The Marginal Value of Cash in Korean Retail Firms

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Abstract

Purpose – We examine the marginal value of cash in Korean retail firms, largely unexamined in literature. The marginal value of cash plays pivotal role in cash management policy; especially, a significantly low marginal cash value indicates substantial manager-shareholder conflicts.

Research design, data, and methodology – We estimate marginal cash values by adopting the approach of Faulkender & Wang (2006). The sample of retail firms traded in Korean Stock Exchange from 1991 to 2013 is analyzed.

Results – We estimate the marginal value of cash for the retail firms as 0.75, implying significant manager-shareholder conflicts. We find a lower marginal value of cash for financially constrained retail firms, contradicting existing theories. The marginal value of cash increases substantially after 2000s, suggesting severe agency conflicts in 1990s as a key reason behind our findings.

Conclusions – Our findings support the substantial resource diversion problem in Korean firms and the agency theory of cash management policy. Our results argue against the widely accepted view focusing on implications of financial constraints, which highlights a need of new cash management theory.

Keywords: Marginal Value of Cash, Financial Constraint, Manager-Shareholder Conflicts, Cash Management.

JEL Classification: G30, G31, G32, G35.

1. Introduction

Do Korean retail firms accumulate cash for their share-holders? This question has largely been unexamined in Korean retail firms, in spite of its critical implications on the understanding of cash management policy. The examination of this question also provides substantial implications to the current debate on the introduction of "retention tax" on excess cash holdings of Korean firms. If a firm accumulates cash for managerial benefits, it is better off to payout cash rather than retain it.

The marginal value of cash, which captures the shareholder value of an additional one dollar of cash inside a firm, should be one of the most appropriate measures to answer this question. Existing studies emphasize two major economic forces behind the determination of marginal cash value: one is the role of financial constraint, and the other is agency problem between a manager and shareholders. The former consideration expects that the marginal value of cash tends to be higher for financially constrained firms because their internal funds are prone to reduce more costly external financing. However, the latter economic force points out the possibility that a self-interested manager burns out cash for his own benefit, for example, by acquiring firms invaluable to shareholders or increasing his perquisite.

Base on the latter argument, we can measure a seriousness of agency problems between a manager and shareholders by using the marginal value of cash. Considering the fact that the marginal value of cash cannot be lower than (1-dividend tax rate) in the absence of any agency conflicts, we may conclude that a firm's cash accumulation is not in line with the interests of shareholders, if the marginal value of cash is significantly low compared to this lower bound. Under this circumstance, a manager may increase the value of the firm by paying out one dollar as dividends rather than retaining it as cash inside a firm.

Furthermore, if a financially constrained firm shows a lower marginal value of cash than a financially unconstrained one, we may also conclude the existence of substantial agency conflict between a manager and shareholders in financially constrained firms. Severe frictions in external financing, "financial constraints", tend to raise the value of cash inside a corporation. Accordingly, a financially constrained firm has to show a higher marginal cash value without any agency frictions. So a lower marginal cash value in a financially constrained firm indicates the existence of substantial agency problem between a manager and shareholders.

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To calculate the marginal value of cash in Korean retail firms, we adopt the approach of Faulkender & Wang (2006). We examine how a dollar change in cash holdings leads to a change in the market valuation of a firm compared to its benchmark group. We employ two representative benchmark returns for our calculation. The first benchmark return is the 4 by 4 formed on size and BE to ME ratios, consistent with the model of Faulkender & Wang (2006). The second one is the market portfolio return based on the assumption of the capital asset pricing model (CAPM).

We examine the sample of retail firms listed in Korean Stock Exchange from 1991 to 2013 for our calculation of marginal cash values. Our main empirical findings are as follows. Most of all, we find that the marginal value of cash for an average retail firm is around 0.75, which is quite smaller than the theoretical lower bound of marginal cash value 0.85. Our estimated value is also robust to the change of the benchmark returns. This finding indicates a significant agency conflict between a manager and shareholders in Korean retail firms.

Our analysis based on financial constraints also suggests the possibility of serious agency problem for financially constrained retail firms. The financial constraint analysis based on credit ratings shows a lower marginal value of cash for financially constrained retail firms, which contradicts a widely accepted prediction of Faulkender & Wang (2006). Without more severe agency conflicts in financially constrained retail firms, this finding is hardly justifiable.

Moreover, our sub-period analysis points out that the marginal value of cash in retail firms increase significantly after 2000s. This finding is robust to the change in the benchmark returns. Our finding suggests substantial agency conflicts in 1990s as a key reason behind the low marginal value of cash observed in Korean retail firms.

