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Governance-Owner Structure and Earnings Management: Evidence from Korea

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Abstract

This paper examines how the threat of expropriation by the ultimate owners affects earnings management and auditing quality. The empirical results indicate that the ultimate owners of Korean firms typically exert control in considerable excess of their cash flow rights. This study also shows the threat of expropriation by ultimate owners has a positive effect on earnings management as measured by discretionary accruals estimates, while auditing quality and the percent of institutional investor shareholding are not significantly related to CEOs' opportunistic behavior.

Keywords: Cash flow rights, Earnings management, Governance-owner structure, Ultimate owner, Voting control rights

1. Introduction

The accounting field focuses primarily on earnings management. The Arthur Anderson, Enron, and WorldCom scandals heighten public awareness of the seriousness of earnings management. In South Korea, many firms have typically managed earnings manipulation ever since economic crisis of 1997.

Many studies present new angles regarding earnings management. For example, Dechow and Skinner (2000) discuss the differences between academic and regulator/practitioner perceptions of earnings management and emphasize the importance of exploring the causes of earnings management in capital markets. Further, remarkable research by Dechow, Sloan and Sweeny (1996) identifies the corporate governance structures most commonly associated with earnings manipulations.

Examining Asian firms, Fan and Wong (2001) find that highly concentrated share ownership and a large separation between cash flow rights and voting rights (common scenarios in East Asia) weaken the credibility of reported earnings among outside investors and hence lower the informativeness of the accounting earnings. Examining the United States, Bushman and Smith (2003) also note that financial accounting information, particularly which related to governance mechanisms, can affect investment, productivity, and value additions.

Since Korea's economic crisis of 1997, the problem of corporate governance has concerned researchers and regulators. For example, Jee and Chang (2000) find that ultimate owners have greater voting rights than cash flow rights and that the separation of cash flow rights and voting control rights significantly correlates with earnings manipulation. Based on this context, the paper examines the relationship between corporate governance and earnings management.

The paper explores how corporate ownership structures within the Korean economy affect the credibility of reported accounting information. Specifically, the paper reports a study on how the ownership structure affects earnings management as related to cash flow and voting rights. The study also analyzes how corporate governance controls, such as external auditing systems and institutional investors, relate to the opportunistic behaviors of ultimate owners.

The paper reports three sets of findings. First, larger voting rights give the ultimate owners more power to expropriate control over their companies, while smaller cash flow rights reduce the share of losses ultimate owners incur from the extraction of wealth. Second, the threat of expropriation by ultimate owners has a positive effect on earnings management as measured by discretionary accruals estimates.

Third, no significant relationship exists between monitoring variables (e.g., auditing quality and the percent of institutional investor shareholding) and earnings management. The empirical evidence of this study provides reasons for the decline of Korean financial information credibility.

The rest of the paper is organized as follows. The next section discusses the separation of governance and ownership and the relationship between earnings management and auditing quality/institutional investor ratios. Section three presents hypotheses. Section four provides empirical results regarding whether the ownership structure affects earnings management and on the relationship between the control system and the opportunistic behaviors of ultimate owners. Section five provides a summary and conclusions.

2. Literature Review

2.1 Separation of governance and ownership and the relationship with opportunistic behavior

Typically, a single family dominates the control of listed Korean firms. Ultimate control is achieved through such devices as stock pyramids and cross-share holdings. This ownership structure often creates a separation between the cash flow rights and voting rights of the ultimate owners. This section discusses the separation of governance and ownership and the relationship of such separation to opportunistic behavior.

La Porta, Lopez-de-silanes, Shleifer, and Vishny (1999) illustrate that controlling shareholders exert power in excess of their cash flow rights through the use of pyramids and management participation. Jensen and Meckling (1976) document the ways in which ultimate owners achieve absolute power in a corporation. When managers hold little equity and shareholders are too dispersed to take action against an opportunistic behavior, insiders can use corporate resources for personal benefit.

In East Asia, Fan and Wong (2001) show that highly concentrated share ownership and a large separation between cash flow rights and voting rights weaken the credibility of reported earnings to outside investors and hence lowers the informativeness of the accounted earnings. Further, Fan and Wong (2001) find less informativeness in the accounted earnings of firms in which a family hold large voting rights and in which there is a large voting–control divergence. However, family controls *per se* do not lower earnings informativeness. In a subsequent study, Fan and Wong (2001) empirically illustrate that complex pyramid structures and cross-holdings in East Asian firms create more voting control rights than cash flows rights.

