

Financial Analysis on Changes in Profitability for Chaebol Firms in the Post-period of the Global Financial Turmoil

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국제금융위기 이후 국내 재벌 계열사들의 수익성 변화요인에 대한 재무분석

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Abstract The study investigates one of the long-standing, but still controversial issues in modern finance from the international and domestic perspectives. That is, financial components and differences on corporate profitability are identified and compared under the primary hypotheses. Empirical research settings include the sample data as KOSPI-listed chaebol firms, time reference covering the post-era of the global financial turmoil and two differently defined profitability indices measured by the market- and the book-value bases. A majority of total 7 explanatory variables except firm size and leverage ratio reveal their statistically significant power to explain profitability indices for the chaebol firms in the first hypothesis. The results are generally compatible with those obtained from their counterparts of non-chaebol firms. In the second hypothesis applying multinomial logistic model, the chaebol firms are classified into three groups according to the level of profitability. It is then confirmed that variables to represent the market-valued debt ratio, business risk and growth potential are financially discriminating factors among the three groups. The study may provide a new vision to identify financial factors of corporate profitability for Korean chaebol firms after the global financial crisis, which can enhance the benefits of interested parties at the government or corporate level in a virtuous cycle.

요약 본 논문에서는 경영학 재무 분야에서 국내외적으로 지속적인 관심의 대상이지만, 학문적 의견 일치를 보이지 못하고 있는 주제가 연구되었다. 즉, 기업의 수익성에 대한 재무적 결정요인과 상호 차별성이 가설검정을 통하여 상호 비교되었다. 연구 분석 방법과 관련하여 본 연구에서는 국내 재벌 계열사들을 대상으로 표본기간은 국제금융위기 이후의 기간으로 설정되었으며 시장가치와 장부가치 기준의 두 분류의 수익성 지표들이 각각 분석되었다. 첫 번째 가설검정 결과 관련, 총 7개의 설명변수들 중, 기업 규모와 부채비율을 제외한 나머지 변수들이 재벌기업들의 수익성 결정에 유의성 있는 영향을 줄 수 있는 재무적 요인들이었으며, 동 결과는 비교그룹인 비재벌 소속 기업들에 대한 검정 결과와도 일반적으로 유사하였다. 또한, 다항로지스틱 모형을 활용한 두 번째 가설 검정에서는, 표본기업인 재벌기업들이 수익성 수준을 기준으로 3단계로 분류되었다. 이를 기준으로 부채비율, 부도위험성 그리고 잠재성장성을 나타내는 변수들이 재벌기업들 간의 차별성을 나타내는 변수들로서 판명되었다. 본 연구의 결과들은 국제금융위기라는 재무적 시점을 경험한 국내 재벌기업들의 수익성 결정요인들을 판명하는 측면에 새로운 방향을 제시할 수 있다고 판단하며, 또한 선순환적 관점에서 정부와 기업을 포함한 이해관계자들의 향후 이익 제고에도 기여할 수 있다고 판단된다.

Keywords : Corporate Profitability Index, Global Financial Turmoil, Korean Chaebol Firm, Multinomial Logistic Regression Model, Static Panel Data Model

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1. Introduction

The study presents one of the conventional financial issues, but may be regarded as one of the most essential issues when implementing corporate strategies from the perspectives of government or corporate level. Corporate manager may well be interested in maximizing profit for the benefits of their interest parties inclusive of shareholders and likewise, policy maker of government may keep their attention on the changes in corporate profitability index at the macro level. It was announced by [1] that average corporate profit of manufacturing firms in Korean corporate sector, measured by the ratio of earnings before interest and taxes (EBIT) to sales, was estimated at 5.1% during the fiscal year, 2015, which is an increase of 0.9% point, over the level of the prior year. For instance, profitability of the firms in the petrochemical and the metallic product industries surpassed the average level of profitability of total domestic industries. To date, overall profitability index for domestic (external audit) firms in terms of the aforementioned ratio was recorded as 8.2% as of the first quarter of the year, 2018, which is an increase of 0.2% point on a year over year (yoy) basis. [2] Overall profitability for large firms was ameliorated from 7.4% to 7.8% (yoy), whereas small firms recorded less profit from 5.7% to 5.3% during the same comparing periods.

