

Business Diversification and The Marginal Value of Cash under Financial Constraints and Agency Problem

Author: Hyunsoo Kim¹; Soeun Kim²

Affiliation: Department of Culture and Art Management, Sangmyeong University, Korea¹

Department of Global Finance and Management, Sangmyeong University, Korea²

E-mail: hskim@smu.ac.kr¹; sekim@smu.ac.kr²

ABSTRACT

This study empirically analyzes the effect of business diversification on the marginal value of cash holdings for diversified companies listed on the securities market of Korea Exchange. The main results are as follows. Shareholders assess the marginal value of cash held by the company lower than the cash individually owned, and shareholders assess the marginal value of cash holding low if the existing cash holding is excessive. In addition, shareholders assess the marginal value of cash holdings low for entities with high leverage levels because the interest costs increase due to the increased cost paid to the creditor among the added value created by the cash holding caused by high profit. And as a result of classification based on financial constraints such as dividend payments, capital market access and credit ratings, the companies with financial constraints than the companies without financial constraints assess the marginal value of cash higher while shareholders of the companies with financial constraints than the companies without financial constraints assess the marginal value of cash higher in terms of liquidity management that plays a role of preparation asset. In addition, the higher the existing level of cash holdings by the companies with financial constraints than the companies without financial constraints, the lower the marginal value of the cash holding is discounted, and the higher the existing level of cash holdings by the shareholder of the companies with financial constraints than the companies without financial constraints, the lower discount of marginal value of the cash holding. Besides, the higher the leverage level by the companies with financial constraints than the companies without financial restrictions, the lower discount of marginal value about the cash holding, and the lower the diversification discounts.

Keywords: Business Diversification, Marginal Value of Cash Holdings, financial constraints

1. INTRODUCTION

The companies expose problems such as increased profitability, liquidity, and debt ratios due to aggressive investments like business diversification such as business expansion and borrowing management, but they are positive in terms of leading future investments. Currently, with uncertainties in the global economy rising, most companies tend to prefer to keep cash instead of investing. The global trend is that shareholders watch out excessive cash holdings and are trying to increase shareholder value by suggesting the shareholder-friendly policies such as dividends. From the past, companies have focused on expanding their business to increase their scale by diversifying their business. Before IMF, the companies expanded their business more aggressively, but after the IMF, they have expanded the business into a conservative approach, there remain the conflicting aspects in the business diversification from the view of selection and focus. Korean firms do not have many precedent studies on corporate diversification, and in particular, there is a lack in determining how much the marginal value of cash is according to the cash holding of the companies which have performed the diversification, or whether the measurement of marginal value is important or not. Opler et al. (1999) suggested that there is a possibility to actively invest cash because the companies tend to secure future growth engines through diversification, mergers, and acquisition. Harford (1999) said when five years have passed after a company pursued a merger or acquisition using cash, it would not be able to procure excessive cash demand in the capital market, adversely affecting the business performance such as operating profit, Harford(2008)

said that companies with weak governance are likely to make strategic investments such as dominant shareholder defense by using the cash holding for the protection of major shareholder. In addition, Faulkender and Wang (2006) analyzed the direct effect of an entity's cash holding on to its shareholders' value, noting that the more the cash holding of company, the lower the marginal value of cash holding, commented that this is the evidence that the entity's cash holding damages its shareholder value. Dittmar and Mahrt-Smith (2007) stated that entities with proxy problems experience a greater decline in the marginal value of cash than the decrease of current value by the companies without financial constraint. Berger and Ofek (1995) first discovered diversification discounts, interpreting that is the evidence of corporate value damage from diversification, and announced the research result that the size of diversification discount is about 15% when the corporate value is measured by using Tober-q. Denis et al. (1997) stated that the diversification discount is related with the issue of proxy, it is identical with the research of Myers and Rajan(1998) that the managers use the cash asset, not for the investment but the individual purpose, also identical with the suggestion by Jensen(1986) that the managers obtain the incidental personal profit through diversification. Shin and Stulz (1998) and Rajan et al. (2000) found that diversification discounts were related to the inefficiency of internal capital markets by diversified companies. That is, the diversified firms would allocate fewer resources to the department with high investment opportunities through the domestic capital market and rather allocate more resources to the department with low investment opportunities. Also, Amihud and Lev (1981) noted that managers are more likely to diversify their business to avoid the risk rather than to innovate in consideration of the risks of the business. This study intends to explore how much the corporate business diversification affects the marginal value of cash holding. Total 22 years from 1996 to 2017 are set as an analysis period, and 4,271 companies-years counts will be analyzed as sample data only for diversified companies in corporate stocks listed on the Korea Exchange. This study uses the cross-sectional data, which may appear problems of heteroscedastic and series correlation at the same time, so this study will create the panel data incorporating time series and cross-section data for analysis.