By testing entrenchment and private information effects, some studies also propose that controlling shareholders have more power than controlling rights. Morck, Shleifer, and Vishny (1988), McConnel and Servaes (1990), and Farinha (2002), Xie (2007) test the entrenchment effect and document the excess power of controlling shareholders. With the entrenchment effect, at low levels of managerial ownership, increases in ownership lead to a greater focus on value-maximizing objectives. This goal alignment through managerial ownership is referred to as the "convergence-of-interests effect." At intermediate levels of managerial ownership, however, managers may have sufficient voting power to indulge in their personal preferences instead of focusing on value-maximizing activities (Kissan and Richardson, 2004).

The private information effect refers to controlling shareholders managing inside information so as to avoid interventions by other shareholders (Jensen and Meckling ,1992; Christie, Joye, and Watts, 1993). Pyramidal structures and cross-share holdings can maximize the entrenchment and private information effects (Morck et al., 1998).

2.2 The relationship between opportunistic behavior and auditing quality/institutional investor ratios

As noted above, separate governance can affect opportunistic behavior. This section examines variables that can affect opportunistic behavior. Many studies find that corporate leaders often choose external auditing to decrease agency costs (Watts and Zimmerman, 1983) and that external auditor can restrict the opportunistic behavior of CEOs (Becker, Defond, Jiambalvo, and Subramayam, 1998; Francies, Meydew, and Sparks, 1999; Teodora, 2008).

Auditing quality can alter the level of control external auditing exerts on the opportunistic behavior of CEOs (Becker et al., 1998). Auditing quality is a parameter of the auditor's independence to discover significant financial statement errors (DeAngelo, 1981). A high level of auditing quality leads to a high possibility of detecting financial statement fraud and errors and a greater possibility of transparent reporting (Nah and Choi, 2001). Overall, these studies show that auditing quality significantly influences the opportunistic behaviors of CEOs.

Many papers identify institutional investors as a control factor (*e.g.*, Black, 1992) within the principal–agent arrangement between owners and managers. While some studies report that institutional investors have a positive role, others report negative roles.

Longstreth (1991) shows that institutional investors allow voluntarily monitoring because they hold many stocks and have incentives for controlling the corporation. Therefore, institutional investors decrease the possibility of opportunistic behavior by CEOs (Schleifer and Vishnny, 1986; Black, 1992).

By contrast, Graves (1988) proposes that institutional investors have no control incentives because they are transient investors with little time to spare. Coffee (1991) also reports that institutional investors have little incentive to control CEO behavior because these investors are mainly focused on customer interests.

3. Hypothesis

3.1 Hypotheses

To examine the divergence of cash flow, voting control rights, and earnings manipulation, two opposing hypotheses need to be tested. The first is the "convergence-of-interests" hypothesis. According to this hypothesis, the voting rights of the CEO increase when conflicts of interest between the CEO and external shareholders decrease. Greater voting rights for the CEO will create lower agency costs, and the value of firm equity will increase (Klassen, 1997; Jesen, 1986).

The second hypothesis is the entrenchment hypothesis. According to this hypothesis, if the CEO's voting rights increase because conflicts of interest between the CEO and external minority shareholders decrease, the agency cost will also decrease. However, because other costs (excluding the agency cost) will increase, the total value of the firm will decrease (Shleifer and Vishny, 1997; La Porta et al., 1998, 1999, 2000; Classens, Djankov, Fan, and Lang, 1999, 2000).

Demsetz (1983), Fama and Jensen (1983), and Warfield et al. (1995) also stress that before analyzing the relationship between owner shareholding and earnings information, a correct understanding of the firm's governance-owner structure is needed. These studies report that if pyramidal structures and cross-holdings protect a CEO, he or she probably uses firm resources for personal uses; moreover if conflicts of interest between CEOs and external minority shareholders occur, the possibility of CEOs' opportunistic behaviors increases.

Hypothesis 1: The separation between cash flow rights and voting rights affects earnings manipulation.

The paper tests the relationship between auditing quality/institutional investors and opportunistic behaviors of CEOs. External auditing can be used to monitor agency costs between firms and stakeholders. External auditing also plays a role in restricting opportunistic behaviors by CEOs. Francis et al. (1999) document the relationship between increases in discretionary accruals in earnings factors and the high possibility of earnings management. Therefore, controlling shareholders should prefer high-quality external auditing.