In the study, changes in financial factors to determine profitability are empirically investigated in the international or domestic context. As for empirical research settings, subsidiaries classified into "Large Enterprise Conglomerate" according to the guideline of the Fair Trade Commission (FTC) of the Korean Government set the sample observations (hereafter, chaebol firms) and time reference comprehends a post-era of the global financial crisis originated in the U.S. capital market in 2008.

In comparison with the preceding studies on the subject of corporate profitability, that are reviewed in the following section, major motivations to conduct the present study are described as follows with presenting its differences from the previous ones in terms of academic and practical aspects: First, as an extension of the preceding research of [3] and [5], it seems to be worthwhile to reexamine to detect financial changes in corporate profitability for Korean chaebol firms. As an extensive study, the current research particularly differs from the studies of [3] and [5], in that the former utilized a different sample firms (i.e., NYSE and KRX firms) and the latter used an other sample period covering the year until 2011. As one of the major reasons to select the chaebol firms in the present study, it was reported that the proportions of total operating income that was only accounted by large firms were 55.7% in the year, 2016 and 61.0% in 2017 among the domestic corporations, respectively.[4] Moreover, corporate profit earned by the chaebol firms among the large firms has overall increased by 54.8% in 2017 (yoy), while the other corporations in the same group of large firms has only attained an increase of 8.2% (yoy) in terms of profitability. Given the phenomena, it may be appropriate in time and important to identify financial components of profitability for the chaebol firms, assuming that polarization of corporate profits tends to be directed to the chaebol firms. It will be of interest to compare financial differences between the chaebol firms and their counterparts of non-chaebol firms, that did not examined in the preceding studies. Second, by comparing to those in [3] and [5], corporate trend in terms of profitability may be traced out across time in identifying changes in financial factors for the chaebol firms for the purpose of comparability and consistency. For instance, the outcome of the study may be compared with the findings of [3] which

empirically examine financial differences of profitability between firms in the U.S. and Korea. Therefore, from the perspective of foreign investors, results of the study seem to be also interesting when constructing their investment portfolios since most chaebol firms are operated in the type of multinational business in their international operations, that were not examined in the majority of the previous studies. Third, a new vision for a change in a financial paradigm of the chaebol firms appears to be recently demanded by investors as well as domestic policy makers, as presented in [6]. To be accompanied by the recent trend, more robust consequences of the study are anticipated to be obtained from the current study by adopting a wide spectrum of and rigorous econometric methodologies, whose results may differ from the preceding studies in the analogous issue of corporate profitability.

2. Literature Review

In the section, preceding literature on the corporate profitability is sequentially outlined and recapitulated in the international or domestic context. A majority of the studies reviewed in the section had also been presented in the previous researches such as [3] and [5].

In the study of [7], results were presented on financial components of profitability in European manufacturing and services during the period from 1993 to 2001 since the formation of a Single Market in EU (European Union). Results were shown that there seems to be a positive and statistically significant persistence of profitability across all sample nations, that was supported by the estimated coefficients on the lagged dependent variable. Moreover, total assets as proxy for firm size was a negatively significant effect on the profit rate which may result from a more competitive rivalry with its competitors after the Single Market formation, whereas the

variables for market share and leverage ratio were found to be positive and negative significant relationship with the dependent variable, respectively. [8] also tested several major financial attributes that may have significant effects on profitability for Portuguese firms in EU. It was empirically found that growth rate of sales has a positive and significant relationship with the dependent variable defined as the ratio of operating income to total assets. Moreover, the value for persistence of profitability over time showed its prominently significant effect on the regressand in the model. In the mean time, by utilizing the U.S. sample firms, [9] examined a financial aspect of profitability to obtain robust results applicable to cross-border cases. They adopted three types of proxy variable for leverage such as short-term, long-term, and total debt to find effects on profitability defined as return on equity (ROE). While there were positive relationships between short-term and total debt ratios, and profitability in both the manufacturing and the service industries, the results on the long-term leverage ratio were not consistent between the two industries. Relevant tests were empirically performed in [10] to detect statistically significant components to determine the profitability index, ROE, for the non-life and composite insurance companies headquartered in Bosnia & Herzegovina as also a member nations consisting the EU. By adopting dynamic panel data model, the results confirmed that there existed a positive and statistically significant dynamic character of profitability, based upon the model specification. In the study of [11], it was concluded that lagged effects of customer satisfaction as an instrumental variable (IV) was statistically associated with a variety of internal and external dependent variables in the models, along with other significant variables such as net income per share of firm and earnings-price ratio. Moreover, they confirmed a

