Categorical Financial Analyses on the Level of Corporate Cash Reserves for the Korean Chaebol Firms in the Post-Era of the Global Financial Crisis

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Abstract

The primary objective of implementing the study was to further investigate any pronounced financial components affecting the level of cash retention for the Korean chaebol firms. The research was framed to test for two hypotheses on the cash savings with utilizing the chaebol firms during the post-era of the global financial turmoil (from 2009 to 2013). In the first hypothesis test, any significant explanatory variables relative to the cash holdings, were identified in each corresponding category of the conditional quantile regression (CQR) model, while multilogistic regression analysis was performed to discriminate relevant financial factors in each pair of classes consisting of the chaebol firms. Concerning the results, liquidity, agency costs, and cash conversion cycle were found to be statistically significant in the majority of classified categories in the former test and liquidy, firm size, and dividend yield, also showed discriminating powers in each pair of categorical for the firms in the latter test.

■ keyword : | Cash Holdings | Chaebol Firms | Quantile Regression | Multilogistic Regression | Financial Determinant |

I. Introduction

This study addresses on the in-depth analyses on the financial determinants of cash holdings for the firms belonging to the large business conglomerates, so called as the 'chaebol' firms in the Korean domestic capital markets. Given the contemporary financial phenomenon of the excessive cash savings for the firms across borders or nations, it may be interesting or even impactful to further analyze proposed financial components which may have significant effects on corporate cash holdings. This study is an extension of the previous literature of Kim [1] and Kim [2] which examined the analogous subject on the chaebol firms' cash holdings, but further investigates any financial factors affecting the level of cash savings, applying the conditional quantile regression (CQR) analysis, as described later. It had been reported that the amount of total cash holdings reserved by 500 largest corporations increased to about KRW 158 trillion (i.e., equivalent to about US $1.44 billion) as of the 3rd quarter of 2014, in comparison to its previous level of 94.5 trillion KRW at the year-end of 2007. [3] On the contrary, the total amount of investments in fixed assets of domestic corporations tends to shrink in the trend after the global financial turmoil. For example, the amount in 2008 was estimated as more than KRW 100 trillion, followed by the about KRW 128.3 trillion in the year, 2013, but, decreased to the level of KRW 123.5 trillion in 2014. [3] Moreover, the proportion of cash-equivalent assets held by the 5 largest business conglomerates such as Samsung Group, Hyundai Mobile Group, SK Group, LG

Group, and Lotte Group, recorded 58.6% of the total amount of cash-equivalent assets possessed by the top 30 largest chaebols in assets as of the 1st quarter of 2015, which amounted to about KRW 32.74 trillion. [4]　Therefore, given the results derived from the preceding researches to identify financial components comprising corporate cash holdings for the chaebol firms, it may be worth noting to further examine any financial elements influencing on cash reserves, which were subdivided by each category of the chaebol firms on the basis of the level of cash holdings.

The primary motivation to implement the study may be as follows: First, very little attention has been paid in the previous empirical literature to detect any significant financial attributes on the level of cash holdings for the chaebol firms, which may be discriminated by each corresponding category where the chaebol firm belongs, as described.　It may also include any financially disparate factors between the chaebol firms being classified into the polarized categories such as the firms between the highest and the lowest levels of cash holdings.　Second, based upon the results obtained from the study, selective policy dependent on the level of cash holdings, may be more effectively implemented at the governmental and/or corporate level, given the ongoing debate or concern on the excessive cash savings retained by the chaebol firm among the interest parties such as policy makers, corporate managers, and investors in the domestic capital markets.　Third, by identifying any financial differences found in each hypothesis postulation, higher level of foreign investments in the form of FDI (Foreign Direct Investments) or portfolio diversification may be expected, given the ongoing agreements among the associated nations such as the FTA (Free Trade Agreement) and the TPP (Trans Pacific Partnership).

II. Review on the Previous Literature

The following literature was reviewed as updated references of the similar subject of corporate cash holdings in international context. .