Various environmental factors influence the degree to which an external audit restricts a firm's discretionary accounting choice (Becker et al., 1998; Francis et al., 1999). Therefore, although a CEO may have incentives toward opportunistic behavior, the level of external auditing quality can change the scope and degree of this behavior.

Likewise, Schleifer and Vishny (1986) and Pound (1988) note that institutional investors also play a role in controlling and restricting the behaviors of CEOs. The active-monitoring hypothesis and on the idea that institutional investors have incentives to actively monitor firms inform these studies.

Hypothesis 2: The auditing quality and percentage of shares held by institutional investors affect earnings manipulation.

3.2 Sample data

Sample firms are selected from the Korea Investor Service-Financial Analysis System (KIS-FAS) and Korea Internet Survey and Research Institute (KISRI) databases. Included firms have sufficient ownership, stock returns, earnings, and other financial data for empirical analysis. Firms involved with banking or which have issues with their administration are excluded. Table 1 describes the data sources.

Insert Table 1 about here

3.3 Regression model

The following model tests whether or not the divergence between cash flow and voting control affects earnings management:

$$DA_{it} = \alpha_0+\alpha_1 CV_{it}+\alpha_2 SIZE_{it}+\alpha_3 LEV_{it}+\alpha_1 CFO_{it}+\mu_{it} \quad (1)$$

Where, for sample firm i and year t,

DA_{it} = the absolute value of discretionary accruals divided by total assets for year t,

CV_{it} = cash flow-voting control divergence, defined as the ratio of cash flow rights to voting rights of the largest ultimate owner,

$SIZE_{it}$ = the market value of equity at the beginning of year t,

LEV_{it} = the total liability divided by total assets at the beginning of year *t*,

CFO_{it} = the operating cash flow divided by total assets at the beginning of year *t*, and

μ_{it} = the error term at year *t*.

In this model, *DA* serves as a proxy for earnings management, and total assets were added to control for size. *SIZE* proxy for the political costs and is expected to negatively relate to *DA* (Han and Wang, 1998). *LEV* is the leverage variable and is expected to have a positive relationship with *DA* because firms with high *LEV*s tend to have greater earnings management (McNichols and Wilson, 1988). The *CFO* is included to test whether the operating cash flow affects earnings management.

A second model is also used to test whether auditing quality (AQ) and the percentage of shares held by institutional investors (IIH), which can control the opportunistic behaviors of CEOs, affect earnings management. Generally, big institutional investors benefit from control of the firm in that they have access to firm information and incentives for controlling CEO activities (Shleifer and Vishny, 1997).

$$DA_{it} = \alpha_0+\alpha_1 CV_{it}+\alpha_2 SIZE_{it}+\alpha_3 LEV_{it}+\alpha_4 CFO_{ik}+\alpha_5 AQ_{it}+\alpha_6 IIH_{it}+\mu_{it} \quad (2)$$

Where, for sample firm *i* and year *t*,

DA_{it} = the absolute value of discretionary accruals divided by total assets for year *t*,

CV_{it} = the ratio of cash flow rights to voting rights of the largest ultimate owner,

$SIZE_{it}$ = the market value of equity at the beginning of year *t*,

LEV_{it} = the total liability divided by the total assets at the beginning of year *t*,

CFO_{it} = the operating cash flow divided by the total assets at the beginning of year *t*,

AQ_{it} = the auditing quality (if audited by a Big Six auditing firm, AQ = 1, otherwise AQ = 0), and

IIH_{it} = the percentage of shares held by institutional investors at year *t*.

3.4 Variable selection

3.4.1 Divergence of cash flow rights and voting control rights

The methods used by La Porta et al. (1999) and Fan and Wong (2001) are used to examine the divergence between cash flow rights and voting control rights. Cash flow rights are defined as the percentage of shares or cash flow held by a firm owner; voting control rights are defined as the real control level of firms and reflect pyramidal structures and cross-holdings. The procedure used to identify the ultimate owner is similar to methods by Classens et al. (2000), La Porta et al. (1999), and Fan and Wong (2001). An ultimate owner is defined as a shareholder with at least 5% of the voting rights in a firm. A firm without an ultimate owner was classified as "widely held."

