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# Corporate Governance and the Marginal Cash Value for Korean Retail Firms\*

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## Abstract

**Purpose** – Prior theories expect a lower marginal value of cash for weak governance firms. To test this hypothesis, we examine the relationship between corporate governance structures and marginal cash values in Korean retail firms.

**Research design, data, and methodology** – We estimate marginal cash values based on the model of Faulkender & Wang (2006). The retail firms listed in Korean Stock Exchange from 2005 to 2013 are analyzed. Corporate governance scores are provided by Korean Corporate Governance Services.

**Results** – We show a higher marginal value of cash for the weak governance retail firms in terms of total governance score. Our analysis on a detailed set of governance scores generally confirms this tendency. Yet, a higher marginal cash value is obtained for the firms with better board structures and dividend policies.

**Conclusions** – Our findings argue against the agency view of cash policy predicting a negative relationship between corporate governance scores and marginal cash values. A low marginal value of cash, widely observed in the sample firms, also supports severe resource diversion problem in Korean corporations.

**Keywords:** Cash Management, Corporate Governance, Manager-Shareholder Conflicts, Marginal Value of Cash.

**JEL Classifications:** G30, G31, G32, G35.

## 1. Introduction

It is one of the most widely examined question in corporate finance literature whether corporate governance structure significantly affects cash management policy. The marginal value of cash lies at the core of the analysis because of its central role in shaping a firm's cash retention, dividends payout, and external financing policies (Bolton et al., 2011). However, this relationship between corporate governance structure and the marginal value of cash is largely unstudied in Korean retail firms, even though its critical importance is in the understanding of cash management policy in the retail industry.

According to prior theories, a firm with weaker corporate governance structures is expected to show a lower marginal value of cash. Weaker governance structures tend to allow more severe managerial resource diversions; as a manager burns out cash inside a corporation for his/her own managerial benefits, the shareholders value one dollar of cash stock inside the firm less significantly. Acquisition of value destructive plants or increasing perk consumptions could be a representative example in the use of cash holdings for such managerial benefits.

This economic argument allows us to develop a testable empirical hypothesis between corporate governance indices and the marginal cash value. Corporate governance scores assess a company's corporate governance practices; a better governance firm receives greater governance scores. Thus, the marginal (shareholder) value of cash is expected to be smaller for the firms with lower governance scores. This approach is well aligned with prior empirical studies such as Dittmar & Mahrt-Smith (2007) and Pinkowitz, Stulz, & Williamson (2006); these studies examine the relationship between corporate governance indices and marginal cash values for different samples.

We test this predicted relationship between the marginal value of cash and corporate governance scores for the Korean retail firms. To calculate the marginal value of cash, we use the model of Faulkender & Wang (2006). We investigate how a dollar change in cash holdings results in the change in the market firm value against its benchmark group. We consider the 4 by 4 formed on the firm size and BE to ME ratios as our benchmark return. This use of benchmark return is in line with the model of Faulkender & Wang (2006) as well. Kim & Lee

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(2016) also use the same benchmark return for the estimation of marginal cash value in the Korean retail industry.

We employ corporate governance scores published by Korean corporate governance services. This set of governance scores measures the quality of overall governance structure, shareholder rights, board structure, auditing, distribution and information disclosure. Such detailed categorization permits us to investigate the importance of specific governance attributes in the determination of marginal cash values.

To test our empirical hypothesis, we examine the sample of Korean retail firms listed in Korean Stock Exchange from 2005 to 2013. Because the corporate governance scores are only available after 2005, our sample selection is a natural one. We categorize firm-year observations into the low and high score groups for each corporate governance attribute. Then we estimate the marginal value of cash according to the group of high and low governance scores.

Our main empirical findings are as follows. First, we find that the marginal cash value for the low total governance score group is rather higher than its counter-part for the high score group. In our baseline model using the total governance score, the marginal cash value of the low score group is 1.14 which is far higher than that of the high score group 0.29. This finding is also robust to the change of our benchmark return to the market portfolio return according to the implication of capital asset pricing model (CAPM).

Our results point out a lower marginal value of cash for the firms with weaker corporate governance structures. This finding contradicts the widely accepted prediction between corporate governance structure and the marginal value of cash, as highlighted in Dittmar & Mahrt-Smith (2007) and Pinkowitz et al. (2006).

Next, we investigate the marginal value of cash in accordance with the different categories of corporate governance attributes. The marginal cash value of the low governance score group is larger than that of the high score group in the analyses using the scores of shareholder rights, auditing, and information disclosure. In contrast, the Korean retail firms with better board structure and distribution policy show higher marginal cash values as expected in prior theories.

The results from our analysis of each governance attribute are interesting in a couple of aspects. First, these findings argue that our estimation results with the total governance score is not a mere coincidence. Weaker governance structures in terms of shareholder rights, auditing, and information disclosure, all imply a higher marginal value of cash for the Korean retail firms. Moreover, our findings highlight the importance of distribution policy and board structure in the determination of marginal cash value. As a firm's distribution policy or board structure becomes more in line with the interests of shareholders, the marginal value of cash increases.

Our results contribute to existing studies in a number of perspectives. First of all, such a higher marginal value of cash for the firms with weaker corporate governance structure argues against the agency view of cash management policy. Pinkowitz et al. (2006) show that the marginal value of cash is lower in

countries with worse corporate governance structures. Dittmar & Mahrt-Smith (2007) argued that a weaker governance structure is associated with a lower marginal value of cash for the sample of U.S. corporations. Unlike these studies, our results imply a higher marginal value of cash for the weak governance firms, which is largely unobserved in the existing literature.

Moreover, our estimation results confirm severe agency conflicts in Korean retail firms, which presents a new empirical evidence to the existing studies of managerial resource diversion in Korean firms. Korean firms are accepted to experience substantial resource diversion problems. For example, value destructive acquisitions (Bae, Kang, & Kim, 2002), and offering favorable stock prices for controlling shareholders (Baek, Kang, & Lee, 2006) are representative ways of resource diversions. This managerial resource diversion problem is considered as a key economic reason driving a lower marginal value of cash (Nikolov & Whited, 2014). A quite low marginal value of cash, widely observed in our estimations, is consistent with the existing studies on the serious managerial resource diversion in Korean firms. This low marginal value of cash is also in line with the results of Kim & Lee (2016), which estimate the marginal value of cash for the Korean retail firms from 1991 to 2013.