Our results contribute to the existing literature in a number of ways. Most of all, such low marginal value of cash in Korean retail firms adds new evidence to the agency view of cash management policy. Pinkowitz, Stulz, & Williamson (2006) argue that the marginal value of cash is smaller in countries with weak corporate governance. Dittmar & Mahrt-Smith (2007) found that a weaker governance structure is related to a lower marginal values of cash in the U.S. corporation. Our calculation of marginal cash value in Korean retail firms is consistent with their findings and argues for the significant role of agency frictions in cash management policy.

Moreover, our findings confirm agency conflicts in Korean retail firms, which provides another piece of empirical evidence to the literature of managerial resource diversion in Korean corporations. Korean firms are believed to experience serious resource diversion problems, such as value destructive acquisitions (Bae, Kang, & Kim, 2002), and setting up favorable equity prices for controlling shareholders (Baek, Kang, & Lee, 2006). This managerial resource diversion problems is regarded as one of the key reasons behind lower marginal values of cash (Nikolov & Whited, 2014). Our empirical findings are exactly in line with these prior studies related to the managerial resource diversion in Korean firms.

Our finding also presents empirical evidence against a strand of literature highlighting the role of financial constraints on cash management policy. For instance, Faulkender & Wang (2006) predict a higher marginal value of cash for financially constrained firms due to their limitations in accessing external financing. Unlike their prediction, our findings indicate a lower marginal value of cash for financially constrained firms, which point to a need of new economic theory related to the role of financial constraints.

Section 2 reviews related literature. Section 3 provides our empirical models and describes data. Section 4 presents the results of our empirical analysis. In section 5, we conclude.

2. Related Literature

A number of theoretical studies have investigated economic determinants of cash management policy. The marginal value cash is at the core of these studies due to its pivotal role in shaping dividend payout, cash savings, and external financing choices. For instance, Bolton et al. (2011), and Hennessy & Whited (2005) theoretically argue that the lower bound of cash value is determined by the margin between a firm's dividends payout and cash accumulation decisions. Their arguments tell us that the marginal value of cash could not be lower than $(1-\tau d)$ without any agency frictions, where τd represents dividend income tax rate. Gamba & Triantis (2008) also highlight the significance of external financing frictions on marginal cash value in their dynamic model of corporation.

There are two mainstream empirical studies on the determination of marginal cash values. The first strand of literature confirms the implications of external financing frictions on the marginal value of cash. The representative study is Faulkender & Wang (2006). They predict that the marginal value of cash has to be higher for a financially constrained firm than for a financially unconstrained one. Their empirical study, in fact, confirms this empirical prediction in the sample of publicly traded U.S. corporations.

The other strand of literature emphasizes the implications of conflicts between a manager and shareholders in deciding marginal cash values. In this strand of literature, the marginal shareholder value of cash may be significantly low due to the agency conflicts. The managerial resource diversion as emphasized in Nikolov & Whited (2014) is a representative economic reason behind such low shareholder value of cash. For the U.S. firms, Dittmar & Mahrt-Smith (2007) show that the marginal cash value of good governance firms is almost as twice large as that of weak governance firms. Pinkowitz et al. (2006) investigate the marginal value of cash across markets by using country-level corporate governance indices. They find that investors highly value one dollar of cash stocks in a country with greater corporate governance scores.

Our work is also closely related to the empirical studies on Korean corporations. With respect to agency conflicts between manager and shareholders, Bae et al. (2002) and Baek et al.

(2006) provide empirical evidence supporting significant resource diversion problems in Korean corporations. Gong (2006) examines the cross-sectional determinants of cash holdings in Korean firms. Park & Yon (2009) find that Korean firms with weaker governance structure retain more cashes based on their empirical models employing corporate governance scores published by Korean Corporate Governance Service.

While these prior studies examined the determinants of cash balance itself, the marginal value of cash in Korean corporations has received limited attentions. Especially with respect to the retail industry, to our knowledge, this is the first study attempting to estimate the marginal cash values.

3. Empirical models and Sample Description

3.1. Empirical Models

We estimate the marginal value of cash based on the approach of Faulkender & Wang (2006). They calculate the additional shareholder value of cash resulting from changes in cash holdings of firms over a fiscal year. The dependent variable is the excess return of an individual stock, which is defined as the difference between a firm's stock return and its benchmark return. This inclusion of benchmark portfolio return can offset an individual stock i's common risk components. To take account of firm specific risk factors, the independent variables also incorporate several firm level financing and investment variables. Our main empirical model is described as follows.

