국제 금융위기 이후 KOSPI 상장회사들의 자본구조 결정요인 분석
Financial Profile of Capital Structures for the Firms Listed in the KOSPI Market in South Korea

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요약

본 연구는 국내 유가증권시장(KOSPI 시장) 상장회사들의 국제금융위기 전, 후 기간의(2006년부터 2011년 사이) 자본구조 결정요인에 대한 추세적 변화를 검정함이 주된 목적이다. 기존의 국내,외 분석들과 비교하여, 본 연구는 패널자료분석을 이용한 동 시기를 기준으로한 표본회사들에 대한 분석이며, 결과들이 과거 연구들과 유사성을 보인다면 동 위기와 관계없는 일관성있는 결정요인으로서 분석될 수 있을 것이다. 자본구조와 관련된 4가지 가설들(즉, 패널자료모형을 통한 결정요인분석, 미국발 금융위기 전,후의 자본구조의 구조적 변화분석, 수정된 '듀퐁 시스템'분석을 통한 요인별 분석, 그리고 국내 상장회사들의 부채비율 관련 해당산업 평균 또는 중앙값 회귀 등)이 각각 검정되었다. 패널자료 분석결과 장부가와 시장가 기준 모든 부채비율에서 음(-)의 수익성, 양(+)의 자산규모, 그리고 음(-)의 영업이익의 변동성 등이 통계적 유의성을 보였으며, 로지스틱 회귀모형 결과 금융위기 전, 후의 자본구조 결정요인의 변화요인으로서 외국인 지분율, 기업의 자유현금흐름 등이 유의성있는 요인들로 분석되었다. 국내 KOSPI 상장회사들은 5년의 주기(cycle)로 해당산업 부채비율의 중심경향척도(특히, 중앙값)에 수렴하는 특성도 나타내었다.

■ 중심어 : | 자본구조 | 국제금융위기 | 패널자료분석 | 로지스틱회기모형 | 피셔정확확률검정 | KOSPI 상장기업 |

Abstract

This study performed comprehensive tests on the four hypotheses on the capital structures for the firms listed in the KOSPI during the period from 2006 to 2011. It may be of concern to find any financial profiles on firms' leverage across the book- and market-value bases since there was relatively little attention drawn to any financial changing profile of the leverage surrounding the period of the pre-and the post-global financial crises. The findings of this study may also be compared with those of the previous related literature, by which it may be expected to enhance the robustness and consistency of the results across the different classifications on capital markets. It was found that three explanatory variables such as PFT, SIZE, and RISK, were found to be the statistically significant attributes on leverage during the tested period. Moreover, the outcome by the Fisher Exact test showed that a firm belonging to each corresponding industry may possess its reversion tendency towards the industry mean and median leverage ratios.

■ keyword : | Capital Structure | Global Financial Crisis | Panel Data Analysis | Logistic Regression Model | Fisher Exact Probability Test | KOSPI-listed Firms |

Ⅰ. Introduction

This research addresses any possible changes of financial profiles on the capital structures for the KOSPI(Korea Composite Stock Price Index) listed firms in the Korean capital market surrounding the global financial crisis originated, in large part, from the U.S. sub-prime mortgage loans in 2008. It may be of particular interest to identify any primary phenomena on the stereotyped financial characteristics affecting the level of the capital structure for a firm belonging to the KOSPI market, by testing for the major hypothesis tests to derive the results. Meanwhile, there seems to be a relatively lot of researches on the (financial) issues of capital structure or financial leverage for a firm at the country or industry level across advanced and emerging capital markets since the seminal paper by M&M[1] was presented on the theory capital structure. However, it may be a intriguing issue if further investigations are performed to identify any (changed) attributes surrounding the global financial turmoil, especially, for the firms domiciled in the capital market such as the Korean one, which is in transition to its reclassification into an advanced market to date. Moreover, as one of the objectives of this present study, given the results obtained from this study, it may be beneficial for the policy makers at the domestic government level as well, who would implement their own operational tasks by effectively applying the outcome to mitigate any financially unexpected or possibly recurrent unstable situations, which may, in turn, have the domestic market conditions enhanced in quality.

The following are the primary motivations of the present study towards achieving its research objectives:

First, as described, while there seems to be relatively abundant studies on the issue of financial aspects determining capital structure across the global regions, little attention may so far be drawn to the study on examining any financial changed profile of leverage for the firms listed in the KOSPI market (or the KOSPI-listed firms) in the Korean capital market utilizing the sample period covering both the pre-and post-global financial crises with applying each corresponding methodology such as the panel data model and the Fisher exact probability one.