Finally, our findings emphasize the importance of board structure and distribution policy on the shareholder value of cash. The importance of payout policy in the determination of marginal cash value is theoretically well examined in prior literature (Bolton et al., 2011; Hennessy & Whited, 2005). The board of directors has the legal rights to supervise managerial activities (Hermanlin & Weishbach, 1998). Our results from the governance scores of board structure and payout policy are well aligned with these studies.

Section 2 reviews related literature. Section 3 presents our empirical models and illustrates our sample data. Section 4 provides the results of our empirical estimations. Section 5 concludes.

## 2. Related Literature

A number of studies have theoretically examined the economic determinants of cash management policy. The marginal value cash lies at the core of these analyses due to its central role in deciding dividend payout, cash savings, and external financing policies. For example, Bolton et al. (2011), and Hennessy & Whited (2005) show that the lower bound of marginal cash value is decided by the margin between dividends payout and cash saving choices. Their arguments indicate that the marginal value of cash cannot be smaller than  $(1-\tau_d)$  without any agency considerations, where  $\tau_d$  represents the dividend income tax rate. Furthermore, these arguments also expect that the lower bound for the marginal cash values also increases as a firm's payout policy becomes more in line with the interests of shareholders.

There are two main strands of empirical studies on the

determination of marginal cash values. The first branch of the studies emphasizes how external financing frictions affect the marginal shareholder value of cash. The study of Faulkender & Wang (2006) is a representative example. They argue that the marginal value of cash should be larger for financially constrained firms than for financially unconstrained ones. They also empirically confirm this empirical prediction for the publicly traded U.S. firms.

The other branch of the studies highlights the implications of agency conflicts in the determination of marginal cash values. As a firm experiences more severe manager-shareholder conflicts, its cash stock is more likely to burn out for the managerial benefits, leading to a lower marginal value of cash. Such managerial resource diversions are a representative economic reason driving such low marginal cash values (Nikolov & Whited, 2014). This strand of literature has mainly used corporate governance scores as a proxy variable for the manager-shareholder conflicts. For example, Dittmar & Mahrt-Smith (2007) confirm that the marginal cash value of good governance score firms is as twice large as that of poor governance score firms in their cross-sectional analysis of the U.S. firms. Pinkowitz et al. (2006) examine the marginal cash values across financial markets by using country-level corporate governance scores. They find that shareholders highly value one dollar of cash holding in a country with higher corporate governance scores.

Our study is also closely associated with the empirical studies on cash policy for Korean corporations. Gong (2006) analyzes the determinants of cash holdings in Korean firms. With regard to agency problems between a manager and equity holders, Bae et al. (2002) and Baek et al. (2006) highlight substantial resource diversion problems in Korean firms. Park & Yon (2009) show that Korean firms with weaker governance structures retain more cash stocks by using corporate governance scores.

Our work is also closely related to cash management policy in Korean retail corporations. For instance, Son (2015) examined the cash flow sensitivity of cash in Korean retail firms. Kim & Lee (2016) investigated the marginal value of cash for the sample firms from 1991 to 2013 and confirmed the significant agency conflicts in Korean retail firms. Yet, the relationship between corporate governance structures and the marginal value of cash in Korean retail industry has been largely unexamined in existing literature.

### 3. Empirical Methods and Sample Firms

#### 3.1. Empirical Methods

We calculate the marginal value of cash by following the empirical models of Faulkender & Wang (2006). They estimate the additional shareholder value of cash resulting from the changes in cash holdings of firms over a fiscal year. Their dependent variable is the excess return of each firm year

observation, which is defined as the difference between its stock return and benchmark return. This introduction of benchmark returns offsets an individual stock *i*'s common risk factors. To account for firm specific risk components, they include several firm level financing and investment variables as independent variables. Accordingly, our main empirical model is illustrated as follows.

$$r_{i,t} - R_{i,t}^B = \beta_0 + \beta_1 \Delta C_{i,t} / M_{i,t-1} + \beta_2 \Delta E_{i,t} / M_{i,t-1} + \beta_3 \Delta NA_{i,t} / M_{i,t-1} + \beta_4 \Delta RD_{i,t} / M_{i,t-1} \\ + \beta_5 \Delta I_{i,t} / M_{i,t-1} + \beta_6 \Delta D_{i,t} / M_{i,t-1} + \beta_7 C_{i,t} / M_{i,t-1} + \beta_8 L_{i,t} + \beta_9 NF_{i,t} / M_{i,t-1} \\ + \beta_{10} C_{i,t-1} / M_{i,t-1} * \Delta C_{i,t} / M_{i,t-1} + \beta_{11} L_{i,t} * \Delta C_{i,t} / M_{i,t-1} + \epsilon \quad (1)$$

This equation investigates how a dollar change in cash stock results in a change in the firm's market value compared to its benchmark group. In the equation (1), the term  $\Delta X$  points to the changes in a general variable *X*. For instance,  $\Delta C$  represents the changes in a firm's cash stocks over a fiscal year. We use the realized change as the unexpected change component of cash by following the model of Faulkender & Wang (2006). The dependent variable  $r_{i,t} - R_{i,t}^B$  represents the excess return of firm *i* over the fiscal year *t* in which  $r_{i,t}$  is the firm's stock return and  $R_{i,t}^B$  is its benchmark portfolio return. The set of control variables includes a number of firm characteristic proxy variables. They take account of the idiosyncratic risk components that may be associated with the changes in the value of firm. The control variables for financing activities are cash stocks,  $C_{i,t}$ , interest expenses  $I_{i,t}$ , market leverage  $L_{i,t}$ , and net financing  $NF_{i,t}$ . Earnings before interest and extraordinary items,  $E_{i,t}$  represents the effect of a firm's profitability on the changes in the value of firm. Investment policy is captured by total assets minus cash holdings,  $NA_{i,t}$  and R&D expenditures,  $RD_{i,t}$ . To control payout policies, cash dividends,  $D_{i,t}$  is also introduced. All independent variables are deflated by the previous year market equity value,  $M_{i,t-1}$ . This normalization allows interpreting the estimated coefficient as the dollar changes in the (shareholders') firm value for additional one dollar in the corresponding independent variables.

In our baseline specification, the marginal value of cash for the sample firm, MVC is calculated via the following equation.

$$MVC = \beta_1 + \beta_{10} (\overline{C/M}) + \beta_{11} \overline{L} \quad (2)$$

In this equation (2),  $\overline{C/M}$  is the mean value of prior period cash holdings divided by the market equity value and  $\overline{L}$  is the average market leverage ratio. This is because the change in cash holding linearly affects the value of firm throughout  $\beta_1$ ,  $\beta_{10}$  and  $\beta_{11}$ .