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

In this equation (1), the term ΔX indicates unexpected changes in a general variable X. We regard the realized change as the unexpected change component of cash by following the approach of Faulkender & Wang (2006). The dependent variable $r_{i,t}-R_{i,t}^B$ is the excess stock return of firm i over the fiscal year t where $r_{i,t}$ is the firm's stock return and $R_{i,t}^B$ is the benchmark portfolio return. The independent variables contain firm characteristic ratios to control the sources idiosyncratic risks that may be correlated with the changes in cash holdings. The financing variables are cash holdings, $C_{i,t}$, interest expenses $I_{i,t}$, market leverage $L_{i,t}$, and the firm's net financing $NF_{i,t}$. Earnings before interest and extraordinary items, $E_{i,t}$ capture the influence of a firm's profitability on changes in cash holdings. Total assets net out of cash holding, $NA_{i,t}$ and R&D expenditures, $RD_{i,t}$ are introduced to control for a firm i's investment decisions. To consider payout activities, the amount of dividends, $D_{i,t}$ is also included. All variables are divided by the market value of equity in the previous year, $M_{i,t-1}$, which allows interpreting the obtained coefficient as the dollar change in shareholders' value for one dollar increase in the corresponding independent variables.

In our baseline model, the marginal value of cash for an average firm, MVC is obtained 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 of prior period cash holdings deflated by the market equity value and $\overline{L}$ is the average market leverage ratio.

3.2. Data Description

We estimate this marginal value of cash for the retail firms traded in Korean Stock Exchange from 1991 to 2013. We use WISEfn database to obtain accounting statements for the sample of retail firms. The break points for the 4 by 4 benchmark portfolios formed on size and BE to ME portfolio are from the results of Son, Kim, & Yoon (2009). All benchmark returns correspond to a firm's fiscal year.

All other variable constructions are in line with the approach of Faulkender & Wang (2006). The market value of equity is defined as the number of outstanding shares multiplied by the stock's closing price at the end of the fiscal year. Net assets is total book assets minus cash holdings. Cash holdings refer to cash plus marketable securities. The profitability measure is earnings before interest and taxes (EBIT). Market leverage is the debt to market value ratio, calculated as the sum of short term and long term debt over the sum of market value of equity and total debt. Net financing is defined as total equity issuance less repurchases plus debt issuance minus debt retirements. If R&D expenditures are missing, we set the values equal to zero. All variables in our estimations are winsorized at 1% level.

Table 1 summarizes our main variables of interests. This table documents the mean, 1st quartile (p25), median (p50), 3rd quartile (p75) and standard deviation (sd) of each variable used in our estimation. All variables except the market leverage are divided by the lagged market equity value. The variables of interests are $r_t\text{-}R_t^B$, the exceess return with the benchmark of 4 by 4 portfolios formed on BE/ME and size; $\Delta C_t/M_{t-1}$, the change of cash holdings; C_t/M_{t-1}, the amount of cash stock; $\Delta E_t/M_{t-1}$, the changes in cash flow generation; $\Delta NA_t/M_{t-1}$, the change net asset value; $\Delta RD_t/M_{t-1}$, the change in R&D expenditure; $\Delta I_t/M_{t-1}$, the change in interest expenses; $\Delta D_t/M_{t-1}$, the change in dividend payout; L_t, market leverage ratio; and NF_t/M_{t-1}, net financing.

<Table 1> Summary Statistics

stats	mean	p25	p50	p75	sd
$r_t\text{-}R_t^B$	0.050	-0.287	-0.061	0.175	0.612
$\Delta C_t/M_{t-1}$	-0.004	-0.052	-0.001	0.053	0.253
C_t/M_{t-1}	0.248	0.033	0.112	0.242	0.395
$\Delta E_t/M_{t-1}$	0.013	-0.023	0.009	0.060	0.297
$\Delta NA_t/M_{t-1}$	0.093	-0.110	0.144	0.465	1.020
$\Delta RD_t/M_{t-1}$	-0.000	0.000	0.000	0.000	0.002
$\Delta I_t/M_{t-1}$	-0.010	-0.013	0.000	0.013	0.139
$\Delta D_t/M_{t-1}$	0.002	0.000	0.000	0.001	0.017
L_t	0.574	0.380	0.571	0.781	0.244
NF_t/M_{t-1}	0.038	-0.132	0.061	0.335	1.001

<Table 2> Correlations in Variables

Vars	r-R^B	ΔC/M	C/M	ΔE/M	ΔNA/M	ΔRD/M	ΔI/M	ΔD/M	L	NF/M
r-R^B	1.00									
ΔC/M	0.16	1.00								
C/M	-0.03	-0.30	1.00							
ΔE/M	0.05	-0.18	0.01	1.00						
ΔNA/M	0.07	-0.04	-0.42	0.13	1.00					
ΔRD/M	0.14	0.20	-0.04	0.03	0.01	1.00				
ΔI/M	-0.16	0.01	-0.14	-0.07	0.14	-0.01	1.00			
ΔD/M	0.18	-0.06	0.03	0.13	-0.04	0.00	-0.28	1.00		
L	-0.22	-0.03	0.29	0.05	-0.15	-0.01	-0.01	0.01	1.00	
NF/M	-0.05	0.35	-0.38	-0.18	0.66	0.03	0.09	-0.14	-0.07	1.00

