

# 국내 금융기관들의 신용부도스왑 스프레드에 대한 재무적 결정요인 분석

## Financial Determinants of Credit Default Swap Spreads for Financial Institutions Headquartered in the Republic of Korea

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### 요약

본 연구의 주제는 국내 금융기관들의 신용부도스왑(CDS) 스프레드의 재무적 결정요인에 대한 분석이다. 대부분의 기존 유사주제관련 연구논문들의 대상 (표본)기업들은 선진자본시장에 소속되어 있었으나, 본 연구의 특성으로서, 현재까지는 신흥자본시장에 소속되어 있는 국내 금융업종 소속기업들에 대한 동 스프레드에 관한 연구라는 점에도 의의가 있다. 연구 방법론과 관련하여, 본문 중 분석된 다중회귀분석과 주요인분석방법 외에도, 강건성 제고를 고려한 단계별회귀분석을 이용한 최종'선정'모형이 추가적으로 검증되었으며, 표본 기업들은 국제적으로 거래가 되는 국내 금융기관들(은행, 금융지주회사 포함)이다. 예를 들어, KB국민은행, 하나은행, 기업은행, 우리은행, 그리고 신한금융지주 등이다. 동 연구결과, 여러 재무관련 주요 설명변수들 중, 종합적으로 '이자율기간구조'에 대한 대용변수(즉, 5년만기 국고채와 3년만기 국고채간의 스프레드)와 베타와 동 기간구조 간의 '교호효과변수', 즉, 2가지의 설명변수들이 동 신용부도스왑 스프레드 결정에 대한 통계상의 일관적 중요성을 나타냄이 발견되었다. 본 연구결의 추가적인 기대효과로서는, 국내 투자자(기관투자자 포함)들에게는 상대적으로 생소하지만, 국제자본시장에서는 현재까지 활발히 개발,매매되는 장외파생금융상품에 대한 이해를 제고할 수 있다는 점이라고 판단된다. 추가적으로, 동 상품의 결정요인에 대한 심층 분석을 통하여, 다국간 자유무역협정(FTA) 체결 등을 통하여 향후 국내외에 신규 진출할 것으로 예상되는 해당 금융기관들이, 신용부도스왑에 대한 자신들의 위험수준을 효율적으로 사전분석할 수 있는 효과도 기대된다.

■ 중심어 : | 사회과학 | 신용부도스왑 스프레드 | 금융기관 | 대한민국 | 다중회귀모형 | 주요인분석 |

### Abstract

This study investigated any possible financial attributes of the CDS spreads of a firm belonging to financial industries headquartered in the Republic of Korea. There were few studies on this issue, especially for the firms located in emerging capital markets. Coupled with the models such as a multiple regression and a principal component analysis(PCA), this research has identified that only two explanatory variables such as SLOPE and INTER3 (i.e. interaction effect between the BETA and the SLOPE) consistently showed their statistically significant influence on the CDS spreads through the 'selected' model without and with applying a stepwise regression procedure for the robustness. Given the rapid developments of sophisticated financial derivatives, this study may suggest a valuable insight to foreign and domestic investors to identify the possible determinants of CDS spreads at the firm- and/or the industry-level.

■ keyword : | Social Science | CDS Spreads | Financial Institutions | Korea | Multiple Regression | Principal Component Analysis |

## I. Introduction

This study investigates an empirical issue that has received little attention in the field of finance so far: the financial characteristics or determinants of the credit default swap (CDS) spreads for financial institutions (including banks) headquartered in the Republic of Korea, which is contemporarily belonging to the emerging capital market regions. Moreover, it examines a financial area which has received a relatively much deal of attention in manufacturing industries, but relatively little attention in the banking (or financial) industry: Following a review of the brief history and the essential structure of this new and/or sophisticated financial product, CDS, as in Park & Kim[1] and Kim[2], it may also be interesting to investigate the possible financial attributes to determine the spreads of CDS for the sample firms especially utilizing major and robust methodologies. Looking back the real causes of the recent U.S. financial crisis, the so-called as ‘the sub-prime mortgage’ problem, it may be primarily resulted from the prolonged policy of a low interest rate since the 2001-01 tech-stock collapse and the subsequent 9-11 disaster, besides the chronic U.S. BOP imbalance or deficit[3]. Give the economic or financial circumstances with a low interest rate policy, investors may well look for more competitive financial products which were mostly created by major investment banks or consulting firms toward higher investment yields. As byproduct, credit default swap(CDS) referred to as synthetic collateralized debt obligation(Synthetic CDO), was actively spread over and favored by professionals participated in the capital markets to exploit any arbitrage profit[4].

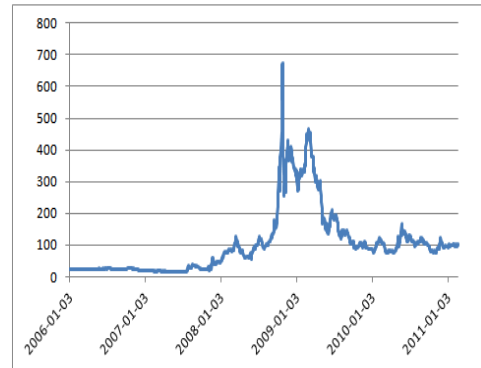


Figure 1. Korea's 5-year CDS premium  
(Unit: b.p.)  
(Source: Bloomberg Database)

Regarding the Basic Structure of ‘synthetic CDO’ and CDS[5], the second development was the creation of the notorious “CDO squared” and the occasional “CDO cubed”, which repackaged the hard-to-sell mezzanine CDO tranches as collaterals to create more AAA-rated CDO bonds. while the first generation CDOs (Collateralized Debt Obligations) utilized as collaterals such assets as mortgage loans, MBS, CMOs, and ABS. Finally, the latest, third generation CDOs known as “synthetic CDOs” were created by Wall Street, significantly altering the evolution of the CDO market and opening the door to rampant market abuses and resulting in the eventual collapse of the huge securitization market triggering the global financial crisis. Rather than relying upon cash assets such as bonds and loans as collaterals, synthetic CDOs are created from pools of CDS, which are derivatives similar to insurance contracts protecting against certain credit risks. To illustrate the structure of CDS, party A, called as a protection buyer, purchases credit protection on a reference securities (or obligations) such as a bond or loan issued by a particular issuer, from a protection seller. Party A purchasing protection, pays the seller, (called as a protection seller), a fixed payment on a regular

interval like an insurance premium until a credit event (i.e., bankruptcy or unexpected credit problems), or until the maturity of the swap contract. In terms of the option structure, a protection seller of CDS may take a put option writer on the underlying assets of CDOs.