3.4.2 Discretionary accruals

The paper uses the cross sectional modified Jones' model (1991) (Dechow et al., 1995) to estimate discretionary accruals as a proxy for earnings management for the years 1998 through 2001. Because the discretionary portion of accruals is the difference between total accruals and the estimate of the non-discretionary accruals, the paper calculates total accruals and non-discretionary accruals to estimate discretionary accruals.

Following modified Jones' model (1991), the residuals (ε_{jt}) from model (3) are discretionary accruals of the paper. Since the study does not focus on the direction but magnitude of earnings management, the paper uses the absolute value of discretionary accruals.

$$TA_{jt}/A_{jt-1} = \alpha[1/A_{jt-1}]+\beta_1[(\Delta REV_{jt}-\Delta REC_{jt})/A_{jt-1}] + \beta_2[(PPE_{jt})/A_{jt-1}]+\varepsilon_{jt} \quad (3)$$

$$DA_{jt} = TA_{jt}/A_{jt-1}-\{\alpha[1/A_{jt-1}]+\beta_1[(\Delta REV_{jt}-\Delta REC_{jt})/A_{jt-1}] + \beta_2[(PPE_{jt})/A_{jt-1}]\} \quad (4)$$

Where, for the sample firm *i* and year *t*,

TA_{jt} = total accruals for year *t*,

ΔREV_{jt} = changes in total sales for year *t*,

ΔREC_{jt} = changes in receivables for year *t*,

PPE_{jt} = equipment assets for year *t*, and

A_{jt-1} = total assets at the beginning of year *t*.

DA_{jt} = discretionary accruals for year *t.*

3.4.3 Auditing quality

The appointment of quality auditors assures investors of the accuracy and truthfulness of financial disclosers. In this study, to test whether external auditors perform a controlling role, "name brand" (*i.e.*, "Big Five") auditors are used as proxies for auditing quality. The so-called Big Five auditors have international reputations and are generally perceived as more independent than local auditors.

3.4.4 Other variables

SIZE: the market value of equity is used to control for any size effects

LEV: commonly, high leverage firms tend toward opportunistic behaviors (Dhaliwal et al., 1999). In this study *LEV* is defined as the total liability divided by the total assets.

IIH: the ratios of shares held by banking, securities, and insurance companies

4. Empirical Tests Results

4.1 Statistical results

The descriptive statistics in Table 2 illustrate the separation between the cash flow rights and voting rights of ultimate owners. For the study firms, the mean cash flow rights and voting control rights are 24% and 30%, respectively. These values contrast those of the non-Korean firms (*e.g.*, U.S. firms) examined in most studies.

CV indicates the degree of divergence between cash flow and voting control rights and is, by definition, between zero and one. If CV = 1, a firm is widely held. As the value approaches zero, the divergence becomes larger. Basic CV ratio statistics are shown in Table 2. The mean CV is 0.79, indicating a divergence between cash flow rights and voting control rights of 24%, with cash flow rights lower than voting control rights. This relation suggests the existence of a possible agency problem that separates cash flow and voting control rights. Within these results, the *chaebol* (large conglomerates) has the lowest degree of divergence, suggesting that most Korean *chaebol* groups have more voting control rights than cash flow rights.

Insert Table 2 about here

Table 3 lists the descriptive statistics for other variables. The mean and median values for net income were 0.03 and 0.02, respectively, suggesting that operating performance decreases after Korea's economic crisis of 1997. However, the mean and median values for cash flow are 0.06 and 0.06, respectively. Other variables have the following mean and median values, respectively: total accruals (TA): 0.08 and 0.06; discretionary accruals (DA) 0.06 and 0.02; and firm size (SIZE) 2,018 billion won and 921 billion won. The mean LEV is 57.8%.

Insert Table 3 about here

4.2 Correlation analysis of main variables

Table 4 presents the results of the correlation analysis. All the correlation coefficients are significantly different from zero at the 1% level. TA and DA are positively correlated at the 1% level, while CV, LEV, and CFO are negatively correlated at the 1% level. These correlations suggest that the divergence of cash flow and voting control rights is related to DA.