significant relationship of causality arising from customer satisfaction (as an independent variable) to the profitability measures. Recently, empirical tests were performed in [5] to identify financial determinants of the profitability indices for Korean chaebol firms during the period from 2006 to 2011. Regarding the overall results obtained from the three hypothesis tests, the explanatory variables such as book-valued debt ratio, market-valued debt ratio, the ratio of market- to book-valued equity, business risk, free cash flow to the firm and foreign ownership, showed their statistically significant association with the book-valued profitability ratio, while the market-value based profitability index was explained only by BVLEV2. Finally, in the study of [3], sample data were chosen from the firms listed on the New York Stock Exchange and those on the Korea Exchange in the post-period of the global financial turmoil from 2010 to 2015. A majority of total variables overall showed statistical significance on the profitability indices (i.e., market-value and book-value based ones) for NYSE-listed firms, whereas about half of the independent variables revealed their importance only on the book-value based one for Korean sample firms. Moreover, both sample groups seem to maintain excessive non-current asset turnover on a relative basis, which may result in diminishing profit margins.

3. Empirical Research Settings

3.1 Data Collection and Variables Adopted

As described in the previous section, one of the primary motivations to conduct the study is to examine changes in financial determinants of corporate profitability in comparison with the findings of the preceding studies such as [3] and [5]. In particular, the results derived from the former, [3], are to be primarily compared to

those in the current one, both of which use the same time reference from the year, 2010 to 2015 to cover the post-period of the global financial turmoil, while the outcomes in the preceding study of [5] are indirectly referred to as complementary findings on the financial issue of the chaebol firms' profitability. Accordingly, for the purpose of comparability and persistency, empirical research settings inclusive of the criteria for sampling data and explanatory variables, are analogous to those in the study of [3]. Criteria to meet the selection for final sample data are presented in [Table 1].

Table 1. Sampling criteria for Korean chaebol firms

1. Data for each sample firm are available for at least six years from 2010 to 2015 which are the post-period of the global financial crisis.
2. The sample firms are listed on the KOSPI stock exchange during the sample period.
3. They are included in the population of the database of KisValue provided by the NICE.
4. Criteria to classify a firm into being the chaebol group, are set in accordance with the guidelines by the Fair Trade Commission (FTC) of the Korean Government, such that it is the one classified into a "Large Business Group", subject to the ceiling limits on cross shareholding mechanism.
5. Financial and regulated industries are excluded in the final data screening process.

As screened by the above criteria, total number of the chaebol firms are counted as 126 ones that belong to each corresponding industry among the 20 domestic industries, while their counterparts of non-chaebol firms (i.e., non-chaebol group) are 458 firms in number across the 23 industries, as also presented in [6].

Table 2. Definition and symbol for proxy variables

Variable	Symbol	Definition
Book-value based profitability	DV1 (Dependent variable1)	[Earnings before interest and taxes (EBIT) / Total assets]
Market-value based profitability	DV2 (Dependent variable2)	[EBIT / (Liabilities at book-value + Preferred equity at book-value + Common equity at market-value)]
Firm size	SIZE	[Natural logarithm of sales amount at the fiscal year-end]

Market-value based debt Ratio	MLEVER	[Liabilities / (Liabilities + Market-value of common equity + Book-value of Preferred stock)]
Business Risk	VOLAT	[3.3 x (EBIT/Total assets) + 1.0 x (Sales /Total assets) + 1.4 x (Net income/Total assets) + 0.6 x (Market value of equity/Book value of equity)]
Growth Rate	GROWTH	[Market value of equity / Book value of equity]
Noncurrent Asset Turnover	TURNOVER	[Sales amount / Noncurrent assets]
Intangible Assets	INTANGIB	[Intangible assets / Sales]
Corporate Cash Holdings	CASHHOLD	[Cash, Cash equivalents and Marketable securities / Sales]

3.2 Formation of Primary Hypotheses Tested

Concerning primary hypotheses to proceed empirical investigation of the subject, two first null hypothesis is postulated as follows, in order to identify financial determinants of corporate profitability for the chaebol firms:

H1: During the post-era of the global financial turmoil (i.e., from 2010 to 2015), it is assumed that from a statistical perspective, no significant financial components exist among the proposed explanatory variables to determine corporate profitability index for chaebol firms (or also their counterparts of non-chaebol firms) that are listed on the doemstic KOSPI stock market.