The use of CDS as collateral pools in CDOs could give the same payoff profile as cash assets but did not require the upfront cash funding for buying the traditional collateral asset pools. Furthermore, using CDS as opposed to cash bonds gave CDO managers in Wall Street the freedom to securitize any cash flows without the need to locate, purchase, or own the specific collateral asset pools prior to CDO issuance. With the development of synthetic CDOs, the CDS market became even more valuable to Wall Street, and the volume of both CDS and CDOs experienced an exponential growth. The volume of the CDS has been peaked in the year of 2007 starting the 'sub-prime mortgage' crisis, which amounted to 48,470.5 in billions of U.S. dollars[6].

The following example shows how the transaction of CDS has eventually driven one of the multinational insurance firms, American International Group, Inc.(AIG) bailed out by the liquidity injection of U.S. government, after the financial crises in 2008. Before describing the general bailout plan for AIG, it may be worthwhile to exemplify, as the adverse effect of CDS, how the trading structure of the financial innovative, could result in or give rise to the possible bankruptcy of an insurance firm as a protection seller: Bank A provides \$100 5-year loan to Investment Bank B, it can hedge against B's potential loan default by purchasing 5-year \$100 million CDS on the B's credit risk from Insurance Firm C at a price of 150 basis points (BP). Bank A pays insurance firm C, each year \$1.5 million (150 BP on \$100 million), but if investment bank B either defaults on its \$100

million loan or goes bankrupt, A can collect \$100 million from C, who is the protection seller of the particular CDS. However, this useful financial innovation to hedge against credit risk may turn into speculative tools, as many speculators such as hedge funds, purchased B's CDS, even without any credit exposure to the investment bank. As the demand for the CDS drastically increases, its premium or spread should go up from, say, 150 BP to 500 BP or even higher, resulting in the harsh day for C to get financing in the domestic or even global capital markets[7]. That is, the possibility of B's default seems to be evaluated higher than its original credit risk in terms of CDS premium, which may result in a credit crunch to affect all the market participants.

This is the case of AIG bailout in \$85 billion by the U.S. federal government in August 2008. Since the late 1990s, CDS has become a lucrative instrument for the firms especially belonging to the insurance industry. In primary, they have alternatives: investing in fixed income securities through the purchase of corporate bond or the sale of CDS. The latter seems to be favored by major players in the industry for the following main reasons: As a protection seller, no money-down is needed and a profit limited only by how many it can sell to the potential protection buyer. Second, bond issuers historically almost never go bankrupt, which seemed that most protection sellers such as insurance firms and banks, regarded the financial innovation of CDS as more quick and easy instrument acting as a cash cow, compared with the traditional investment in fixed income securities[8].

As expected, most firms engaged in the business of trading the CDS, they simultaneously take both investment strategies such as protection buyers and sellers to hedge against unexpected or misestimated future outcome. However, this was not the case of

AIG which only took the one-side position as a protection seller, only to anticipate the heyday of U.S. housing markets. Looking back upon this case, we should remind that it may be more emphasized on the investment function of financial derivatives for its hedging purposes in the insurance industry.

The major objectives or motivation to perform this particular study may be summarized as follows: First, given the fast growing and voluminous over-the-counter (OTC) derivative markets with their sophisticated structures, it may be desirable or helpful for potential investors (i.e. institutional and individual investors) to examine the underlying knowledge of the particular OTC financial derivative such as CDS for their potential investment instruments. Second, few researches have been so far empirically performed and tested the theoretical implication of any possible determinant of the CDS spreads for financial institutions, even if most of the previous literature were weighed on the manufacturing industries, as described earlier. In particular, as currently classified into one of the emerging capital markets, i.e. the Korean capital market, it may be valuable to perform further researches on the issue of this study, given the contemporary financial market integration through the free trade agreements (FTAs). Third, as a technical aspect, it has empirically performed more thorough and comprehensive examinations to identify any financial attributes to determine the CDS spreads of the firms belonging to the financial industry in Korea in their 'absolute' and 'relative' levels. By taking into account of the results obtained from the previous research for the manufacturing industries[9], financial practitioners may analyze or look into the factors composing the CDS spreads for each corresponding firm, at the macro- and/or the firm-levels. For instance, when selecting a time period of this

particular study, more consideration was given to the motivation to find any new or changing financial characteristics of the CDS spreads in the 'post' global financial crisis period with minimizing any possible spillover effects from the event.

This study is composed as follows: Following the introduction section, the historical background and the concepts of the OTC financial derivatives such as CDS and CDO, are briefly illustrated in the following section. The real example or situation of the bailout of AIG(American International Group) related to the CDS, was also described as an example for reference. Following a review of the previous literature, to derive any possible financial determinants of the CDS spreads for Korean financial institutions, major robust methodologies such as a full regression model (i.e. a kitchen-sink model) and the principle component analysis(PCA), were presented in the third section with describing the sampling criteria. The results were then analyzed and interpreted in the next section, and wrapped up in the conclusion.

## II. Review of the Previous Literature

Since few researches have been empirically performed to test for finding any possible financial characteristics of the CDS spreads for financial institutions, in comparison with those for manufacturing firms, the literature review in this section has been described on the determinants of CDS spreads for manufacturing industries, coupled with the financial characteristics of financial or non-manufacturing firms derived from the test results of financial activities such as mergers & acquisitions in modern finance theory.

Rose[10] surveyed 591 national and state-chartered banking institutions which displayed the completed

merger history between 1970 and 1985. Among the major financial factors listed in his survey, expected increase in profitability, market share, growth rate, market power, and, finally, stock price were the key factors which the survey respondents considered as the important motives needed to pursue their merger activities. For instance, 71.2% of the respondents expected the increase of profitability after their mergers.

The study by Wheelock & Wilson[11] found that cost efficiency reduced the probability of being acquired, all else equal. Inefficiency may discourage potential acquirers because of the costs of reorganizing an inefficient bank, or because inefficiency might signal hidden problems with the bank's operations. They also found that, after controlling for other determinants, the lower a bank's capitalization, the greater the probability that it would be acquired. The probability of failure was higher for managerially inefficient banks, as reflected in measures of both cost and technical inefficiency. Moreover, the costs of reorganizing an inefficient bank and the potential for other hidden problems that inefficiency might signal tend to discourage the acquisition of inefficient banks.

Abid & Naifar[12] tested the possible determinants of credit default swap price and the drivers of default risk during the period of May, 2000 to May 2001. Total 73 credits consisting of the sample data were obtained from eleven European countries. Among the five independent variables, the slope of the yield curve was measured as the difference between the long- and short-term interest rate. For example, the spread between the European government bond yield (as a long-term rate) and the French interest rate as a short-term one was calculated as a proxy for the slope. Credit ratings were found to be the most statistically significant attribute to explain the prices

of CDS. While the slope of the yield curve and risk-free interest rate as determinants showed their significant influence on the CDS prices, systematic risk and standard deviation on equity return could not show their effects on the price.