<Table 3> Estimation Results: All Retail Firms

Benchmark Return	4 by 4 Portfolio		Market Return	
$\Delta C_t/M_{t-1}$	0.727***	0.596	0.781**	0.999
	(2.8)	(0.7)	(2.5)	(1.0)
$\Delta E_t/M_{t-1}$	-0.015	-0.011	-0.137	-0.144
	(-0.1)	(-0.1)	(-0.7)	(-0.8)
$\Delta NA_t/M_{t-1}$	0.192***	0.189***	0.188***	0.193***
	(3.1)	(3.0)	(2.7)	(2.8)
$\Delta RD_t/M_{t-1}$	26.544*	28.796	18.050	14.295
	(1.7)	(1.3)	(1.2)	(0.6)
$\Delta I_t/M_{t-1}$	-0.564*	-0.563*	0.053	0.052
	(-1.8)	(-1.8)	(0.1)	(0.1)
$\Delta D_t/M_{t-1}$	5.037*	4.984*	8.149***	8.246***
	(1.9)	(1.9)	(2.8)	(2.9)
C_t/M_{t-1}	0.199	0.192	0.328*	0.342
	(1.3)	(1.0)	(1.9)	(1.5)
L_t	-0.570***	-0.572***	-0.616***	-0.613***
	(-3.2)	(-3.2)	(-3.2)	(-3.2)
NF_t/M_{t-1}	-0.185**	-0.184***	-0.137	-0.138
	(-2.6)	(-2.6)	(-1.5)	(-1.6)
$(\Delta C_t/M_{t-1})*C_t-1/M_{t-1}$		-0.044		0.091
		(-0.1)		(0.2)
$(\Delta C_t/M_{t-1})*L_t$		0.231		-0.404
		(0.2)		(-0.3)
Intercept	0.307***	0.310***	0.334***	0.329***
	(2.7)	(2.7)	(2.8)	(2.7)
N	242	242	242	242
$adj.R^2$	0.159	0.152	0.130	0.124
Implied MVC	0.72	0.73	0.78	0.79

In Table 1, a median retail firm has –0.061 of one year excess return, even though the average excess return is slightly positive. These values of mean and median returns indicate a weakly right-skewed distribution of excess returns. The mean and median of change in cash holdings are slightly negative but do not differ significantly, which suggests a relatively symmetric shape of distribution. In contrast, the mean value of cash holding is far higher than its median counterpart. The changes in net assets and net financing vary quite substantially across firms. Yet the changes in R&D expenditures and interest expenses remain relatively unchanged around 0, which probably indicates rigidities in R&D expenditures and debt financing policies.

To check potential multicollinearity issues in variables, Table 2 reports the pair-wise correlations in the variables used for the estimation of our baseline model.

The correlation results reported in Table 2 indicate no serious correlation between independent variables. In general, the pair-wise correlation between two independent variables is less than 0.5 in its terms of its absolute value. Only one exception is the correlation between net financing and changes in net assets. Yet, this correlation is still smaller than 0.7, which permits us to conclude no serious multicollinearity issue in our empirical estimations.

4. Empirical Results

4.1. The Whole Sample Analysis

We firstly investigate the whole sample of Korean retail firms. This examination helps us to confirm potential agency problems between a manager and shareholders.

Table 3 documents the estimation results of marginal cash values for the whole sample of Korean retail firms. The first two regressions use the benchmark return, R_{it}^B, as the 4 by 4 portfolios formed on the size and BE to ME ratios. The next two regressions set the benchmark return as the market portfolio returns by following the assumption of CAPM. This table re-

ports the estimated coefficients, t-values (in parenthesis) and the marginal value of cash implied by each estimation. For each benchmark return, our first empirical model does not include any interaction terms. For our second model, we permit the change in cash to interact with the level of previous period cash holdings, and with current market leverage ratios. These two empirical models are adopted from the study of Faulkender & Wang (2006). '*' indicates the statistical significance of 90% level. '**' and '***' point to the significance of 95% level and 99% level, respectively.