Second, by comparing the consequences obtained from this study with those derived from the previous literature on the subject of leverage as in Kim & Berger[2] and Kim[3], this study may be utilized to reinforce the robustness of the outcomes. In other words, through the comparison procedure, new findings consistent with or different from those in the previous researches, may warrant a future research to explore any opportunities to reinterpret the results in the context of contemporary finance theory.

Finally, from a Korean firm's perspective, it may be an appropriate moment to reconsider or control the level of capital structure for a firm headquartered in Korea, whose level might be artificially lowered by the domestic government in cooperation with IMF in the unprecedented event of the Asian financial crisis occurred in 1997. In other words, since the Korean financial turmoil in 1997, the government had expedited to carry out proper steps to resolve the unstable financial conditions by implementing five major restructuring tasks including the 'Improvement of Capital Structure'[4]. That is, the plan for 'Improvement' had articulated that the firms belonging to the Korean chaebols should have lowered their debt ratios (in terms of debt/equity), below 200% by the end of 1999 and also an interest-tax shield were only applicable to debt financing whose amounts were maintained within the

range of fivefold equity capital in size, effective the onset of the year, 2000. Even if the applicable firms under the task, had successfully accomplished the restructuring plan in time, there may, however, still be a pervasive effect resulting from this measure, in that they may keep the debt ratios lower than those determined by the traditional 'trade-off' capital structure theory in finance.

This study consists of the following sections: Coupled with the introduction section, the second section chronologically reviews the previous literature on the capital structure across the advanced and emerging capital markets, which were also frequently referred and cited by many previous researches as in [5] and [6]. The third one discusses the data collection criteria and the methodologies applied to each hypothesis test in this study. Followed by the final section presenting conclusion, the fourth section analyzes the results of the hypothesis tests and interprets the implications in the context of finance theory.

II. Literature Review

The following literature was chronologically described as several of the major researches concentrating on the issues on the financial profile of capital structure for the firms including those in the Korean capital markets[7].

Remmers et al.[8] presented their sample selection criteria in more detail to guide other researchers to find the reason why their study could have different results on industry influence on capital structure. As for the results of their F-tests, industry was not a determinant of corporate leverage ratios in the manufacturing sectors in the United States. Regarding the results for the other sample countries,

they did not find the existence of industry differences for the majority of the nations such as the Netherlands and Norway while they did for those of France and Japan. Size was not a determinant of capital structure in most sample countries.

Another important article on industry effect by Scott & Martin[9] showed how their results describing the evident existence of inter-industry differences on capital structure have been reinforced by employing both parametric and nonparametric approaches. In this article, the adjustments of industry mean equity ratios based on firm size differences have been performed and the results of the analysis of covariance (ANCOVA) confirmed that industry itself along with a significant size effect was a determinant of capital structure.

As one of the few approaches to country and industry effects on capital structure for developing countries, Errunza[10] argued that industry norms were significantly different for most countries comprising the Central American Common Market (CACM), whereas country norms were not as important as industry norms. After obtaining a significant interaction between industry and country effects using the two-way ANOVA, he performed the separate one-way ANOVA tests for each country and industry in his paper.

Michel & Shaked[11] examined a widely believed notion that Japanese firms may be more highly levered that U.S. firms. They tested both book and market value based capitalization ratios (CRs) and the results showed that there were no significant differences in location based on market value CRs between the two countries, while significant differences at book value were found between the two sets of CRs as expected. However, differences in skewness existed when measured at market value.

Krishnan & Moyer[12] also performed an

international study to find the determinants of corporate performance and capital structure for four countries such as Hong Kong, Korea, Malaysia, and Singapore. Their results supported that Korean firms, on average, had a statistically significant market value based leverage ratio which was higher than those of the firms from the other three countries. They argued that the close linkages between chaebols and domestic banks in Korea may well result in the higher leverage of Korean firms in the sample. Moreover, size and tax effects were the significant determinants of capital structure after controlling for country and industry influence.

Cho[13] tested financial characteristics which may discriminate successful group from unsuccessful group sampled by the 51 KOSDAQ firms. By employing two separate tests such as Wilcoxon rank-sum test and logit analysis, this study found that all the tested variables excluding equity turnover ratio, showed their statistically significant effects to discriminate between the two groups in the former test result. Moreover, the EBIT(earnings before interest & taxes) ratio was significant at 5% level.

Glen & Singh[14] compared capital structures in developed and emerging markets considering 7968 firms from 44 countries (22 developed markets vs. 22 emerging markets) during the period of 1994-2000. The amount of leverage, defined as total liabilities to total assets, in the emerging markets were found to be significantly higher than those in the developed markets. They also noted that the median leverage ratio of Korean sample firms was 72% in 1994, but declined to 52% in 2000, following the 1997 financial crisis.