2. MODELS and VARIABLES

In order to analyze the effect of corporate diversification on the marginal value of cash holdings,

the value evaluation model which expands the stock excess earning rate decision model by Faulkender and Wang(2006) was set as shown in Equation (1), and measured the stock excess earning rate in the manner to subtract benchmark earning rates from stock earning rates.

$$R_{i,t} - R_{i,t}^E = \beta_0 + \beta_1 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \beta_2 \text{Diversification}_{i,t}^d \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \beta_3 \frac{C_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \beta_4 L_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \beta_5 \frac{\Delta \text{EBIT}_{i,t}}{M_{i,t-1}} + \beta_6 \frac{\Delta \text{NA}_{i,t}}{M_{i,t-1}} + \beta_7 \frac{\Delta I_{i,t}}{M_{i,t-1}} + \beta_8 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \varepsilon_{i,t}$$

(1)

Where, $R_{i,t}$ =i company's stock earning rate in t year

$R_{i,t}^E$ =i company's benchmark earning rate in t year

$M_{i,t-1}$ =i company's total market capitalization in t-1 year

$\Delta C_{i,t}$ =i company's cash holding change in t year

$C_{i,t-1}$ =i company's cash holding in t-1

$\text{Diversification}_{i,t}^d$ =i company's diversification dummy in t year

$\Delta \text{EBIT}_{i,t}$ = i company's EBIT change in t year

$\Delta \text{NA}_{i,t}$ = i company's non-cash net asset change in t year.

$\Delta \text{INT}_{i,t}$ =i company's interest cost change in t year

$\Delta D_{i,t}$ =i company's dividend change in t year

$\varepsilon_{i,t}$ =Error term

In formula (1) the share excess earning rate ($R_{i,t} - R_{i,t}^E$) that is a dependent variable is measured in the manner of the Grinblatt and Moskowitz (2004) that subtracts the benchmark earning rate from the stock earning rate[i company's stock earning rate in t year ($R_{i,t}$) - i company's benchmark earning rate in t year ($R_{i,t}^E$)]. For the benchmark earning rate ($R_{i,t}^E$),

use the scale and BM ratio contained in the three elements model by Fama and French(1993), form 25 benchmark portfolios, and measure it at a value-weighted rate based on the annual market capitalization by benchmark portfolio to which the entity is affiliated. Among the independent variables in Equation (1), the change rate in cash holdings

($\Delta C_{it}/M_{it-1}$) is measured in the manner of [(i company's cash and cash equivalent asset in t year - i company's cash and cash equivalent asset in t-1 year)/(i company's market capitalization in t-1 year)], and the interaction variable($Diversification_{it}^c \times \Delta C_{it}/M_{it-1}$) between the diversification dummy and the cash holding change ratio is measured by multiplying the diversification dummy 1 by the cash holding change ratio, EBIT change rate($\Delta EBIT_{it}/M_{it-1}$) is measured in the manner of [(i company's EBIT in t year - i company's EBIT in t-1 year)/(i company's market capitalization in t-1 year)] and non-cash net asset change ratio($\Delta NA_{it}/M_{it-1}$) is measured in the manner of Dittmar et al.(2003) [(i company's total asset in t year - i company's cash and cash equivalent asset in t year) - (i company's total asset in t-1 year - i company's cash and cash equivalent asset in t-1 year)]/(i company's total capitalization in t-1 year)], R & D investment change rate ($\Delta RD_{it}/M_{it-1}$) is measured in the manner of [(i company's R & D investment in t year - i company's R & D investment in t-1 year) / (i company's market capitalization in t-1 year)], and the interest cost change rate($\Delta INT_{it}/M_{it-1}$) is measured in the manner of [(i company's interest cost in t year - i company's interest cost in t-1 year) / (i company's market capitalization in t-1 year)], and the ratio of change in dividend ($\Delta D_{it}/M_{it-1}$) is measured in the manner of [(i company's cash dividend in t year + i company's treasury stock purchase amount in t year) - (i company's cash dividend in t-1 year + i company's treasury stock purchase in t-1 year)] / (i company's market capitalization in t-1 year)] by including the cash dividend and treasury stock purchase amount.