As for the first hypothesis, two separate tests are conducted for the chaebol group and its counterpart of non-chaebol group, respectively. Moreover, tests for each group are empirically performed on the two differently defined profitability indices (i.e., DV1 and DV2). Concerning the econometric estimations to test for the hypothesis, (static) panel data model is applied to derive results, given the structure of the sample data as a cross-sectional and time-series one. To determine the most

appropriate model amongst the fixed-effect, random-effect and pooled OLS ones in terms of the panel data model, the *a priori* specification tests are also implemented as presented in [12]. To reinforce validity of results, stepwise regression model controlled by 5% level of statistical significance for its entry and deletion, is also employed to test for the hypothesis, as also used in [3]. This estimation method may be more effective when fitting the model by alleviating the econometric issues such as heteroscedasticity and autocorrelation as illustrated in [13].

H2: A Firm whose profitability index is categorized in the mid-range level among the sample chaebol firms, may not have any financially significant factors to discriminate it from its counterparts that are positioned in either a high- or low-range of corporate profitability during the investigated period.

To specify, the profitability indices in terms of a book-value basis (i.e., DV1) are divided into three categories such as chaebol firms with low profitability (CATEG=1), those with mid-range of profitability (CATEG=2) and high levels of profitability (CATEG=3). Then, multinomial logistic regression model is applied to detect any discriminating factors among the three categories.

Functional form of the multinomial logistic model is outlined, as presented in [14]:

$$\ln [P(\text{CATEG}=1) / (P(\text{CATEG}=2))] = a_1 + b_1 x$$

$$\ln [P(\text{CATEG}=3) / (P(\text{CATEG}=2))] = a_3 + b_3 x,$$

where a_i and b_i are an intercept and a vector of coefficients in the c model, respectively. x is a vector of explanatory variables for each fiscal year.

Based on the function, two separate tests are then implemented for empirical estimations such that one is for a comparison between the groups of CATEG=1 and CATEG=2 (=reference category), and the other is made to statistically compare between CATEG=3 and CATEG=2, respectively.

Overall, as an objective of implementing the present research, it is to identify financial components for the chaebol firms, whose results are expected to contribute to maximizing corporate profitability at a macro- and a micro-level. The results may also be applied to ameliorate a level of profitability for firms whose management strategies may not be effectively in comparison with the other categories of the chaebol firms within the same group. Moreover, by comparing financial factors of the sample firms with their counterparts of non-chaebol firms, it is in anticipation of balancing profitability level across entire KOSPI-listed firms in the domestic capital market, which may be useful to attain the current socio-economic demand on the chaebol firms, as a theoretical and practical background of the study.

4. Analysis and Discussion

4.1 Analyses For Hypothesis Tests

4.1.1 Univariate Analyses for the Sample Firms

As a legitimate univariate analysis, fundamental descriptive statistics under two sample groups (i.e., chaebol vs. non-chaebol firms) are presented in [Table 3] and [Table 4], in which 7 explanatory variables are analyzed with 2 dependent variables such as DV1 and DV2, respectively.

Table 3. Descriptive statistics for chaebol firms

Variable	Mean	Median	Standard Deviation	Max.	Min.
DV1	0.043	0.039	0.053	0.224	-0.349
DV2	0.038	0.041	0.049	0.231	-0.538
SIZE	28.794	28.823	1.642	33.063	24.313
MLEVER	0.573	0.604	0.231	0.989	0.092
VOLAT	1.985	1.688	1.453	19.277	-7.149
GROWTH	1.301	0.923	1.898	30.678	-11.308
TURNOVER	2.497	1.647	3.936	50.252	0.043
INTANGIB	0.860	0.704	0.971	22.708	0.180
CASHHOLD	0.083	0.062	0.103	1.264	0.001