The estimated marginal cash values point to significant agency conflicts between a manager and shareholders in Korean retail industry. In the estimation using 4 by 4 benchmark returns, the first model implies that shareholders value an additional dollar of cash inside a retail firm as 0.72. Considering the fact that the dividend income tax rate is around 15% in Korea, this value suggests significant agency conflicts between a manager and shareholders in retail firms; existing theories without agency conflicts predict that the marginal value of cash cannot be lower than 1-dividend income tax rate, 0.85 in Korea. While we permit the change in cash holdings to interact with prior cash holdings and current leverage ratios, the marginal value of cash is still around 0.73.

The change of benchmark return does not induce substantial changes in the estimated value of marginal value of cash. The first model with CAPM as the benchmark return calculates the marginal value of cash as 0.78. The inclusion of interaction variable does not change the marginal value of cash substantially. The value is still 0.79 in the second model.

The effects of other financing and investment variables on firm values are also noteworthy. Unlike the findings of Faulkender & Wang (2006), the increases in profitability have negative correlations with a firm's excess return, while those values are statistically insignificant. The increases in interest payments have negative effects on the excess returns, which suggests an unfavorable signal of debt outstanding for the return of firm. Changes in net assets have positive coefficients, implying positive valuation effects of investments to shareholders.

Our findings robustly suggest that the marginal value of cash for an average retail firm is around 0.75. For different empirical models and benchmark return, the marginal value of cash is stable around 0.75. This stable results reinforce the validity of our estimated marginal cash value even without a great number of samples.

This lower marginal value of cash indicates the existence of the conflicts between a manager and shareholder in Korean retail corporations. This finding is also in line with existing studies highlighting significant resource diversion problems in Korean corporations. For instance Bae et al. (2002) & Baek et al. (2006) argue for considerable resource diversions in Korean corporations, which potentially reduces the marginal shareholder value of cash.

4.2. The Analysis of Sub-Sample Periods

This section examines whether the choice of time period affects the marginal value of cash in retail firms. To mainly control the effect from the IMF crisis of 1997, we split the whole sample into two time periods- before and after 2001. This sample selection is also in line with the study of Lim & Choi (2005). Their paper argues that the cash policy of Korean firms has changed considerably after the IMF crisis of 1997, especially during 2000s.

<Table 4> Estimation Results: Before 2001

Benchmark Return	4 by 4 Portfolio		Market Return	
$\Delta C_t/M_{t-1}$	0.628**	3.063	0.738**	6.104***
	(2.3)	(1.3)	(2.0)	(3.4)
$\Delta E_t/M_{t-1}$	-0.233	-0.271	-0.473**	-0.554**
	(-1.3)	(-1.5)	(-2.1)	(-2.4)
$\Delta NA_t/M_{t-1}$	0.139	0.184**	0.148	0.246**
	(1.6)	(2.1)	(1.3)	(2.3)
$\Delta RD_t/M_{t-1}$	5922.481**	5770.080*	4645.083	4312.852
	(2.1)	(2.0)	(1.0)	(0.9)
$\Delta I_t/M_{t-1}$	-1.030***	-1.009***	-0.378	-0.326
	(-2.9)	(-2.9)	(-0.9)	(-0.8)
$\Delta D_t/M_{t-1}$	0.388	1.469	4.980	7.391**
	(0.1)	(0.6)	(1.4)	(2.4)
C_t/M_{t-1}	0.043	0.057	0.246	0.294
	(0.2)	(0.3)	(1.1)	(1.1)
L_t	-1.108**	-1.101**	-1.279**	-1.254**
	(-2.2)	(-2.1)	(-2.3)	(-2.1)
NF_t/M_{t-1}	-0.207***	-0.220***	-0.152	-0.177*
	(-2.7)	(-3.0)	(-1.4)	(-1.9)
$(\Delta C_t/M_{t-1})*C_{t-1}/M_{t-1}$		0.050		0.226
		(0.1)		(0.4)
$(\Delta C_t/M_{t-1})*L_t$		-3.173		-7.125***
		(-1.0)		(-3.2)
Intercept	0.854**	0.827*	0.941**	0.871*
	(2.1)	(1.9)	(2.1)	(1.8)
N	74	74	74	74
$adj.R^2$	0.339	0.340	0.213	0.279
Implied MVC	0.62	0.60	0.73	0.63