Korean Corporate Governance Services provides a detailed set of corporate governance scores for the publicly traded Korean firms after 2005. This set of governance grades measures a number of governance attributes in Korean corporations. This set of governance scores encompasses the quality of overall governance structure, shareholder rights, board structure, auditing, distribution and information disclosure.

We categorize the firm-year observations into the low and high governance score group based on the scores of each governance attribute. For each fiscal year, we rank the firm-year observation according to its governance scores. We choose the firm-year observations in the top (bottom) 50% of score distribution as the high (low) score group for each item of the governance grades. According to this categorization, we compare the marginal value of cash between the high and low score groups.

### 3.2. Data Description

We calculate the marginal cash value for the retail firms listed in Korean Stock Exchange from 2005 to 2013. The sample selection is a natural one, considering the availability of corporate governance scores for Korean corporations. We employ the WISEfn database to obtain financial statements for the sample firms.

To calculate a firm's excess return, we have to know about its benchmark returns. We use the 4 by 4 benchmark portfolios based on the size and BE to ME ratios as our benchmark return consistent to the method of Faulkender & Wang (2006). The break points for the benchmark portfolio returns are obtained from the analysis of Son, Kim & Yoon (2009). All of the benchmark returns correspond to the fiscal year of each firm-year observation.

All variable constructions are in line with the approach used in Faulkender & Wang (2006). The market value of equity is obtained as the multiple of the number of outstanding shares and the stock's closing price for the fiscal year. Net assets is defined as total book assets minus cash holdings. Cash holdings is from the item of cash plus marketable securities. The profitability is captured by earnings before interest and taxes (EBIT). Market leverage is a firm's debt to market value ratio, constructed as the sum of short-term and long-term debt obligations over the total of market value of equity and total debt obligations. Net financing indicates total equity issuances minus repurchases plus debt issuance less debt retirements. If a firm does not report its R&D expenditures, we set the values to zero. All variables in our empirical models are winsorized at the 1% level for the stability of our estimations.

To control the influence of financial constraints on the marginal cash value, we use the index developed by Kaplan and Zingales (1997). Their prediction equation has the following formulation:

$$KZindex = -1.002Pr\text{ofits} + 0.283Q + 3.139Lev - 39.998Divs. \\ - 1.131Cash\text{ Holding}$$

The Profits variable here is earnings before interest and taxes (EBIT). Cash Holdings is cash plus marketable securities. Dividends are cash dividends. Lev refers to total debt obligations. Q variable indicates the Tobin's Q ratio and is defined as the sum of market equity and total debt obligations divided by total assets. All variables are deflated value total book asset values.

A higher score in this Kaplan-Zingales index implies a greater likelihood of experiencing financial constraints. Therefore, we remove the firm-year observations in the top 20% of Kaplan-Zingales index to take account the effect of financial constraints.

<Table 1> summarizes the variables of interests used in our main empirical model. This table reports the mean, first quartile (p25), median (p50), third quartile (p75) and standard deviation (sd) for each variable. All variables except the market leverage are deflated by the lagged market equity value. The table includes the following set of variables,  $r_t - R_t^B$ , the excess return using the benchmark returns of 4 by 4 portfolios formed on the BE/ME ratios and size;  $\Delta C_t/M_{t-1}$ , the change of cash stocks;  $C_t/M_{t-1}$ , cash holdings;  $\Delta E_t/M_{t-1}$ , the changes in profits;  $\Delta NA_t/M_{t-1}$ , the change in net asset value;  $\Delta RD_t/M_{t-1}$ , the change in R&D expenditures;  $\Delta I_t/M_{t-1}$ , the change in interest expenses;  $\Delta D_t/M_{t-1}$ , the change in cash dividends;  $L_t$ , market leverage; and  $NF_t/M_{t-1}$ , net financing.

<Table 1> Summary Statistics

stats	mean	p25	p50	p75	sd
$r_t - R_t^B$	0.101	-0.234	-0.024	0.190	0.589
$\Delta C_t/M_{t-1}$	0.012	-0.027	0.001	0.051	0.157
$C_t/M_{t-1}$	0.137	0.023	0.091	0.184	0.170
$\Delta E_t/M_{t-1}$	0.008	-0.011	0.007	0.031	0.088
$\Delta NA_t/M_{t-1}$	0.212	0.025	0.144	0.377	0.494
$\Delta RD_t/M_{t-1}$	-0.000	0.000	0.000	0.000	0.003
$\Delta I_t/M_{t-1}$	-0.001	-0.004	0.000	0.004	0.033
$\Delta D_t/M_{t-1}$	0.002	0.000	0.000	0.001	0.009
$L_t$	0.429	0.270	0.425	0.570	0.193
$NF_t/M_{t-1}$	0.094	-0.061	0.038	0.173	0.451

In <Table 1>, a median retail firm shows -0.024 of one-year excess return, while the average excess return is positive as 0.101. Such mean and median returns point out a strongly right-skewed distribution of excess returns. The mean and median of change in cash stocks are slightly positive but they are not different significantly. This result points to a relatively symmetric distribution of changes in cash holdings. In contrast, the mean value of cash holding, 0.137 is far higher than its median value, 0.091. The changes in net assets and net financing show significant variations in our sample. In contrast, the changes in R&D expenditures and interest expenses are almost stable around 0, which potentially implies rigidities in debt financing policies and R&D expenditures.

To consider the possibility of multicollinearity issues in independent variables, <Table 2> reports the pair-wise correlations between our variables of interests used for the estimation of marginal cash values.

**<Table 2>** Correlations in Variables

Vars	$r_t-R_t^B$	$\Delta C_t/M_{t-1}$	$C_t/M_{t-1}$	$\Delta E_t/M_{t-1}$	$\Delta NA_t/M_{t-1}$	$\Delta RD_t/M_{t-1}$	$\Delta I_t/M_{t-1}$	$\Delta D_t/M_{t-1}$	$L_t$	$NF_t/M_{t-1}$
$r_t-R_t^B$	1.00									
$\Delta C_t/M_{t-1}$	0.04	1.00								
$C_t/M_{t-1}$	0.13	-0.34	1.00							
$\Delta E_t/M_{t-1}$	-0.01	-0.20	0.12	1.00						
$\Delta NA_t/M_{t-1}$	0.02	-0.18	0.00	0.13	1.00					
$\Delta RD_t/M_{t-1}$	0.18	0.48	-0.21	-0.28	-0.04	1.00				
$\Delta I_t/M_{t-1}$	-0.08	0.04	-0.11	-0.37	0.50	-0.03	1.00			
$\Delta D_t/M_{t-1}$	0.13	-0.02	0.14	0.11	0.01	0.01	-0.03	1.00		
$L_t$	-0.20	0.00	-0.07	0.02	0.34	-0.02	0.20	0.01	1.00	
$NF_t/M_{t-1}$	-0.10	0.31	-0.11	-0.25	0.62	0.19	0.67	-0.06	0.25	1.00

The correlation results documented in <Table 2> indicate no substantial correlation between our independent variables. In general, the pair-wise correlation between any couple of independent variables is smaller than 0.5 in terms of its absolute value. Only two exceptions are the correlation between a firm's net financing and its changes in net assets, and the correlation between a firm's net financing and changes in its interest expenses. Yet, these correlations are still smaller than 0.7, which allows us to conclude no significant multicollinearity issues in our model.

<Table 3> documents the summary statistics results for the corporate governance scores. The table reports the mean, first quartile (p25), median (p50), third quartile (p75) and standard deviation (sd) for each variable of each corporate governance score. The set of corporate governance scores consists of the overall governance structure, shareholder rights, board structure, auditing, distribution and information disclosure.

<Table 3> shows that a median retail firm has 118.5 of the total governance score, while the average score is 121.3. Such mean and median returns indicate a slightly right-skewed distribution of the scores. The mean and median of shareholder right scores are around 48 and almost identical, which points to a relatively symmetric shape of the distribution. This relatively symmetric pattern is also observed in all other governance scores.

**<Table 3>** Summary Statistics: Governance Scores

stats	mean	p25	p50	p75	sd
Total	121.5	98.0	118.5	144.0	29.6
Shareholder Rights	48.5	42.0	47.0	56.0	9.2
Board	23.0	16.0	21.0	29.0	9.2
Auditing	27.1	18.5	27.5	36.0	10.9
Distribution Policy	1.9	0.0	2.0	3.0	2.1
Information Disclosure	21.2	14.0	19.0	27.0	9.8

## 4. Empirical Results

### 4.1. Total Governance Score

We firstly investigate the relationship between corporate governance structures and marginal cash value based on the total governance score. This total score is the representative measure capturing the quality of overall corporate governance in Korean retail firms.

**<Table 4>** Estimation Results: Total Governance Score

Independent Variables	Low Score Group		High Score Group	
$\Delta C_t/M_{t-1}$	0.71	3.46**	-0.14	-2.58
	(1.0)	(2.1)	(-0.2)	(-0.6)
$\Delta E_t/M_{t-1}$	-0.58	0.19	1.69	0.83
	(-0.6)	(0.2)	(1.0)	(0.5)
$\Delta NA_t/M_{t-1}$	0.50***	0.59***	0.17	0.26
	(3.1)	(2.9)	(0.5)	(0.7)
$\Delta RD_t/M_{t-1}$	34.98	11.96	940.34	1162.03**
	(1.4)	(0.5)	(1.7)	(2.3)
$\Delta I_t/M_{t-1}$	-5.10	-1.98	10.85	0.76
	(-1.6)	(-0.7)	(0.7)	(0.1)
$\Delta D_t/M_{t-1}$	4.28	3.73	31.77	30.41
	(1.3)	(1.2)	(1.1)	(1.1)
$C_t/M_{t-1}$	0.28	0.16	1.32*	0.60
	(0.6)	(0.4)	(1.8)	(0.6)
$L_t$	-0.78	-0.59	-0.46	-0.36
	(-1.5)	(-1.0)	(-1.1)	(-0.9)
$NF_t/M_{t-1}$	-0.59*	-0.94***	-0.52	-0.41
	(-1.9)	(-2.8)	(-1.4)	(-1.1)
$(\Delta C_t/M_{t-1}) * C_{t-1}/M_{t-1}$		-1.68		-1.44
		(-1.5)		(-0.3)
$(\Delta C_t/M_{t-1}) * L_t$		-4.73*		7.32
		(-1.9)		(0.9)
Intercept	0.26	0.17	0.16	0.16
	(0.9)	(0.5)	(0.9)	(0.9)
N	59	59	54	54
adj. $R^2$	0.082	0.114	0.190	0.190
Implied MVC	0.71	1.14	-0.14	0.29

<Table 4> reports our estimation results for the high/low score group firms in terms of the total governance scores. All

empirical models employ the benchmark return,  $R_{it}^B$ , as the 4 by 4 portfolio returns based on the size and BE to ME ratios. The first two columns report the estimation results on the low score group and the last two columns document the results on the high score group. This table includes the estimated coefficients and their t-values (in parenthesis), and the marginal cash value implied by each estimation. For both of the low and high score groups, our first empirical model does not include any interaction terms. For our second model, we allow the change in cash holdings to interact with the previous period cash holdings, and with market leverage ratios. These two empirical models are consistent to the method of Faulkender & Wang (2006). The mark of ‘\*’ points to the statistical 90% level. The marks of ‘\*\*’ and ‘\*\*\*’ point out the significance at the 95% and the 99% level, respectively.

<Table 4> shows a higher marginal value of cash for the low governance score group. For instance, the marginal cash value of the low score group is 1.14 in our baseline model with the interaction terms, which is far higher than that of the high score group 0.29. This qualitative implication remains unchanged even if we consider the estimation results from the models without any interaction terms.

This finding implies a higher marginal value of cash for weak corporate governance firms, which argues against the agency view of cash management policy. A lower corporate governance score indicates a weaker corporate governance structure. Such weak governance structures allow more severe manager-shareholder conflicts leading to a lower shareholder value of cash. In fact, a number of prior empirical studies such as Dittmar & Mahrt-Smith (2007) and Pinkowitz et al. (2006) confirm the negative relationship between corporate governance scores and marginal cash values. In contrast to this prediction, our findings show a higher marginal cash value for the firms with weak corporate governance structures.