Table 4. Descriptive statistics for non-chaebol firms

Variable	Mean	Median	Standard Deviation	Max.	Min.
DV1	0.037	0.038	0.074	0.365	-0.657
DV2	0.039	0.042	0.068	0.709	-0.562
SIZE	26.268	26.236	1.263	31.708	22.156
MLEVER	0.497	0.500	0.238	1.000	0.009
VOLAT	1.835	1.614	1.224	13.513	-2.157
GROWTH	1.184	0.771	1.586	20.502	-3.441
TURNOVER	2.633	1.779	5.656	188.312	0.02189
INTANGIB	0.862	0.677	1.269	23.294	-27.701
CASHHOLD	0.111	0.064	0.240	9.165	0.001

Concerning the results of the univariate analysis, it is interesting to find that the sample distribution of DV1 as a proxy variable for a book-value based profitability index shows a right-skewed shape, being indicated by a larger value of mean (=0.043) than the statistic of the median (=0.039) for the chaebol group. On the other hand, the shape of the distribution for the non-chaebol group seems to be in symmetry, as suggested by about the same values of the statistics (i.e., 0.037 vs. 0.038). In contrast, sample distributions of DV2 for both groups tend to be left-skewed, which may arise from either a small proportion of the sample observations (in number) with over-valued equity or with under-valued one for a majority of the observations in each sample group. Besides, the average level of corporate cash holdings (CASHHOLD) reserved by the latter group (i.e., non-chaebol firms) as 0.111 is larger than that of the former as 0.083. It may imply that cash management policy of non-chaebol firms, overall appears to be more conservative than that of the chaebol group, according to a precautionary motive in modern finance theory.

4.1.2 Results of the First Hypothesis Test

The outcomes obtained from the tests of the first hypothesis are presented in [Table 5] for the chaebol group and [Table 6] for the non-chaebol

group, respectively, that are explained in terms of both the book-value and the market-value based profitability indices. (i.e., DV1 and DV2)

Table 5. Results on the financial determinants of corporate profitability for the chaebol firms

IDV	DV1		DV2	
	Fixed effects model	Stepwise reg. model	Fixed effects model	Stepwise reg. model
Constant	0.19	<N.A.>	0.33*	<N.A.>
SIZE	-0.01	0.01*	-0.01*	0.01*
MLEVER	-0.04*	-0.11*	0.01	-0.07*
VOLAT	0.09*	0.02*	0.08*	0.02*
GROWTH	-0.05*	-0.01*	-0.05*	-0.01*
TURNOVER	-0.01*	-0.01*	-0.01*	-0.01*
INTANGIB	-0.01*	-0.01*	-0.02*	-0.02*
CASHHOLD	0.05*	0.03*	0.05*	0.04*

<Note> * indicates a statistical significance at the 5% level. <N.A.> denotes an insignificant effect of the corresponding variable at the 5% entry and deletion levels.

On the results of the static panel data analysis on DV1 for the chaebol group, the null hypothesis is not accepted by all the *a priori* specification tests such as Wald (F), Breusch-Pagan (BP) and Hausman tests at the 5% level. To specify, the statistics of the BP and Hausman are m-values of 261.06 and 245.09, respectively, while F-statistic is 9.74. Therefore, fixed effect model is chosen to be the most appropriate one among the three models (i.e., the fixed effect, random effect and pooled OLS models), as presented in [12]. Likewise, fixed effects model is also selected as the best one for the profitability index of DV2 as in [Table 5]. To recap, it is interesting to identify that all the explanatory variables except SIZE, are shown to be important to explain the book-valued profitability of DV1 with the same direction of sign and level of significance across two models (i.e, fixed model and stepwise regression model). On the other hand, all the independent variables (IDVs) other than, SIZE and MLEVER, revealed their pronounced effects to determine DV2 measured by a market-value basis in the models.

Table 6. Results on the financial determinants of corporate profitability for the non-chaebol firms

IDV	DV1		DV2	
	Fixed effects model	Stepwise reg. model	Fixed effects model	Stepwise reg. model
Constant	0.13*	-0.31*	0.32*	-0.20*
SIZE	-0.01*	0.01*	-0.02*	0.01*
MLEVER	0.01	-0.08*	0.03*	-0.07*
VOLAT	0.10*	0.06*	0.09*	0.05*
GROWTH	-0.06*	-0.04*	-0.05*	-0.04*
TURNOVER	-0.01*	-0.01*	-0.01*	-0.01*
INTANGIB	0.01*	0.01*	-0.01	0.01*
CASHHOLD	0.01	<N.A.>	0.01*	<N.A.>

<Note> * indicates a statistical significance at the 5% level. <N.A.> denotes an insignificant effect of the corresponding variable at the 5% entry and deletion levels.