<Table 5> Estimation Results: After 2001

Benchmark Return	4 by 4 Portfolio		Market Return	
$\Delta C_t/M_{t-1}$	0.763**	0.832	0.731**	1.450
	(2.1)	(0.8)	(2.0)	(1.4)
$\Delta E_t/M_{t-1}$	0.194	0.193	0.505	0.482
	(0.6)	(0.6)	(1.5)	(1.5)
$\Delta NA_t/M_{t-1}$	0.325***	0.332***	0.331***	0.381***
	(3.6)	(3.9)	(3.8)	(3.9)
$\Delta RD_t/M_{t-1}$	26.820	27.337	17.970	9.177
	(1.3)	(1.1)	(0.8)	(0.4)
$\Delta I_t/M_{t-1}$	0.642	0.591	0.373	0.211
	(1.1)	(0.9)	(0.6)	(0.3)
$\Delta D_t/M_{t-1}$	10.818**	10.282**	11.790**	11.820**
	(2.6)	(2.5)	(2.5)	(2.4)
C_t/M_{t-1}	0.397	0.303	0.442	0.277
	(1.5)	(1.1)	(1.5)	(1.0)
L_t	-0.578**	-0.567**	-0.546**	-0.527**
	(-2.6)	(-2.5)	(-2.3)	(-2.2)
NF_t/M_{t-1}	-0.262*	-0.269*	-0.202	-0.236*
	(-1.7)	(-1.8)	(-1.5)	(-1.7)
$(\Delta C_t/M_{t-1})*C_{t-1}/M_{t-1}$		-1.113		-1.761*
		(-1.1)		(-1.7)
$(\Delta C_t/M_{t-1})*L_t$		0.885		0.307
		(0.6)		(0.2)
Intercept	0.240*	0.237*	0.246*	0.235*
	(1.8)	(1.8)	(1.8)	(1.7)
N	168	168	168	168
$adj.R^2$	0.188	0.186	0.183	0.187
Implied MVC	0.76	1.076	0.73	1.31

Table 4 reports the estimation results of marginal cash values for Korean retail firms before 2001. The first two regressions adopt the benchmark return, RitB as the 4 by 4 portfolios formed on the size and BE to ME ratios. The next two regressions set the benchmark return as the market portfolio returns based on the assumption of CAPM. This table documents the estimated coefficients, t-values (in parenthesis) and the marginal value of cash implied by each empirical model. For each benchmark return, our first model excludes any interaction terms. For our second empirical model, we allow the change in cash to interact with the level of previous period cash holdings, and with current market leverage ratios. These two empirical models are in line with the study of Faulkender & Wang (2006). '*' points to the statistical significance of 90% level. '**' and '***' indicate the statistical significance of 95% level and 99% level, respectively.

The estimated marginal cash values point out more substantial conflicts between a manager and shareholders in Korean retail industry before 2001. In the estimation using 4 by 4 benchmark returns, the first model implies that the shareholders value an additional dollar of cash inside a retail firm as 0.62, which is far lower than its whole sample counterpart, 0.72. After considering the interaction term, the estimated marginal value of cash becomes smaller to 0.60, which is still quite lower than its counterpart documented in Table 3. The change of benchmark return to the market portfolio return does not induce

substantial changes in these tendencies. For instance, the estimated marginal value of cash in the model with interaction term is 0.63. This value is quite smaller than the marginal cash value from the same empirical model with the whole samples, 0.79.

Table 5 reports the estimation results of marginal cash values for Korean retail firms after 2001. The first two regressions employ the benchmark return, RitB as the 4 by 4 portfolios formed on the size and BE to ME ratios. The last two regressions use the benchmark return as the market portfolio returns based on the assumption of CAPM. This table includes the estimated coefficients, t-values (in parenthesis) and the marginal value of cash implied by each empirical specification. For each benchmark return, our first model excludes any interaction variables. For our second empirical specification, we allow the change in cash to interact with the level of previous period cash holdings, and with current market leverage ratios. These two empirical models are consistent with the study of Faulkender & Wang (2006). '*' points to the statistical significance of 90% level. '**' and '***' indicate the statistical significance of 95% level and 99% level, respectively.

Our statistical results point out a higher marginal value of cash after 2000s compared to that of 1990s. For all empirical models, the implied marginal value of cash is generally greater than its counterpart in the estimation using the sample before 2001. For instance, the estimated marginal value of cash in the

second column is around 1.07, which is far greater than its corresponding value in Table 4, 0.60. Even though we change the benchmark return to the market portfolio return, the estimated marginal cash value is still far higher than its counterpart in Table 4.

This finding can be interpreted in a couple of ways. First of all, there is a possibility of improvement in corporate governance in 2000s. This is plausible because many stake holders, such as equity holders and creditors, began to pay considerable attention to the corporate governance structure of Korean firms after the crisis of 1997. For instance, Korean Corporate Governance Service started to publish a detailed set of corporate governance scores after 2003.

The other possibility is the tightening external financing conditions after the financial crisis of 1997. For instance, the Korean government began to recommend 200% debt to equity ratio for the publicly traded Korean firms. Such recommendation limits an excessive use of debt financing and tends to make internal funds more valuable, which may eventually increase the marginal value of cash. This economic reason is able to apply

for Korean retail industry case in the same way.