As expected, DA and CV are negatively correlated at the 1% significance level, suggesting that compounded cash flow–voting control divergence is significantly related to DA. As illustrated in Table 4, SIZE is positively related to DA, but not significantly, corresponding to results by Watts and Zimmerman (1986). LEV is negatively related to DA at the 1% level of significance, in contrast to results by DeFond and Jiambalvo (1994). CFO and DA are negatively correlated at the 1% level of significance, in agreement with findings of Dechow et al. (1995). AQ and CV are negatively correlated at the 1% level and positively related to SIZE at the 1% level. These results suggest that if the cash flow–voting control divergence is high, firms require the high quality control provided by Big Six auditors.

Insert Table 4 about here

4.3 Analysis of hypothesis 1

4.3.1 Simple regression analysis

Before testing hypothesis 1, the paper uses simple linear regression to provide preliminary evidence for the relation between cash flow–voting control divergence and earnings management. For this test, the paper divides the sample firms into high, middle, and low groups based on the DDA size and then performed cross-tabulation.

The paper divides the CV group according to the size of the cash flow–voting control divergence. The divergence is in the order CV1 < CV2 < CV3. The paper also divides the DA group according to the size of discretionary accruals, such that DDA1 < DDA2 < DDA3.

As reported in Table 5, the relationship between CV and DA is Z shaped, suggesting that if the cash flow–voting control divergence is small, discretionary accruals are also small.

Insert Table 5 about here

4.3.2 Multiple regression analysis

Table 6 shows CV, LEV, and CFO relate negatively to DA at the 1% significance levels, respectively. In contrast to previous studies, LEV is negatively related to DA. However, the significant negative relation of DA and CFO replicates and supports the results of Dechow et al. (1995) and Becker et al. (1998).

Table 6 also shows that CV, a proxy of the cash flow–voting control divergence, is negatively related to DA, a proxy for the possibility of earnings management. This suggests as the cash flow–voting control divergence increases, incentives for earnings management grow.

Insert Table 6 about here

4.4 Analysis of hypothesis 2

4.4.1 Simple regression analysis

The paper divides samples into Big Six and non-Big Six groups to test the mean difference between discretionary accruals and cash flows. As reported in Table 7, the mean level for the Big Six group is larger than that of the non-Big Six group at the 5% significance level. This suggests that in firms audited by non-Big Six auditors, earnings management is greater than in firms audited by Big Six groups.

Insert Table 7 about here

For further evidence, the paper performs additional tests of the mean difference in cash flow. As shown in Table 7, the cash flows of firms audited by non-Big Six auditors are smaller than those of firms audited by the Big Six auditors. This also indicates that earnings management of non-Big 6 audited firms is greater than that for Big Six audited firms.

In Table 8, the paper divides samples into four groups based on the CV size to test the mean DA differences. Group CV1 has the smallest cash flow–voting control divergence of the four CV groups, while CV4 has the greatest divergence. The DA difference between Big Six and non-Big Six groups is significant at the 1% levels in CV4 and CV2. Given the high possibility of opportunistic behavior, these results suggest that auditing quality controls this behavior by the ultimate owner.

Insert Table 8 about here

4.4.2 Multiple regression analysis

Multiple regression analysis includes the percentage of shareholding by institutional investors to test whether this factor has a monitoring effect on opportunistic behavior by CEOs. The results show no significant relation between the percentage of shares held by institutional investors and earnings management. Monitoring variables (*e.g*., auditing quality and the percent of institutional investor shareholding) are not linearly related to opportunistic behavior (*i.e*., earnings management) by CEOs.

Insert Table 9 about here

4.5 Checks of robustness

To test for any possible bias in our results, the study reruns the above regression after changing the independent variable DA to TA (total accruals). As shown in Table 10, the sign of the coefficients for CV remain the same, but the values increased compared with those estimated at the 1% level of significance.

Insert Table 10 about here

For further diagnostic checks, the paper also includes the percentage of shareholding by the ultimate owner (OWN) in the multiple regression analysis. As shown in Table 11, the signs of the coefficients for CV remain the same at the same level of significance. Specifically, OWN, positively related to DA. This suggests that increasing the percentage of shares held by a CEO magnifies the effect on earnings management.

Insert Table 11 about here

Next, to test the information effect, the analyses include performing separate regression analyses including CONT and CASH as independent variables. The test results show that CONT is positively related to DA at the 1% level of significance, suggesting that as the degree of control held by the ultimate owner increases, earnings management also increases.

Insert Table 12 about here

5. Summary and Conclusions

Korea's economic crisis of 1997 has spurred the re-examination of corporate financial reporting. Poor accounting information and associated high capital costs pose a significant threat to the competitiveness of Korean firms. Despite efforts to improve corporate transparency by imposing new accounting and disclosure rules, perceptions of corporate financial reporting credibility remain low. It is important to understand why the credibility of Korean financial information is so low.

The underlying assumption of this study is that highly concentrated share ownership and a large separation between cash flow rights and voting rights, which are common in South Korea, weaken the credibility of reported earnings to outside investors, and hence lower the informativeness of accounting earnings. Earnings credibility is weakened because minority shareholders expect that the ownership structure gives controlling owners both the ability and incentive to manipulate earnings for either outright expropriation or for other opportunistic and often hidden activities.

The results of the study indicate that the ultimate owners of Korean firms typically exert control in considerable excess of their cash flow rights. This practice is due in part to the pyramidal structure of firms and because the ultimate owners often manage the firms they control. Accordingly, the incentives for ultimate owners to expropriate control from minority shareholders increases as the separation of cash flow rights and voting control rights of the ultimate owners' increases. Larger voting rights give the ultimate owners more power to expropriate control over their companies, while smaller cash flow rights reduce the share of losses ultimate owners incur from the extraction of wealth.

Since our definition of ownership relies on both cash flow and voting control rights, the cash flow rights that support control by ultimate owners must be further identified. Firm-specific information on pyramidal structures and cross-holdings can be used to distinguish between cash flow and voting rights. This study also shows that the threat of expropriation by ultimate owners has a positive effect on earnings management as measured by discretionary accruals estimates.

The important contribution of the study is in showing reasons for the deterioration of credibility in Korean financial markets. And the empirical results of the paper reinforce the adoption of a new policy model of corporate governance-owner structure to promote the credibility of accounting information in Korean financial markets.

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Table 1. Selection of sample firms

Sum of Listed companies at the end of 1998-2001	1,432
Minus (-) :	
Firms that do not settle their accounts in December[1)]	(180)
Financial banking businesses	(121)
Issues in administration	(154)
Firms with missing financial data	(55)
Firms lacking data necessary for calculating the percentage of ultimate owner shareholdings	(145)
Other firms (extreme data[2)], capital encroachment firms, loss firms)	(19)
Total sample firms	758

1) Including firms that change the settling day

2) Extreme value of data ($\geq$|mean $\pm$ 3σ|)

Table 2. Voting rights (V), cash flow rights (C), and the cash flow–voting control divergence (CV)

(Sample firms: 758)

		Mean	Standard deviation	Minimum	Q1	Median	Q3	Maximum
V	1998	0.29	0.13	0.06	0.19	0.31	0.40	0.60
	1999	0.29	0.13	0.07	0.19	0.31	0.40	0.60
	2000	0.31	0.14	0.06	0.18	0.32	0.43	0.60
	2001	0.33	0.15	0.06	0.18	0.35	0.44	0.61
	Total	0.30	0.14	0.06	0.18	0.32	0.41	0.60
C	1998	0.24	0.15	0.03	0.16	0.26	0.35	0.51
	1999	0.25	0.16	0.05	0.17	0.27	0.37	0.55
	2000	0.24	0.15	0.04	0.15	0.25	0.37	0.50
	2001	0.24	0.15	0.04	0.15	0.24	0.37	0.50
	Total	0.24	0.19	0.03	0.16	0.25	0.37	0.55
CV	1998	0.83	0.25	0.45	0.78	0.85	0.90	1.00
	1999	0.87	0.20	0.48	0.80	0.88	0.90	1.00
	2000	0.77	0.21	0.41	0.69	0.84	0.87	1.00
	2001	0.73	0.24	0.42	0.60	0.80	0.85	1.00
	Total	0.79	0.24	0.43	0.67	0.81	0.85	1.00

*CV: the ratio of cash flow rights to voting rights for the largest ultimate owner

Table 3. Descriptive statistics of the input variables

	Mean	Median	Standard deviation	Minimum	Maximum
NI	0.03	0.02	0.21	-0.23	0.30
CFO	0.06	0.06	0.13	-0.31	0.39
TA	0.08	0.06	0.10	0.00	0.47
DA	0.06	0.02	0.08	0.00	0.32
IIH	0.22	0.18	0.21	0.00	0.43
SIZE	2018	921	4101	178	40167
LEV	0.58	0.50	0.27	0.11	1.00
AQ	0.68	0.61	0.25	0.00	1.00