The study done by Avramov et al.[13] was to test the potential determinants of credit spread changes, not its level. Even if this study may not be directly related to find any characteristics or effects on CDS premium or spread, the results obtained may imply the possible determinants of the premium to be considered. Based upon a larger number of the sample data(2,375 corporate bonds including high-yield bonds), the results obtained, revealed that idiosyncratic volatility and the price-to-book ratio have statistically significant influence on the time-series variation in corporate credit-spread changes. Overall, there was strong evidence that company-level variables combined with common factors, explained more than 53 percent of the variation in credit-spread changes (measured in adjusted  $R^2$ ), which is statistically significant in F-statistic.

Knapp et al.[14] investigated the post-merger performance of bank holding companies (BHCs) during the studied period of 1987 to 1998. They described that the period between the late 1980s and the early 1990s was a difficult time for the U.S. economy and banking industry, compared to the late 1990s. In this study, they found that merged institutions are shifting funds from securities to loans, but this shift is not enough to offset the weakness in fee income. More importantly, they suggested that credit-quality is the most significant factor explaining the post-merger decrease in performance  $e(ROE)$ . Poor generation of non-interest income also contributes to the underperformance of the BHCs.

The research investigated by Ericsson et al.[15]

was to find any relationship between default swap spreads and independent variables including firm leverage, volatility, and riskless yields. The data for the spreads covering the period of 1999-2002 on senior debt, were utilized as the sample. On the general results of the levels regression and the difference regression obtained in this study, the estimated sign for the statistically significant coefficient on leverage was positive, as expected a priori in finance theory. Second, the estimated sign for the coefficient on volatility was positive with its coefficient being statistically significant. Third, the coefficient on the 10-year yield as a proxy for riskless yield also confirmed to theoretical expectations because it showed a negative sign.

The study performed by Greatrex[16] utilized regression analyses to explore the ability of structural variables to explain the variation in CDS spread changes. They employed the five-year maturity contract price to calculate the changes of the spread, taking into account of its accessibility with most commonly traded maturity. Especially, two legs of CDS spread changes were used to control for autocorrelation in the study. By employing nine explanatory variables to be applied to the multivariate regressions, they found that leverage and volatility were key determinants of CDS spread changes, since these two variables explained about half of the variation for the dependent variable. The coefficient on a CDS rating-based index was consistently positive in its sign, and statistically significant in the models.

Kim & Lee[17] suggested two methods for determining Korean won (KRW)-denominated CDS spread: One method used the market quotes of dollar-denominated CDS, whose reference entities were dollar-denominated bonds issued by domestic firms. The other one utilized the credit spreads of

won (KRW)-denominated risky bonds. To test for the determinants of KRW -denominated CDS spread by utilizing the former method, they found that volatility of KOSPI200 options and KOSPI200 returns were statistically significant factors affecting the spread. However, the Korean treasury bond yields and the spreads between Korean long-term bond yields and short-term bond yields were the significant ones in the latter method, but not in the former. They explained that this conflicting aspect may in part, have resulted in or shown the difference between the two methods when determining KRW-denominated CDS spread.

In comparison with the previous literature such as the study of Park & Kim[18], the research by Km[19] empirically performed more thorough and comprehensive investigations to find any financial characteristics or attributes to determine the CDS spreads for manufacturing industries. Regarding the results obtained from the multiple regression models, the explanatory variables such as STYIELD3, SLOPE, INASSETS, and VOLATILITY, showed their statistically significant effects on all the tested dependent variables(DVs). For robustness, all the IDVs proxied for the study, were employed to be tested in the 'full' regression model with stepwise procedure. As a result, STYIELD3, SLOPE, and VOLATILITY, and BETA showed their statistically significant relationship with all the dependent variables of the CDS spreads.

Table 1. Comparison of Related Literature

Previous Research	Findings on Significant (financial) Independent Variable
Rose(1988)	expected increase in profitability, market share, growth rate, market power
Wheelock & Wilson(2000)	inefficiency, capitalization
Knapp et al.(2005)	credit-quality, noninterest income
Abid & Naifar(2006)	credit rating, slope of the yield curve, risk-free interest rate

Avramov et al.(2007)	idiosyncratic volatility, price-to-book ratio
Kim & Lee(2007)	volatility of KOSPI200, KOSPI200 returns, Korean treasury bond yields, the spread between Korean long-term and short-term bond yields
Ericsson et al.(2009)	leverage, volatility, riskless yield
Greatrex(2009)	leverage, volatility, rating-based index
Kim(2012)	three-year Korean treasury yield, spread between Korean five-year and three-year bond yields

### III. Data Collection and Methodologies

#### 3. Data Collection

This study collected and utilized the recent financial data between the years of 2009 and 2010 for the financial CDS spreads with major explanatory variables. As previously described, when selecting the tested period of this study, consideration was particularly given to the motivation to investigate any new and/or changing financial characteristics of the CDS spreads in the 'post-global financial' crisis following the recent global financial chaos, taking into account minimizing any possible spillover effects from the crisis. The followings are the sampling criteria employed for the Korean sample data:

**Table 2. The Sampling Criteria**

<p>First, the sample firms should be included in the population of Bloomberg Database and NewKisValue whose population is domestic firms in the Republic of Korea.</p> <p>Second, all of the data for each corporation should be available for at least 2 years from the year of 2009 to 2010.</p> <p>Third, manufacturing industries including regulated ones, were not included in the sample.</p> <p>Fourth, the method of linear interpolation was utilized to obtain daily based estimates if necessary, as also utilized in Blanco[20] and Greatrex[21].</p>
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Based on the criteria, the final sample firms were composed as follows: Hana bank, Industrial Bank of Korea, KB Kookmin Bank, Shinhan Financial Group Co., LTD, and Woori Bank.