4.3. The Analysis of Financial Constraints

We examine the implication of financial constraints on the marginal value of cash for Korean retail firms. We adopt two different criteria to categorize financially constrained/unconstrained firms by following Almeida, Campello & Weisbach (2004). These two measures rely on long-term debt and commercial paper ratings, respectively. These bond ratings are provided by the Korea Investor Service (KIS). If a firm has credit ratings greater than or equal to A grade ($\geq$A) during the sample period, we categorize the firm as financially unconstrained. We group a firm as financially constrained, otherwise. In this estimation using the groups according to financial constraint, we only report the results from the 4 by 4 benchmark return case, while our results remain unchanged in the analysis using the market portfolio return as the benchmark.

\<Table 6\> Financial Constraints: Long-term Debt Ratings

Benchmark Return	4 by 4 Portfolio		Market Return	
$\Delta C_t/M_{t-1}$	1.018***	1.794	0.361	-0.080
	(3.7)	(0.9)	(1.2)	(-0.1)
$\Delta E_t/M_{t-1}$	-0.118	-0.151	0.091	0.140
	(-0.6)	(-0.7)	(0.4)	(0.6)
$\Delta NA_t/M_{t-1}$	0.139	0.157*	0.190*	0.168*
	(1.6)	(1.7)	(1.9)	(1.8)
$\Delta RD_t/M_{t-1}$	18.145	18.487	31.849*	39.289
	(1.6)	(1.6)	(1.7)	(1.6)
$\Delta I_t/M_{t-1}$	-0.425	-0.509	-0.520	-0.461
	(-1.0)	(-1.2)	(-0.9)	(-0.9)
$\Delta D_t/M_{t-1}$	12.092***	12.812***	-0.393	-0.735
	(3.9)	(3.4)	(-0.1)	(-0.2)
C_t/M_{t-1}	0.257	0.358	0.216	0.236
	(0.9)	(1.3)	(1.1)	(1.0)
L_t	-0.874***	-0.895***	-0.461**	-0.457**
	(-2.8)	(-2.9)	(-2.1)	(-2.0)
NF_t/M_{t-1}	-0.173	-0.164	-0.110	-0.095
	(-1.6)	(-1.5)	(-1.1)	(-1.0)
$(\Delta C_t/M_{t-1})*C_{t-1}/M_{t-1}$		0.513		0.231
		(0.6)		(0.4)
$(\Delta C_t/M_{t-1})*L_t$		-1.607		0.350
		(-0.6)		(0.2)
Intercept	0.525***	0.520***	0.171	0.175
	(2.9)	(2.9)	(1.1)	(1.1)
N	122	122	120	120
$adj.R^2$	0.261	0.254	0.113	0.102
Implied MVC	1.02	0.97	0.36	0.19

Table 6 reports the estimated marginal cash values according to the financial constraint measures based on long-term debt ratings. The empirical models use the 4 by 4 size-BE/ME portfolios as the benchmark returns. The table shows the estimated coefficients, t-values (in parenthesis) and the marginal value of

cash. The first two estimation results are related to the financially unconstrained firms. The last two estimation results are associated with the financially constrained ones. We use the same empirical models analyzed in the previous tables.

Table 6 indicates that the marginal cash value of financially

constrained firms is indeed lower than that of financially uncon-strained one in Korean retail industry. This finding is robust to the use of different empirical models. For instance, the esti-mated marginal values of cash for the financially unconstrained firms are 1.02 and 0.97 for the two empirical models. These values are quite higher than their counterparts reported in the third and fourth columns, 0.36 and 0.19 respectively.

Our finding indicates potentially more severe agency prob-lems in financially constrained firms. Faulkender & Wang (2006) theoretically show that the marginal value of cash has to be higher for financially constrained firms without any agency frictions. More severe agency frictions in financially constrained firms only justify such lower marginal value of cash in these firms. This agency consideration is in line with the results of Dittmar & Mahrt-Smith (2007) investigating the relationship be-tween corporate governance scores and the marginal value of cash.

Table 7 documents the estimated marginal cash values ac-cording to the financial constraint measures based on commer-cial paper ratings. The empirical models adopt the 4 by 4 size-BE/ME portfolios as the benchmark returns. The table re-ports the estimated coefficients, t-values (in parenthesis) and the marginal value of cash. The first two estimation results are as-sociated with the financially unconstrained firms. The last two estimation results are related with the financially constrained ones. We employ the same empirical models analyzed in the previous tables.

Even with a different criterion of financial constraint, Table 7 robustly shows that the marginal cash value of financially con-strained firms is smaller than that of financially unconstrained ones in Korean retail industry. This finding remain unchanged for the different empirical models as well. For instance, the esti-mated marginal value of cash for the financially unconstrained firms are 1.16 and 1.63 for our empirical models. These values are quite higher than their counterparts documented in the third and fourth columns, 0.37 and 0.12 respectively.

