of compensations between the owner CEO³⁾ and the non-owner CEO. They find that the

compensation of the owner CEO is higher than that of the non-owner CEO. Shleifer and Vishny (1997) and La Porta et al. (1999) argue that the majority shareholders try to maximize their wealth in the process of using their control rights, which brings agency problems between the inside majority shareholders and the outside minority shareholders. The owner CEO has a greater managerial power than the non-owner CEO and therefore the owner CEO is likely to be compensated more than his/her performance. Previous discussions lead to the following hypothesis:

H1-1: CEO compensation is positively related to firm performance.

H1-2: The positive relationship between CEO compensation and firm performance diminishes in the owner CEO firms.

B. The Level of CEO Ownership, Compensation, and Firm Performance

Some studies show that CEO compensation is a decreasing function of CEO ownership. Allen (1981) finds that CEO compensation is directly related to his/her power⁴⁾ except for the CEO who is a principal stockholder due to dividends that the CEO receives. Lambert et al. (1993) also find similar results and argue that the value of equity of the firms and the value of shares owned by CEO increase as the CEO compensation decreases. Core et al. (1999) find a negative relation between the compensation and the ownership of CEO and assert that less effective governance structure is associated with increases in CEO compensation. Their findings suggest that corporate governance structure is more effective as CEO ownership gets higher. Brick et al. (2006) and Li et al. (2014) also argue that CEO ownership is negatively related to the need for monitoring by directors and positively related to the interest of shareholders. Yermack (1996) studies the relation between CEO ownership and firm performance. He finds that the firm value is significantly higher

2) Lambert et al. (1993) define CEO power as the number of employees, the percentage of external board members appointed by CEO, ownership of CEO, ownership of external board members, the percentage of external board members, and the existence of internal board member or external party owning at least 5 percent shares.

3) Holderness and Sheehan (1988) use the term 'majority shareholder' rather than owner, and they define majority shareholder as individual or entity owns at least 50.1% of the common stock.

4) Allen (1981) defines CEO power as CEO or other family members own at least 5 percent shares.

when the inside ownership is high although inside ownership has an ambiguous relation with the measures of accounting operating performance. Core and Larcker (2002) adopt target ownership plan. They find that the increases in the level of CEO ownership to the target ownership improve firm performance. Tong (2008) tries to measure optimal CEO ownership and finds that deviations on both sides of optimal CEO ownership are negatively related to the firm performance which is consistent with transaction cost theory. Morck et al. (1988) find a S-shaped relationship between the inside ownership and the firm performance. Specifically, they find that the firm performance increases in the beginning but declines as insider ownership increases, and the firm performance increases again as the level of insider ownership is high. McConnell and Servaes (1990) and Hermalin and Weisbach (1991) also find a U-shaped relationship, but there is no consensus on the turning point. Morck et al. (1988)'s turning points are 5 percent and 25 percent; McConnell and Servaes (1990)'s turning point is approximate 50 percent; and Hermalin and Weisbach (1991)'s turning point is 1 percent. Therefore, 1 percent, 5 percent, 25 percent, and approximate 50 percent of CEO ownership seem to be critical points to change the relation between CEO ownership and firm performance. McConnell and Servaes (1990) and Hermalin and Weisbach (1991) argue that the alignment-of-interests effect is more prevalent in the low level of CEO ownership and the conflict-of-interests effect is more prevalent in the high level of CEO ownership. Morck et al. (1988) also explain that the convergence-of-interest effect dominates when the insider ownership is low but the entrenchment effect dominates when insider ownership is high. In other words, the level of the ownership of the owner (non-owner) CEO would be higher (lower) and thus it may negatively (positively) relate to the firm performance if the entrenchment (convergence-of-interests) effect is prevalent in the owner (non-owner) CEO firms. Previous discussions lead to the following hypothesis:

H2-1: The level of the ownership is negatively related to firm performance in the owner CEO firms.

H2-2: The level of the ownership is positively related to firm performance in the non-owner CEO firms.

C. Largest CEO, Family CEO, Compensation, and Firm Performance

The family CEO firms face less severe agency problems that arise from the separation between ownership and management, while they are characterized by more severe agency problems that arise between controlling and non-controlling shareholders (Gilson & Gordon 2003). According to previous studies, we classify agency problems as three different types: Type I, Type II, and Type III. Type I agency problem arises between inside majority and outside minority shareholders because majority shareholders try to maximize their wealth rather than firm value or all shareholders. Type II agency problem arises between controlling and non-controlling shareholders because the power of family CEOs (non-controlling shareholders) is weaker than that of controlling shareholders. Type III agency problem arises between owners and managers due to the separation of ownership and management. The largest CEO firms are defined as firms whose CEOs are majority shareholders. These companies are likely to face more severe Type I agency problem. For example, LG Corporation is classified as a largest CEO firm because Koo, Bon-Moo is a CEO and at the same time the largest shareholder of the company. The family CEO firms are defined as firms whose CEOs are the largest shareholder's family members but are not controlling shareholders. These companies are likely to face more severe Type II agency problem. For example, Doosan Corporation is classified as a family CEO firm because Park, Yong-Man who is the fifth son of Park, Doo-Byung, a founder of Doosan Group, is a CEO of Doosan Corporation but not the largest shareholder of the company. The non-owner CEO firms are defined as firms whose CEOs are neither majority shareholders nor the family members. These companies are likely to face more severe Type III agency problem. For

Table 1. Agency problems by type

Type		Type I	Type II	Type III
Owner CEO	Largest CEO	more severe	less severe	less severe
	Family CEO	less severe	more severe	less severe
Non-owner CEO		less severe	less severe	more severe

Note) Type definitions;

Type I : Agency problems between inside majority and outside minority shareholders

Type II : Agency problems between controlling and non-controlling shareholders in inside majority shareholders

Type III : Agency problems between owners (inside majority shareholders) and managers

example, Samsung Electronics is classified as a non-owner CEO firm because Kwon, Oh-Hyun is a CEO of Samsung Electronics but is neither the largest nor the family of Lee, Byung-Chul, the founder of Samsung. Table 1 categorizes firms by types of agency problems.