3. DATA and DESCRIPTIVE STATISTICS

This study selected the sample companies from companies listed on the Korea Exchange's securities market based on the following criteria. First, the entities whose financial and stock price data are not available from 1 January 1996 to 31 December 2017 in the KIS Value Library, FnGuide and TS2000 are excluded, and the banking, securities, and insurance industries are excluded from sample companies because they differ from general manufacturing business in terms of capital structure, operating methods, and government supervision. The de-listed

company during the analysis period is excluded from the sample company, and the merged company or managed company during the analysis period is excluded from the sample company because of the continuity of financial data. In addition, companies with an asset total less than 1 billion won or no sales may generate the abnormal variables. 1% above and below of each variable are winsorized to control the effect of the outliers on the analysis results. The number of diversified entities-years that meet the above conditions is 4,271. Diversified companies are defined as those that have at least two or more divisions belonging to different standard industry classification codes under the Korean Standard Industry Classification (KSIC) (Tong, 2011). Diversified entities are classified as companies with financial constraints and companies without financial constraint depending on whether they are financially constrained or not. Subsample classification using the existence of dividend payments is classified as non-dividend and dividend companies based on dividend payments in accordance with the method in Lintner (1956). The subsampling classification according to accessibility to capital markets is classified in accordance with the method of Faulkender and Smith (2007), if the company's new debt or new shares issuance amount or debt repayment amount or capital reduction amount is more than 5% of the total assets, it is classified as an accessible entity, and if it is under 5%, it is classified as a non-accessible entity. Besides, the subsampling classification depending on the credit score level is classified into high credit score companies and low credit score companies based on the median of the credit scores of Korea Credit Rating Information Co., Ltd. according to the method of Aivazian et al. (2006). In this section, the probability distribution characteristics and anomalies of variables are identified by analyzing the basic statistics and correlations of the specific variables of the diversified entity. <Table 1> presents the basic statistical analysis of the specific variables of a diversified entity. As a result of the basic statistical analysis for diversified enterprises, the mean of the stock access earning rate is -1.10%, greater than the median -3.25%, and the mean of the change in cash holdings is 1.39%, less than the median 3.8%, which constitute asymmetric distribution. The mean of the interaction variable between the diversification dummy and the change in cash holdings is 0.01%, less than the median 0.07%, and the mean of the interaction variable between cash holdings ratio and cash holdings change ratio is 0.21%, higher than the median 0.16%, and the

mean of the interaction variable between the leverage ratio and the change in cash holdings is 0.78%, which is less than the median of 0.82%. The average of EBIT change rate is 1.49%, higher than the median 1.42%, the average ratio of non-cash net assets change rate is 9.53%, higher than the median 9.16%, and the average of interest cost change rate is -2.07%, lower than the median -1.90%, and the average rate of dividend change is 0.88%, lower than the median 1.04%. As a result of the analysis, the specific variables of most entities are not affected significantly by the extreme value, and their distributions are slightly more stable because the variables exceeding the top and bottom 1% are winsorized. <Table 2> represents the correlation of variables using Pearson's correlation coefficients. First, the percentage change in cash holdings, the percentage change in EBIT, the percentage change in non-cash net assets, and the percentage change in dividends have a significantly positive(+)correlation with the excess earning rate at 1~5%, respectively, the interest cost change rate has a significant positive(+)correlation with the stock access earning rate at 1%. Also, the

interaction variables between diversification dummy and cash holding change rates, interaction variables between cash holding rates and cash holding change rates, and interaction variables between leverage ratios and cash holding change rates have all significant negative(-)correlation with the stock access earning rate at 1~5%. Besides, the cases with significant correlations between the variables determining the excess earning rate are mixed with the cases without significant correlation, but the former has a correlation not exceeding 0.5, and so there is no concern of multicollinearity. In addition, when additionally checking the status of multicollinearity by measuring the variation inflation factors (VIFs) for each variable, the VIF value of the change rate in cash holdings was 2.76, which was the largest, but lower than the standard of statistic multicollinearity (Neter et al., 1990). Therefore, the multicollinearity issue that frequently occurs in regression analysis using financial variables is not worried.