Regarding the consequences reported in [Table 6] to test for financial factors of corporate profitability indices for the non-chaebol group, more than a half of total IDVs such as VOLAT, GROWTH, TURNOVER and INTANGIB, are demonstrated to be financial components to determine the DV1 measured by a book-value basis in terms of sign and statistical significance. On the contrary, relatively different results are obtained for DV2, indicating that only a few variables such as VOLAT, GROWTH, TURNOVER show their statistical importance to explain the relationship with DV2. Meanwhile, in the stepwise regression analysis, six significant variables other than CASHHOLD, are empirically proven to account for the model at the 5% level with F-statistics of 437.18 for DV1 and 249.05 for DV2, respectively. However, it may be suggested that there seem to be additional variables to enter into the models, given that the estimates for Constant (i.e., -0.31 for DV1 and -0.20 for DV2) are significant.

Moreover, alternative model such as Robust regression one, is applied to the two groups of the sample firms, which is accompanied by static panel data model and stepwise model that are presented in [Table 5] and [Table 6]. The

methodology is primarily adopted to winsorize possible outlier in the sample data to derive empirical results and it is found that a majority of variables detected in the aforementioned models may be also important in a statistical perspective.

4.1.3 Results of the Second Hypothesis Test

The outcomes derived from multinomial logistic regression model for DV1 and DV2 in the second hypothesis test, are presented in [Table 7] and [Table 8], respectively.

Table 7. Results of multinomial logistic regression on the financial determinants of DV1 for chaebol firms

IDV	CATEG	Estimate	Chi-square	p-value
Constant	1	4.96	7.17	0.0074
Constant	3	-1.67	0.83	0.3628
SIZE	1	-0.24	12.86	0.0003
SIZE	3	0.09	1.98	0.1593
MLEVER	1	3.42	38.33	<.0001
MLEVER	3	-4.22	51.88	<.0001
VOLAT	1	-0.67	8.02	0.0046
VOLAT	3	0.73	9.20	0.0024
GROWTH	1	0.37	6.04	0.0140
GROWTH	3	-0.41	6.43	0.0112
TURNOVER	1	0.06	2.19	0.1388
TURNOVER	3	0.05	0.93	0.3349
INTANGIB	1	0.11	0.28	0.5970
INTANGIB	3	-0.09	0.08	0.7831
CASHHOLD	1	0.58	0.29	0.5921
CASHHOLD	3	1.66	1.43	0.2324
Goodness of Fit	<N.A.>	<N.A.>	360.36	<.0001

(Note) Each coefficient was estimated by the maximum likelihood method. Test for overall goodness of fit was performed by the likelihood ratio test, while the Wald test was used to test for a significance of each individual coefficient.

As for the outcomes for DV1, it is empirically detected that, among total seven IDVs, four financial factors such as SIZE, MLEVER, VOLAT and GROWTH are significant to discriminate between chaebol firms with mid-range profitability (i.e., CATEG=2 as a reference group) and their counterparts with low profitability (i.e., CATEG=1). On the other hand, the variables of MLEVER, VOLAT and GROWTH are found to have discriminating power between the chaebol groups (i.e., CATEG=2 vs. CATEG=3). To explain,

probability to be classified in the group with high profitability (CATEG=3) is higher, if VOLAT becomes larger with its estimated coefficient of 0.73, in comparison with CATEG=2.

Table 8. Results of multinomial logistic regression on the financial determinants of DV2 for chaebol firms

IDV	CATEG	Estimate	Chi-square	p-value
Constant	1	4.30	5.77	0.0163
Constant	3	-0.54	0.10	0.7522
SIZE	1	-0.18	7.54	0.0060
SIZE	3	0.06	1.20	0.2743
MLEVER	1	2.14	17.26	<.0001
MLEVER	3	-2.95	25.37	<.0001
VOLAT	1	-0.91	17.29	<.0001
VOLAT	3	0.88	9.50	0.0021
GROWTH	1	0.61	16.91	<.0001
GROWTH	3	-1.22	29.69	<.0001
TURNOVER	1	0.06	2.49	0.1147
TURNOVER	3	-0.13	2.25	0.1340
INTANGIB	1	-0.06	0.20	0.6576
INTANGIB	3	-0.07	0.09	0.7626
CASHHOLD	1	2.88	4.14	0.0418
CASHHOLD	3	3.62	5.82	0.0158
Goodness of Fit	<N.A.>	<N.A.>	231.85	<.0001

On the results for the market-value based profitability (DV2), as reported in [Table 8], financial factors such as SIZE, MLEVER, VOLAT, GROWTH and CASHHOLD are identified to be statistically important to differentiate the group with low profitability (CATEG=1) and the reference group (CATEG=2). All the aforementioned variables except SIZE are found to be discriminating components between the two groups classified as CATEG=2 and CATEG=3.

4.2 Discussion

Concerning the bases of the outcomes reported in [Table 3] and [Table 4], coefficient of variation (CV) for each independent variables is estimated by standard deviation scaled by its mean. For the chaebol sample firms, CVs of TURNOVER and SIZE are estimated at 1.576 (= the largest value among total variables) and 0.057 (=the smallest one), respectively. In contrast, for the non-chaebol group, SIZE has the smallest value (=0.048), while the value of CV for CASHHOLD is

the largest as 2.162, among the variables. It seems that the distribution of CASHHOLD for the non-chaebol firms is more widely dispersed than that of their counterparts, indicating that there may be a larger proportion of firms belonging to the former group without reserving corporate cash holdings for a precautionary motive on a relative basis. Moreover, even if the estimate of CV for TURNOVER among total IDVS, is the highest as 1.576 in the chaebol group, the magnitude of the statistic is smaller than that of the non-chaebol group as 2.148. The phenomenon may suggest that asset utilization of the latter group is overall more effective than that of the chaebol group, implying that corporate restructuring plans associated with non-current assets may be necessary to enhance corporate profitability in the domestic market.

Regarding the results of the first hypothesis tests to identify financial determinants of profitability indices such as DV1 and DV2, it was interesting that most of the IDVs show their importance across two sample groups, as presented in [Table 5] and [Table 6]. Among the IDVs that consistently show their importance to account for both profitability indices, VOLAT as a proxy for business risk reveals its positive and significant effects on these dependent variables for both sample groups. The definition of the variable denotes a negative relationship of VOLAT to business risk. Findings of the study are compatible with those obtained from [3], in which sample firms in both capital markets (i.e., the U.S. and Korea) were tested. However, the results are contradictory to the findings in [5], where different time period was covered from 2006 to 2011 to test for the chaebol firms. Therefore, it is plausible that the conventional finance theory presenting a positive relationship between risk and return, may not be applicable to the cases of Korean chaebol and non-chaebol firms during the post-era of the global financial turmoil. Second, the proxy variable of GROWTH

to represent a firm's growth potential were detected to have negative association with both profitability indices across two sample groups, whose results are in conformity with those in the preceding study of [3], but differs from the findings of [8]. The phenomenon may be, in part, attributable to the time-lagged difference between corporate earnings to be realized in the book-value of equity and future investment opportunities which may be immediately reflected in the market-value of equity in the capital market. In contrast, corporate growth rate in sales for the chaebol firms did not have statistically pronounced effects on the profitability indices in the previous study of [5]. The findings are in contrast with the outcome in the present study, which imply that firms belonging to the chaebol group seem to be more engaged in the growth businesses with higher investment opportunities after the global financial turmoil. Third, as for the outcome of the market-value based debt ratios for the chaebol firms, a majority of the variable, MLEVER, show its negative and significant role to explain the profitability indices. While it is generally compatible with the findings of [3], [5] and [7], the results are in contrast with that of [9] for the U.S. sample firms, in which a positive relationship between corporate profit and debt ratio may, to a larger extent, arise from the benefits from interest tax shield. However, the negative relationship between MLEVER and profitability for the chaebol firms, is likely to result from higher borrowing costs in proportions to the level of the debt ratio, as also presented in the previous studies of [3] and [5]. Meanwhile, there is a positively significant relationship between corporate cash holdings (CASHHOLD) and profitability for the chaebol group, as reported in [Table 5], in comparison with the insignificant relationship for the non-chaebol group. It may provide evidence that the former overall utilizes cash reserves in more

effective way to support profitable investment opportunities than the latter of the non-chaebol group during the sample period.

With respect to the results of the second hypothesis test, the chaebol sample firms are divided into three groups, based on the level of profitability, as described earlier. First, it is interesting that no financial differences are found on TURNOVER among the three categories in terms of profitability index. By implementing further investigations on the results in the second hypothesis, the lower asset utilization rate is likely to prevail across all levels of profitability indices for the chaebol firms, which may need more consideration to activate corporate restructuring processes, as discussed. Meanwhile, in the first hypothesis, the variable to measure for firm size (SIZE) does not show its consistency in sign to determine the level of corporate profits across the two sample groups. Consequently, the financial variable of SIZE in the present study does not seem to be an important one to affect the level of corporate profits for Korean sample groups inclusive of both chaebol and non-chaebol firms. Given the inconsistent signs of the estimated coefficient for SIZE, the sample firms do not seem to increase their size to further expect benefits in relation to the theory of “economies of scale”. However, firm size is identified to be a statistically important factor discriminated between one of the two comparative pair-wise groups in the second hypothesis. A one-unit increase in the variable of SIZE indicates a 0.24 decrease (i.e., -0.24) in the relative log-odds of being in the chaebol group (CATEG=1), in comparison with the reference group (CATEG=2), as described in [14]. In contrast, there is no financial differences between the other pair-wise comparative group (i.e., CATEG=2 vs. CATEG=3) with its p -value of 0.1595 for DV1 and 0.2743 for DV2, respectively. Therefore, chaebol firms in the category of low profitability may still need to increase their size

in sales to obtain benefits from the scale economies, even if further benefits may not be available for the firms in the other two profitability levels. Finally, corporate cash holdings (CASHHOLD) reserved by the chaebol firms show its discriminating power among three categorical groups in terms of the market-value based profitability, while any financial differences are not found when the groups are divided by the book-value based one. The chaebol firms in the high and the low level of profitability index may maintain larger proportions of cash holdings than their counterpart of the reference group (CATEG=2). In relation to future investment opportunities, the former group with high market-value based profitability (CATEG=3) may reserve a higher proportion of cash holdings as a source of internal financing to encounter a possible adverse effect related to under-priced equity in terms of Myers’ pecking order theory. On the other hand, the chaebol firms with low market-value based profitability may hold excess cash holdings for a precautionary motive rather than a source of internal financing to support under-valued investment opportunities.

5. Concluding Remarks

The study addresses one of the long-lasting financial issues, which may need to be focused on a regular basis associated with changes in global or domestic economic conditions. That is, as an extension of the previous researches such as [3] and [5] of the analogous subject, corporate profitability measured by the book-value and market-value bases are analyzed in relation to the financial determinants of domestic firms. In the first hypothesis testing for the chaebol group, all variables except SIZE are proved to have significant effects among total seven variables to determine the book-valued profitability index, whereas the variables other than SIZE and

MLEVER, show their significance on the DV2 measured by a market-value basis. The outcomes derived from the multinomial model for DV1 are compatible with those for DV2 in the second hypothesis. Financial differences are not overall found in the variables of TURNOVER and INTANGIB to discriminate between two comparative pair-wise groups, whereas there are categorical differences in each variable of MLEVER, VOLAT and GROWTH from a statistical viewpoint.

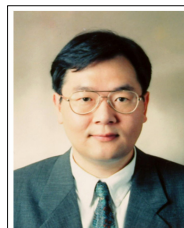
Despite suffering from legitimate and possible redundant weaknesses associated with different empirical settings of the present study inclusive of econometric methodologies compared to the previous studies, the study may provide a new vision for Korean chaebol firms to ameliorate corporate profitability to the benefits of interest parties inclusive of shareholders and bondholders. It is also anticipated to contribute to making decisions at the government level, whose ultimate goal includes a balanced enhancement of corporate profitability between the chaebol firms and their counterparts in non-chaebol firms as well.

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<Research Interests>

Corporate Finance, M&A, Valuation, Int'l Finance