Moreover, the estimated marginal cash value for the high score group points to considerable agency problems between a manager and shareholders in the Korean retail industry. In our baseline model with the interaction terms, the estimated marginal cash value for the high score group is 0.29. Considering the fact that the tax rate for dividend income is around 15% in Korea, such a low value suggests significant manager-shareholder conflicts in a group of Korean retail firms. For this high score group, the estimated marginal cash value is even negative in our empirical model without any interaction terms.

This low marginal value of cash is well aligned with the existing studies highlighting significant resource diversion problems in Korean corporations. For instance, Bae et al. (2002) and Baek et al. (2006) show considerable resource diversions in Korean firms, which probably diminishes the marginal shareholder value of cash. This finding is also consistent with the results of Kim & Lee (2016), which argue a low marginal value of cash in the Korean retail industry for their sample firms from 1991 to 2013.

<Table 5> Estimation Results with Market Returns: Total Governance Score

Independent Variables	Low Score Group		High Score Group	
	Coefficient	t-value	Coefficient	t-value
$\Delta C_t/M_{t-1}$	0.75	4.08**	-0.67	-4.71
	(1.0)	(2.3)	(-0.7)	(-1.1)
$\Delta E_t/M_{t-1}$	-0.49	0.41	2.80	1.61
	(-0.5)	(0.4)	(1.2)	(0.7)
$\Delta NA_t/M_{t-1}$	0.45***	0.58**	0.25	0.39
	(2.8)	(2.6)	(0.6)	(0.8)
$\Delta RD_t/M_{t-1}$	11.44	-16.05	1063.50**	1367.74*
	(0.5)	(-0.7)	(2.1)	(2.0)
$\Delta I_t/M_{t-1}$	-3.44	0.27	6.33	-7.24
	(-0.9)	(0.1)	(0.3)	(-0.4)
$\Delta D_t/M_{t-1}$	6.25	5.42	44.52	41.91
	(1.6)	(1.4)	(1.3)	(1.2)
$C_t/M_{t-1}$	0.16	-0.01	1.02	0.12
	(0.3)	(-0.0)	(1.1)	(0.1)
$L_t$	-0.86	-0.64	-0.08	0.05
	(-1.5)	(-1.1)	(-0.2)	(0.1)
$NF_t/M_{t-1}$	-0.33	-0.75**	-0.64	-0.50
	(-1.2)	(-2.2)	(-1.3)	(-1.1)
$(\Delta C_t/M_{t-1}) * C_{t-1}/M_{t-1}$		-2.63**		-1.00
		(-2.4)		(-0.2)
$(\Delta C_t/M_{t-1}) * L_t$		-4.99*		11.12
		(-1.9)		(1.3)
Intercept	0.39	0.28	0.05	0.05
	(1.2)	(0.8)	(0.2)	(0.3)
N	59	59	54	54
adj. R <sup>2</sup>	0.018	0.034	0.204	0.217
Implied MVC	0.75	1.47	-0.67	-0.22

<Table 5> reports our estimation results for the high/low score group firms with the market portfolio return as the benchmark return,  $R_{it}^B$ . It still investigates the implication of the total governance scores on the marginal value of cash. The first two columns show our estimation results on the low score group and the last two columns describe the results on the high score group. This table contains the estimated coefficients and their t-values (in parenthesis), and the marginal cash value implied by each empirical model. For both of the low and high score groups, our first empirical model excludes any interaction terms. For our second model, we permit the change in cash holdings to interact with the level of previous period cash holdings, and with current market leverage ratios. These two empirical models follow the approach of Faulkender & Wang (2006). The sign of ‘\*’ points to the statistical significance at the 90% level. The signs of ‘\*\*’ and ‘\*\*\*’ point out the significance at the 95% level and the 99% level, respectively.

The table robustly confirms a higher marginal value of cash for the low governance score firms. For instance, the marginal

cash value of the low score group is 1.47 in our second model, which is far higher than that of the high score group -0.22. This qualitative implication remains stable even though we consider the estimation results from the models without any interaction terms.

<Table 5> strengthens the validity of our previous estimation results in <Table 4>. First of all, <Table 5> suggests a higher marginal value of cash for weak governance firms even with the change of the benchmark returns. This finding argues against the agency view of cash management policy as well. Moreover, the table also documents a quite low marginal value of cash for the high governance score group; this result is also in line with prior studies showing significant manager-shareholder conflicts in Korean corporations.

Such a low marginal value of cash in the high score group is in line with existing literature emphasizing significant resource diversion problems in Korean corporations, as mentioned above. For example, Bae et al. (2002) and Baek et al. (2006) show considerable resource diversions in Korean corporations, which potentially decreases the marginal shareholder value of cash. This finding is also consistent to the results of Kim & Lee (2016), which confirm a low marginal value of cash in the Korean retail industry for their sample firms from 1991 to 2013.

#### 4.2. A Detailed Set of Governance Scores

In this section, we study the relationship between the marginal value of cash and specific corporate governance attributes. Korean Corporate Governance Service provides a detailed set of governance measures as well as the total governance score. It publishes the scores for the quality of shareholder rights, board structure, auditing, distribution and information disclosure. Based on this detailed set of governance measures, we conduct cross-sectional studies. We use the 4 by 4 portfolio returns formed on the size and BE to ME ratio as the benchmark return. The change of benchmark return to the market return does not influence our estimation results while we do not report the estimation results here.

<Table 6> reports our estimation results for the high/low score group firms in terms of the shareholder right scores. The first two columns document our estimation results on the low score group and the last two columns show the results on the high score group. This table contains the estimated coefficients and their t-values (in parenthesis), and the marginal cash value implied by each empirical model. For both of the low and high score groups, our first empirical model does not consider any interaction terms. For our second model, we allow the change in cash holdings to interact with the previous cash holdings, and with current market leverage ratios. These two empirical models are consistent to the approach of Faulkender & Wang (2006). The sign of ‘\*’ implies the statistical 90% level. The signs of ‘\*\*’ and ‘\*\*\*’ indicate the significance at the 95% level and the 99% level, respectively.

<Table 6> Estimation Results: Shareholder Rights

Independent Variables	Low Score Group		High Score Group	
$\Delta C_t/M_{t-1}$	1.42*	4.33***	-0.21	-5.90*
	(1.7)	(3.1)	(-0.3)	(-1.8)
$\Delta E_t/M_{t-1}$	0.54	1.10	0.62	-0.94
	(0.5)	(1.3)	(0.5)	(-0.7)
$\Delta NA_t/M_{t-1}$	0.56	0.72*	0.47***	0.50***
	(1.4)	(1.7)	(4.7)	(4.8)
$\Delta RD_t/M_{t-1}$	45.47	12.51	880.96	1788.50
	(1.5)	(0.5)	(0.9)	(1.5)
$\Delta I_t/M_{t-1}$	-2.87	-0.63	16.08*	5.13
	(-0.7)	(-0.2)	(1.8)	(0.5)
$\Delta D_t/M_{t-1}$	-1.30	-0.80	26.64	23.00
	(-0.3)	(-0.2)	(1.3)	(1.2)
$C_t/M_{t-1}$	1.42*	1.25	0.24	0.07
	(1.8)	(1.7)	(0.6)	(0.2)
$L_t$	-1.41**	-1.22**	-0.30	-0.66
	(-2.4)	(-2.0)	(-0.7)	(-1.3)
$NF_t/M_{t-1}$	-0.69	-1.11**	-0.84***	-0.49*
	(-1.6)	(-2.3)	(-3.8)	(-1.7)
$(\Delta C_t/M_{t-1}) * C_{t-1}/M_{t-1}$		0.19		2.25
		(0.1)		(1.0)
$(\Delta C_t/M_{t-1}) * L_t$		-6.59***		15.30**
		(-2.7)		(2.1)
Intercept	0.49*	0.40	0.08	0.22
	(1.7)	(1.3)	(0.4)	(0.9)
N	60	60	53	53
$adj. R^2$	0.173	0.227	0.151	0.200
Implied MVC	1.42	1.41	-0.21	0.38

The table shows a higher marginal value of cash for the low governance score firms, even if we use the score of shareholder rights. For example, the marginal cash value of the low score group is 1.42 in our model with interaction terms, which is far higher than its high score group counterpart, 0.38. This result remain unchanged when we consider the estimation results from the models excluding any interaction terms.

<Table 6> strengthens the validity of our previous estimation results employing the total governance score. First of all, <Table 6> suggests a higher marginal value of cash for weak governance firms while we investigate a sub-category of the total governance index, the shareholder rights score. This finding implies that our estimation results in <Table 4> and <Table 5> are not mere coincidence. The result in <Table 6> argues against the agency view of cash management policy as well. Moreover, the table also documents a quite low marginal value of cash for the high governance score group; this result is also in line with existing studies indicating significant manager-shareholder conflicts in Korean corporations such as Bae et al. (2002) and Baek et al. (2006).

<Table 7> shows our estimation results for the high/low score group firms based on the scores for the board of directors. The first two columns reports our regression estimation results on the low score group and the last two columns documents the regression results on the high score group. This table documents the estimated coefficients and their t-values (in parenthesis), and the marginal cash value implied by each

regression model. For both of the low and high score groups, our first empirical model does not incorporate any interaction terms. For our second model, we permit the change in cash holdings to interact with the prior period cash holdings, and with current market leverage ratios. These two empirical models are in line with the model of Faulkender & Wang (2006). The ‘\*’ implies the statistical significance of 90% level. The ‘\*\*\*’ and ‘\*\*\*\*’ indicate the significance at the 95% level and the 99% level, respectively.

<Table 7> Estimation Results: Board Structure

Independent Variables	Low Score Group		High Score Group	
$\Delta C_t/M_{t-1}$	-0.27	2.07*	2.31**	-5.18
	(-0.8)	(1.9)	(2.4)	(-1.0)
$\Delta E_t/M_{t-1}$	0.45	1.04	-0.17	-0.18
	(0.4)	(1.2)	(-0.1)	(-0.1)
$\Delta NA_t/M_{t-1}$	0.22*	0.32***	0.71	0.75
	(1.9)	(3.6)	(1.3)	(1.6)
$\Delta RD_t/M_{t-1}$	79.39***	56.22**	-26.40*	-20.53
	(3.1)	(2.5)	(-1.7)	(-1.3)
$\Delta I_t/M_{t-1}$	-2.30	-0.03	-10.09	-13.17*
	(-0.9)	(-0.0)	(-1.6)	(-1.8)
$\Delta D_t/M_{t-1}$	2.30	2.10	28.17	23.02
	(0.8)	(0.7)	(1.2)	(1.0)
$C_t/M_{t-1}$	-0.23	-0.30	3.32***	4.30***
	(-0.8)	(-1.1)	(5.5)	(4.3)
$L_t$	-0.44	-0.33	-0.39	-0.44
	(-0.9)	(-0.6)	(-0.9)	(-1.0)
$NF_t/M_{t-1}$	-0.51**	-0.81***	-0.80	-0.77
	(-2.1)	(-3.3)	(-1.3)	(-1.5)
$(\Delta C_t/M_{t-1}) * C_{t-1}/M_{t-1}$		-1.75**		10.38
		(-2.4)		(1.5)
$(\Delta C_t/M_{t-1}) * L_t$		-3.31*		12.33
		(-1.9)		(1.3)
Intercept	0.25	0.16	-0.08	-0.12
	(0.9)	(0.5)	(-0.4)	(-0.7)
N	59	59	54	54
adj. $R^2$	0.180	0.212	0.471	0.490
Implied MVC	-0.27	0.38	2.31	0.84

Unlike our prior estimation results, <Table 7> shows a smaller marginal value of cash for the low governance score firms. For instance, the marginal cash value of the low score group is 0.38 in our baseline model, which is quite smaller than that of the high score group, 0.84. Even if we consider the model without any interaction terms, the finding remains stable.

The estimation results in <Table 7> are interesting in a couple of perspectives. Most of all, this finding is well aligned with the agency view of cash management policy. A weaker corporate governance firm indeed shows a lower marginal value of cash.

Considering the supervising role of the board of directors on managerial behaviors (Hermalin & Weisbach, 1998), this finding is generally consistent to the literature focusing on corporate board structure.

The low marginal value of cash in the low governance score group is still in line with the existing studies suggesting significant resource diversion problems in Korean corporations. For instance, Bae et al. (2002) and Baek et al. (2006) provide empirical evidence about substantial resource diversions in Korean firms, which probably decreases the marginal shareholder value of cash. This finding is also consistent to the results of Kim & Lee (2016), which confirm a low marginal value of cash in the Korean retail industry for their sample firms from 1991 to 2013.

<Table 8> Estimation Results: Auditing

Independent Variables	Low Score Group		High Score Group	
$\Delta C_t/M_{t-1}$	0.65	3.83**	-0.79	-4.21
	(0.9)	(2.3)	(-0.7)	(-0.9)
$\Delta E_t/M_{t-1}$	-0.42	0.54	1.80	0.75
	(-0.5)	(0.6)	(1.2)	(0.6)
$\Delta NA_t/M_{t-1}$	0.42***	0.52***	0.43	0.43
	(3.6)	(3.4)	(0.7)	(1.0)
$\Delta RD_t/M_{t-1}$	35.00	8.74	883.57	1842.94**
	(1.4)	(0.4)	(1.6)	(2.2)
$\Delta I_t/M_{t-1}$	-5.07	-1.40	-2.45	-17.96
	(-1.6)	(-0.5)	(-0.1)	(-1.0)
$\Delta D_t/M_{t-1}$	5.08	4.38	48.37	25.73
	(1.6)	(1.4)	(1.6)	(0.9)
$C_t/M_{t-1}$	0.14	-0.01		4.18**
	(0.3)	(-0.0)		(2.5)
$L_t$	-0.66	-0.42		-0.20
	(-1.3)	(-0.8)		(-0.5)
$NF_t/M_{t-1}$	-0.56*	-0.97***	-0.66	-0.39
	(-1.9)	(-3.0)	(-1.1)	(-0.8)
$(\Delta C_t/M_{t-1}) * C_{t-1}/M_{t-1}$		-1.98*		8.64
		(-2.0)		(1.2)
$(\Delta C_t/M_{t-1}) * L_t$		-5.42**		10.51
		(-2.3)		(1.2)
Intercept	0.21	0.10	0.10	-0.17
	(0.7)	(0.3)	(1.0)	(-0.9)
N	60	60	53	53
adj. $R^2$	0.097	0.171	0.097	0.321
Implied MVC	0.65	1.14	-0.79	0.93

<Table 8> contains our estimation results for the high/low score group firms according to the quality of auditing. The first two columns show our regression estimation results on the low score group and the last two columns illustrate our regression results on the high score group. This table contains the



estimated coefficients and their t-values (in parenthesis), and the marginal cash value implied by each empirical model. For both of the low and high score groups, our first empirical model does not consider any interaction terms. For our second model, we permit the change in cash holdings to interact with the prior period cash holdings, and with current market leverage ratios. These two empirical model specifications are in line with those of Faulkender & Wang (2006). The '\*' indicates the statistical significance of 90% level. The '\*\*' and '\*\*\*' represent the significance at the 95% level and the 99% level, respectively.

The table documents a higher marginal value of cash for the low governance score firms, even if we conduct our empirical analysis based on the quality of auditing. For example, the marginal cash value of the low score group is estimated as 1.14 in our model with interaction terms, which is larger than its high score group counterpart, 0.93. This result is robust to the change of the empirical model as reported in the first and third columns.

<Table 8> argues for the validity of our previous estimation results employing the total governance score. Most of all, <Table 8> reaffirms a higher marginal value of cash for weak governance firms in the analysis of the auditing quality. This finding suggests that our previous estimation results are not mere coincidences. Of course, the result in <Table 8> contradicts the agency view of cash management policy as well.

<Table 9> contains our estimation results for the high/low score group firms in accordance with the distribution policy scores. The first two columns show our regression estimation results on the low score group and the last two columns reports our regression results on the high score group. The table includes the estimated coefficients and their t-values (in parenthesis), and the marginal cash value implied by each cross-sectional model. For both of the low and high score groups, our first regression model does not include any interaction terms. In our second model, we allow the change in cash holdings to interact with the prior levels of cash holdings, and with current market leverage ratios. These two empirical specifications are founded on the model Faulkender & Wang (2006). The mark of '\*' points to the statistical significance of 90% level. The marks of '\*\*' and '\*\*\*' point out the significance at the 95% level and the 99% level, respectively.

Unlike the results of our analysis on total governance scores, <Table 9> shows a smaller marginal value of cash for the low score group. For instance, the marginal cash value of the low score group is calculated as 0.83 in our baseline model, which is far smaller than that of the high score group, 1.64. Even if we consider the model without any interaction terms, the finding remain unvaried.

The estimation results in <Table 9> are consistent to the agency theory of cash management policy. A weaker corporate governance firm in fact has a lower marginal value of cash. Considering the critical role of dividend payout policy in shaping the marginal value of cash (Bolton et al., 2011), this finding is consistent with the theoretical prediction on the relationship between payout policy and the shareholder value of firm (Jensen 1986).

Our estimation results in <Table 9> are also in line with the findings in <Table 7>, which use the high and low score groups based on the quality of the board of directors. These findings imply that the positive correlation between corporate governance scores and the marginal cash value holds for specific attributes of corporate governance structures, even if it does not apply well for the total governance measure.

<Table 9> Estimation Results: Distribution Policy

Independent Variables	Low Score Group		High Score Group	
	Coefficient	t-value	Coefficient	t-value
$\Delta C_t/M_{t-1}$	0.01	1.48	1.83	8.18**
	(0.0)	(1.0)	(1.5)	(2.2)
$\Delta E_t/M_{t-1}$	-0.84	-0.40	-0.14	0.04
	(-0.6)	(-0.3)	(-0.1)	(0.0)
$\Delta NA_t/M_{t-1}$	0.49**	0.56***	0.51	0.42
	(2.6)	(2.7)	(1.3)	(1.1)
$\Delta RD_t/M_{t-1}$	51.83*	40.04	3651.73	397.08
	(1.7)	(1.3)	(0.4)	(0.0)
$\Delta I_t/M_{t-1}$	-3.01	-1.04	-6.56	-6.22
	(-0.9)	(-0.3)	(-1.5)	(-1.5)
$\Delta D_t/M_{t-1}$	13.46	12.74	3.46	3.14
	(0.6)	(0.6)	(0.7)	(0.6)
$C_t/M_{t-1}$	0.42	0.29	0.23	0.41
	(0.9)	(0.7)	(0.3)	(0.6)
$L_t$	-0.74	-0.66	-1.15	-0.24
	(-1.6)	(-1.4)	(-1.1)	(-0.2)
$NF_t/M_{t-1}$	-0.49**	-0.68**	-0.76	-0.64
	(-2.1)	(-2.3)	(-1.3)	(-1.1)
$(\Delta C_t/M_{t-1}) * C_{t-1}/M_{t-1}$		-1.91		-5.77
		(-1.3)		(-1.2)
$(\Delta C_t/M_{t-1}) * L_t$		-1.07		-11.05*
		(-0.4)		(-1.9)
Intercept	0.28	0.24	0.50	0.04
	(1.3)	(1.1)	(0.9)	(0.1)
N	72	72	41	41
adj. $R^2$	0.085	0.075	0.120	0.193
Implied MVC	0.01	0.83	1.83	1.64

<Table 10> reports our estimation results for the high/low score group firms according to the score of information disclosure. The first two columns show our estimation results on the low score group and the last two columns describes the results on the high score group. This table includes the estimated coefficients and their t-values (in parenthesis), and the marginal cash value implied by each cross-sectional model. For both of the low and high score groups, our first empirical model does not incorporate any interaction terms with the changes in cash holdings. For our second model, we allow the change in cash holdings to interact with the prior cash holdings, and with

current market leverage ratios. These two empirical models are based on the model of Faulkender & Wang (2006). The '\*\*' implies the statistical 90% level. The '\*\*\*' and '\*\*\*\*' point out the significance at the 95% level and the 99% level, respectively.

<Table 10> Estimation Results: Information Disclosure

Independent Variables	Low Score Group		High Score Group	
$\Delta C_t/M_{t-1}$	0.87 (1.0)	2.82 (1.6)	0.29 (0.5)	-3.58 (-1.3)
$\Delta E_t/M_{t-1}$	-0.63 (-0.6)	-0.05 (-0.0)	0.83 (0.6)	-0.07 (-0.0)
$\Delta NA_t/M_{t-1}$	0.54*** (3.6)	0.63*** (3.5)	0.49 (1.2)	0.66 (1.5)
$\Delta RD_t/M_{t-1}$	41.29 (1.5)	25.92 (0.9)	1216.49** (2.2)	1457.56*** (2.8)
$\Delta I_t/M_{t-1}$	-4.08 (-1.4)	-1.93 (-0.7)	-2.82 (-0.3)	-6.04 (-0.8)
$\Delta D_t/M_{t-1}$	4.26 (0.7)	3.07 (0.5)	5.61 (0.7)	4.79 (0.7)
$C_t/M_{t-1}$	0.62 (1.1)	0.50 (0.9)	0.34 (0.4)	0.63 (0.7)
$L_t$	-1.11** (-2.0)	-0.96 (-1.6)	-0.38 (-0.8)	-0.51 (-1.1)
$NF_t/M_{t-1}$	-0.81*** (-3.4)	-1.00*** (-3.4)	-0.74 (-1.5)	-0.81 (-1.5)
$(\Delta C_t/M_{t-1}) * C_{t-1}/M_{t-1}$		-2.36* (-1.7)		-11.82* (-1.9)
$(\Delta C_t/M_{t-1}) * L_t$		-2.11 (-0.6)		12.24** (2.1)
Intercept	0.31 (1.1)	0.23 (0.7)	0.21 (1.1)	0.20 (1.1)
N	60	60	53	53
adj. $R^2$	0.142	0.150	0.041	0.004
Implied MVC	0.87	1.56	0.29	0.68

<Table 10> shows a higher marginal value of cash for the low governance score firms, even if we investigate the implications of information disclosure. For example, the marginal cash value of the low score group is obtained as 1.56 in our model with interaction terms, which is quite higher than its high score group counterpart, 0.68. This qualitative finding remains the same even if we consider the estimation results from the models excluding any interaction terms.

<Table 10> highlights the validity of our previous estimation results with the total governance score. First of all, <Table 10> still documents a higher marginal value of cash for weak governance firms while we specifically investigate the role of information disclosure. This finding suggests that our estimation results with the total governance score are not mere coincidences. Similar to the results of <Table 4> and <Table 5>, <Table 10> argues against the agency view of cash management policy as well. Furthermore, <Table 10> also documents a quite low marginal value of cash for the high governance score group; this result is also consistent to existing studies pointing to significant manager-shareholder conflicts in Korean corporations such as Bae et al. (2002) and Baek et al. (2006).

## 5. Concluding Remarks

### 5.1. Summary

This paper examined the relationship between corporate governance structure and the marginal cash value in the Korean retail industry. We firstly found that the marginal cash value of the low governance score group is higher than that of the high score group by using the total governance score; the total governance score is the representative measure for the overall quality of corporate governance structure. This result remains stable even for a set of detailed corporate governance scores. The low score group still showed a higher marginal value of cash in our analysis adopting the governance scores of shareholder rights, auditing, and information disclosure. Yet, a higher marginal value of cash is observed for the high score group when the group is categorized by the quality of board structure and distribution policy.

### 5.2. Discussion

Our findings present novel insights on the existing literature of cash policy. First of all, our estimation result provides empirical evidence against the agency view of cash management policy. This literature expects a lower marginal value of cash for the firms with weaker corporate governance structures. In fact, Dittmar & Mahrt-Smith (2007) empirically support this prediction in the sample of U.S. firms. Pinkowitz et al. (2006) also argues for this relationship in their cross-country analysis. In contrast, our empirical study shows a higher value of cash for the firms with weaker governance structures, which contradicts this agency view of cash management policy. This finding points out a potential need of new cash management theory, which explains a rather higher marginal cash value for weak governance firms. Or there might be some data problems in measuring the corporate governance scores.

Moreover, a substantially low marginal value of cash widely observed in the sample firms supports the significant managerial resource diversion problems documented in Korean corporations. Korean firms are believed to experience considerable managerial diversion problems, such as value destructive acquisitions (Bae et al., 2002), and offering favorable equity prices for controlling shareholders (Baek et al., 2006). Such a resource diversion problem is accepted as a key economic reason driving a lower marginal value of cash (Nikolov & Whited, 2014). The widely observed low marginal cash value in our analysis provides another piece of empirical evidence arguing for the managerial resource diversion problem in Korean corporation. Our finding is also in line with prior estimation results of Kim & Lee (2016) for Korean retail firms.

### 5.3. Future Directions

While we present empirical evidence against the agency view of cash management policy by focusing on the Korean retail

firms, we do not conduct a cross-industry analysis. Such inter-industry analyses would provide other empirical regularities, which help us to understand the relationship between corporate governance structures and cash policy in Korean firms. If we can find a similar empirical regularity for the whole sample of firms, then we may have to develop a new perspective on cash management theory. Moreover, a similar analysis on the retail firms traded in KOSDAQ market is also quite interesting due to their different firm environments. We leave these important topics for future research.

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