There are quite different views on agency costs in the family CEO firms. An undesirable view is that shareholders no longer act as independent monitors in disciplining CEO's decisions, so the agency costs will increase because of the family relation between CEO and shareholders (Hope et al. 2012). An alternative view is that the family CEO is less likely to act in ways that opportunistically harm other family members, so the agency costs are smaller because of closer alignment of the CEO's preferences with family owner (Hope 2013). Gilson and Gordon (2003) argue that the owner CEO firms including the largest CEO and the family CEO face less severe agency problems that arise from the separation of ownership and management (Type III agency problem). The largest CEO firms, however, face more Type I agency problem due to the conflict between inside majority and outside minority shareholders, even though they face less severe Type II agency problem due to the conflict problems between controlling and non-controlling shareholders that arise in the family CEO firms. Previous discussions lead to the following hypothesis:

H3-1: The relation between CEO compensation and firm performance in the largest CEO firms is different from that in the family CEO firms.

H3-2: The effect of the ownership on firm performance in the largest CEO firms is different from that in the family CEO firms.

III. RESEARCH METHODS

We conduct the univariate analysis of variables between the owner CEO and the non-owner CEO firm and the Pearson correlations analysis between variables to simply test our hypothesis, and then we conduct multivariate regression analysis to test our hypothesis after controlling variables that is likely to affect the dependent variable.

A. Models

The basic model for the study is as follows:

$$\begin{aligned}
 FP = & \beta_0 + \beta_1 COM + \beta_2 OwnerCEO + \\
 & \beta_3 COM \times OwnerCEO + \beta_4 SIZE + \\
 & \beta_5 LEV + \beta_6 GROWTH + \beta_7 ROA + \\
 & \beta_8 BTM + \beta_9 CHANGE + IND_{Dummy} + \\
 & YEAR_{Dummy}
 \end{aligned} \quad (1)^5$$

Where, *FP*: Firm performance of firm *i* in year *t* measured by Tobin's Q; *COM*: Natural log of CEO compensation of firm *i* in year *t*; *OwnerCEO*: Dummy variable coded 1 if CEO is the largest shareholder or the largest shareholder's family, 0 otherwise; *LargestCEO*: Dummy variable coded 1 if CEO is the largest shareholder, 0 otherwise; *FamilyCEO*: Dummy variable coded 1 if CEO is the largest shareholder's family, 0

5) We use concurrent year data for dependent and explanatory variables because our study investigates the relation between CEO compensation and firm performance, not the causality.

otherwise; *SIZE*: Natural log of total assets of firm *i* in year *t*; *LEV*: Total liabilities scaled by total assets of firm *i* in year *t*; *GROWTH*: Growth rate of sales of firm *i* in year *t*; *ROA*: Earnings after tax scaled by total assets of firm *i* in year *t*; *BTM*: Book to market value of equity of firm *i* in year *t*; *CHANGE*: Dummy variable coded 1 if CEO is changed, 0 otherwise; *IND_{Dummy}*: Industry dummy variable; *Year_{Dummy}*: Year dummy variable

We use *Tobin's Q* as the proxy of the firm performance as suggested by previous studies (Yermack 1996; Adams et al. 2005; Daske et al. 2008; Li et al. 2014; Fong et al. 2015). *Tobin's Q* is defined as follows:

$$Tobin's\ Q = \frac{Market\ value\ of\ assets}{Book\ value\ of\ assets} \quad (2)$$

The market value of assets is the sum of the market value of stockholders' equity and the book value of total liabilities. *COM* is the CEO compensation which consists of salary, incentive pay, and other cash compensation. We do not include stock options because few Korean firms grant stock options and the amount of stock options is negligible. We expect the coefficient of *COM* to be positive. *OwnerCEO* is defined as CEO who is either the largest shareholder or the largest shareholder's family. We further divide *OwnerCEO* into *LargestCEO* and *FamilyCEO*. *COM* × *OwnerCEO* is an interaction term to capture the effect of the owner CEO on the relation between CEO compensation and firm performance. We expect the coefficient of *COM* × *OwnerCEO* to be negative because the relationship between CEO compensation and firm performance is likely to diminish in the owner CEO firms.

We consider the following control variables based on the suggestions by previous studies: *SIZE*, *LEV*, *GROWTH*, *ROA*, *BTM*, and *CHANGE*. *SIZE* represents firm size. Fong et al. (2015) show that firm size is negatively related to firm performance.

It is calculated as a natural log of the book value of total assets. *LEV* represents leverage. Fong et al. (2015) document that leverage is negatively related to firm performance. It is calculated by dividing total liabilities by total assets. *GROWTH* represents the growth rate of sales. Daske et al. (2008) find that the growth rate and it is positively related to firm performance. It is calculated as the difference between the current sales and the previous sales divided by the previous sales. *ROA* represents firm profitability. Previous studies find that the profitability is positively related to firm performance. It is calculated as the earnings after tax divided by total assets. *BTM* represents an accounting conservatism. Beaver and Ryan (2000) use *BTM* as a proxy of accounting conservatism and find that accounting conservatism is positively related to firm performance. It is calculated as the book value of stockholders' equity divided by the market value of stockholders' equity. Finally, *CHANGE* is the dummy variable of the change of CEO. It is difficult to estimate the effect of *CHANGE* on firm performance (*Tobin's Q*) because the new CEO is likely to manage accruals in a way that decreases earnings in the year of the change (Pourciau, 1993), but the stock market negatively reflects the announcement of CEO changes on the value of the firms (Beatty & Zajac, 1987).