First, by utilizing the sample data from the so-called as BRICS (Brazil, Russia, India, and China) belonging to the emerging capital markets and from the US and the UK as the advanced capital ones, Al-Najjar(2013) analyzed explanatory variables to affect the level of cash holdings for the firms headquartered in each sample nation. After controlling for time effects, five independent variables were utilized to proxy for profitability, leverage, dividend payout, size, and liquidity, respectively, and the last four predictor variables overall showed their significant effects on the level of cash reserves by applying two stage least squares (2SLS) estimation technique.　He stated that a firm' value may be maximized by searching for an optimal level of cash holdings theorized by the tradeoff rationale between the marginal cost and benefit of corporate cash savings, while there may not exist any optimal level to maximize the value in terms of Myers' pecking order theory related to asymmetric information.　As one of tests on the firms operated in the emerging capital markets.[5]

Farinha and Prego(2014) tested interesting empirical aspects for the firms located in Portugal which may suffer from current European financial crisis.　By employing dynamic pane data procedure, they found that there was a positive and persistent relationship with the dependent

variable of liquidity level and its lagged dependent variable as explanatory one in addition to the significant relationships of cash flow and its variability to the liquidity level.[6] Several advantages of which a firm may take by retaining cash reserves were illustrated by Lian et al.(2011) such as possible enhancement of financial flexibility related to the level of debt ratio, investment opportunities, and even its reputation. With employing the sample data of Chinese domestic firms, they provided evidences that Tobin' Q, financially unconstrained status of a firm, the event of the global financial crisis, may affect statistically significant effects on the level of cash holdings for the Chinese sample firms. On the other hand, a positive association between firm size and alternative dependent variable measuring for a change of cash holdings scaled by total assets, may be, to a large extent, attributable to the current stage of many firms classified into a relatively early stage of their business cycle, in comparison with those operated in an advanced capital market.[7]

The study done by Kim [1] examined one of the on-going issues on debate to discriminate any significant financial characteristics on the level of cash holdings of the Korean cheabol firms in the domestic capital markets. In the study, major findings on the financial characteristics to affect the level of cash holdings were presented by adopting several econometric estimations. The explanatory variables such as cash flow, market-to book-value ratio of total assets, reinvestments, and agency costs revealed their pronounced influences on the corporate cash savings for the chaebol firms during the post-period of the global financial crisis. Kim [2] performed to further examine the level of corporate cash holdings for the firms belonging to the chaebols in the Korean capital markets. The primary objective of the study was to corroborate any results obtained in the previous result inclusive of [1] for validity.

In line with more comprehensive independent variables proposed to be possible elements, several robust econometric estimation techniques such as static and dynamic panel data model, and Fama-Macbeth model were employed to derive the outcome for each corresponding model. More importantly, the financial elements which had been found to be significant in the precedent research by [1] still showed their statistical importance on the level of the cash liquidity for the chaebol firms, along with an additional exogenous variable representing cash conversion cycle.

III. Data Collection and Econometric Estimations

1. Data Sampling Criteria and Variable Definitions

This section described a data collection criteria and proposed variables inclusive of a dependent and explanatory variables adopted in each model to test for relevant hypotheses postulated. As an extensive study of discriminating financial determinants on cash reserves among the Korean chaebol firms categorized by each level of cash savings, this study utilized the same sampling criteria utilized in the previous researches of the analogous subject such as [1] and [2]. The particular rationale to select the time reference covering from 2009 to 2013 (for 5 years) in the study was to mitigate or eliminate any probable spill-over effects resulting from the financial event of the global turmoil, coupled with the recent ongoing debates on the excess cash

savings for the chaebol firms, as described earlier.

Table 1. Sampling Criteria to finalize Korean Firms Belonging to the Chaebols

1. All the data for the variables employed in each corresponding model were available for at least five years from 2009 to 2013, which comprehended the post-period of the global financial turmoil.
2. The sample firms were listed on either the KOSPI or the KOSDAQ market during the investigated period.
3. The firms were in the population of the database of New KisValue sourced by the NICE.
4. The criteria to classify a firm into belonging to the chaebols during the sample period, were established in line with the official guideline made by the Fair Trade Commission (FTC) in the Republic of Korea, as it was the one to be classified into a 'Large Business Group', subject to the ceiling limits on cross-shareholding corporate structure.
5. Financial and regulated industries were excluded in the final data collection.

For reference, total number of the sample firms utilized in the study were 157, which were selected on the basis of the definition in [Table 1] during the studied period (for 5 years). They were inclusive of primary subsidiaries belonging to the representative chaebols such as Samsung, LG, Hyundai Motors, and SK. Data and their descriptive statistics are also available from the author upon request. Concerning the variables employed in the study are tabulated as reported in the following table.

Table 2. Definition for the Independent Variables (IDVs)

Definition of IDV	Symbol	Measurement of Proxy
Liquidity	LIQUID1	[Current Assets – (Cash + Cash Equivalents)] / Current Liabilities
Liquidity	LIQUID2	[(Cash + Cash Equivalents) + Marketable securities – Inventory] / Current liabilities
Cash Conversion Period	CCC	(Accounts Receivable + Inventory – Accounts Payable) / Sales
Days Sales Outstanding	DSO	Accounts Receivable / (Sales / 365)
Profitability	BPT	(Earnings before Interest and Taxed (=EBIT)) / Total Assets
Profitability	PMARGIN	Net Income / Sales
Cash Flow	CASHFLOW1	(Net Income + Depreciation + Amortization) / Total Assets
Cash Flow	CASHFLOW2	(Earnings before Interest and Taxed + Depreciation + Amortization) / Total Assets
Volatility of Cash Flow	VOLATILITY	(Deviations from the Mean Cash Flow) / Mean Cash Flow for a firm at fiscal year-end
Leverage	MVLEV	Book value of liabilities / [book value of liabilities plus book value of preferred equity plus market value of common equity]
Leverage	LEVERAGE	Interest expenses / EBIT
Size	SIZE1	Logarithm transformation of Total Assets at the Fiscal year-end
Size	SIZE2	Logarithm transformation of Sales at the Fiscal year-end
Market- to Book-Value of Assets	MVBV1	(Market value of Common Equity + Book Value of Preferred Equity + Book value of Liabilities) / Book value of Total Assets
Market- to Book-Value of Equities	MVBV2	(Market Value of Common Equity + Book Value of Preferred Equity) / Book Value of Equity
Growth	GROWTH	$(Sales_t - Sales_{t-1}) / Sales_{t-1}$
Bank Relationship	BLOAN	Long term loan / Total Liabilities
Investments	NETINVEST1	$(Tangible\ Assets_t - Tangible\ Assets_{t-1}) / Total\ Assets_t$
Investments	NETINVEST2	$(Tangible\ Assets_t - Tangible\ Assets_{t-1}) / Non\ current\ Assets_t$
Agency Costs	AGENCY1	(Research & Development Expenses + Advertizing Expenses + Total Assets) / Sales
Agency Costs	AGENCY2	[(Research & Development Expenses + Advertizing Expenses] / Sales]
Foreign ownership	FOS	Foreign ownership in common stock for each sample firm

Dividend Payout	DPAYOUT	Dividend per Share / Earnings per Share
Dividend Yield	DYIELD	Dividend per Share / Common Stock Price a the Fiscal Year-end
Interaction Effect between Foreign Ownership and Dividend Payout	DPAYOUTF	FOS x DPAYOUT
Financial Risk	FRISK	Z-score = 3.3 x (Earnings before interest & taxes / Total assets) + 1.0 x (Sales / Total assets) + 1.4 x (Retained earnings / Total assets) + 0.6 x (Market value of equity / Book value of equity)

For validity of robustness and consistency, the selection of the explanatory variables adopted in the present study, were based on the those which had also been tested as proposed financial determinants in the previous literature such as [1], [2], and [11], relevant to testing for each corresponding hypothesis. That is, tt was an aim of the study, (as an extended one), to corroborate the preceded results by sharing commonalities in adopting the IDVs as well as a comparison purpose. The dependent variable (DV) to measure for the level of corporate cash retention was defined by $[(Cash_t + Cash\ Equivalents_t + Marketable\ Securities_t) / Total\ Assets_t]$, which was also used in the aforementioned researches.

2. Relevant Hypotheses Postulated

As a major part of an empirical study, the study postulated two primary hypotheses to be tested as follows:

<The First Hypothesis>

H_0: There may not exist any statistically different financial determinants affecting the level of cash holdings for the Korean chaebol firms which were classified into quantiles by utilizing conditional quantile regression (CQR) model.

As described earlier, it may be of concern to investigate any financial differences among the proposed variables which may have influence on the cash retention ratio for the chaebol firms in the domestic capital markets. To analyze the phenomenon, the present study applied conditional quantile regression (CQR) model, as presented in [8] and [9]. Another untraversed test on the financial characteristics was carried out for the Korean sample firms by applying the multilogistic regression analysis.[10] It may be of interest to investigate any financially unique characteristics between the chaebol firms whose levels of cash savings changed in a positive or negative direction during the period of the post-global financial crisis. That is, any unique financial components which may have caused the sample firms to more accumulate or increase their levels of cash holdings in comparison to the levels in the year, 2009, were expected to be identified, and vice versa.

<The Second Hypothesis>

H_0: The chaebol firms accumulating higher or lower level of cash holdings in the year, 2013, in comparison to those in the year, 2009, may not maintain any financially discriminating factors than their counterparts possessing lower levels during the comparing period in the Korean domestic capital markets.

Technically, as a predecessor to apply the econometric estimations of multilogistic regression methodology, all of the sample firms belonging to the chaebols during the studied period (2009 – 2013) were divided into three categories, based on

the change of the level of cash liquidity between the year of 2009 (i.e., just after the occurrence of the global financial turmoil) and to the year of 2013 (i.e., after a five-year term assumed that any effect of the crisis may have been much dissipated). Once numeric difference on the level of cash holdings for each chaebol firm was calculated between the studied years, (the years, 2009 and 2013), each categorical number (=CATEG) such that '1', '2', and '3' was assigned to each firm to be performed in the multilogistic regression model. To specify, after all of the differences for the sample firms were divided into three subsections in terms of the magnitude of the changes of the level, a categorical number as '1' for the response variable was assigned to each sample firm, if it was classified into the subset in which numeric changes comprehended the smallest number (inclusive of a negative one) in ascending order (i.e, the firms whose levels in the year, 2009 were larger than those in 2013, respectively).

Conversely, class as '3' was also assigned to the subset of the firms whose numeric differences between the levels in 2009 and in 2013 were the largest in descending order. For reference, the logistic regression model run in SAS 9.4 version, used a category of '2' (CATEG=2) as a reference group. The functional form of the multilogistic regression model of the present study may be described as follows, as presented in [10]:

$$ln \ \{(P(CATEG=1) \ / \ (P(CATEG=2)\} \ = \ \alpha_1 + \beta_1\text{'}x$$

$$ln \ \{(P(CATEG=3) \ / \ (P(CATEG=2)\} \ = \ \alpha_3 + \beta_3\text{'}x$$

, where a_i and βi are the intercept and vector of coefficients in each corresponding logistic model, respectively.   x is a vector of exogenous variables for each given year.

To analyze, two separate tests were performed in the multilogistic regression procedure, one of which implemented a comparison between CATEG=1 and CATEG=2 (=reference category), and the other which made to compare between CATEG=3 and CATEG=2, respectively.

IV. Analysis and Discussion

1. Analyses on the Results

The following table, [Table 3], presented the results obtained from the first hypothesis postulated for testing for examining any financial determinants discriminating the firms in the domestic capital markets, which were classified into different locations (or categories) in terms of the level of cash retention ratio.

Table 3. Results of the Estimated Coefficient of the IDVs on the Level of Cash Holdings for the Chaebol Firms Applying Ordinary Least Square (OLS) and Conditional Quantile Regression (CQR) Models

IDV	OLS	Quantile (20%)	Quantile (40%)	Quantile (60%)	Quantile (80%)
Constant	0.159 * (3.62)	−0.085 * (−2.11)	0.07 (1.68)	0.18 * (3.28)	0.300 * (4.13)
LIQUID1	0.002 (0.91)	0.003 (1.70)	0.003 (1.19)	0.0004 (0.08)	0.008 (1.01)
BPT	0.045 (0.99)	0.056 (1.24)	0.044 (0.88)	0.022 (0.38)	0.077 (1.03)
CASHFLOW1	−0.016 (−1.12)	−0.022 (−1.29)	−0.034 (−1.59)	−0.016 (−0.43)	−0.024 (−0.33)
VOLATILITY	−0.000001 (−0.02)	−0.001 (−0.29)	−0.001 (−0.22)	−0.001 (−0.09)	−0.0001 (−0.53)
SIZE1	−0.002 (−1.08)	0.004 * (2.78)	0.0002 (0.13)	−0.003 (−1.49)	−0.007 * (−3.01)
MVBV1	−0.0004 (−0.09)	0.001 (0.32)	0.002 (0.35)	0.010 (1.08)	0.019 (1.46)
GROWTH	0.00002 (0.11)	0.0001 (0.10)	0.001 (0.05)	−0.001 (−0.03)	−0.001 (−0.01)

MVLEV	-0.04 * (-2.75)	-0.008 (-0.79)	-0.030 * (-2.65)	-0.023 (-1.33)	-0.003 (-0.10)
NETINVEST1	-0.001 (-0.23))	-0.004 (-0.69)	-0.001 (-0.19)	-0.003 (-0.25)	0.004 (0.16)
AGENCY1	-0.005 * (-2.08)	-0.0072 * (-2.62)	-0.012 * (-2.49)	-0.01 * (-2.34)	-0.0012 (-0.19)
DPAYOUT	0.00003 (0.30)	0.001 (0.75)	0.001 (0.55)	0.001 (0.30)	-0.0001 (-0.56)
FOS	0.027 (1.24)	0.019 (1.04)	0.023 (1.28)	0.038 (1.31)	0.041 (1.25)
CCC	-0.089 * (-5.89))	-0.011 (-0.98)	-0.032 * (-2.56)	-0.075 * (-3.64)	-0.148 * (-6.56)
BLOAN	-0.025 (-1.27)	0.009 (0.69)	0.011 (0.75)	-0.030 (-1.62)	-0.049 (-1.66)
DPAYOUTF	-0.00001 (-0.03)	0.0002 (0.75)	0.0001 ()0.49)	-0.001 (-0.09)	0.0004 (0.48)

<Note> * indexes a statistically significant estimate at the 5% level next to a parenthesis in which a value of its t-statistic is presented.

With respect to the results obtained from the CQR analysis, all of the estimated parameters in each equation across the four quantiles of the level of cash savings were reported in [Table 3]. The outcome analyzed by OLS procedure was accompanied for a comparison purpose as well.

Overall, the explanatory variables such as AGENCY1 and CCC showed their negative and statistically significant effects on the accumulation of cash reserves in the majority of the quantiles. Meanwhile, SIZE1 as a proxy for a firm size, revealed its positively and negatively pronounced impacts on the DV for the chaebol firms classified into the two extreme quantiles (i.e., the 20% and the 80% ones, respectively), whereas the market value based leverage ratio (MVLEV) showed it negative coefficient (= -0.030) related to the DV at the 40% quantile.

Regarding the findings on the second hypothesis, which was tested to identify any discriminating factors between the chaebol firms which may have increased the levels of cash holdings in the post-era of the global financial turmoil and their counterparts, [Table 4] was constructed to describe the results from the multilogistic regression model.

Table 4. Results of the Multilogistic Regression Analysis for the Chaebol Firms on the Changes of the Level of Cash Reserves During the Post-period of the Global Financial Turmoil (From 2009 to 2013)

parameter	CATEG	estimate	chi-square	p-value
intercept	1	5.09	9.99	0.002
intercept	3	7.38	20.66	<0.0001
LIQUID2	1	1.22	17.80	<0.0001
LIQUID2	3	0.91	10.98	0.001
DSO	1	-0.006	4.26	0.039
DSO	3	-0.005	3.27	0.070
PMARGIN	1	-0.47	0.25	0.616
PMARGIN	3	-0.56	0.34	0.559
CASHFLOW2	1	-4.29	3.63	0.057
CASHFLOW2	3	-1.35	0.35	0.554
SIZE2	1	-0.18	10.20	0.001
SIZE2	3	-0.24	18.41	<0.0001
AGENCY2	1	-8.02	3.68	0.055
AGENCY2	3	-8.84	4.74	0.030
MVBV2	1	-0.07	0.30	0.586
MVBV2	3	0.05	0.16	0.692
LEVERAGE	1	0.005	0.16	0.688
LEVERAGE	3	0.001	0.01	0.943
NETINVEST2	1	-0.57	3.22	0.072
NETINVEST2	3	-0.23	0.45	0.500
FRISK	1	0.29	3.49	0.062
FRISK	3	0.005	0.001	0.975
DYIELD	1	0.18	4.94	0.026
DYIELD	3	0.20	5.85	0.016
DPAYOUTF	1	-0.004	0.28	0.600
DPAYOUTF	3	-0.07	9.59	0.002
Goodness of Fit			105.95	<0.0001

<Note> Each ooefficient was estimated by the method of maximum likelihood (ML) and the overall goodness of fit was estimated by the likelihood ratio (LR) test, while the significance of each individual coefficient was tested by the Wald specification test.

Among the total number of twelve explanatory variables which had also been employed in the preceding study of [11], four or five predictors showed their statistically discriminating power at the 5% level, depending on the categories such as CATEG=1 and CATEG=3. In other words, the IDVs such as LIQUID2, DSO, SIZE2, DYIELD, provided evidence that they were statistically different between the Korean chaebol firms

belonging to the category of 1 (i.e., CATEG=1) and 2 (CATE=2 as a reference category). For example, one unit increase in the explanatory variable as LIQUID2, may indicate a 0.006 decrease in the relative logarithm odds (i.e., relative risk) of being in CATEG as '1' vs. CATEG as '2' (as a baseline category), as similarly described in [10].

2. Discussion

Regarding the financial implications in the first hypothesis test, one of the most pronounced effects on the level of cash holdings for the Korean firms was associated with the negative estimated coefficient of CCC (cash conversion cycle) across the majority of corresponding quantiles in [Table 3]. The amount of cash reserves seemed to be lower for the chaebol firms, as CCC was expanded in the working capital management in finance. The result was consistent with those obtained from the previous study of [11]. Anjum & Malik(2013) interpreted their results on the plausible existence of a negative relationship between the CCC and the DV of cash savings, when a firm's manager may be redeemed the amount of accounts receivable in the type of cash, prior to the clearing of accounts payable or liquidating the assets (in place).[13]

Another prominent factor affecting corporate cash retention rate was identified as AGENCY1 which showed its negative linkage to the level of cash holdings. This was consistent with the outcome obtained from [11] and [13]. Jensen(1986) presented that owner of a firm tend to maintain the level of cash holdings as low as possible to mitigate or eliminate any agency costs incurred by a corporate manager who may not act in their best interest in cash management.[14] The negative association between the CCC and the dependent variable may suggest an interesting implications for the management of contemporary chaebol firms in the context of the Gill & Shah(2012)'s study as well.[15] That is, they used a firm's board size (i.e., the number of directors of board) and CEO duality (i.e., CEO who hold a positions of a chairman as well as a majority shareholder) as a proxy for a firm's agency costs of equity. The estimated coefficients with a positive sign for both proxies were consistently found to be significant in relation to the level of cash retention rate, which may indicate that the degree or severity of agency costs may be diluted as the aforementioned proxies increase. Consequently, ongoing debates among the interest parties on the excessive cash savings held by the chaebol firms in the domestic capital markets, may be alleviated or lessoned by finding an optimal board size and/or activating the function of non-executive or outside director of board, as presented in [2]. Meanwhile, a firm size (SIZE1) showed their contradicting results on corporate cash savings, depending on their locations or quantiles, as reported in [Table 3]. One of the interpretations on the different cash hoardings may be attributed to the fact that the chaebol firms categorized to possess the lowest levels of cash reserves (i.e, 20% quantile), may be overall in the early stage of their businesses or belong to the cyclical industries. These may cause a situation that financial constraints to access credit to financial institutions may be less severe, as firm size increases with larger tangible assets collateralized for external financing in spite of their less reputations due to the early stage of businesses. Farinah and Prego [6] also presented

the results of the empirical test such that small firms in size may exhibit large difficulties to access credit market for financing and seem to attach more value to keep cash savings on a conservative basis. In terms of financial implications obtained from the hypothesis test, a chaebol firm may increase or maximize its value with utilizing each significant factor differentiated among the classified categories. For example, the firms belonging to the lowest class (i.e., 20% quantile) may adjust the levels of SIZE and AGENCY, while those in the 80% quantile can control the levels of SIZE and CCC, as implied in [Table 3].