NI: earnings/total assets at the beginning of year *t*; CFO: operating cash flow/total assets at the beginning of year *t*; TA: total accruals at year *t*/total assets at the beginning of year *t*; DA: the absolute value of discretionary accruals/total assets at the beginning of year *t*; SIZE: market value of equity at the end of year *t*; LEV: total liability/total assets at the beginning of year *t*; IIH: percentage of shares held by institutional investors at year *t* (shares held by banking, securities, and insurance companies), AQ : Big Six accounting firm = 1, non-Big Six = 0

Table 4. Correlation analysis of the variables

	TA	DA	CV	SIZE	LEV	CFO	AQ	IIH
TA	1.000 p=0.000							
DA	0.914 (0.000)	1.00						
CV	-0.313 (0.000)	-0.215 (0.000)	1.00					
SIZE	-0.034 (0.912)	0.011 (0.356)	-0.091 (0.005)	1.00				
LEV	-0.451 (0.000)	-0.217 (0.000)	-0.0611 (0.811)	-0.012 (0.468)	1.00			
CFO	-0.299 (0.000)	-0.283 (0.000)	0.099 (0.005)	0.098 (0.007)	-0.263 (0.000)	1.00		
AQ	0.016 (0.125)	-0.035 (0.211)	-0.167 (0.000)	0.241 (0.000)	0.001 (0.912)	0.014 (0.644)	1.00	
IIH	0.014 (0.541)	0.044 (0.573)	-0.267 (0.000)	0.157 (0.000)	0.111 (0.000)	0.003 (0.821)	0.023 (0.634)	1.00

Pearson's coefficient of correlation, two-sided test

CV: the ratio of cash flow rights to voting rights of the largest ultimate owner (cash flow right/voting right); The other abbreviations are as in Table 3.

Table 5. Cross analysis of CV and DDA

	CV 1[1)]	CV 2	CV 3	Chi-square (*p*-value)
DDA 1[2)]	108[3)]	83	59	21.65 (.000)
DDA 2	68	106	59	
DDA 3	73	91	111	

1) CV = the ratio of cash flow rights to voting rights of the largest ultimate owner (cash flow right/voting right)

2) DDA = |total accruals at year t – total accruals at year t-1|/|total accruals at year t-1|

3) The number of firms

Table 6. Regression analysis of DA (earnings management) and CV (cash flow–voting divergence)

$$DA_{it} = \alpha_0+\alpha_1 CV_{it}+\alpha_2 SIZE_{it}+\alpha_3 LEV_{it}+\alpha_4 CFO_{it}+\mu_{it}$$

	Expected sign	Statistics	
		Coefficient (α)	t-value
Constant	?	0.147***	3.34
CV	–	-0.099***	-4.12
SIZE	–	0.002	0.99
LEV	+	-0.106***	-3.21
CFO	–	-0.414***	-7.41

1) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2) N: number of sample firms

3) The abbreviations are as in Tables 3 and 4.

4) Since the maximum value of VIF was 6.7, the multicollinearity between the independent variables was not significant.

Table 7. Difference analysis for total accruals according to auditing quality

Group variable[1)]	Big Six audited[3)]			Non-Big Six audited			Difference test[2)]	
	Mean	Median	Standard deviation	Mean	Median	Standard deviation	t-value	Z-value
DA	0.000	-0.004	0.211	0.003	0.000	0.209	2.11*	1.98*
CFO	0.078	0.067	0.312	0.037	0.025	0.258	4.34**	3.99**

1) The abbreviations are as in Table 3.

2) The result of I-statistics and the Wilcoxon rank test, */** : $p < 0.05/0.01$

3) Audited by a Korean auditing firm associated with a Big Six auditing firm

Table 8. Difference test of CV (cash flow–voting divergence) and DA (discretionary accruals) according to auditing quality

	CV1	CV2	CV3	CV4
	Non-Big Six : Big Six	Non-Big Six : Big Six	Non-Big Six : Big Six	Non-Big Six : Big Six
Mean difference	0.0089	0.0309	0.0211	0.0516
Median difference	0.0081	0.0284	0.0201	0.0511
t-test	0.521	0.005	0.109	0.000
W-test	0.678	0.005	0.088	0.000

CV = the ratio of the largest ultimate owner's cash flow rights to voting rights (cash flow right/voting right). CV1= the top 25% of the CV ratio distribution (the group in which the cash flow–voting divergence was the lowest); CV4 = the lowest 25% of the CV ratio distribution (the group in which the cash flow–voting divergence was highest). W-test refers to the Wilcoxon rank test. Big Six indicates auditing by a Korean auditing firm allied with a Big Six auditing firm; Non-Big Six indicates auditing by a Korean auditing firm not associated with a Big Six auditing firm.