We also use the following model to analyze the effect of CEO ownership on firm performance.

$$FP = \beta_0 + \beta_1 COM + \beta_2 \%CEO + \beta_3 SIZE + \beta_4 LEV + \beta_5 GROWTH + \beta_6 ROA + \beta_7 BTM + \beta_8 CHANGE + IND_{Dummy} + YEAR_{Dummy} \quad (3)$$

Where, *FP*: Firm performance of firm *i* in year *t* measured by *Tobin's Q*; *COM*: Natural log of CEO compensation of firm *i* in year *t*; *%CEO*: Common stock ownership of CEO of firm *i* in year *t*; *SIZE*: Natural log of total assets of firm *i* in year *t*; *LEV*: Total liabilities scaled by total assets of firm *i* in year *t*; *GROWTH*: Growth rate of sales of firm *i* in year *t*; *ROA*: Earnings after tax

scaled by total assets of firm i in year t ;
BTM: Book to market value of equity of
 firm i in year t ; *CHANGE*: Dummy variable
 coded 1 if CEO is changed, 0 otherwise;
IND_{Dummy}: Industry dummy variable;
Year_{Dummy}: Year dummy variable

We expect the coefficient of %*CEO* to be positive in the non-owner CEO firms due to the convergence-of-interests effect and negative in the owner CEO firms due to the entrenchment effect. We conduct OLS regressions and include year and industry fixed effects at the two-digit SIC industry classification to control for potential omitted variables in equations (1) and (3).

Finally, we use Hollander's (1973) Distribution Free Test for the parallelism of two regression lines to analyze the differences of the relation between CEO compensation and firm performance and the effect of the ownership on firm performance between the largest CEO firms and the family CEO firms. Distribution Free Test for the parallelism is a statistical method to demonstrate if there is a difference in the coefficients among the interested variables. We test the null hypothesis ($\beta_1 - \beta_2 = 0$) against the alternative ($\beta_1 - \beta_2 < 0$). The test statistic is the Wilcoxon signed rank statistic applied to the ω 's,

$$W_n = \sum_{i=1}^n \gamma_i \varnothing(\omega_i) = \sum_{i \leq j}^n \varnothing(\omega_i + \omega_j) \quad (4)$$

Where, γ_i : rank of $|\omega_i|$ in the joint raking from least to greatest of $|\omega_1|, |\omega_2|, \dots, |\omega_n|$;
 $\varnothing(\alpha)$: dummy variable coded 1 if $\alpha > 0$, 0 otherwise. The two-sided test against the alternative ($\beta_1 - \beta_2 < 0$) rejects for large and small values of W_n (Hollander 1970).

B. Sample Selection

In 2013, Korean government launched a new regulation that mandated the disclosure of CEO compensation over 500 million Korean won

(approximately \$500,000). So, we select firms that are listed on the Korean Stock Exchange (KSE) between 2013 and 2014 and whose compensation for CEOs is over 500 million Korean won. 342 firms which disclosed CEO compensation out of 1,338 listed firms during that period are used for the study. Table 2 shows the summary sample firms by industry.

Table 2. Sample Description by Industry

Industry	Frequency	%
Construction	9	2.6%
Machinery	27	7.9%
Nonmetal Minerals	8	2.3%
Service	68	19.9%
Textiles	8	2.3%
Transportation	34	9.9%
Distributions	39	11.4%
Foods	20	5.8%
Medicine and Healthcare	16	4.7%
Electronics	22	6.4%
Paper and Wood	7	2.0%
Metal and Steel	24	7.0%
Chemicals	54	15.8%
Electricity and Gas/Telecommunication	6	1.8%
Total	342	100%

IV. RESULTS

A. Descriptive statistics

Table 3 summarizes the descriptive statistics: Panel A shows the statistics for total samples, and Panel B shows the univariate analysis of variables between the owner CEO and the non-owner CEO firms. The mean (median) of *FP* is 1.211 (0.950) and further analysis shows that those numbers in owner CEO firms are significantly lower than those of non-owner CEO firms ($p < 0.01$, both of mean and median). The mean (median) of *COM* is 20.810 (20.705) and those numbers in the owner CEO firms are significantly higher than those of the non-owner CEO firms

($p=0.021$ and $p=0.066$, respectively). In sum, the owner CEO receives compensation more than the non-owner CEO even though the performance of owner CEO firms is not better than that of non-owner CEO firms. The means of *OwnerCEO*, *LargestCEO*,

and *FamilyCEO* are 0.582, 0.301, and 0.281, respectively. The results show that about 58 percent of the sample firms are classified as owner CEO firms, about 30 percent, largest CEO firms, and about 28 percent, family CEO firms. The mean (median)

Table 3. Descriptive Statistics (N=342)

Panel A: Descriptive Statistics for Total Sample

Variable	Mean	Median	STD.	Min	1Q	3Q	Max
<i>FP</i>	1.211	0.950	0.858	0.410	0.820	1.275	9.300
<i>COM</i>	20.810	20.705	0.610	20.035	20.308	21.182	22.963
<i>%CEO</i>	0.091	0.018	0.133	0.000	0.000	0.135	0.573
<i>OwnerCEO</i>	0.582	1.000	0.494	0.000	0.000	1.000	1.000
<i>LargestCEO</i>	0.301	0.000	0.459	0.000	0.000	1.000	1.000
<i>FamilyCEO</i>	0.281	0.000	0.450	0.000	0.000	1.000	1.000
<i>SIZE</i>	28.220	28.167	1.739	23.897	26.946	29.311	33.071
<i>LEV</i>	0.486	0.503	0.191	0.035	0.342	0.630	0.992
<i>GROWTH</i>	0.087	0.030	0.621	-0.820	-0.040	0.090	9.920
<i>ROA</i>	0.031	0.029	0.081	-0.377	0.007	0.056	0.712
<i>BTM</i>	1.044	0.899	0.800	0.066	0.525	1.301	8.776
<i>CHANGE</i>	0.058	0.000	0.235	0.000	0.000	0.000	1.000

Panel B: Univariate Analysis of Difference between Owner CEO and Non-owner CEO

Variable	Owner CEO (N=199)		Non-Owner CEO (N=143)		t-value	z-value
	Mean	Median	Mean	Median		
<i>FP</i>	1.054	0.920	1.429	1.060	-3.658***	-4.129***
<i>COM</i>	20.873	20.713	20.724	20.636	2.310**	1.837*
<i>%CEO</i>	0.154	0.110	0.004	0.000	14.522***	12.333***
<i>SIZE</i>	27.785	27.658	28.825	28.865	-5.698***	-5.910***
<i>LEV</i>	0.466	0.446	0.513	0.524	-2.252**	-2.228**
<i>GROWTH</i>	0.118	0.030	0.043	0.020	1.109	0.355
<i>ROA</i>	0.028	0.030	0.036	0.026	-0.758	0.361
<i>BTM</i>	1.133	1.010	0.920	0.697	2.442**	3.908***
<i>CHANGE</i>	0.020	0.000	0.112	0.000	-3.247***	-3.563***

1) Variable definitions;

FP: Market value of total assets (Market value of equity and Book value of liabilities) divided by book value of total assets of firm i in year t

COM: Natural log of total compensation (Salary, Bonus, and other cash compensation) of a chief executive officer of firm i in year t

%CEO: Common stock ownership of CEO of firm i in year t

OwnerCEO: Dummy variable coded 1 if CEO is the largest shareholder or his/her family, 0 otherwise

LargestCEO: Dummy variable coded 1 if CEO is the largest shareholder, 0 otherwise

FamilyCEO: Dummy variable coded 1 if CEO is the largest shareholder's family, 0 otherwise

SIZE: Natural log of total assets of firm i in year t

LEV: Total liabilities scaled by total assets of firm i in year t

GROWTH: Sales growth ratio of firm i in year t

ROA: Net income (loss) scaled by total assets of firm i in year t

BTM: Book to market value of equity of firm i in year t

CHANGE: Dummy variable coded 1 if CEO is changed, 0 otherwise

2) ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, based on two-tailed t-test (t-value) and two-tailed Mann-Whitney (z-value)

of %CEO are 0.091 (0.018) and the scores of the owner CEO firms are significantly higher than those of the non-owner CEO firms ($p < 0.01$, both of mean and median).

B. Correlations

Table 4 shows the Pearson correlations between variables. First, *FP* is negatively correlated with %CEO, *OwnerCEO*, *LargestCEO*, *FamilyCEO*, *LEV*, *BTM*, and *CHANGE*. On the other hand, *FP* is positively correlated with *GROWTH* and *ROA*. *COM* is positively correlated with *OwnerCEO*, *FamilyCEO*, *SIZE*, and *LEV*, but is negatively correlated with %CEO, *LargestCEO*, *BTM*, and *CHANGE*. %CEO is positively correlated with *OwnerCEO*, *LargestCEO*, *GROWTH*, and *BTM*, but is negatively correlated with *FamilyCEO*, *SIZE*, *LEV*, and *CHANGE*. *LargestCEO* is negatively correlated with *FamilyCEO*, *SIZE*, *LEV*, and *CHANGE*, but is positively correlated with *GROWTH*, and *BTM*. *FamilyCEO* is positively correlated with *LEV*, but is negatively correlated with *CHANGE*.

C. Owner CEO and the Relation between Compensation and Firm Performance

Table 5 summarizes the results. Panel A is the analysis on the effect of the owner CEO; Panel B; the largest CEO among the owner CEO firms. Panel C, the family CEO among the owner CEO firms. We use the mean-centering method to resolve the multicollinearity due to interaction terms in the models. We conclude that multicollinearity among dependent variables is not material since the values of VIF (Variance Inflation Factor) are below 4 in each Panel of Table 4. The main interested variables for the study are *COM* and the interaction term of *COM* and *OwnerCEO*. The coefficient β_1 is significantly positive ($p = 0.032$ in Model 6 and $p < 0.01$ in the other Models) except in Model 1 and Model

4, which means that CEO compensation is positively related to firm performance and supports H1-1. However, the coefficient β_1 is significantly negative ($p = 0.062$) in the largest CEO firms, which means that the firm performance decreases as the largest CEO compensation increases. The coefficient β_3 is significantly negative in Model 3 and Model 5 ($p = 0.071$ and $p = 0.024$, respectively), which means that the largest CEO reduces the positive relation between CEO compensation and firm performance. The coefficient β_3 , however, is insignificantly negative in Model 7, which means that there is no significant difference between the family CEO firms and non-owner CEO firms. The results support H1-2, but only in the largest CEO firms. The third interested variable is *OwnerCEO*. The coefficient β_2 is significantly negative ($p < 0.01$) in Model 3, Model 5, and Model 7, which means that the performance of the owner CEO firms is significantly lower than that of the non-owner CEO firms. The analysis of control variables shows that the coefficients β_4 and β_8 are overall negative and the coefficients β_6 and β_7 are overall positive. In other words, the firm performance improves when the firm size is small, accounting conservatism is strong, and the growth rate of sales and the profitability are high. Leverage (β_5) and CEO change (β_9) are not significantly related to firm performance. In sum, CEO compensation has a positive (negative) relationship with firm performance in the family CEO firms and the non-owner CEO firms (the largest CEO firms). The positive relation between CEO compensation and firm performance, however, diminishes in the largest CEO firms, but not in the family CEO firms. It means that the largest CEO firms face more severe Type I agency problem that deteriorates the relation between CEO compensation and firm performance.

D. The Effect of the CEO Ownership on Firm Performance

Table 6 summarizes the results of the analysis

Table 4. Pearson Correlations (N=342)

	<i>FP</i>	<i>COM</i>	<i>%CEO</i>	<i>OwnerCEO</i>	<i>LargestCEO</i>	<i>FamilyCEO</i>	<i>SIZE</i>	<i>LEV</i>	<i>GROWTH</i>	<i>ROA</i>	<i>BTM</i>	<i>CHANGE</i>
<i>FP</i>	1.000											
<i>COM</i>	0.061 (0.261)	1.000										
<i>%CEO</i>	-0.125** (0.021)	-0.094* (0.083)	1.000									
<i>OwnerCEO</i>	-0.216*** (0.000)	0.121** (0.026)	0.557*** (0.000)	1.000								
<i>LargestCEO</i>	-0.131** (0.016)	-0.108** (0.045)	0.812*** (0.000)	0.556*** (0.000)	1.000							
<i>FamilyCEO</i>	-0.104* (0.055)	0.243*** (0.000)	-0.218*** (0.000)	0.530*** (0.000)	-0.410*** (0.000)	1.000						
<i>SIZE</i>	-0.085 (0.118)	0.465*** (0.000)	-0.362*** (0.000)	-0.295*** (0.000)	-0.352*** (0.000)	0.036 (0.510)	1.000					
<i>LEV</i>	-0.140*** (0.009)	0.124** (0.022)	-0.191*** (0.000)	-0.119** (0.027)	-0.231*** (0.000)	0.104* (0.054)	0.402*** (0.000)	1.000				
<i>GROWTH</i>	0.101* (0.063)	-0.067 (0.214)	0.166*** (0.002)	0.060 (0.268)	0.125** (0.021)	-0.061 (0.257)	-0.070 (0.199)	-0.115** (0.034)	1.000			
<i>ROA</i>	0.353*** (0.000)	0.040 (0.466)	0.007 (0.901)	-0.045 (0.406)	0.008 (0.889)	-0.057 (0.291)	0.040 (0.463)	-0.293*** (0.000)	0.036 (0.508)	1.000		
<i>BTM</i>	-0.440*** (0.000)	-0.125** (0.021)	0.181*** (0.001)	0.131** (0.015)	0.127** (0.019)	0.014 (0.790)	-0.099* (0.067)	0.098* (0.071)	-0.089* (0.100)	-0.223*** (0.000)	1.000	
<i>CHANGE</i>	-0.095* (0.080)	-0.140*** (0.010)	-0.134** (0.013)	-0.193*** (0.000)	-0.109** (0.043)	-0.100* (0.064)	0.163*** (0.003)	0.082 (0.129)	0.006 (0.915)	-0.057 (0.292)	0.096* (0.077)	1.000

1) Variable definitions; refer to Table 3

2) Text in the bracket is p-value, and ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, based on two-tailed t-test

Table 5. The Effect of Owner CEO on the Relation between Compensation and Firm Performance

$$FP = \beta_0 + \beta_1 COM + \beta_2 Owner CEO + \beta_3 COM \times Owner CEO + \beta_4 SIZE + \beta_5 LEV + \beta_6 GROWTH + \beta_7 ROA + \beta_8 BTM + \beta_9 CHANGE + IND_{Dummy} + YEAR_{Dummy}$$

Coeff.	Expected Sign	Panel A : Owner CEO			Panel B : Largest CEO		Panel C : Family CEO	
		Model 1 : Owner CEO	Model 2 : Non-Owner CEO	Model 3 : Total	Model 4 : Largest CEO	Model 5 : Largest CEO & Non-Owner CEO	Model 6 : Family CEO	Model 7 : Family CEO & Non-Owner CEO
β_0	(+/-)	2.654*** (3.536)	7.492*** (4.490)	5.798*** (6.670)	1.929 (1.537)	6.736*** (5.720)	3.143*** (3.322)	6.040*** (5.686)
β_1	(+)	0.008 (0.128)	0.440*** (2.615)	0.400*** (3.359)	-0.188* (-1.892)	0.457*** (3.276)	0.185** (2.184)	0.361*** (2.781)
β_2	(+/-)	-	-	-0.485*** (-5.479)	-	-0.631*** (-4.968)	-	-0.398*** (-3.463)
β_3	(-)	-	-	-0.255* (-1.814)	-	-0.431** (-2.271)	-	-0.120 (-0.682)
β_4	(-)	-0.051* (-1.827)	-0.203*** (-3.491)	-0.146*** (-4.730)	-0.036 (-0.788)	-0.178*** (-4.314)	-0.053 (-1.508)	-0.155*** (-4.098)
β_5	(-)	0.290 (1.326)	-0.328 (-0.676)	0.231 (0.971)	0.613** (2.148)	0.130 (0.419)	-0.343 (-1.013)	-0.037 (-0.118)
β_6	(+)	0.058 (1.491)	1.016*** (3.166)	0.081 (1.289)	0.036 (0.891)	0.063 (0.878)	0.843** (2.535)	1.045*** (4.315)
β_7	(+)	2.060*** (2.790)	3.522*** (4.558)	3.101*** (5.989)	2.145* (1.811)	3.455*** (5.549)	0.234 (0.251)	3.086*** (5.303)
β_8	(-)	-0.306*** (-5.956)	-0.281*** (-2.885)	-0.347*** (-6.343)	-0.267*** (-3.724)	-0.340*** (-5.016)	-0.383*** (-5.250)	-0.305*** (-4.351)
β_9	(+/-)	0.011 (0.042)	-0.238 (-0.885)	-0.112 (-0.645)	-0.140 (-0.401)	-0.144 (-0.673)	-0.214 (-0.593)	-0.217 (-1.097)
IND_{Dummy}		Include	Include	Include	Include	Include	Include	Include
$YEAR_{Dummy}$		Include	Include	Include	Include	Include	Include	Include
F value		6.470***	5.394***	8.550***	5.415***	6.399***	5.368***	7.672***
Adjusted R^2		0.367	0.382	0.337	0.464	0.336	0.466	0.392
N		199	143	342	103	246	96	239

1) Variable definitions; refer to Table 3

2) Text in the bracket is t-value, and ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, based on two-tailed t-test

Panel A is the analysis on the owner CEO, the non-owner CEO, and total sample; Panel B, on the largest CEO among the owner CEO firms; Panel C, on the family CEO among the owner CEO firms. We also divide the sample by the level of CEO ownership into three groups: below 5 percent, between 5 and 20 percent, and over 20 percent based on the suggestions by previous studies and all the level of

CEO ownership in the non-owner CEO firms is below 5 percent. The main variable of interest here is %CEO. The coefficient β_2 is significantly negative in Model 3 ($p < 0.01$), but significantly positive in Model 2 ($p = 0.031$). It means that when all the firms are tested together, the firm performance shows an inverse relationship with the level of CEO ownership, but in the non-owner CEO firms, the firm performance

Table 6. The Effect of CEO Ownership on Firm Performance

$$FP = \beta_0 + \beta_1 COM + \beta_2 \% CEO + \beta_3 SIZE + \beta_4 LEV + \beta_5 GROWTH + \beta_6 ROA + \beta_7 BTM + \beta_8 CHANGE + IND_{Dummy} + YEAR_{Dummy}$$

Coeff.	Expected Sign	Panel A : Total			Panel B : Largest CEO			Panel C : Family CEO			Parallelism Test (t-value)
		Model 1 : Owner CEO	Model 2 : Non-owner CEO	Model 3 : Total	Model 4 : over 20%	Model 5 : below 20% over 5%	Model 6 : LC Total	Model 7 : below 20% over 5%	Model 8 : below 5%	Model 9 : FC Total	
β_0	(+/-)	2.234*** (2.791)	6.840*** (4.095)	5.226*** (5.881)	1.947 (1.050)	2.072 (1.525)	1.728 (1.231)	7.772*** (3.705)	2.914*** (2.976)	3.136*** (3.268)	
β_1	(+)	0.003 (0.042)	0.397** (2.377)	0.143* (1.841)	-0.055 (-0.398)	0.084 (0.870)	-0.192* (-1.908)	0.710*** (4.009)	0.093 (1.110)	0.185** (2.164)	-2.846***
β_2	(+/-)	0.401 (1.476)	10.997** (2.178)	-1.177*** (-3.299)	-0.297 (-0.357)	-0.635 (-0.482)	0.141 (0.327)	-1.620 (-0.726)	0.446 (0.116)	0.057 (0.064)	0.070
β_3	(-)	-0.036 (-1.229)	-0.183*** (-3.159)	-0.133*** (-4.155)	-0.022 (-0.316)	-0.023 (-0.507)	-0.029 (-0.573)	-0.225*** (-2.994)	-0.072* (-1.954)	-0.053 (-1.483)	
β_4	(-)	0.263 (1.202)	-0.151 (-0.312)	0.165 (0.672)	0.192 (0.508)	-0.072 (-0.156)	0.582* (1.928)	-0.224 (-0.264)	0.541 (1.551)	-0.346 (-1.005)	
β_5	(+)	0.053 (1.377)	0.962*** (3.037)	0.093 (1.434)	0.049 (1.236)	1.090* (1.945)	0.035 (0.843)	2.817*** (3.097)	0.916* (1.874)	0.839** (2.466)	
β_6	(+)	1.866** (2.495)	3.681*** (4.814)	3.207*** (6.003)	-0.060 (-0.048)	1.030 (0.504)	2.125 (1.783)	2.002 (0.485)	1.753** (2.056)	0.216 (0.220)	
β_7	(-)	-0.329*** (-6.144)	-0.307*** (-3.170)	-0.347*** (-6.051)	-0.211** (-2.456)	-0.394*** (-3.226)	-0.275*** (-3.592)	-0.206 (-1.497)	-0.276*** (-3.142)	-0.383*** (-5.187)	
β_8	(+/-)	0.032 (0.127)	-0.199 (-0.751)	-0.073 (-0.412)	- ³⁾	0.158 (0.757)	-0.138 (-0.393)	- ³⁾	-0.222 (-0.772)	-0.210 (-0.572)	
IND_{Dummy}		Include	Include	Include	Include	Include	Include	Include	Include	Include	
$YEAR_{Dummy}$		Include	Include	Include	Include	Include	Include	Include	Include	Include	
F value		6.316***	5.521***	7.478***	8.918***	4.521***	5.106***	4.496***	5.903***	5.033***	
Adjusted R^2		0.371	0.401	0.295	0.711	0.621	0.458	0.571	0.642	0.459	
N		199	143	342	59	44	103	43	53	96	

1) Variable definitions; refer to Table 3

2) Text in the bracket is t-value, and ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, based on two-tailed t-test

3) There is no sample to change CEO

increases as the level of the CEO ownership increases. Interestingly, all coefficient β_2 of ownership below 5 percent are positive in Model 2 (significant) and Model 8 (insignificant), and all coefficient β_2 of ownership over 5 percent are negative in Model 4, Model 5, and Model 7, even though the results are not statistically significant, which means that CEO ownership below 5 percent affects firm performance positively, while CEO ownership over 5 percent does not. The results support H2-2 that expects positive

relation between the level of the ownership and firm performance in non-owner CEO firms and partially support H2-1 that expects negative relation between those in owner CEO firms. Morck et al. (1988) argue that the convergence-of-interests (entrenchment) effect dominates when the insider ownership is below (over) 5 percent. We also find that the convergence-of-interests (entrenchment) effect dominates in the non-owner CEO firms (the largest CEO firms) and the convergence-of-interests and the conflict-of-

interest effects exist together in the family CEO firms where the level of CEO ownership is between 0 and 20 percent. The coefficient β_1 is significantly positive in Model 2 ($p=0.019$), Model 3 ($p=0.066$), Model 7 ($p<0.01$), and Model 9 ($p=0.034$), but significantly negative in Model 6 ($p=0.060$). The results are similar to those in Table 5. The analysis of control variables shows that most of the coefficients β_3 and β_7 are negative and most of the coefficients β_5 and β_6 are positive. Leverage (β_4) and CEO change (β_8) are not significantly related to firm performance. The results are also similar to those in Table 5. In sum, the level of CEO ownership has a positive relationship with firm performance only in the non-owner CEO firms probably because the convergence-of-interests effect dominates in the non-owner CEO firms. Such positive relationship is not found in the largest CEO firms probably because the entrenchment effect dominates in the largest CEO firms. Moreover, a positive relationship at the low level of CEO ownership and a negative relationship at the high level are found in the family CEO firms probably because those firms face more severe Type II agency problem at the high level of CEO ownership.

E. Difference between the Largest CEO Firms and the Family CEO Firms

Table 6 also shows the results for the difference of the relation between CEO compensation and firm performance and the effect of the ownership on the firm performance between the largest CEO firms and the family CEO firms by Distribution Free Test for the parallelism in the last column. Distribution Free Test for the parallelism on the coefficient β_1 between the largest CEO firms (Model 6) and the family CEO firms (Model 9) is significantly negative ($p<0.01$), which means that the relation between CEO compensation and firm performance in the largest CEO firms is different from that in the family CEO firms. The results support H3-1. However, the coefficient β_2 between the largest CEO firms (Model 6) and the family CEO firms (Model 9) is not

significant, which means the effect of the ownership on the firm performance in the largest CEO firms is not different from that in the family CEO firms. Therefore, H3-2 is not supported. In sum, there is no significant difference in the effect of the ownership on the firm performance between the largest CEO firms and the family CEO firms because both of them are likely to face less severe Type III agency problem. However, there is significant difference in the relation of CEO compensation and firm performance between the largest CEO firms and the family CEO firms because only the family CEO firms face severe Type II agency problem. Therefore, the controlling shareholders are likely to act as independent monitors in disciplining the family CEO's decisions including CEO compensation, but they are less likely to act as independent monitors in their own decisions.

F. Additional Analysis

We conduct an additional analysis on difference of the financial characteristics between CEO compensation over and below 500 million Korean won using logistic regression to confirm if there is any type of selection bias inherent in our results.

We use the following model to analyze difference between CEO compensation over and below 500 million Korean won.

$$\begin{aligned}
 500M_{Dummy} = & \beta_0 + \beta_1 FP + \beta_2 Average\ COM \\
 & + \beta_3 \%CEO + \beta_4 SIZE + \beta_5 LEV \\
 & + \beta_6 GROWTH + \beta_7 ROA \\
 & + \beta_8 BTM + IND_{Dummy} \\
 & + YEAR_{Dummy}
 \end{aligned} \tag{5}$$

Where, $500M_{Dummy}$: Dummy variable coded 1 if CEO compensation is over 500 million Korean won, 0 otherwise; FP : Firm performance of firm i in year t measured by Tobin's Q; $Average\ COM$: Natural log of average compensation (Salary, Bonus, and other cash compensation) of members of BOD of firm i in year t ; $\%CEO$: Common stock ownership

of CEO of firm i in year t ; *SIZE*: Natural log of total assets of firm i in year t ; *LEV*: Total liabilities scaled by total assets of firm i in year t ; *GROWTH*: Growth rate of sales of firm i in year t ; *ROA*: Earnings after tax scaled by total assets of firm i in year t ; *BTM*: Book to market value of equity of firm i in year t ; *IND_{Dummy}*: Industry dummy variable; *Year_{Dummy}*: Year dummy variable