<Table 1> Basic Statistics Analysis and Difference Verification

Variables	Diversified companies				
	Mean	Standard Deviation	Minimum value	Maximum value	Median
$R_{it} - R_{it}^E$	-0.0110	1.3347	-0.5642	0.4886	-0.0325
$\Delta C_{it}/M_{it-1}$	0.0139	0.5145	-0.5685	0.6287	0.0380
$Diversification_{it} \times \Delta C_{it}/M_{it-1}$	0.0001	0.4587	-0.3995	0.4904	0.0007
$C_{it-1}/M_{it-1} \times \Delta C_{it}/M_{it-1}$	0.0021	0.3988	-0.4589	0.7569	0.0016
$L_{it} \times \Delta C_{it}/M_{it-1}$	0.0078	0.4200	-0.3596	0.6948	0.0082
$\Delta EBIT_{it}/M_{it-1}$	0.0149	1.1299	-0.5857	0.5546	0.0142
$\Delta NA_{it}/M_{it-1}$	0.0953	0.5845	-0.4865	0.5867	0.0916
$\Delta INT_{it}/M_{it-1}$	-0.0207	1.0233	-0.3865	0.4758	-0.0190
$\Delta D_t/M_{t-1}$	0.0088	0.1134	-0.1386	0.1967	0.0104

***, **, * refers to be significant at 1%, 5% and 10% levels (both), respectively.

<Table 2> Correlation and Multicollinearity Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	VIFs
(1) $R_{it} - R_{it}^E$	1									
(2) $\Delta C_{it}/M_{it-1}$	0.019**	1								2.34
(3) $Diversification_{it} \times \Delta C_{it}/M_{it-1}$	-0.009**	0.356**	1							1.49
(4) $C_{it-1}/M_{it-1} \times \Delta C_{it}/M_{it-1}$	-0.151*	0.002*	-0.026*	1						1.32
(5) $L_{it} \times \Delta C_{it}/M_{it-1}$	-0.090*	-0.160*	-0.117**	0.189**	1					1.19
(6) $\Delta EBIT_{it}/M_{it-1}$	0.033**	0.163**	0.130**	-0.046**	0.233**	1				1.15
(7) $\Delta NA_{it}/M_{it-1}$	0.046**	0.011*	0.020**	0.005*	0.006**	0.004	1			1.08
(8) $\Delta INT_{it}/M_{it-1}$	-0.024**	0.379**	0.406**	0.025*	-0.082**	0.065**	0.028*	1		2.76
(9) $\Delta D_t/M_{t-1}$	0.019**	0.330**	0.561**	0.003	-0.132**	0.189**	0.012	0.211**	1	2.50

** , * refers to be significant at 1% and 5% levels (both), respectively.

4. EMPIRICAL RESULTES

This section analyzes the effect of corporate diversification on the marginal value of cash holdings under financial constraints. For this, the diversified companies are classified into companies with financial constraints and the companies without financial constraints according to their financial constraints, and the classification criteria include dividend payment, capital market access and credit score level. The marginal value of cash holdings is measured by applying a valuation model that extends the excess earning rate determination model by Faulkender and Wang (2006). <Table 3> presents the results of analyzing the effect of the diversification of business on the marginal value of cash holdings under financial constraints based on dividend payments. First, as a result of the analysis on [Model 1] and [Model 2], the change rate of cash holding ($\Delta C_{it}/M_{it-1}$) has a significantly positive(+) effect on the stock excess earning rate at 5% level, and its coefficient (β_1) is estimated 0.101 and 0.107. This is identical with Faulkender and Wang (2006)'s research result that the company's additional cash holding has a positive(+) influence to the corporate value but additional 1 won increase in cash means that the company's value will increase by 0.101 and 0.107 won, which is lower than 1 won, accordingly shareholders value the cash held by a company lower than the cash held by them. The interaction variable between the cash holding ratio and the cash holding change ratio has a significant negative

(-)effect on the stock excess earning rate at 5%, its coefficient(β_3) is -0.130. It means that shareholders value the marginal value of cash holdings low if their existing cash holding levels are excessive. Besides, the interaction variable between the leverage ratio and the change in cash holdings has a significant negative(-) effect on the stock excess earning rate at 10%, its coefficient(β_4) is -0.015. It means that shareholders underestimate the marginal value of cash holdings because companies with high leverage levels increase the interest cost to be paid to the creditors among the added value created from cash holding. The analysis results on the control variables show that the rate of change in EBIT, the rate of change in non-cash net assets, and the rate of change in dividends have a significantly positive(+) effect on the excess stock earning rate at 1%, and the rate of interest cost change has a significant negative(-) effect on the surplus stock earning rate at 1%. When analyzing [Model 3] using the dividend payment as a financial constraint criterion, the coefficient ($\beta_1=0.110$)of change in cash holdings of a financial constrained entity which is a non-dividend entity is significantly higher than that of the company without financial constraint which is dividend entity ($\beta_1=0.069$) at 10%, meaning that the marginal value per cash 1 Won is assessed higher by the company with financial constraints than the company without financial constraints, and the marginal value of cash reserved as liquidity is assessed

higher by the shareholder of the company with financial constraints than the company without financial constraints. And among the three interaction variables related to the rate of change in cash holdings, the absolute value of the negative(-) coefficient ($\beta_3 = -0.103$) of the interaction variable between the rate of cash holdings and the rate of change in cash holdings of the company with financial constraints than the company without financial constraints is significantly lower than the dividend company ($\beta_3 = -0.162$) without financial constraint at 10%, which means that the higher the level of existing cash holdings of non-dividing firms, the lower the marginal value of cash holdings is discounted, and the higher the existing level of cash holdings of the shareholder of company with financial constraint, the lower the marginal value of cash holdings is discounted than the company without financial constraint. Also, the absolute value of the negative (-) coefficient ($\beta_4 = -0.016$) of the interaction variable between the ratio and the rate of change in cash holding of leverage of non-dividend entity is significantly lower than the dividend entity ($\beta_4 = -0.176$) at 10%, meaning that the higher the leverage level of a non-dividend entity, the lower the marginal value of cash holding is discounted. In addition, the absolute value of the negative(-) coefficient ($\beta_2 = -0.012$) of the interaction variable between the diversification dummy and the change in cash holdings of the non-dividing firm is significantly lower than the dividend firm ($\beta_2 = -0.095$) at 10%, this means that a non-dividend company which is the company with financial constraint has a decreased diversification discount than the dividend company, which is the company without financial constraint. <Table 4> presents the results of an analysis of the effect of an entity's diversification on the marginal value of its cash holding under financial constraints based on capital market accessibility. First, the coefficient ($\beta_1 = 0.034$) of cash holding change ratio of a capital market non-access entity which is the company without financial constraint is significantly higher than that of the capital market non-accessible firm ($\beta_1 = 0.029$) at 10%, meaning that the marginal value of cash holding is evaluated higher in the company with financial constraint than the company without financial constraint. And among the three interaction variables related to the rate of change in cash holdings, the absolute value of the negative(-)

coefficient ($\beta_3 = -0.153$) of the interaction variable between the cash holdings rate and the rate of change in cash holdings of the capital market inaccessible firm which is the company with financial constraint is significantly lower than that of the capital market accessible firm which is the company without financial constraints ($\beta_3 = -0.201$) at 10%, meaning that the higher the existing level of cash holdings of a financially constrained firm, the lower the marginal value of cash holdings is discounted than the company without financial constraint, and the higher the cash holding, the lower the marginal value of cash holding is discounted than the company without financial constraint. In addition, the absolute value of the negative(-) coefficient ($\beta_4 = -0.019$) of the interaction variable between the ratio of leverage and the cash holding change ratio of the capital market non-access company which is the company with financial constraint, is significantly lower than that of the capital market access company ($\beta_4 = -0.201$) at 10%, meaning that the higher the leverage of the company with financial constraint, the lower the marginal value of cash holding of the company with financial constraint is discounted. And the absolute value of the negative(-) coefficient ($\beta_2 = -0.015$) of the interaction variable between the diversification dummy and the rate of change in cash holdings of the capital market inaccessible firm, which is the company with financial constraint, is significantly higher than that ($\beta_2 = -0.052$) of the capital market accessible company at 10%, meaning that the company with financial constraint has more decreased diversified discounts than the company without financial constraint. <Table 5> represents the results of analyzing the impact of corporate diversification on the marginal value of cash holdings under financial constraints based on the credit score level. First, the coefficient ($\beta_1 = 0.129$) of change in cash holdings of low credit rating firms (companies with financial constraint) is significantly higher than that of high credit score firms which is company without financial constraint ($\beta_1 = 0.093$) at 5%. It means that the marginal value of cash holding is assessed higher in the company with financial constraints than the company without financial constraint. And among the three interaction variables related to the cash holding change ratio, the absolute value of the negative (-) coefficient ($\beta_3 = -0.209$) of the interaction variable between the cash holding ratio and cash holding

<Table 3> Analysis of the effects of corporate diversification on the marginal value of cash holdings under financial constraints

Variables	Sign	Entity diversification			
		Total sample		Whether to pay the dividend or not	
		Model 1	Model 2	No dividend	Dividend
Constant	β_0	-0.219*** (-9.75)	-0.286*** (-11.04)	-0.116*** (-2.59)	-0.220*** (-7.53)
$\Delta C_{it}/M_{it-1}$	β_1	0.101** (2.11)	0.107** (2.03)	0.110* (1.89)	0.069 (1.04)
Diversification _{it} × $\Delta C_{it}/M_{it-1}$	β_2		-0.020** (-2.40)	-0.012* (-1.84)	-0.095 (-1.16)
$C_{it-1}/M_{it-1} \times \Delta C_{it}/M_{it-1}$	β_3	-0.122** (-2.21)	-0.130** (-2.28)	-0.103* (-1.80)	-0.162 (-1.11)
$L_{it} \times \Delta C_{it}/M_{it-1}$	β_4	-0.008* (-1.80)	-0.015* (-1.82)	-0.016* (-1.71)	-0.176 (-1.40)
$\Delta EBIT_{it}/M_{it-1}$	β_5	0.252*** (10.29)	0.254*** (10.51)	0.233*** (6.84)	0.341*** (8.68)
$\Delta NA_{it}/M_{it-1}$	β_6	0.057*** (6.69)	0.060*** (6.79)	0.056*** (4.84)	0.056*** (3.52)
$\Delta INT_{it}/M_{it-1}$	β_7	-0.381*** (-3.62)	-0.383*** (-3.55)	-0.355*** (-2.73)	-0.806*** (-3.46)
$\Delta D_{it}/M_{it-1}$	β_8	0.441*** (3.70)	0.446*** (3.76)	0.405*** (2.61)	0.465** (2.17)
Count of observation		4,271	4,271	1,472	2,799
Number of entities		320	320	275	302
Adjusted - R ²		0.2576	0.2673	0.1658	0.1576
F - value		247.56***	254.42***	198.55***	204.31***

() represents t-value in which the corrected standard error of White(1980), ***, **, * refers to be significant at 1%, 5%, 10% (both sides) respectively.

change ratio of the low credit rating company which is the company with financial constraint is significantly lower than that of the high credit rating firm ($\beta_3 = -0.266$) at 5~10%, meaning that the higher the existing cash holding of the company with financial constraint, the lower the marginal value of cash holding is discounted than the company without financial constraint, and the higher the existing cash holding of the company with financial constraint, the lower the marginal value of cash holding is discounted by the shareholder of the company with financial constraint than the company without financial constraint. In addition, the absolute value of the negative (-) coefficient ($\beta_4 = -0.217$) of the interaction variable between the leverage ratio and the cash holding change

rate of the low credit rating company which is the company with financial constraint is significantly lower than that of the high credit rating company ($\beta_4 = -0.329$) at 10%, meaning that the higher the leveraged level of financial constraint companies, the lower the marginal value of cash holdings is discounted. And the absolute value of the negative(-) coefficient ($\beta_2 = -0.029$) of interaction variables between the diversification dummy and the cash holding change ratio of a low credit rating entity, a company with financial constraint, is significantly lower than that of the high credit rating ($\beta_2 = -0.033$) at 5~10%, meaning that the financial constraint firm will have a lower discount than the financial non-constrained entity.

<Table 4> Analysis of the effects of corporate diversification on the marginal value of cash holdings under financial constraints

Variables	Sign	Corporate diversification			
		Total sample		Capital market accessibility	
		Model 1	Model 2	Non-access	Access
Constant	β_0	-0.219*** (-9.75)	-0.286*** (-11.04)	-0.188*** (-8.43)	-0.252*** (-4.53)
$\Delta C_{it}/M_{it-1}$	β_1	0.101** (2.11)	0.107** (2.03)	0.034* (1.72)	0.029* (1.80)
$Diversification_{it}^2 \times \Delta C_{it}/M_{it-1}$	β_2		-0.020** (-2.40)	-0.015* (-1.77)	-0.053* (-1.73)
$C_{it-1}/M_{it-1} \times \Delta C_{it}/M_{it-1}$	β_3	-0.122** (-2.21)	-0.130** (-2.28)	-0.153* (-1.89)	-0.201* (-1.91)
$L_{it} \times \Delta C_{it}/M_{it-1}$	β_4	-0.008* (-1.80)	-0.015* (-1.82)	-0.019* (-1.92)	-0.201* (-1.78)
$\Delta EBIT_{it}/M_{it-1}$	β_5	0.252*** (10.29)	0.254*** (10.51)	0.230*** (8.43)	0.328*** (4.50)
$\Delta NA_{it}/M_{it-1}$	β_6	0.057*** (6.69)	0.060*** (6.79)	0.063*** (5.91)	0.053** (2.44)
$\Delta INT_{it}/M_{it-1}$	β_7	-0.381*** (-3.62)	-0.383*** (-3.55)	-0.413 (-3.36)	-0.267 (-1.18)
$\Delta D_{it}/M_{it-1}$	β_8	0.441*** (3.70)	0.446*** (3.76)	0.435*** (3.20)	0.298 (1.27)
Count of observation		4,271	4,271	2,948	1,323
Number of entities		320	320	310	295
Adjusted - R ²		0.2576	0.2673	0.2286	0.2358
F - value		247.56***	254.42***	171.49***	201.73***

() represents t-value in which the corrected standard error of White(1980), ***, **, * refers to be significant at 1%, 5%, 10% (both sides) respectively.

<Table 5> Analysis of the effects of corporate diversification on the marginal value of cash holdings under financial constraints

Variables	Sign	Corporate diversification			
		Total sample		Level of credit rating	
		Model 1	Model 2	Low	High
Constant	β_0	-0.219*** (-9.75)	-0.286*** (-11.04)	-0.221*** (-7.86)	-0.232*** (-5.43)
$\Delta C_{it}/M_{it-1}$	β_1	0.101** (2.11)	0.107** (2.03)	0.129** (2.26)	0.093** (2.30)
$Diversification_{it}^2 \times \Delta C_{it}/M_{it-1}$	β_2		-0.020** (-2.40)	-0.029* (-1.75)	-0.033** (-2.11)
$C_{it-1}/M_{it-1} \times \Delta C_{it}/M_{it-1}$	β_3	-0.122** (-2.21)	-0.130** (-2.28)	-0.209* (-1.76)	-0.266** (-2.04)
$L_{it} \times \Delta C_{it}/M_{it-1}$	β_4	-0.008* (-1.80)	-0.015* (-1.82)	-0.217* (-1.75)	-0.329* (-1.71)
$\Delta EBIT_{it}/M_{it-1}$	β_5	0.252*** (10.29)	0.254*** (10.51)	0.353*** (6.92)	0.246*** (8.15)
$\Delta NA_{it}/M_{it-1}$	β_6	0.057*** (6.69)	0.060*** (6.79)	0.128*** (5.51)	0.040*** (4.32)
$\Delta INT_{it}/M_{it-1}$	β_7	-0.381*** (-3.62)	-0.383*** (-3.55)	-0.480** (-2.15)	-0.397*** (-3.06)
$\Delta D_{it}/M_{it-1}$	β_8	0.441*** (3.70)	0.446*** (3.76)	0.615*** (3.33)	0.381** (2.36)
Count of observation		4,271	4,271	2,135	2,136
Number of entities		320	320	279	269
Adjusted - R ²		0.2576	0.2673	0.1942	0.2006
F - value		247.56***	254.42***	218.40***	211.97***

() represents t-value in which the corrected standard error of White(1980), ***, **, * refers to be significant at 1%, 5%, 10% (both sides) respectively.

5. CONCLUSIONS AND DISCUSSION

This study empirically analyzes the effect of business diversification on the marginal value of cash holdings for diversified companies listed on the securities market of Korea Exchange. The main results are as follows. Shareholders assess the marginal value of cash held by the company lower than the cash individually owned, and shareholders assess the marginal value of cash holding low if the existing cash holding is excessive. In addition, shareholders assess the marginal value of cash holdings low for entities with high leverage levels because the interest costs increase due to the increased cost paid to the creditor among the added value created by the cash holding caused by high profit. And as a result of classification based on financial constraints such as dividend payments, capital market access and credit ratings, the companies with financial constraints than the companies without financial constraints assess the marginal value of cash higher while shareholders of the companies with financial constraints than the companies without financial constraints assess the marginal value of cash in terms of liquidity management that plays a role of preparation asset. In addition, the higher the existing level of cash holdings by the companies with financial constraints than the companies without financial constraints, the lower discount of marginal value about the cash holding, and the higher the existing level of cash holdings by the shareholder of the companies with financial constraints than the companies without financial constraints, the lower discount of marginal value about the cash holding. Besides, the higher the leverage level by the companies with financial constraints than the companies without financial constraints, the lower discount of marginal value about the cash holding, and the lower the diversification discounts. In conclusion, cash holding by diversified entities increases the value of the entity, but if the additional cash holding limit decreases in situations where the current cash holding level or leverage level is high, resulting in a diversified discount phenomenon in which the limit is further reduced. Diversified discounts may damage the shareholder value through a decline in corporate value, which means that the capital market regulates these entities. Therefore, diversified companies need to manage cash holding at an appropriate level in order to preserve shareholder value. However, the current companies may have a somewhat excessive aspect because cash holdings have increased uncertainty in the future.

Governments and corporations should consider institutional support which can induce future

investments by cash and strategic investments to secure future growth engines in advance. However, since this study was conducted only on diversified companies listed on the Korea Exchange's securities market and analyzed only to those that meet strict sampling standards, there may exist many limitations in generalizing the interpretation of the analysis results. Besides, since this study is only an early-stage study of the effect of business diversification on the marginal value of cash holding, it is considered to be necessary to expand the sample companies and diversify the analyzer method for more precise research in the future.

6. REFERENCES

- [1]. Aivazian, V., L. Booth and S. Cleary, "Dividend Smoothing And Debt Ratings," *Journal of Financial And Quantitative Analysis*, 41(2), 2006, pp.439-453.
- [2]. Amihud, Y. and B. Lev, "Risk Reduction as a Managerial Motive for Conglomerate Mergers," *Bell Journal of Economics*, 12(2), 1981, pp.605-617.
- [3]. Berger, P. and E. Ofek, "Diversification's Effect on Firm Value," *Journal of Financial Economics*, 37(3), 1995, 39-65.
- [4]. Denis, D. J., D. K. Denis and A. Sarin, "Agency Problems, Equity Ownership, and Corporate Diversification," *Journal of Finance*, 52(1), 1997, pp.135-160.
- [5]. Dittmar, A. and J. Mahrt-Smith, "Corporate Governance and the Value of Cash Holdings," *Journal of Financial Economics*, 83(3), 2007, 599-634.
- [6]. Fama, E. F. and K. R. French, "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics*, 33(1), 1993, pp.3-56.
- [7]. Faulkender, M. and J. Smith, "Are Adjustment Costs Impeding Realization of Target Capital Structure?" Working Paper, 2007.
- [8]. Faulkender, M. and R. Wang, "Corporate Financial Policy and the Value of Cash," *Journal of Finance*, 61(4), 2006, pp.1957-1990.
- [9]. Grinblatt, M. and T. J. Moskowitz, "Predicting Stock Price Movements From Past Returns: The Role of Consistency and Tax-loss Selling," *Journal of Financial Economics*, 71(3), 2004, 541-579.
- [10]. Harford, J., "Corporate Cash Reserves and Acquisitions," *Journal of Finance*, 54(6), 1999, pp.1969-1997.
- [11]. Harford, J., S. Mansi, and W. Maxwell, "Corporate Governance and Firm Cash Holdings in the US," *Journal Of Financial Economics*, 87(1), 2008, pp.535-555.
- [12]. Jensen, M., "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, 76(2), 1986, 323-329.
- [13]. Kennedy, P., *A Guide to Econometrics*, 3ed., (Basil

-
- Blackwell, Oxford: UK), 1992.
- [14]. Lintner, J.(1956), "Distribution of incomes of corporations among dividends, retained earnings, and taxes," American Economic Review 46, 97-113.
- [15]. Myers, S. and R. Rajan, "The Paradox of Liquidity," Quarterly Journal of Economics, 113(3), 1998, pp.733-771.
- [16]. Neter, J., M. Kutner, and W. Wasserman, Applied Linear Diversity: The Diversification Discount and Inefficient Investment," Journal of Finance 55(!), 2000, pp.35-80.
- Statistical Models: Regression, Analysis of Variance, and Experimental Designs, 1990.
- [17]. Opler, T., L. Pinkowitz, R. Stulz, and R. Williamson, "The Determinants and Implications of Corporate Cash Holdings," Journal of Financial Economics, 52(1), 1999, pp.3-46.
- [18]. Rajan, R., H. H. Servaes, and L. Zingales, "The Cost of

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