#### 3.1 Definition of the Variables employed in the model

To examine the possible determinants of the CDS spreads for the Korean financial firms with the sample data, three dependent variables(DVs) were separately employ as follows:

**CHANGE= Daily change of CDS premium measured in 'relative' terms or proportion**

**LEVEL= CDS premium measured in 'absolute' terms**

**DIFF= Two lagged time difference as [CHANGE(t+2) - CHANGE(t)]**

In the previous literature, most empirical tests on the determinants of CDS spread were carried out, based on either the 'CHANGE' or 'LEVEL' of the CDS spread as a dependent variable(DV). However, there may be a controversial issue to be considered, when selecting the DV between the two definitions as also described in Kim[22]. In other words, the latter may face econometric problems such as the violation of stationarity assumption in the time-series analysis. "The focus of this study is on changes in CDS spreads as opposed to levels, because stationarity tests find CDS spread levels to be non-stationary, while CDS spread changes are stationary. Thus, focusing on spread changes is important from a statistical point of view to avoid spurious regression inferences." in Greatrex[23]. For a cross-checking purpose, another dependent variable(DIFF) with two-lagged time difference, was also utilized to reduce any possibility of non-stationality and

autocorrelation, which may otherwise incur any spurious inferences, as tested in the same study. On the other hand, if the former DV (i.e. CHANGE) was utilized to test for the financial determinants, the explanatory power of the multiple regression model may be lower, measured by 'adjusted R<sup>2</sup>' in the model in Ericsson et al.[24]. Therefore, taking into account this controversial aspect, this paper has employed both DVs such as CHANGE for the 'relative' measurement of CDS spreads and 'LEVEL' for the 'absolute' one, as well as DIFF as in Kim[25]

With respect to the independent variables(IDVs) entered into the each tested model of this study, they were selected, based upon their commonalities theorized and tested in the finance literature. In this particular study, three categories with total seventeen variables were selected to be tested. These categories can be classified as follows: Macroeconomic level, Firm-specific level, and Type of organization as shown in [Table 3].

The IDVs classified into macroeconomic level were risk-free interest rate(STYIELD3, TYIELD3), term structure of interest rate(SLOPE), respectively, while the IDVs employed to account for the firm-specific level were size(INASSETS), profitability(PFT1, PFT2), business risk(STD), book value based leverage ratio(BLEVERAGE), the proportion of total deposits to total liabilities(GROWTH1), management ability(MABLE), operating efficiency(EFF1, EFF2). Other than these original IDVs selected at the firm specific level, four market-value based proxies such as market value to book value of equity(MVBV), market capitalization(MVE), beta coefficient(BETA), and another measurement for business risk(VOLATILITY) were also tested in the separate tested models. In particular, all the sample data on CDS spreads (except Shinhan Financial Group Co., LTD,) were applicable to the level of each bank which

belongs to its financial holding company, the so-called as 'Financial Group Co., LTD.' in Korea. However, due to the fact that the shares of each bank were not separately listed and so unavailable to calculate its market related ratio such as MVBV and MVE, this paper has utilized the stock price of each financial group as a proxy for that of its subsidiary, each bank, taking into account that in general, more than 90% of each financial group in assets, were accounted for by that of each corresponding bank. In addition, a dummy variable(IND1) proxied for a bank holding company (=1) such as Shinhan Financial Group Co., LTD. as a type of organization, was also employed in each model, if the CDS spreads were not available to its subsidiary (i.e. bank) level.

In summary, total seventeen explanatory variables including a dummy variable, were employed for each corresponding model, such as a full regression (or a kitchen-sink regression) model and the principal component analysis(PCA) to find any possible determinants of the CDS spreads for the Korean financial industries.

Table 3. Definition of the Independent Variables(IDVs)

Definition	Proxy Variable	Measurement
Size	INASSETS	Natural Log of Book value of assets at the fiscal year-end
Profitability	PFT1	Earnings before interest and taxes(EBIT)/Book value of assets at the fiscal year-end
	PFT2	Net income / Book value of assets at the fiscal year-end
Volatility	STD	Standard deviation of the changes in EBIT during the sample period
	VOLATILITY	(Annual equity return) x (Total daily number of equity trading during a particular year) <sup>1/2</sup>
Book value based leverage	BLEVERAGE	Total liabilities/Total assets
Management ability	MABLE	Charge-offs / Loans





the *i*th principal component is the *i*th eigenvector which is selected to satisfy the following conditions:

1. Var(*C<sub>i</sub>*), eigenvalue, is as large as possible.
2. The *N* values (of observations) of *C<sub>i</sub>* and *C<sub>j</sub>* are uncorrelated.
3.  $a_{11}^2 + a_{12}^2 + \dots + a_{1n}^2 = \dots = a_{n1}^2 + a_{n2}^2 + \dots + a_{nm}^2 = 1$

As for new explanatory variables of the PCA in this study, seven IDVs such as BETA as a proxy for systematic risk, PFT2 as for profitability, GROWTH1 for growth rate of total deposits to total liabilities, TYIELD3 for risk-free interest rate, VOLATILITY for business risk, MVE for market capitalization, and EFF2 for operating efficiency, were finally employed in this model.

Table 4. Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum	Median
1.STYIELD3	16.65	2.21	11.49	20.79	16.81
2.SLOPE	0.56	0.10	32.56	0.85	0.54
3.INASSETS	32.94	0.26	32.56	33.21	33.06
4.PFT1	0.005	0.003	-0.001	0.011	0.005
5.STD	6.54E11	3.22E11	4.28E11	1.28E12	5.22E11
6.BLEVERAGE	0.93	0.01	0.91	0.95	0.93
7.MBV	0.88	0.16	0.43	1.28	0.87
8.MABLE	0.009	0.002	0.006	0.013	0.01
9.EFF1	0.97	0.02	0.92	1.01	0.97
10.IND1	0.20	0.40	0	1	0
11.BETA	1.49	0.20	0.93	1.92	1.49
12.PFT2	0.06	0.02	0.01	0.11	0.07
13.GROWTH1	0.62	0.14	0.31	0.76	0.69
14.TYIELD3	4.07	0.27	3.39	4.56	4.10
15.VOLATILITY	64.79	25.91	30.05	173.24	59.64
16.MVE	1.32	6.15	3.46	2.44	1.19
17.EFF2	0.77	0.05	0.69	0.87	0.79

(Note: Pearson's Correlation Coefficient between IDVs is available from the author upon request.)

## IV. Analyses and Interpretations

### 4.1 Analyses

#### 4.1.1 Results on the multiple regressions

Table 5. Results from the regression for each dependent variable(DV)

<b>Result A1: Without including market-related IDVs and applying a stepwise procedure:</b>	
CHANGE=	1.61226 +0.0011STYIELD3
(t-statistic)	(3.53)* (1.21)
	+ 0.00661SLOPE + 0.026687INASSETS
	(0.33) (2.06)*
	- 3.53860PFT1 - 4.6267E-14STD
	(-0.56) (-3.93)*
	- 2.08272BLEVERAGE - 0.15234MABLE
	(-2.43)* (-0.11)
	- 0.54307EFF1 - 0.03742IND1
	(-0.80) (-1.23)
F-value* = 2.63, R <sup>2</sup> =2.08%, Adjusted R <sup>2</sup> =1.29%	
*: Significant at the 5% level of significance	
<b>Result A2: Without including market-related IDVs and applying a stepwise procedure:</b>	
LEVEL=	- 12677 - 8.36225STYIELD3
(t-statistic)	(-29.19)* (-9.53)*
	+ 108.28954SLOPE - 157.01322INASSETS
	(5.60)* (-12.65)*
	+ 18781PFT1 + 2.8897E-10STD
	(3.13)* (25.77)*
	+ 15161BLEVERAGE - 1245.51615MABLE
	(18.58)* (-0.91)
	+ 3732.70932EFF1 + 287.34459IND1
	(5.80)* (9.94)*
F-value* = 187.97, R <sup>2</sup> =60.27%, Adjusted R <sup>2</sup> =59.95%	
*: Significant at the 5% level of significance	
<b>Result A3: Without including market-related IDVs and applying a stepwise procedure:</b>	
DIFF=	- 0.57658 - 0.00034787STYIELD3
(t-statistic)	(-0.86) (-0.26)
	- 0.02629SLOPE - 0.01042INASSETS
	(-0.88) (-0.55)
	+ 1.45401PFT1 + 1.379E-14STD
	(0.16) (0.80)
	+ 0.70667BLEVERAGE + 0.13941MABLE
	(0.56) (0.07)
	+ 0.26824EFF1 + 0.01384IND1
	(0.27) (0.31)
F-value = 0.27, R <sup>2</sup> =0.22%, Adjusted R <sup>2</sup> =-0.59%	
*: Significant at the 5% level of significance	

Regarding the results obtained from the multiple regression analyses[Table 5], the explanatory variables such as INASSETS, STD, and BLEVERAGE, showed their commonalities as statistically significant influences on the tested dependent variables(DVs) of CHANGE and LEVEL, respectively. However, no significant IDVs were found in the model for the DV of DIFF, resulting in the statistically insignificant effect explained by the F-statistic(=0.27) in [Result A3].

Moreover, this study, for a cross-check purpose, has employed a stepwise procedure across all DVs with including the same IDVs and found that INASSETS and STD, consistently showed their statistical significance[32].

On the aforementioned controversial issue on the explanatory power of different DVs measured by either the 'relative' term as CHANGE or the 'absolute' term as LEVEL of the CDS spreads, this study confirmed that the adjusted  $R^2$  (=1.29%) relative to CHANGE was much lower than that (=59.95%) of LEVEL, as shown in [Table 5: Result A1 & Result A2], which was consistent with the findings in Ericsson et al.[33] and Kim[34]. Similar results were confirmed in the separate multiple regression including a market-related IDV such as MVBV, which showed that the adjusted  $R^2$  (=1.44%) for CHANGE was also lower than 71.86% of the adjusted  $R^2$  relative to LEVEL, even if the analyses were not presented in this section. (However, the results of these analyses are available from the author upon request.)

This study has also employed the principal component analysis(PCA), as one of the most widely utilized methodologies for an explanatory purpose, to find new or additional IDVs consisting of the CDS spreads of the Korean sample, as performed in Kim[35] for manufacturing industries.

#### 4.1.2 Results on the principle component analysis (PCA)

**Table 6. Results from the principle component analysis(PCA) with new independent variables(IDVs)**

PCA With market-related IDVs		
1. Eigenvalues of the Correlation Matrix:		
Principle Component #	Proportion	Cumulative
PC 1	0.3053	0.3053
PC 2	0.2009	0.5062
PC 3	0.1812	0.6875
PC 4	0.1421	0.8295
PC 5	0.1162	0.9458
PC 6	0.0370	0.9828
PC 7	0.0172	1.0000
2. Eigenvectors:		
IDV	PC 1	PC 2
BETA	0.387821	0.024866
PFT2	- 0.571698	0.128987
GROWTH1	0.602269	- 0.160851
TYIELD3	0.200986	0.351709
VOLATILITY	0.108288	0.542584
MVE	0.186314	- 0.544898
EFF2	0.270544	0.491794

Regarding the results obtained from the PCA as in [Table 6], the first principle component(PC) accounted for 30.53%, while the proportions of the second and the third principle components were 20.09% and 18.12%, respectively. Thereby, the cumulative percentage of the first three PCs was calculated as 68.75%. In particular, based upon the results obtained from the first(PC1) and the second(PC2) principle components, the variable with a coefficient of larger than 0.50 in each corresponding eigenvector (i.e. in the set of coefficients of each PC) was finally selected as a new explanatory one composing the CDS premia.

In summary, among the employed seven IDVs, the variables such as GROWTH1 and PFT2 with its negative sign of a coefficient in PC1 may be classified as new IDVs, while VOLATILITY and MVE with a minus sign, may also be selected as new ones in PC2.

4.1.3 Results on the full regression ('kitchen- sink' regression) and the selected model for robustness

Table 7. Results on the 'full' regression model

<b>Result: With including market-related IDVs and a stepwise procedure*:</b>	
LEVEL=	-2653.48482 + 62.23948STYIELD3
(t-statistic)	(-4.48) (4.32)
+ 41.99729SLOPE	- 334.69994INASSETS
(2.97)	(-14.37)
- 53399PFFT1 + 3.83089E-10STD + 22461BLEVERAGE	
(-7.48)	(13.78) (17.46)
-494.55520MVBV + 9172.32389 MABLE - 7006.69200EFF1	
(-15.35)	(6.41) (-7.65)
+ 508.88157IND1 - 30.31184BETA + 215.97973GROWTH1	
(10.86)	(-2.51) (6.28)
-522.17257TYIELD3 +1.45831E-11MVE + 960.76867EFF2	
(-4.49)	(7.55) (9.11)
F-value** = 308.07, R <sup>2</sup> =80.65%, Adjusted R <sup>2</sup> =80.38%	
*: The significant levels for entry and staying in the stepwise procedure were controlled at the 0.05 level, respectively.	
**: Significant at the 5% level of significance	

Table 8. Results on the selected model with IDVs (VIF <10) and interaction effects

<b>Result B1: With including IDVs (VIF &lt;10) and Interaction effects:</b>	
LEVEL =	-28,39188 + 731.58531SLOPE
(t-statistic)	(-0.20) (4.45)*
- 6431.25033MABLE - 22.02056BETA	
(-0.49)	(0.27)
- 7559.45697INTER1 + 6142.37966INTER2	
(-0.61)	(0.98)
- 295.068111INTER3	
(-2.93)*	
(Note) INTER1= SLOPE * MABLE, INTER2=MABLE * BETA, INTER3=BETA * SLOPE	
F-value* = 50.22, R <sup>2</sup> = 21.23%, Adjusted R <sup>2</sup> =20.81%	
*: Significant at the 5% level of significance.	

<b>Result B2: With including IDVs (VIF &lt;10) and Interaction effects and with applying a stepwise procedure *:</b>	
LEVEL=	27.69969 + 469.06125SLOPE - 163.08053INTER3
(t-statistic)	(2.47) (16.85) (-9.95)
F-value** = 147.33, R <sup>2</sup> =20.8%, Adjusted R <sup>2</sup> =20.66%	
*: The significant levels for entry and staying in the stepwise procedure were controlled at the 0.05 level, respectively.	
**:Significant at the 5% level of significance	

All explanatory variables(total seventeen IDVs) employed in the previous two methodologies at both macro- and firm-levels, were employed and tested in a full regression model, the so-called as a 'kitchen-sink regression' model to identify any possible determinants of CDS spreads for Korean financial institutions. Among the IDVs tested, fifteen variables showed their statistically significant relationships with the DV of 'LEVEL' on the CDS spreads at the 5% level of significance, as presented in [Table 7]. On the contrary, the models separately utilizing 'CHANGE' and 'DIFF' as DVs, did not show their statistically significant effects at the 5% level by employing the same IDVs.

Even if the adjusted R<sup>2</sup> was estimated as 80.38%, which showed a relatively high explanatory power of a set of fifteen significant IDVs to explain the full regression model, it was found that only three IDVs (out of all the fifteen significant IDVs) such as SLOPE, MABLE, and BETA, had the values of VIF (variance inflation factor) less than 10, indicating their relatively free of multicollinearity. Therefore, another regression, model, I.e. the 'selected' model, was run, which only included the three significant IDVs with the VIF (< 10), as well as the interaction terms such as INTER1, INTER2, and INTER3 to find any interaction effects available among those three IDVs.

Without and with applying the stepwise regression procedures, only two explanatory variables such as SLOPE and INTER3 (i.e. the interaction term between the BETA and the SLOPE) were found to be statistically significant in this 'selected' model, as separately presented in [Table8: Result B1 & Result B2].

Table 9. Summary of the Multiple Regression Results in terms of the IDVs employed

[Table #]	Statistically significant IDVs at the 5% level
[Table 5] Results from the regression for each dependent variable(DV)	
Result A1: Without including market-related IDVs and applying a stepwise procedure	INASSETS, STD, BLEVERAGE,
Result A2: Without including market-related IDVs and applying a stepwise procedure	STYIELD3, SLOPE, INASSETS, PFT1, STD, BLEVERAGE, EFF1, IND1
[Table 7] Results on the 'full' regression model	
Result: With including market-related IDVs and a stepwise procedure	STYIELD3, SLOPE, INASSETS, PFT1, STD, BLEVERAGE, MVBV, MABLE, EFF1, IND1, BETA, GROWTH1, TYIELD3, MVE, EFF2
[Table 8] Results on the selected model with IDVs (VIF <10) and interaction effects	
Result B1: With including IDVs (VIF <10) and Interaction effects	SLOPE, INTER3
Result B2: With including IDVs (VIF <10) and Interaction effects and with applying a stepwise procedure	SLOPE, INTER3

## 4.2 Interpretations

Since major methodologies with a spectrum of IDVs, have been applied to investigate the determinants of CDS spreads for the Korean financial industries, it would be interesting or important to interpret or find any implications on the results obtained from the tests.

Regarding the results from the final 'selected'

regression model with the two statistically significant explanatory variables such as SLOPE and INTER3, the former was also tested in the previous literature as one of the possible determinants comprising the CDS spreads.(Abid & Naifar[36], Avramov et al.[37], and Greatrex[38]. In other word, as a proxy for measuring the term structure of interest rate, this study employed SLOPE, the difference in yield between five-year Korean treasury and three-year Korean one, which was similar to the proxy utilized in Abid & Naifar[39] as the spread between the European government bond yield (as a long-term rate) and the French interest rate as a short-term one. This explanatory variable with the *ex ante* expectation of a negative(-) sign of coefficient in the previous literature, was employed as a measurement for a future business climate, theorizing that an increasing slope may signal the recovery of domestic economic condition and vice versa, as presented in Greatrex[40]. However, the 'positive' and significant relationship between this particular IDV and the DV as 'LEVEL' as analyzed in this study, was consistent with the results on the CDS spreads of Korean firms belonging to manufacturing industries[41]. Therefore, the results in this study may imply that it was one of the most crucial or significant determinants on the CDS spreads of Korean firms across all Korean industries including manufacturing and financial ones. Regarding the plausible interpretations of this phenomenon, similar rationale presented in Avramov et al.[42] may be applied to the result : An increasing slope may decrease the expected net present value(NPV) of relatively (long-term) projects or businesses due to higher cost of debt and then eventually reduce a firm's value which may in turn, increase the possibility of bankruptcy with higher CDS spreads.

Second, the latter IDV, INTER3, as an interaction

effect between the BETA for systematic risk and the SLOPE, showed its statistically significant and 'negative' influence on the level of CDS spreads as shown in [Table 8]. An interaction or cross-product term in a regression model was primarily employed to find the marginal propensity of one variable, dependent upon the other variable consisting the (same) corresponding interaction term (Ramanathan[43]). While the mean response in the regression model when SLOPE was constant, was still a linear function of BETA, both the intercept and the slope of the function change, as the level at which SLOPE was held constant, was varied, and vice versa, as theoretically described in Neter et al.[44]. While Abid & Naifar[45] found that the systematic risk of a firm was not found to have an influence on the CDS premia, this variable showed its statically significant effect on the spreads for the Korean manufacturing firms as presented in Kim[46]. Couple with the aforementioned rationale of the SLOPE, the BETA as the other term composing the corresponding cross-product term (INTER3), may interact with its counterpart of the SLOPE in terms of the 'levered' beta theory, the so-called as 'Hamada' equation, in finance. In other words, the systematic risk (BETA) of a firm, was expected to be increased by a higher level of financial leverage estimated by a ratio of long-term debt to equity, according to the theory. Consequently, if a firm expects higher cost of debt resulting from the larger spread between a short-term and a long-term bond yields, e.g. 5 year bond yield minus 3 year bond yield, SLOPE, it may reduce or even avoid the debt financing, which may, in turn, decrease the debt ratio causing the 'levered' beta lower. However, the marginal propensity to the BETA from the changing SLOPE represented by INTER3 in this study, was found to have a negative relationship with the CDS spreads in this study,

which may indicate that a lower INTER3 indicating decreased bankruptcy risk, seemed to have a negative effect on the level of the CDS spreads for Korean financial firms. Therefore, this situation may further imply that Korean financial firms including the domestic banks, currently need to pay more attention to taking advantage of the 'interest tax shield' in the theory of optimal capital structure rather than focusing on the issue involved in higher bankruptcy costs beyond their optimal leverage.

Third, while there were so far little researches to test any possible size effect on the CDS spreads of the firms headquartered in advanced capital markets, recent studies showed a statistically significant and negative relationship between the CDS spreads (measured in either 'absolute' or 'relative' term) and the size of the firms in manufacturing industries in Korea classified into one of the emerging capital markets[47][48]. The general results between these variables (i.e., INASSETS and CDS spreads) may be interpreted in terms of traditional finance theory: A larger firm can take more advantage of diversification benefits to reduce its total risk exposure which may, in turn, lower bankruptcy risk or CDS spreads, as in Kim & Berger[49]. Besides this rationale, there seemed to be other implications or interpretations on the relationship with the DV of CDS spreads with its negative sign, especially for the firms in financial industries, as described in Kim[50]: Information asymmetries, Economies of scale and scope, and 'Too big to fail' First, the 'information asymmetries' may be less severe for larger financial institutions. A larger bank may have, on average, a better chance to access more information on the capital market conditions related to the banking activities such as borrowing and lending ones, and other smaller bank in size through inter-banking transactions, as similarly argued by Yang[51]. Second, it may be

easier to achieve 'economies of scale' and 'scale' from the perspective of a larger financial institution. In general, 'economies of scale' exist by decreasing the average costs of a bank when its output increases, while scope economies are expected when the cost of the joint production of  $m$  goods by one bank is less than the total costs of production of  $m$  specialty firms[52]. Finally, the myth of the 'too big to fail' may still exist in reality. Even if classified into advanced capital markets, U.S. federal regulators may also be more concerned with the safety of larger banks and so their debt were implicitly guaranteed by the government as described in Koch[53]. Mainly due to these factors, larger financial organizations including banks could maintain lower default risk, resulting in the inverse relationship to the CDS spreads found in this study.

Besides the independent variables (IDVs) which were found to have statistically significant effects on the DVs of the CDS spreads for the Korean financial firms, one may formulate rationale on the insignificant explanatory variables obtained from the tested models. In other words, the IDVs which were found to be insignificant under the conventional criteria of significance (i.e.,  $p$ -value  $< 0.05$ ), but only just so, may be interpreted by their own implications in the context of modern finance theory as follows:

One of the unique attributes characterizing financial institutions in comparison with firms belonging to manufacturing industries, may be financial aspects in terms of total deposits or core deposits classified into total liabilities in the financial statements. In this study, the growth rate of a sample financial firm was defined as the ratio of total deposits to total liabilities, since larger deposits in size and proportion than their counterparts may well be one of the essential factors forecasting the higher growth rate for each financial entity or organization, as also presented in Kim[54].

In this study, the growth rate (GROWTH1) with its coefficient of 0.602269 showed its explanatory power as the most important factor comprising the CDS spreads, as presented in [Table 6:PC1].

The independent variable to measure the management ability of a sample firm was proxied by the ratio of charge-off to loans(MABLE), which showed its statistically insignificant effect on the DVs of CDS spreads as in [Table 5]. The *ex ante* expectation on this variable was a positive sign(+) relative to the CDS spreads, due to the increased default risk of each financial institution resulting from higher portion of the charge-off amount. However, the sign of each coefficient on this IDV was negative, even if insignificant, relating to the DVs, as shown in [Table 5: A1 & A2]. This phenomenon may imply that market participants regards the charge-off decision by the incumbent management, as a good signal toward restructuring or reinforcing its financial position by 'cleaning out' non-performing loans(NPL), which may incurred in the post financial crisis. In addition, Hwang[55] investigated Korean Financial Investment Institutions to analyze their efficiencies in the investment policies.

## V. Concluding Remarks

This study investigated any possible financial determinants or attributes characterizing the CDS spreads or premia of a firm belonging to financial or non-manufacturing industries such as a bank and a financial holding company headquartered in Korea. There were few researches on this issue, especially for the firms located in emerging capital markets, as described.

The major objectives or motivation on this particular study may be summarized as follows: First,

it may be useful for potential investors to understand the sophisticated and/or enhanced features of the OTC financial derivative of the CDS, as for foreign currency derivative in Jeon & Kang[56]. Second, even if there were recent studies on the determinants of the CDS spreads for Korean manufacturing firms, this particular study has focused on the comparable issue from the perspective of domestic financial industries. In other words, it has empirically performed comprehensive examinations to find possible financial characteristics or attributes to determine the CDS spreads of the domestic firms classified into financial industries in the 'absolute' and 'relative' levels. Moreover, when selecting a time period of this research, more consideration was given to the motivation to examine any new or changing financial characteristics of the CDS spreads in the period of the 'post' financial crisis with minimizing any possible spillover effects after the event, as described earlier, as in Kim[57].

Regarding the results obtained from the multiple regression models, the explanatory variables such as INASSETS, STD, and BLEVERAGE, showed their commonalities as statistically significant determinants on the dependent variables(DVs) of CHANGE and LEVEL, respectively. For a cross-check purpose, this study has also employed a stepwise procedure to regress each DV against the same IDVs in the previous model and found that both IDVs such as INASSETS and STD, consistently showed their statistical significance to characterize the CDS spreads for Korean financial institutions.

Since the constant term in the majority of the regression models, estimating the average effects of omitted variables, showed their statistically significant at the 5% level, another procedure such as the principal component analysis(PCA), was further performed to account for additional possible IDVs as

the determinants of the DV. As a result, based on larger coefficients of each corresponding eigenvector in the PCA, new explanatory variables such as GROWTH, PFT2, VOLATILITY, and MVE, were estimated to have their significant explanatory power on the CDS spreads. For robustness, all the IDVs (i.e. total seventeen variables including market-related ones), were included in the 'full' regression model (the so-called as the 'kitchen sink' regression) with applying the stepwise procedure. Due to higher multicollinearities among the IDVs, a final 'selected' model was run, which also included interaction effects such as INTER1, INTER2, and INTER3 as well as the three IDVs (with VIF <10). As a result, without and with applying the stepwise regression procedures in the 'selected' model, only two explanatory variables such as SLOPE and INTER3 (i.e. interaction effect between the BETA and the SLOPE) finally showed their statistically significant influence as the possible determinants of the CDS spreads.

This study may have a few weaknesses. For example, a relatively small number of sample firms were included in this study, due to the small population of Korean financial institutions whose CDS spreads were traded in the international capital markets. More general results may be analyzed in the future by collecting a wider spectrum of domestic financial firms esp., for its comparison purposes with the western nations. Also, it would be possible that some of our results different from those of previous researches, may result from the different measures of the variables, different time periods and methodologies studied.

Despite the limitations of the study as one of the empirical researches, it sheds new light on understanding one of the actively traded OTC derivatives, CDS, from the perspective of potential investors[58]. Given the rapidly growing markets of



financial derivatives, this study may be an effective instrument for potential practitioners to identify possible determinants or characteristics of CDS spreads, thereby estimating or even controlling the spreads (or risk) at firm- or industry-level. Moreover, financial institutions which are headquartered in either advanced or emerging capital market regions, may take advantage of the financial attributes obtained from this study, especially when establishing their own subsidiaries in the counterparts, since each one may maintain common or different explanatory variables (or elements) to affect the level of CDS spreads.

#### 참 고 문 헌

- [1] S. Y. Park and H. Kim, "Determinants of Credit Default Swap: The Case of Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.12, No.10, pp.4359-4368, 2011.
- [2] H. Kim, "Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.13, No.9, pp.1-15, 2012.
- [3] Y. S. Park and H. Kim, "Determinants of Credit Default Swap: The Case of Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.12, No.10, pp.4359-4368, 2011.
- [4] H. Kim, "The Financial and Legal Characteristics of "Credit Default Swap(CDS)," Advanced Commercial Law Review, Vol.54, pp.83-113, 2011.
- [5] Refer to the articles by Park & Kim (2011) and Kim(2012) for more details on the underlying issues of CDS and the article by Kim(2011) for the case of AIG. The most parts of this section, have been reproduced from the aforementioned references to enhance the understanding of potential readers on these aspects.
- [6] <http://www.sifma.org>
- [7] Y. S. Park, "The Role of Rinalcial Innovations in the Current Global Financial Crisis," Seoul Journal of Economics, pp.123-144, Vo.122, 2009.
- [8] <http://www.reuters.com>
- [9] H. Kim, "Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.13, No.9, pp.1-15, 2012.
- [10] Peter S. Rose, Bank Mergers in a Deregulated Environment. Rolling Meadows: Bank Administration Institute, 1988.
- [11] D. C. Wheelock and Paul W. Wilson, "Why Do Banks Disappear? The Determinants of U.S. Bank Failures and Acquisitions," The Review of Economics and Statistics, Vol82, No.1, pp.127-138, 2000.
- [12] F. Abid, and N. Naifar, "The Determinants of Credit Default Swap Rates: An Explanatory Study," International Journal of Theoretical and Applied Finance, Vol.9, pp.23-42, 2006.
- [13] D. Avramov, Gergana Jostova, Alexander Philipov, "Understanding Changes in Corporate Credit Spreads," Financial Analyst Journal, Vol.64, pp.90-105, 2007.
- [14] Morris Knapp, Alan Gart, and David Becher, "Post-Merger Performance of Bank Holding Companies, 1987-1998," The Financial Review, Vol.40, pp.549-574, 2005.
- [15] J. Ericsson, K. Jacobs, and Robolfo Oviedo, "The Determinants of Credit Default Swap Premia," Journal of Financial and Quantitative Analysis, Vol.44, pp.109-132, 2009.
- [16] C. A. Greatrex, "Credit Default Swap Market

- Determinants,” *Journal of Fixed Income*, pp.18-32, Vol.18, No.3, 2009.
- [17] M. Kim and J. Lee, “A Study of Determining the Spreads of Won-denominated Credit Default Swap,” *The Korean Journal of Finance*, Vol.20, pp.1-32, 2007.
- [18] Y. S. Park and H. Kim, “Determinants of Credit Default Swap: The Case of Korean Firms,” *The Korea Academia-Industrial Cooperation Society*, Vol.12, No.10, pp.4359-4368, 2011.
- [19] H. Kim, “Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms,” *The Korea Academia-Industrial Cooperation Society*, Vol.13, No.9, pp.1-15, 2012.
- [20] R. Blanco, S. Brennan, and I. Marsh, “An Empirical Analysis of the Dynamic Relation Between Investment-grade Bonds and Credit Default Swaps,” *Journal of Finance*, Vol.60, No.5, pp.2255-2281, 2005.
- [21] C. A. Greatrex, “Credit Default Swap Market Determinants,” *Journal of Fixed Income*, pp.18-32, Vol.18, No.3, 2009.
- [22] H. Kim, “Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms,” *The Korea Academia-Industrial Cooperation Society*, Vol.13, No.9, pp.1-15, 2012.
- [23] C. A. Greatrex, “Credit Default Swap Market Determinants,” *Journal of Fixed Income*, pp.18-32, Vol.18, No.3, 2009.
- [24] J. Ericsson, Kris Jacobs, and Robolfo Oviedo, “The Determinants of Credit Default Swap Premia,” *Journal of Financial and Quantitative Analysis*, Vol.44, pp.109-132, 2009.
- [25] H. Kim, “Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms,” *The Korea Academia-Industrial Cooperation Society*, Vol.13, No.9, pp.1-15, 2012.
- [26] H. Kim and Paul D. Berger, “The Management Characteristics of Korean Chaebols vs. non-Chaebols: Differences in Leverage and Its Ramifications: Myth or Reality?,” *Advanced In Management*, Vol.2, No.11, pp.26-35, 2009.
- [27] V. A. Palenzuela and A. M. Bobillo, “Financial Structures of Spanish Firms: Multinational vs. Domestic,” *Multinational Business Review*, pp.64-79, Fall, 1994.
- [28] D. Avramov, Gergana Jostova, and Alexander Philipov, “Understanding Changes in Corporate Credit Spreads,” *Financial Analyst Journal*, Vol.64, pp.90-105, 2007.
- [29] J. Ericsson, K. Jacobs, and Robolfo Oviedo, “The Determinants of Credit Default Swap Premia,” *Journal of Financial and Quantitative Analysis*, Vol.44, pp.109-132, 2009.
- [30] C. Jung and H. Kim, “Analysis of Socio-economic Factors for Prediction of Railroad Trip Generation by Principal Component Analysis,” *Journal of the Korea Contents Association*, Vol.12, No.7, pp.437-444, 2012.
- [31] A. Afifi and V. Clark, *Computer-aided Multivariate Analysis* (2nd ed.), Chapman & Hall, New York, 1990.
- [32] The results with applying a stepwise procedure are available upon request from the author.
- [33] J. Ericsson, Kris Jacobs, and Robolfo Oviedo, “The Determinants of Credit Default Swap Premia,” *Journal of Financial and Quantitative Analysis*, Vol.44, pp.109-132, 2009.
- [34] H. Kim, “Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms,” *The Korea Academia-Industrial Cooperation Society*,

- Vol.13, No.9, pp.1-15, 2012.
- [35] H. Kim, "Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.13, No.9, pp.1-15, 2012.
- [36] F. Abid and N. Naifar, "The Determinants of Credit Default Swap Rates: An Explanatory Study," *International Journal of Theoretical and Applied Finance*, Vol.9, pp.23-42, 2006.
- [37] D. Avramov, Gergana Jostova, Alexander Philipov, "Understanding Changes in Corporate Credit Spreads," *Financial Analyst Journal*, Vol.64, pp.90-105, 2007.
- [38] C. A. Greatrex, "Credit Default Swap Market Determinants," *Journal of Fixed Income*, pp.18-32, Vol.18, No.3, 2009.
- [39] F. