

Financial Factors Influencing Corporate Cash Reserves of Firms in Chungcheong Province in the Korean Capital Markets

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Abstract

The study on the subject of corporate cash holdings, is to identify any pronounced financial determinants on the cash holdings of the firms in the domestic capital markets. Specially, it focused on the regional firms with headquarters in Chungcheong province in the Republic of Korea, taking into account a scarcity of the previous literature on the subject which concentrated on the firms in the particular region. Therefore, any empirical findings as significant financial factors of corporate cash holding may contribute to searching for the optimal level of cash holdings, which, in turn, enhance the wealth of the firms' shareholders in the region. Three primary hypotheses were postulated and empirically tested by utilizing robust econometric estimations such and static panel data, Tobit regression, and logistic models: Concerning the first hypothesis test, only five explanatory variables such as DSO, LIQUID, LEVERAGE, PMARGIN, and SIZE, showed their statistically significant effects on the level of cash holdings at the 5% level amongst the total nine variables across the models employed. On the last hypothesis test, it was interesting to have identified that two IDVs such as LEVERAGE and FOS showed their significant power to discriminate between firms with headquarters in North and South Chungcheong regions. Given the continued debates among the interest parties on the optimal cash reserves among, the study may provide a new vision to search for the optimal corporate cash reserves for firms with headquarters in Chungcheong Province, where unprecedented dynamic factors are driven in terms of a socio-economic perspective.

■ **Keywords** :|Chungcheong Province| Corporate Cash Reserves | Financial Determinants |

Logistic Regression Model |The Korean Capital Market|

I. Introduction

Given the stagnant conditions of the global economy after the financial turmoil in the year, 2008, multinational and/or domestic corporations seems to take more conservative positions in corporate cash management. This phenomenon may, to some extent, arise from corporate strategy to prepare a sudden or abrupt shortage of cash reserves in the case of any plausible period of credit crunch. To exemplify, it was reported that the amount of aggregate cash savings held by the largest 500 Korean firms in the domestic capital market, drastically increased to the level of about KRW 158 trillion as the 3rd quarter of 2014, in comparison with the amounts of KRW 94.5 trillion at the end of the year, 2007.[1] The amounts of corporate cash savings retained by the publicly traded corporations belonging to the top 10 largest chaebols, continued to increase to around KRW 85.9 trillion as of the third quarter of 2015, whose amounts were accordingly higher by 34% point than those in the same quarter of 2014.[2]

The following explications are the major motivations to perform the research.

First, the present study is an extension of the previous literature such as [3] and [4], which dealt with identifying financially prominent factors affecting the level of corporate cash holdings in the domestic capital markets. One of the primary differences of the study from those in the previous literature is to focus on investigating the sample firms based in Chungcheong province which is one of the regional areas constituting the Korean capital markets, in comparison with the latter studies testing for relatively large size firms belonging to the Korean chaebols. As described in [5], the socio-economic structures of the particular province are expected to be dynamically changed to affect external and/or internal corporate environments, which, may, in turn, be incorporated in the financial aspects of the firms operating their major businesses in the region. Therefore, it may be of concern to examine any significant financial determinants constituting a firm's cash liquidity in the province, which seem to be useful to effectively exercise corporate strategies to control for the optimal level of cash reserves.

Second, to date, very little researches have been conducted on the motivation of cash reserves for firms based in Chungcheong province, as described in [5], while there may be voluminous studies on the financial issue in the inter- or intra-country context. Therefore, by performing the present study, it is anticipated that the goal of a company in line with maximizing shareholders' wealth, may be closer achieved by controlling financially significant components for an optimal liquidity level. Lastly, assuming any differences in findings between firms based in the province and the other provinces inclusive of the Seoul Metropolitan Area, the results obtained from the study may be financially utilized to establish any unique standards of the level of cash holdings at the central and/or local levels authorized to proceed related-policy implementations. As presented in [6] on the profitability of the firms headquartered in the region, the outcomes are also expected to be effectively used by the domestic financial institutions located in either the Chungcheong or the other domestic regional areas, when lending capital or replenishing working capital or short-term funds, which may, in turn, affect the level of cash holdings at corporate level.

This study consists of several sections as follows: Following the introduction section, each subsection is presented as a part constituting the second section, the first subsection is for presenting the data selection criteria and econometric estimation techniques, followed by the second one to

postulate each hypothesis tested for empirical findings. Analysis and discussion on the results derived from each corresponding test are described in the third one and conclusions are summarized in the last section.

II. Data and Hypothesis Postulations

1. Data Selection and Variables Employed

As a procedure to perform an empirical study, the sample data were collected as follows in [Table 1]. As previously described, the study as an extension of the previous literature, utilized the same procedure as the one in [5] to finalize the sample data. Specially, the data encompass the 5-year period (from 2010 to 2014) comprehending the period after the global financial turmoil, by which any spillover effects caused by the unprecedented credit crunch may be mitigated or reduced as also presented in [5] and [7].

[Table 1] Data Selection Criteria

1. The sample firms were included in the New KisValue database in the Republic of Korea.
2. The firms should be headquartered in 'Chungcheong' province and they were listed on the 'Prime' or 'Venture' section of the KOSDAQ at the end of December 2014
3. All the data for each firm were available for at least 5 years (2010-2014) in the post-era of the global financial crisis
4. Financial and regulated industries were not included when collecting a final sample.

Moreover, firms listed on the KOSDAQ bourse, were only included in the study instead of those in the KOSPI one, taking into account a majority of the manufacturing firms in the region are engaged in the I/T related industries with relatively short history, as described in [6]. The divisions for the 'Prime' and the 'Venture' sections were regulated by the Korea Exchange based upon financial status such as a firm's size and capitalization.[8]

Concerning the variable selection for the dependent variable of the study, the level of corporate cash holdings of the firms based in Chungcheong province were proxied by the following variables, which had been utilized in some of the preceding literatures in the international and domestic context. In other words, the proxy as a dependent variable (DV) was defined as $[(\text{Cash}_t + \text{Cash Equivalents}_t + \text{Marketable Securities}_t) / \text{Total Assets}_t]$. To specify, the dependent variable had also been employed in the previous literature such as in [3] and [9]. With respect to the independent variables (IDVs) accounting for the level of cash holdings as a financial factor, the study employed the following variables as reported in [Table 2].

As an extended study of the previous literature and to mitigate a possibility of measurement error and omitted variables in terms of econometric context, the IDVs which had showed their

significant effects on corporate cash reserves in [11], were employed in the models. That is, nine variables had been found to be statistically prominent to explain the cash savings, which tends to be supported by academic theories and practices in the modern finance. In the present study, in order to overcome or reduce possible legitimate and redundant problems with which any empirical studies may face, these variables were utilized for consistency and commonality.

[Table 2] Definition of Independent Variables (IDVs)

Definition	Denotation	Measurement
Cash Conversion Period	CCC	$(\text{Accounts Receivable} + \text{Inventory} - \text{Accounts Payable}) / \text{Sales}$
Investments	NETINVEST	$(\text{Tangible Assetst} - \text{Tangible Assetst-1}) / \text{Total Assetst}$
Dividend Payout	DPAYOUT	Dividend per Share / Earnings per Share
Days Sales Outstanding	DSO	$\text{Accounts Receivable} / (\text{Sales} / 365)$
Liquidity	LIQUID	$[(\text{Cash} + \text{Cash Equivalents}) + \text{Marketable securities} - \text{Inventory}] / \text{Current liabilities}$
Leverage	LEVERAGE	Book value of liabilities / [book value of liabilities plus book value of preferred equity plus market value of common equity]
Profitability	PMARGIN	Net Income / Sales
Size	SIZE	Logarithm transformation of Total Assets at the Fiscal year-end
Foreign Ownership	FOS	Foreign ownership in common stock for each sample firm
Type of Section in the KOSDAQ Bourse	SCODE	Scode = 1 if a firm is classified in the "venture" section; 0, otherwise.

As presented in [11], the former four financial IDVs (i.e., CCC, NETINVEST, DPAYOUT, and DSO) had been classified as principle determinants of corporate cash holdings under the 'trade-off' theory, while the second group of the IDVs such as LEVERAGE, QUID and PMARGIN and the latter ones such as SIZE and FOS had been categorized as theoretical variables in association with Myers'

Pecking order and agency cost theory of free cash flow, respectively.

2. Hypothesis Postulation and Econometric Estimation

Three primary hypotheses were postulated and tested for financial characteristics of the corporate cash holdings for firms with headquarters in Chungcheong province.

First, it was an intriguing question to identify financial factors to determine the level of cash savings, which may be uniquely applied to the firms whose headquarters were based in the region. The following is a postulation for the first hypothesis to test for the aforementioned issue:

H₀: The firms based in Chungcheong province may not possess any unique and statistically significant financial factors to influence on the level of cash savings during the post-era of the global financial turmoil (from 2010 to 2014).

To proceed econometric estimation techniques to test for the hypothesis, static panel data model was applied to detect the 'best' model among the fixed, random, and pooled OLS models. Moreover, Tobit regression model was also employed to check for robustness on the hypothesis test.

Subsequent to the first hypothesis, the study further examined any discriminating components between the 'Prime' and the 'Venture' sections where the firms in the region were listed, in terms of corporate cash reserves. In the preceding researches such as [5] and [11], there had been analogous investigations to detect any financial differences between the two groups of the firms in terms of profitability, but, there were few studies to be conducted, in terms of the cash savings. The following is the second hypothesis to be empirically tested:

H₀: The firms in Chungcheong province which are listed on the 'Venture' section of the KOSDAQ stock market, may not overall retain any financially discriminating components in comparison with their counterparts on the 'Prime' section of the same domestic bourse.

Finally, it may also be of interest that the firms belonging to one of the regions (that is, North Chungcheong, called officially as 'Chungcheong -Bukdo' may have a different financial profile in terms of the IDVs tested in the aforementioned hypotheses, in comparison with their counterparts located in the other region (South Chungcheong as 'Chungcheong-Namdo') belonging to the same provincial area. So far, very little attention seems to be paid to this issue in the international and domestic researches of finance. Consequently, it may be necessary to identify any differences between the two compared groups in terms of corporate cash reserves, given that there are ongoing dynamical changes of socio-economic structures in Chungcheong province and it may need to find out any financial aspects to be ameliorated or complemented towards a balanced development of the regional capital market in the whole province. The third hypothesis on the issue can be explicated as follows:

H₀: There may not exist any differences between the major financial characteristics of firms based in North and South Chungcheong regions in terms of the level of cash holdings, during the post-era of the global financial turmoil.

For statistical estimations for the second and the third hypothesis tests, logistic regression

models were utilized to investigate any statistically significant difference in each financial variable amongst the total nine IDVs which were tested in the first hypothesis. Moreover, for robustness check, two separate logistic models with and without adopting time dummy variables, were implemented to test for the second hypothesis test, along with the nine proxy variables.

III. Analysis and Discussion

1. Analysis for Each Hypothesis Tested

This section describes the outcomes obtained from each hypothesis test relevant to the subject of the study. First, the results from static panel data model accompanied by Tobit regression model are presented in [Table 3] for the first hypothesis test on the dependent variable of DV.

[Table 3] Results of testing for DV with the explanatory variables (IDVs)

IDV	The Estimated Coefficient from Static Panel Data Model (Random Effects Model)	The Estimated Coefficient from Tobit Regression Model
Constant	-0.31	-0.50*
CCC	0.15*	0.06
NETINVEST	0.005	-0.001
DPAYOUT	0.0001	-0.0002
DSO	-0.0005*	-0.0004*
LIQUID	0.10*	0.11*
LEVERAGE	-1.00*	-0.12*
PMARGIN	-0.03*	-0.04*
SIZE	0.02*	0.03*
FOS	-0.0005	-0.0004

<Note 1> * indicated a statistical significance in t-value at the 5% level.

Concerning the results of the hypothesis test, the "best" model in the static panel data analysis was selected as random effects one, amongst fixed effects, random effects, and pooled OLS models, which was selected the guideline by [12]. To specify a procedure to choose the "best" one, each relevant sub-test as F-static, Breusch-Pagon, and Hausman tests revealed their value of 8.50, 123.35, and 12.35, respectively, indicating that the last test of Hausman was not accepted at the 5%

statistical level. As reported in [Table3], only five explanatory variables such as DSO, LIQUID, LEVERAGE, PMARGIN, and SIZE, were statistically significant at the 5% level amongst the total nine variables across the two models as static panel data and Tobit regression ones, to determine the level of corporate cash holdings for the sample firms.

As for the analysis of the results on the 2nd hypothesis test to discriminate any prominent financial factors of the firms between being classified into the 'Prime' and the 'Venture' sections, two separate logistic analyses with and without time dummies, were conducted as reported in the following table, [Table 4]. (For reference, the results with adopting time dummies are available upon request from the author.)

[Table 4] Results of the Logistic Regression Analysis to Identify a Discriminating Factor for Firms Listed Between the "Prime" and the "Venture" Sections of the KOSDAQ Stock Market

IDV	Coefficient	Chi-square
Constant	102.4	35.32*
CCC	9.55	12.67*
NETINVEST	-0.21	0.02
DPAYOUT	-0.005	0.12
DSO	-0.006	0.41
LIQUID	0.62	1.11
LEVERAGE	1.02	0.37
PMARGIN	-3.92	2.09
SIZE	-4.10	34.43*
FOS	-0.05	3.66
Goodness of Fit		172.83*

<Note 1> * : Significant at the 5% level with respect to the chi-square test

<Note 2> The coefficients were estimated by the method of maximum likelihood (ML). The test for overall goodness of fit was performed by the likelihood ratio(LR) test, while the Wald test was used to test for the significance of each individual coefficient.

With respect to the consequences obtained from the test, statistically pronounced factors distinguished between the two compared groups were found to be the independent variables as CCC and SIZE among the total variables adopted in the model. Meanwhile, the probability modeled was

set "1" for firms classified into the "Venture" section (i.e., SCODE = "1") in the SAS (v.9.4) software. In other words, there may be a higher probability to be classified in the "Venture" section if a firm in Chungcheong province becomes larger in the terms of CCC, while the probability to be categorized into the "Prime" section will be higher as a firm' size, SIZE, gets larger. As for a check for robustness, the logistic model with employing time dummy variables, showed the same results as those in [Table 4], indicating that only two IDVs such as CCC and SIZE were found to be statistically significant out of the nine total variables.

Finally, as described above, one of the untraversed financial aspects to detect financially significant differences or unique features between the firms based in North Chungcheong and South Chungcheong regions were postulated and the results derived from a logistic regression model was presented in the following table, [Table 5].

[Table 5] Results of the Logistic Regression Analysis to Discriminate Firms Headquartered in Between North and South Chungcheong Regions, which were listed on the KOSDAQ Stock Market

IDV	Coefficient	Chi-square
Constant	-3.29	0.28
CCC	2.54	2.85
NETINVEST	0.48	0.33
DPAYOUT	-0.004	0.15
DSO	-0.007	1.19
LIQUID	-0.49	1.50
LEVERAGE	3.44	8.48*
PMARGIN	-0.65	0.45
SIZE	0.005	0.0004
FOS	0.10	15.37*
Goodness of Fit		172.83*

Regarding the last hypothesis test results, it was interesting to have identified that two IDVs such as LEVERAGE and FOS showed their significant power to discriminate between firms with headquarters in North and South Chungcheong regions. (The probability modeled was set as "1" for firms based in North Chungcheong in the logistic model.) In other words, higher leverage and larger

proportion of foreign ownership may characterize a firm's financial aspects headquartered in North Chungcheong region, when compared to their counterparts in South Chungcheong district during the studied period.

2. Discussion

With respect to the analysis on the first hypothesis of identifying financial determinants of cash reserves for corporations based in Chungcheong province, the results shown in [Table 3] may explicate the following financial implications.

First, as indicated in the results, a majority of the IDVs (out of the total nine ones) showed their pronounced effects on the level of the cash savings across the two separate models. For the financial interpretations on each significant IDV, it may as well be compared with those found in the preceding researches inclusive of the studies of [3] and [10], which were the underlying researches of the present study as previously described. DSO showed its negatively significant effect on the level of corporate cash holdings, which indicates that firms with headquarters in Chungcheong province may retain a lower cash liquidity, as DSO increases. This phenomenon can be supported by the conventional finance theory on cash management in association with a collection period of accounts receivable. Kim [4] presented that the Korea chaebol firms whose cash level had not been changed on a relative basis since the occurrence of the global financial turmoil in 2008, seemed to maintain their cash reserves for a transactional motive. Consequently, in terms of the relationship between DSO and cash levels, firms in Chungcheong province controlled by the DSO on the liquidity level, seemed to increase their levels, not to be influenced by any transactional deficiencies on corporate cash holdings. However, it was also interesting to find the result of the positive linkage between the dependent variable and CCC consisting of the collection periods of accounts receivable, inventory, and accounts payable, as defined in [Table 2]. Based on the result, firms in the province seemed to have a payable policy with a relatively short period, which may have them maintain a higher level of cash reserves for a transactional purpose in association with a longer CCC period. Therefore, this phenomenon may suggest that the sample firms may, on average, reconsider existing accounts payable policies for extended or deferred periods, in order to approach optimal level of cash holdings to maximize their firm value.

Meanwhile, the estimated coefficient of LEVERAGE for the sample firms showed its negatively significant impact on the level of cash liquidity across the models as reported in [Table 3]. There may be two primary plausible interpretations on the negative relationship between the dependent and the IDV of LEVERAGE: When borrowing from creditors, higher cost of debt, may deteriorate the level of cash savings for the firms based in the province, given the relative limitations to access to credit in the domestic capital markets. In part, this phenomenon may be attributable to a small firm effect (in size) equipped with lower collateral value of tangible assets than their counterparts located in the other provincial area inclusive of those in Seoul Metropolitan area. Even if the sample data were finally selected among the firms listed in one of the officially regulated bourses (i.e., the KOSDAQ stock market), there seemed to still be a prevalent phenomenon spilled over from the global financial turmoil, which may have firms prefer debt financing over equity one, to mitigate any effect of informational asymmetry, as presented by [13].

Finally, a firm's size, SIZE, showed its positively significant effect on the level of corporate

cash savings. The result obtained from the study was conflicting with those in the preceding studies. As presented In [3] and [14], a firm's size was found not to have its significant impact on the corporate level of cash reserves for the chaebol firms in the domestic capital markets. One the other hand, amongst the chaebol firms categorized by the group levels of cash liquidity, firms belonging to the lowest quantile showed a positively significant influence on the dependent variable, while their counterparts in the highest quantile had a negative importance, as presented in [4]. Lian et al. [15] presented that there was a positive relationship between size and the changes in cash reserves, which was applicable to the small firms in the Chinese capital markets, most of which were engaged in the stage of start-up or early business cycle with a higher possibility of cash scarcity. Kim [4] described that the chaebol firms with a lower category or level of cash savings may face with more limitations to fully access to credit in the domestic markets, resulting, in part, from their early stages of business or engagement in cyclical businesses. Based on the findings from the preceding researches on the relationship between a firm's size and corporate cash holdings, the statistically positive result obtained from the present study may supplement a following implication in the financial aspect: That is, firms with headquarters in Chungcheong province, most of which are engaged in I/T related businesses classified into the cyclical industries, are still subject to financial constraints to access to credit markets, inducing a higher possession of cash reserves, as their firm size increases. In comparison with the other explanatory variables estimated to be statistically significant in the model, the explanatory variables such as NETINVEST, DPAYOUT, FOS, did not reveal their pronounced importance as a financial determinant of corporate cash reserves in a statistical context.

With respect to the results obtained from the second hypothesis test, only two factors showed their importance in terms of statistical context, as reported in [Table 4]. The official criteria to classify a firm into the two sections such as "Prime" and "Venture" one in the KOSDAQ bourse, are regulated by the Korea Exchange. To specify, the requirements under the criteria include the size of equity, market capitalization, profitability, and sales.[8] One of the significant variables which may financially discriminate firms between the two sections, was SIZE in terms of the sales amount, as in [Table 4]. The finding seemed to commensurate with the classification requirements of the Korea Exchange, which mandate a firm's sale amounts more than KRW 10billion to be listed in the "Prime" section, that is larger than that (i.e., KRW 5 billion) of the "Venture" section. Moreover, the proxy variable, CCC, was the other factor characterizing a firm's cash conversion cycle to financially divide the sample firms into the two sections. In other words, the probability to be classified into the "Venture" section may be higher, if a firm in the Chungcheon province increases the period of the CCC. Based on the result, firms in the section may need to adjust the length of the CCC by changing working capital management policy in terms of the levels of accounts receivables and/or accounts payables. This policy can keep the levels of cash holdings lower, which may, in turn, maximize their firm values. Meanwhile, there was another important suggestion for firms with headquarters as presented in [Table 4]. That is, the level of capital structure proxied by LEVERAGE, did not reveal any statistical difference between the sample firms listed in the two sections. In modern finance theory, a firm in the cyclical industry may well issue equity than debt for external financing, due to a higher volatility of cash flows [16], which may, in turn, suggest to maintain a lower capital structure for a firm in the "Venture" section. Consequently, it may be worthwhile to keep current debt ratio lower for the firms in the section to avoid or reduce a possibility of bankruptcy risk. Otherwise, they may overall need to possess a higher level of cash holdings for a precautionary motive, but, it may

deteriorate a firm's value due to a deviation from an optimal cash level from the perspective of shareholders.

As reported in [Table 5] for the outcome of the third hypothesis test, there were only two financial factors (i.e., LEVERAGE and FOS) statistically discriminating the sample firms between the regions of North Chungcheong and South Chungcheong in terms of corporate cash holdings. In other words, firms with headquarters in the former region may, on average, have higher leverage ratios and foreign ownership than their counterparts based in the latter region. As mentioned, little attention has been so far drawn to the researches on the determinants of cash savings, which can financially divide firms into the two separate regions. One of the implications in association with the higher capital structures of the firms in North Chungcheong region may suggest that they may not, on average, maintain an optimal capital structure, given the statistically insignificant difference of PMARGIN (as profitability), between the firms located in the two separate regions as shown in [Table 5]. It may be plausible that higher borrowing costs due to a higher debt ratios can result in the firms in North Chungcheong region to maintain relatively excess level of cash holdings as a precautionary motive. On the other hand, the study also found that the probability to be classified into those in North Chungcheong region will be larger, if the proportion of foreign ownership (FOS) of a firm, increases. Kim [17] presented that higher degree of foreign ownership may improve or prevent from any possible moral hazard which is likely to be linked to a firm's mismanagement detrimental to the wealth of its shareholders. Accompanied by ongoing activities of the particular region to host foreign investments in the local business entities at the local government or authority level, it, as a virtuous cycle, seems to be possible for the firms in the region to search for an optimal level of cash holdings that may result in maximizing a firm value.

IV. Concluding Remarks

This study as an extension of the previous researches, investigated an academic subject of the level of corporate cash holdings, which is still one of the contemporary financial issues on debate between policy makers at the government and corporate levels in international and domestic perspectives. To specify, it is to identify any significant financial factors of corporate cash reserves focusing on the regional firms headquartered in Chungcheong Province in the domestic capital market. One of the valuable contributions the study may retain, may be a geographical and/or demographic focus on the particular region on which very little attention was drawn in the previous literature. By applying legitimate econometric estimations, three hypotheses are postulated to be empirically tested as follows: First, any pronounced financial factors are examined for firms headquartered in the province in the statistical context. Second, as an intra-bourse analysis, firms classified in the "Prime" section of the KOSDAQ market were compared to their counterparts in the "Venture" one to identify any discriminating factors, followed by the last hypothesis in association with financial differences between firms in North and South Chungcheong regions. The results of the study eventually related to searching for an optimal level of corporate cash holdings for firms with headquarters in Chungcheong province, are expected to shed new light on the untraversed empirical subject of cash holdings, which may enhance or invite new external investment (FDI) derived from funds operated by foreign or domestic institutions.

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