Table 7 summarizes the results. The coefficients

β_2 and β_4 are significantly positive ($p < 0.01$ and $p < 0.042$, respectively), and the coefficients β_5 is significantly negative ($p < 0.038$). It means that firm size is larger, average CEO compensation is higher, and leverage is lower when CEO compensation is over 500 million Korean won, which is consistent with our expectation. However, there are insignificant difference between CEO compensation over and below 500 million Korean won in other variables related to firm performance, CEO ownership, sales growth, profitability, and accounting conservatism,

Table 7. Difference between CEO Compensation over and below 500 Million

$$500M_{Dummy} = \beta_0 + \beta_1 FP + \beta_2 Average COM + \beta_3 \% CEO + \beta_4 SIZE + \beta_5 LEV + \beta_6 GROWTH + \beta_7 ROA + \beta_8 BTM + IND_{Dummy} + Year_{Dummy}$$

Coeff.	Expected Sign	Model 1
β_0	(+/-)	-66.919*** (246.833)
β_1	(+/-)	0.293 (2.056)
β_2	(+)	3.120*** (188.228)
β_3	(+/-)	0.009 (1.920)
β_4	(+)	0.168** (4.155)
β_5	(+/-)	-1.142** (4.325)
β_6	(+/-)	0.403 (1.928)
β_7	(+/-)	-1.865 (2.682)
β_8	(+/-)	-0.107 (0.656)
<i>IND_{Dummy}</i>		Include
<i>YEAR_{Dummy}</i>		Include
<i>Chi-square</i>		684.305***
<i>Nagelkerke R²</i>		0.631
<i>N</i>		1,171

1) Variable definitions; refer to Table 3

500M_{Dummy} : Dummy variable coded 1 if CEO compensation is over 500 million Korean won, 0 otherwise

Average COM: Natural log of average compensation (Salary, Bonus, and other cash compensation) of members of BOD of firm i in year t

2) Text in the bracket is wald value, and ***, **, * indicates significance at the 1%, 5%, and 10% level, respectively.

3) There are two groups. One is 342 firms that CEO compensation is over 500 million won, and the other is 829 firms that CEO compensation is below 500 million won. We exclude 167 firms with some missing data from 1,338 listed firms.

which suggests that the concern about selection bias is not material and, if any, it does not significantly affect our results.

We also conduct an additional analysis on overcompensation since prior research suggests an analysis on overcompensation when investigating the relation between CEO compensation and firm performance (Core et al. 1999; Brick et al. 2006; Ashbaugh et al. 2006). We follow a similar process as Core et al. (1999), but we use economic determinants only because owner CEO among board structure and CEO ownership among ownership structure are included in our Models as independent variables. To solve possible endogeneity problems, we analyze change variables to confirm whether CEO compensation increases firm performance and the effect of the owner CEO is different from that of the non-owner CEO. Finally, we winsorize the variables at the upper and lower one percent to solve the outlier problems. We do not report the results in the table, and the results with overcompensation, change variables, and winsorization are basically the same as those in Table 5 and Table 6. Therefore, the effects of overcompensation, endogeneity, and outliers, if any, are minimal.

V. CONCLUSION

In the study, we investigate whether the owner CEO affects the relation between CEO compensation and the firm performance using the firms that are listed on the Korean Stock Exchange (KSE) between 2013 and 2014. We find the following. First, there is a positive relation between CEO compensation and firm performance. Second, such positive relation diminishes in the owner CEO firms. However, further break down analysis shows that the positive relation diminishes only in the largest owner, not in the family CEO firms. The results imply that only the largest CEO has CEO's power to maximize his/her wealth by using the control rights, is overcompensated, and

deteriorates the relation between CEO compensation and firm performance. On the contrary, there is a positive relation between CEO compensation and firm performance in the family CEO firms. Third, firm performance increases as the level of CEO ownership increases when CEO is the non-owner because the convergence-of-interests effect dominates in the non-owner CEO firms. However, the firm performance does not improve as the level of CEO ownership becomes higher when CEO is the owner because the entrenchment effect dominates in the owner CEO firms, especially in the largest CEO firms. Finally, there is significant difference in the relation of CEO compensation and firm performance between the largest CEO firms and the family CEO firms because only the family CEO firms face severe Type II agency problem. Therefore, the controlling shareholders are likely to act as independent monitors in disciplining the family CEO's decisions including CEO compensation, but they are less likely to act as independent monitors in their own decisions.

The contributions of our study are as follows. First, unlike prior studies, we further divide the owner CEO firms into the largest CEO firms and the family CEO firms because the family CEO firms has different agency problems (Type II) from the largest CEO firms (Type I) as well as the non-owner CEO firms (Type III). Second, we document that the family CEO and the non-owner CEO have positive effect and the largest CEO has negative effect on the relation between CEO compensation and firm performance. Third, we confirm why the relation between CEO compensation and firm performance is different by CEO ownership in the previous studies. In other words, there is a convergence-of-interests effect in non-owner CEO whose ownership is below 5 percent and the entrenchment effect in the largest CEO whose ownership is over 5 percent. However, the convergence-of-interests and the conflict-of-interests effects exist together in the family CEO firms where the level of CEO ownership is between 0 and 20 percent.

The study provides new evidences and robust results regarding the effect of the owner CEO on CEO compensation and firm performance. However,

since our analysis is restricted to the Korean firms listed in the period between 2013 and 2014 and the compensation over 500 million Korean won (approximately \$500,000), further research needs to be done before generalizing the results. We also try to alleviate the effects of self-selection bias, overcompensation, endogeneity, and outliers through various additional analyses, but we could not help these effects influencing on our results in different directions because these effects are not able to be removed completely. Finally, we use CEO compensation disclosed in the business reports, so we could not control the classification errors caused by incorrect disclosure of CEO compensation.

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