Our finding provides another piece of empirical evidence ar-guing for potentially more severe agency problems in financially constrained firms. In contrast, our empirical results are not well aligned with the prediction of Faulkender & Wang (2006), which expect higher marginal cash values for financially constrained firms without agency considerations. Probably more substantial agency problems between a manager and shareholders in finan-cially constrained firms result in such lower marginal value of cash.

<Table 7> Financial Constraints: Commercial Paper Ratings

Benchmark Return	4 by 4 Portfolio		Market Return	
$\Delta C_t/M_{t-1}$	1.160***	2.490	0.374	-0.264
	(4.0)	(1.2)	(1.4)	(-0.3)
$\Delta E_t/M_{t-1}$	-0.087	-0.105	0.213	0.302
	(-0.5)	(-0.6)	(0.8)	(0.9)
$\Delta NA_t/M_{t-1}$	0.188**	0.224**	0.211*	0.180*
	(2.1)	(2.6)	(2.0)	(1.8)
$\Delta RD_t/M_{t-1}$	2028.123*	1929.387	29.049	39.893
	(1.8)	(1.6)	(1.4)	(1.6)
$\Delta I_t/M_{t-1}$	-0.406	-0.419	-1.031	-0.935*
	(-1.0)	(-1.1)	(-1.6)	(-1.7)
$\Delta D_t/M_{t-1}$	8.284***	7.689***	-3.610	-4.137
	(3.9)	(3.6)	(-0.8)	(-1.0)
C_t/M_{t-1}	0.633*	0.571	0.109	0.159
	(1.8)	(1.6)	(0.6)	(0.8)
L_t	-0.909***	-0.910***	-0.357	-0.356
	(-3.2)	(-3.3)	(-1.6)	(-1.6)
NF_t/M_{t-1}	-0.175**	-0.196**	-0.080	-0.058
	(-2.0)	(-2.2)	(-0.7)	(-0.5)
$(\Delta C_t/M_{t-1})*C_{t-1}/M_{t-1}$		-0.437		0.398
		(-0.8)		(0.7)
$(\Delta C_t/M_{t-1})*L_t$		-1.377		0.426
		(-0.5)		(0.3)
Intercept	0.506***	0.503***	0.104	0.108
	(3.0)	(3.0)	(0.7)	(0.7)
N	132	132	110	110
$adj. R^2$	0.261	0.255	0.149	0.147
Implied MVC	1.16	1.63	0.37	0.12

5. Concluding Remarks

5.1. Summary

This paper studied how much investors value one additional dollar of cash inside Korean retail firms. The estimated marginal cash value is around 0.75 for an average Korean retail firm, which suggests a significant agency frictions in cash management policy. Our analysis on financial constraint also points out that a more severe agency conflicts in financially constrained retail firms. Their marginal value of cash is lower than 0.4, which is even smaller than that of financially unconstrained ones. This finding argues against the widely accepted cross-sectional prediction of Faulkender & Wang (2006). Our sub-period analysis also indicated that this lower marginal value of cash is probably originated from severe agency conflicts during 1990s. The estimated marginal value of cash is significantly lower during 1990s.

5.2. Discussion

Our empirical findings provide important implications on Korean firm's cash policy. Most of all, our estimation results are consistent with the agency view on cash management policy. Without considerations of agency frictions, it is quite difficult to explain a low marginal value of cash for an average retail firm and a substantially lower marginal value of cash for a financially constrained retail firm. Our empirical finding is in line with prior studies emphasizing substantial resource diversion problems in Korean firms such as Bae et al. (2002) and Baek et al. (2006).

Furthermore, this considerably low marginal value of cash implies that one dollar of dividend payout might be more valuable to shareholders rather than one additional dollar of cash holdings. This point may also have substantial policy implications, especially with respect to the introduction of retention taxes on excessive cash holdings.

Our empirical findings from Korean retail firms are not well aligned with the widely accepted cross-sectional prediction of Faulkender & Wang (2006). They predict a higher marginal value of cash for financially constrained firms. Yet, our analysis on Korean retail industry shows exactly opposite results, which have to be examined more thoroughly from cash management theory perspectives.

5.3. Future Directions

While we propose the existence of substantial agency problems in Korean retail firms, we do not compare our results across Korean industries. Such inter-industry story provides ample empirical regularities which help to understand the cash management policy in Korean corporations. Moreover, the inclusion of retail firms in KOSDAQ enriches the results of our empirical analysis. We leave these research topics for future studies.

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