Table 9. Regression analysis of the auditing quality, percentage of shareholding by institutional investors, and earnings management

$$DA_{it} = \alpha_0+\alpha_1 CV_{it}+\alpha_2 SIZE_{it}+\alpha_3 LEV_{it}+\alpha_4 CFO_{it}+\alpha_5 AQ_{it}+\alpha_6 IIH_{it}+\mu_{it}$$

Variable	Expected sign	Statistics	
		Coefficient (α)	*t*-value
CV	–	-0.168***	-7.12
SIZE	–	0.001	0.87
LEV	+	-0.089***	-2.99
CFO	–	-0.687**	-3.64
AQ	–	-0.001	-0.05
IIH	–	-0.004	-0.12

1) ** $p < 0.05$, *** $p < 0.01$

2) N: number of sample firms

3) The abbreviations are as in Tables 3 and 4.

4) Since the maximum value of VIF was 8.0, the multicollinearity between the independent variables was not significant.

Table 10. Regression analysis including total accruals

$$TA_{it} = \alpha_0+\alpha_1 CV_{it}+\alpha_2 SIZE_{it}+\alpha_3 LEV_{it}+\alpha_4 CFO_{it}+\mu_{it}$$

	Expected sign	Statistics	
		Coefficient (α)	*t*-value
Constant	?	0.167***	5.43
CV	–	-0.351***	-5.12
SIZE	–	0.013	0.416
LEV	+	-0.109***	-4.12
CFO	–	-0.699***	-5.78
Adj. R sq.		0.285	
F		17.34	
N		758	

1) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2) N: number of sample firms

3) The abbreviations are as in Tables 3 and 4.

4) Since the maximum value of VIF was 6.1, the multicollinearity between the independent variables was not significant.

Table 11. Regression analysis including CV

$$DA_{it} = \alpha_0+\alpha_1 CV_{it}+\alpha_2 SIZE_{it}+\alpha_3 LEV_{it}+\alpha_4 CFO_{it}+\alpha_5 OWN_{it}+\mu_{it}$$

	Expected sign	Statistics	
		Coefficient (α)	*t*-value
Constant	?	0.217***	3.54
CV	–	-0.167***	-3.99
SIZE	–	0.001	0.438
LEV	+	-0.176***	-3.99
CFO	–	-0.655***	-14.34
OWN	+	0.064***	3.35
Adj. R sq.		0.291	
F		21.11	
N		758	

1) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2) N: number of sample firms

3) OWN: percentage of shares held by the ultimate owner; The other abbreviations are as in Tables 3 and 4..

4) Since the maximum value of VIF was 7.8, the multicollinearity between the independent variables was not significant.

Table 12. Regression analysis of voting rights, cash flow rights, percentage of shareholding by the ultimate owner, and earnings management

$$DA_{it} = \alpha_0+\alpha_1 CASH_{it}+\alpha_2 VOTR_{it}+\alpha_3 OWN_{it}+\alpha_4 SIZE_{it}+\alpha_5 LEV_{it}+\alpha_7 CFO_{it}+\mu_{it}$$

Variables	Expected sign	Value	
		Coefficient (α)	*t*-value
CASH	+	0.045	0.98
CONT	+	0.214***	4.45
OWN	+	0.079***	3.36
SIZE	–	0.002	0.156
LEV	+	-0.170***	-3.88
CFO	–	-0.666***	-9.91
Adj. R sq.		0.199	
F		7.23	
N		758	

1) ** $p < 0.05$, *** $p < 0.01$

2) N : number of sample firms

3) CASH: cash flow rights; CONT: voting rights; OWN: percentage of shares held by the ultimate owner; the other abbreviations are as in Tables 3 and 4.

4) Since the maximum value of VIF was 21.0, multicollinearity between independent variables can exist to some extent.