Concerning the financial indications on the results of the second hypothesis test, several primary evidences were revealed as reported in [Table 4]. First, financial components such as LIQUID2, SIZE2, and DYIELD, were commonly detected as statistically significant ones at the 5% level, which may discriminate the chaebol firms classified into CATEG1 from those into CATEG2 and into CATEG3 vs. CATEG2 (as a reference category). Based on the outcome, it was estimated that the chaebol firms which may drastically change the levels of cash holdings (on a relative term) during the post-global financial crisis (from 2009 to 2013), on average, seemed to possess more liquidity (=LIQUID2) and higher dividend yield (=DYIELD), but smaller size in sales (=SIZE2) than their counterparts which was classified into the reference group (=CATEG2). Moreover, it was of interest to statistically confirm these persistent outcomes across the two separate comparisons relative to the reference category, which may imply that any firms maintaining a stable level or a lower volatility of the level of the cash holdings were suggested to adapt the three pronounced financial components to prepare for any deficiencies related to the theoretical motives of cash holdings.

Second, the estimated parameters for AGENCY2 (=-8.84) and DPAYOUTF (=-0.07) showed their negatively significant impacts. This may indicate that the firms in CATEG3, which may level up their cash savings during the post-era of the global turmoil, may be attributed to less costs involved with the relationship between shareholders and agent (or manager) and lower dividend payout ratio in association with higher proportion of foreign ownership, than those classified into CATEG2. The results may corroborate the finding of the first hypothesis test as a negatively significant estimate of the variable for agency costs (=AGENCY1) in the domestic capital market. Finally, the significant effect of DSO (days sales outstanding) with a negative sign (=-0.006) between the firms in CATEG1 vs. CATEG2, may suggest a financial rationale of retaining corporate cash savings as a precautionary motive. That is, a chaebol firm in the group of CATEG2, which exercised a less conservative policy in working capital management with longer collection period of trade credit, may maintain a higher level of cash holdings than its counterpart classified into CATEG1 for the purpose of a transactional motive on cash holdings to minimize any default risk. The results of the DSO as reported in [Table 4] may be corroborated with the coefficient estimate (=0.29) of FRISK with a positive sign for the firms in CATEG1, indicating a lower possibilities of bankruptcy significant at the 10 % level.

V. Concluding Remarks

It may be of concern or even imperative to further analyze any financial elements to determine the level of cash reserves for the corporate entities belonging to the Korean chaebol, given the ongoing controversies as a sequence of searching for an optimal cash holdings in the domestic capital market.

This study was an extended one of the preceding researches such as [1] and [2], in which further investigations on the financial characteristics of the cash savings were performed, assuming that the tendency of probable polarization of the level among the chaebol firms, may be pervasive in the contemporary market condition. First, conditional quantile regression analysis (CQR) was applied to examine any relevant factors, based on each group of the sample firms categorized by the level of cash liquidity. Financial variables such as AGENCY1 and CCC were identified as statistically significant ones in the majority quantiles of concern, as described.

Second, another hypothesis was tested by utilizing the multilogistic regression analysis with the explanatory variables employed in [14]. Financial attributes such as LIQUID2 and SIZE2, showed their discriminating power between the firms in CATEG1 and CATEG2 (as a reference category), and CATEG3, respectively, while the negatively significant coefficient for DSO in the model was consistent with a financial motive of cash retention as precautionary one during the sample period of the post-global financial turmoil. Even if any weaknesses of the present study which may suffer from a legitimate empirical procedure such as data collection and econometric estimations, it may shed new light on the determination of financially significant elements on the level of cash holdings for the chaebol firms for academics and practitioners.

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