Kim & Berger[15] investigates the determinants of the capital structure of large corporations headquartered in the United States and Korea. They consider five explanatory variables, profit, company size, non-debt tax shields, growth, and business-risk, along with several industry indicator variables as independent variables and examine, for each country, the relationship to market value based leverage ratio. With our rigid criteria for inclusion in the study, we study the top 13 companies (by size) in each of seven industries. The majority of our findings indicate that we can generalize to Korea what has been found for Japanese companies/industries relative to the U.S.

The study done by Kim[16] investigates empirical issues that have received little attention in the previous research in the Korean capital market. It is to find any financial determinants on the capital structure for the firms listed in the KOSDAQ(Korea Securities Dealers Automated Quotation). Another test is performed to find any possible discriminating factors by utilizing a robust methodology, which may distinguish between the firms belonging the 'prime section' and 'venture section' in terms of their financial aspects. Moreover, the null hypothesis that the changing trend or movement of a firm's capital structure with respect to its industry mean (or median) may be random, is also tested. For the book-value based debt ratios, size(INSIZE), growth(GROWTH), market to book value of equity(MVBV), volatility(VOLATILITY), market value of equity(MVE) and section dummy (SECTION) showed their statistically significant effects on leverage, respectively, while size, growth, market value of equity, beta and section dummy showed their statistically significant effects on the market-value based leverage ratios. This study also found an interesting result that a firm belonging to each corresponding industry has a tendency for reversion toward its mean and median leverage ratios over a five-year tested period.

Ⅲ. Data Collection and Methodologies

1. Data Collection

To identify financial characteristics on the debt ratios for the KOSPI-listed firms in this study, the required data were collected for the dependent variables(DVs) and the independent variables(IDVs) to be employed in each corresponding model. In particular, most of the variables utilized in the previous literature such as those in Kim & Berger[17] and Kim[18], were re-employed in the model to test for the hypotheses of this study to check for robustness and consistency, as previously explained. The followings are the criteria to finalize the sample data utilized in this study.

Table 1. Data for the Korean Sample Firms

1. All the data for each sample firm were available for at least six years including the year from 2006 to 2011,surrounding the period of the global financial turmoil resulting, in large part, from the U.S. sub-prime mortgage crisis.
2. The sample firms were listed on the KOSPI market at the end of December 2011. They were also included in the databases of New KisValue (published by the NICE in Korea).
3. The largest 13 corporations ranked by asset size, were selected for each corresponding industry whose classifications or definitions were matched with those adopted in Kim(2011).
4. Financial and regulated industries were not included in the final sample.

1.1 Dependent Variable(DV)

The DVs proxied for leverage in this study, were defined in various ways to perform more comprehensive tests to find any possible financial determinants on the subject. The followings are the variables in the model as proxies for the DVs, respectively.

(1) Book-value based debt ratio:
1)BVLEV1 = Total liabilities/Total Assets
2)BVLEV2 = Interest charges / EBITDA
(Note: EBITDA is defined as earnings before interest, taxes and depreciation & amortization)

(2) Market-value based debt ratio:
1)MVLEV1 = Total liabilities/(Total liabilities + Market Value of Equity + Preferred Stock)

BVLEV2 as one of the DVs, seems to be a more practical debt-proxy for a firm esp., headquartered in Korea, since this measurement may be more directly related to a firm's bankruptcy risk than the other traditional leverage ratios. (The range of the ratio, BVLEV2, is to be between 0 and infinite.) To exemplify, a firm with a higher value of the BVLEV2 may in practice signal that it is more susceptible to a bankruptcy risk under the Korean capital market conditions.

1.2 Independent Variable(IDV)

To reduce any subjectivity or bias as much as possible when selecting predicted variables entered into each model of this study, the following criteria, from the perspective of the researcher, were contemplated as in [19] to account for this issue on the selection procedure.

First, the variables in each corresponding model, were selected, based upon their commonalities tested in the previous literature, and they usually showed the conflicting results in terms of the sign of a coefficient and its statistical significance. Second, since one of the main objectives of this particular study was to perform comparative analysis with those of the previous literature on capital structure, any consistent or controversial results obtained for each IDV, may induce new interpretation or robust

conclusion across either the capital markets or the time periods investigated. Third, all the data composing each variable, should be available from the data selection criteria as described in [Table 1].

Table 2. Independent Variable Definitions

Definition	Proxy Variable	Measurement
Size	SIZE	Natural Log of Book value of assets at the fiscal year-end
Profitability	PFT	Earnings before interest and taxes(EBIT) / Book value of assets at the fiscal year-end
Market value of equity	MVE	Market value of equity
Business risk	RISK	Standard deviation of EBIT during the sample period
Market- to book- value of equity	MVBV	Market value of equity / book value of equity
Growth	GROWTH	Annual average compound growth rate in sales during the sample period
Foreign ownership	FOS	Foreign ownership of each KOSPI listed sample firm
Beta	BETA	Systematic risk of a sample firm
Free cash flow	FCFF	Earings after corporate taxes – (net changes of the amount of assets during a fiscal year)
Industry	Ind	IND1 = 1 if industry = food. 0, otherwise; IND2 = 1 if industry = pharmaceutical1. 0, otherwise; IND3 = 1 if industry = chemical. 0, otherwise; IND4 = 1 if industry = semiconductor & communication. 0, otherwise; IND5 = 1 if industry = construction. 0, otherwise; (Base industry variable = the wholesale industry)

2. Methodologies Tested for Each Hypothesis

With respect the hypothesis tests with utilizing the sample firms listed in the KOSPI market, this study has employed such methodologies as the panel data, logistic regression, and the Fisher exact probability one for each tested model.

The followings are postulated for the hypothesis tested to derive any results on the subject of this study:

<Hypothesis 1>

H_0: *The firms listed in the KOSPI have no statistically significant financial characteristics to affect their capital structures by adopting a panel data analysis during the studied period (from 2006 to 2011).*

The panel data analysis employed in this study is a one-way model and can be written as follows[20]:

$$Y_{it} = b_0 + b_1 X_{1it} + b_2 X_{2it} + \ldots\ldots + b_k X_{kit} + a_i + u_{it}$$

,where ai is the unobserved effect.

u_{it} is the error term assumed to be independent and identically distributed.

i = 1, 2, ..., n (for each firm), and t = 2006, 2006, ..., 2011.

k = total number of exogenous variables, and j = 1, 2, ..., k.

If $Cov(X_{jit,} a_i)=0$, a random effects model. Otherwise, a fixed effects model.

By applying a panel data analysis to test for the hypothesis, this research finally chose the most effective model among the pooled OLS, a fixed effects(FE) model, and a random effects(RE) model by using the appropriate test such as F test(Wald test), Breusch-Pagan(BP) Lagrange Multiplier test, and Hausman (specification) test[21]. Park[21] presented primary standards to select the best model when implementing the panel data analysis as follows:

Table 3. Method for the Panel Data Analysis

Fixed Effect(Wald test)	Random Effect(BP test)	Hausman Test	Final Model Selected
H_0 Accepted	H_0 Accepted	(N.A.)	Pooled OLS
H_0 Rejected	H_0 Accepted	(N.A.)	Fixed effects model
H_0 Accepted	H_0 Rejected	(N.A.)	Random effects model
H_0 Rejected	H_0 Rejected	H_0 Accepted	Random effects model, otherwise fixed effects model

(Note) N.A. = Not Applicable

<Hypothesis 2-1>

H_0: Any financial determinants on leverage for the firms in the KOSPI market, may not have any statistically significant differences between the pre- and the post-global financial crisis periods. (i.e., 2006-2007 vs. 2010-2011)

To be noted, an intervening period from 2008 to 2009, was excluded by taking into account possible 'spill-over' effects due to the global financial turmoil.

To test for the hypothesis, it employed a (binary) logistic regression model to distinguish the KOSPI-listed firms belonging to the pre-financial crisis period from the counterpart period with respect to financial characteristics.

The functional form of the logistic regression model is as follows:

$$P(\text{Pre-crisis}) = e^{a+b\ell x} / (1 + e^{a+b\ell x}),$$

, where P(Pre-crisis) is the probability that a firm listed in the KOSPI will be classified as one possessing a financial profile relevant to the pre-global financial crisis period, which is bounded between 0 and 1.

It labels α and β as the intercept and vector of slope parameters, respectively. x is a vector of independent variables at each studied year.

In application, the logistic regression is modeling the above probability by assigning the dummy variable, 'Pre-crisis', as 1, if a firm was classified into the period of the pre-global financial crisis and 'Pre-crisis' = 0, otherwise.

<Hypothesis 2-2>

H_0: The firms in the KOSPI market during the period of the pre-global financial turmoil, on average, may not have any statistically significant differences in comparison with their counterparts during the period of the post-global financial one in the components (i.e., Debt Burden, Financial Cost, 1/Asset Turnover) composing a modified 'Dupont' system.

Subsequent to the results of the 1st hypothesis test, it may be of interest to identify any differences of the components in the modified 'Dupont' system for academic and practical purposes, which may be useful to investigate in capital structure between the two tested periods in the Korean capital market. The modified 'Dupont' system had been theorized in the context of traditional finance and was also employed in [23]. It is defined as follows:

Financial Burden = Debt Burden x Financial Cost x (1 / Asset Turnover):

(Interest expense/Sales) = (Liabilities/Assets) x (Interest expense/Liabilities) x (Assets/Sales)

<Hypothesis 3>

H_0: The trends of the capital structures of the firm listed in KOSPI are, on average, random with respect to its industry mean (or median).

As for another hypothesis test, the methodology applied was the 'Fisher exact probability' test as non-parametric statistical method, to identify a trend of reversion to each corresponding industry 'mean' over a five-year interval. Fisher theorizes a statistical

method which gives the probability of the observed or even more extreme configuration under the null hypothesis that no directionality exists[24]. Moreover, this study also performed the test for industry 'median' reversion, given the distribution-free assumption of the non-parametric method as illustrated in [25].

IV. Analysis and Interpretations

1. Analysis on the Results

The followings were the descriptive statistics for the sample firms utilized in this study during the studies from 2006 to 2011.

Table 4. Descriptive Statistics for IDV

IDV	N	Mean	Standard Deviation	Minimum	Maximum
P	468	0.054	0.059	−0.262	0.244
S	468	27.907	0.1.615	24.360	32.679
G	468	0.098	0.089	−0.154	0.337
M	468	1.203	1.131	−4.940	10.704
R	468	1.80E+11	5.66E+11	2.4E+8	4.47E+12

(Note): N=Sample Size, P = PFT, S= SIZE (in assets), G=GROWTH, M=MVBV, R=RISK,

Table 5. Pearson's Correlation Coefficient Matrix between IDVs

IDV	P	S	G	M	R
P	1.00	0.16*	0.25*	0.28*	0.18*
S	0.16*	1.00	0.27*	0.08	0.53*
G	0.25*	0.27*	1.00	0.05	0.12*
M	0.28*	0.08	0.05	1.00	0.07
R	0.18*	0.53*	0.12*	0.07	1.00

(Note) *: a statistically significant at 5% level.)

1.1 Test Results on the 1st Hypothesis

By applying the methodology of the panel data model to the 1st hypothesis test to examine the financial characteristics on capital structure, the most appropriate model for the DV of MVLEV1, was chosen to be the 'one-way fixed effects(FE)' model (among the possible candidates such as pooled OLS,

fixed effects(FE), and random effects(RE) models) at the 10% level of statistical significance, while the pooled OLS model was selected as the best one for the DVs on the book-value based leverage ratios, BVLEV1, at the 5% level. Moreover, the results obtained from the FE model for the MVLEV1, were consistent with those from the pooled OLS at the 5% level. In other words, the predicted variables (i.e., IDVs) in the two market-value based models (i.e., FE model and pooled OLS mdel) were both consistent in regard to each coefficient with the level of statistical significance and a sign. Therefore, this phenomenon may enhance the robustness of the obtained results. However, the model for the DV of BVLEV2 (=Interest charges/EBITDA) was not statistically significant in explaining the variation of DV accounted for by the explanatory variables across all the candidates.

The followings are the best model selected by the panel data analysis for the book-value based and the market-value based debt ratios.

(1) To include a book-value based leverage ratio as a dependent variable(DV): (Pooled OLS model)

$BVLEV1_{it} = -0.90* - 0.87PFT_{it}*$
$+ 0.05SIZE_{it}* - 0.20GROWTH_{it}*$
$+ 0.01MVBV_{it} - (6.67E-14)RISK_{it}*$

(Note: * indicates that the independent variable (IDV) is statistically significant at the 5% level.)

(2) To include a market-value based leverage ratio as a dependent variable(DV): (One-way time fixed effect model)

$MVLEV1_{it} = -0.65* - 1.13PFT_{it}*$
$+ 0.06SIZE_{it}* - 0.12GROWTH_{it}$
$- 0.09MVBV_{it}* - (738E-16)RISK_{it}*$

(Note: * indicates that the independent variable (IDV) is statistically significant at 5%.)

1.2 Test Results on the 2nd Hypothesis

As for the 2nd hypothesis test, two sub-hypotheses were postulated to be tested for the present subject on the Korean leverage. The following output on the 1st sub-hypothesis illustrated the possible financial factors to discriminate the capital structures of the firms in the KOPSI market, separating the periods between the pre-crisis and post-crisis (i.e., the years from 2006 to 2007 vs. from 2010 to 2011), as illustrated earlier.

Table 6. The Logistic Regression Results for between the firms belonging to the pre-global financial crisis and their counterparts with respect to leverage

IDV	Coefficient	Chi-square
Intercept	15.9440	11.8366*
PFT	−6.6250	2.0225
SIZE	−0.6472	13.4163*
GROWTH	0.7611	0.1107
BETA	1.4037	3.4702
MVBV	0.6847	6.6070*
FOS	0.0450	8.0474*
FCFF	2.08E−12	5.5704*
IND1	−0.4376	0.4297
IND2	−1.0951	2.2147
IND3	−0.8132	1.3577
IND4	−0.9475	1.8536
IND5	−0.5596	0.6422
Goodness of Fit		36.5073*

(Note 1) *: Significant at 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.

Subsequent to the above sub-hypothesis, another test on the 2nd sub-hypothesis, was carried out by utilizing the aforementioned modified 'Dupont' system, which may be more effective in the Korean capital market. It was to measure a firm's level of leverage relating to its bankruptcy risk and most firms in the Korean capital market seem to be traditionally more susceptible to the bankruptcy risk than their counterparts in the advanced capital markets, as described earlier. The following table illustrated the outcome available from the logistic regression model on the sub-hypothesis test.

Table 7. The Logistic Regression Results for the 'Financial Burden' between the firms belonging to the pre-global financial crisis and their counterparts with respect to leverage

IDV	Coefficient	Chi-square
Intercept	0.3669	0.4252
DRELY	−1.5262	2.1033
INTRATE	24.6814	3.0108**
RATURN	−0.1410	0.3722
Goodness of Fit		3.4770

(Note) **: significant at 10% level, with respect to the chi-square test

1.3 Test Results on the 3rd Hypothesis

Finally, as one of the intriguing tests on the subject of capital structure, the following primary test concerning a firm's mean (or median) revision to its (corresponding) industry leverage ratio, was implemented across the book-value and the market-value based ones over a five-year interval. as also tested in [26] and [27].

Table 8. Results on the Fisher Exact Probability Test

Leverage	cell I	cell II	cell III	cell IV	p-value
BVLEV1 (mean)	29	17	11	21	0.0207
BVLEV1 (median)	19	17	11	31	0.0205
MVLEV1 (mean)	25	15	17	21	0.1725
MVLEV1 (median)	25	11	18	24	0.0234

(Note):
Cell I = the number of firms belonging to KOSPI which were above the industry mean (or median) in the year of 2006 as a base year, but were closer to the industry mean (or median) after 5 years, the year of 2011.
Cell II = the number of firms belonging to KOSPI which were above the industry mean (or median) in the year of 2006 as a base year and moved farther from the industry mean (or median) after 5 years, the year of 2011.
Cell III = the number of firms belonging to KOSPI which were below the industry mean (or median) in the year of 2006 as a base year that moved farther from the industry mean (median) after 5 years, the year of 2011.
Cell IV = the number of firms belonging to KOSPI which were below the industry mean (or median) in the year of 2006 as a base year, but were closer to the industry mean (or median) after 5 years, the year of 2011.

2. Interpretations

Regarding the results on the 1st hypothesis to find the statistically significant financial attributes on capital structures for the KOSPI listed firms, three explanatory variables such as PFT, SIZE, and RISK, showed their influences on leverage, based upon both the book-value based and the market-value based debt ratios during the selected (or studied) period. First, PFT as proxy variable for profitability defined as (EBIT/Assets) showed its statistically significant effect on capital structure with its negative(−) sign of a coefficient in the two corresponding models. In particular, the proxy, PFT, referred to as 'Basic Earnings Power' may have its own following advantage over the other independent variable utilizing 'net income(NI)' as a possible profitability indicator: On one hand, this proxy variable may reflect the current financial trend in which most market participants or investors seem to be more concerned with any changes of EBIT of the firms they invested or engaged in, than those of net income[28]. On the other hand, this variable may possess a theoretical rationale such that, at the financial break-even point(FBEP), the value for PFT is equal to the cost of debt which incurred by the debt burden of a company. That is, if the amount of the EBIT of a firm is less than that the level of FBEP, a company may prefer to use less debt financing than equity one, due to the negative net of [PFT − the cost of debt], which may result in a decrease of EPS(earnings per share) from a shareholder's standpoint, and vice versa[29]. In common with the previous researches as [30] and [31], this study identified that PFT was in a negatively proportional relationship with both BVLEV1 and MVLEV1, indicating that the Korean firms listed in either the KOSPI or the KOSDAQ, or NYSE in the U.S (stock) market may still prefer internally generated fund over any types of external funds in financing, as posited by the Myers' pecking order theory. Thereby, it may be plausible that a negative relationship between profitability and capital structure, was one of the generally accepted empirical findings across any studied periods, the level of development of the capital market condition, and the type of measurement such as a book- or market-value basis.

Second, the proxy variable to measure a firm's size (denoted as SIZE), was formulated as a natural logarithm of its sales amount at the end of each fiscal year during the tested period. In contrast to the profitability indicator, a firm's size showed conflicting results on leverage, in regard to the direction of a coefficient's sign and the level of (statistical) significance. While Du & Dai[32] indicated that a large-size firm may be more highly leveraged than that of a small-size one, due to the inverse relationship between the firm size and unobservable credit risk. Bancel & Mitto[33] presented that a larger firm with decreasing profits may care less about debt financing than its counterpart, a smaller firm, by taking advantage of its lower agency costs and asymmetric information, which may enable the larger one to maintain a lower debt ratio. In the context of traditional finance theory, a large size firm may keep a higher target capital structure than a small one in size, due to the larger extent of diversification and the higher degree of involvement in the mature industry. Therefore, the outcome of a firm's size shown as the significant effect on leverage, may well be in accordance with the traditional rationale in finance, with its positive sign of the corresponding coefficient in the tested model.

Third, RISK as proxy for estimating volatility of a firm's earnings stream showed its negative and statistically significant relationship with both leverage ratios such as BVLEV1 and MVLEV1. While

Myers[34] theorized that a risky firm may maintain its higher debt level since it is likely to be less affected by issuing more debt due to possessing real options in comparison with a safe firm, the traditional theory in finance predict the negative relationship between the a firm's risk and leverage. Based upon the results obtained from this study, it can be rationalized that a manager engaged in a KOSPI listed firm seems to follow a traditional finance theory on the risk aspect when deciding a target capital structure. It may be plausible that the disparate results from that of [35] with a positive relationship between the two variables, were brought about by the different sampling criteria in which the latter had employed the KOSDAQ (not the KOSPI) listed firms possessing more investments opportunities to utilize real options. On the other hand, the result on the risk of a KOSPI listed firm during the period of the early 1990s, showed its 'insignificant' effect on leverage[36]. Compared with the results of the present study commensurating with the traditional theory, this discrepancy (between the two studies) may imply a (structurally changing) financial profile of the capital structure for a firm in the KOSPI market, which is gradually in transition from an emerging market to an advanced one. Regarding GRWOTH, the growth opportunity of a firm in this study, it's proxy variable was measured by the annual average compound growth rate in 'sales', in that the assets-based firm size variable measuring growth tends to be upwardly biased for firms engaged in the capital intensive industry, and downwardly biased for firms in the labor intensive one[37]. While Gupta[38] presented that a firm's growth (rate) was proportional to leverage resulting from a higher flexibility in structuring its capital structure and also being more convenient for debt financing (over equity one) when raising and

liquidating a fund. Titman & Wessels[39] indicated that a *prior* expectation of the negative effect of the growth opportunities on leverage, wes expected due to the type of assets (as intangible one) which may not be easily assessed as collateral in most cases. According to the result on GROWTH in this study, it may confirm the finding of the Titman & Wessels' study indicating its statistically significant and negative effect on the book-value based leverage ratio.

Concerning the test-results from <Hypothesis 2-1>, it was of interest to find any discriminating factors on capital structure between the two sub-sampled periods (i.e., the periods between the pre-and post-global financial crises). Among the predicted variables employed in the logistic regression model, several IDVs in [Table 6] showed their significant influences on leverage, which may statistically differentiate among them between the two separated periods. FOS as 'foreign' ownership of each corresponding sample firm, represented its positive and statistically significant influence in the model, which was estimated by method of maximum likelihood(ML) tested by the Wald specification. A firm with high degree of 'foreign' ownership may reduce or protect from any possible misuse by incumbent management resulting in agency cost of equity by moral hazard[40]. According to the result on FOS in the model, it was found that the probability to be classified into a firm in the pre-global financial crisis period is higher, if it maintain a higher foreign ownership, and vise versa. This may imply that the degree of foreign ownership decreased for the firms listed in the KOSPI market after the financial turmoil, mainly due to the shrinkage of the global capital markets (including the Korean one) invested by foreign institutions. Moreover, Free cash flow(FCFF) estimated by [Earings after corporate taxes − (Net

changes of the amount of assets during a fiscal year)] in the New Kisvalue Database, also showed its positive discriminating effect to distinguish between the periods. Therefore, the probability for a firm to be classified into the group in the pre-global financial crisis period (the year from 2006 to 2007) will be higher, if it reserves more free cash-flows to the firm, or vise versa.

Meanwhile, out of the three components proposed to test for identifying any discriminating factors the firms between the pre-and the post-financially unstable periods as in <Hypothesis 2-2>, only one variable, INTRATE, showed its significant effect (at the 10% level) on discerning the whole sample firms into the two separate periods, as in [Table 7]. The ratio of interest expense to liabilities as abbreviated by INTRATE, tends to be lower for the KOSPI listed firms after the event of the global financial crisis due to in large part the higher bankruptcy risk affected by the sluggish global economic conditions.

Finally, a firm's reversion trend to its industry mean (or median) in leverage over a five-year interval, was tested as postulated in <Hypothesis 3>. The results from the Fisher exact probability test identified, in general, that a firm belonging to each corresponding industry may possess its reversion tendency towards the industry mean and median leverage ratios, based upon the book-and the market value bases over the five year interval. These findings were consistent with those in [41] for the KOSDAQ listed firms and in [42] for the U.S. sample firms. However, the statistically significant reversion tendency over the same period, was only applicable to the industry 'median' basis, not to the industry 'mean' basis as shown in [Table 8] with each corresponding p-value]. This phenomenon may arise from the issue on the frequency distributions of the

market-value based debt ratios, most of which were skewed to the left (i.e., negatively skewed with the values of 'median > mean') in their shapes. Therefore, it may be plausible that the majority of KOSPI listed firms tend to establish their market-value based, (target) capital structures in terms of industry 'median' (rather than industry 'mean'), given the five-year reversion tendency to the industry norm in leverage.

V. Concluding Remarks

This research implemented comprehensive tests on the four hypotheses related to the capital structures for the firms listed in the KOSPI during the studied period from 2006 to 2011. It may be of concern to find any financial profiles on the firms' debt ratios across the book- and market-value bases from the perspectives of foreign and domestic investors.

The primary motivations to implement this research are as follows: First, in comparison with other subjects in the finance literature such as [43], there was relatively little attention drawn to the subject of the study on the financial changing profile of the leverage for the firms listed in the KOSPI market in the Korean capital market especially, covering the sample periods surrounding the pre-and post-global financial crises. Second, the outcome of this study may be utilized for comparison purposes with those of the previous literature such as [44] and [45], by which it is expected to enhance the robustness and consistency of the results across the different classifications on capital markets (e.g., advanced vs. emerging capital one) and different time periods selected. Finally, from a domestic firm's perspective, the results may be contributed to its financial strategy to reconsider or rearrange the level of the

capital structure, whose level might be artificially lowered and drastically deviated from its target optimal capital structure since the late 1990s coming with the unprecedented event of the Asian financial crisis.

With respect to the results obtained from the 1st hypothesis test, three explanatory variables such as PFT, SIZE, and RISK, were found to be the statistically significant attributes on both the book-value and the market-value based leverage ratios during the selected period. It may be noteworthy that the negative relationship between profitability and capital structure, seems to be one of the generally accepted empirical outcomes, which was confirmed by the majority of the researches such as [46] with robustness. Regarding the results for <Hypothesis 2-1>, a few proposed IDVs such as FOS and FCFF, showed their significant effects on leverage differentiating between the pre- and post-financially unstable periods. Of particular, a policy maker at the government or a manager at the firm level, may need to pay more attention to a decreasing degree of foreign ownership(FOS) after the financial chaos, since a high degree of foreign ownership may protect from any possible mismanagement by incumbent management, thereby resulting in agency cost of equity, as previously described. Finally, the outcome generated from the Fisher Exact test showed that a firm belonging to each corresponding industry may, in general, possess its reversion tendency towards the industry mean and median leverage ratios, based upon the book-and the market value bases over a five year time interval.

The present study has a few limitations (as an empirical research) that may need to be taken into account, such that any conflicting results in comparison with those in the previous researches, may be, in some degree, attributed to different measurement on the proxy variables, diverse time periods and the methodologies studied.

However, the results on the current issue, which were found to be accordant with those of the previous literature, are expected to shed new light on identifying any financial determinants of the capital structures for the KOSPI-listed firms with robustness and consistency, thereby contributing to prevention against any possible and recurrent financial turmoils as described earlier. In other words, it may be useful for a domestic policy-maker to carry out his or her own strategic tasks with considering the findings of this present research to reduce or even eliminate any possibilities of recurring financial unstable conditions in the domestic capital market.

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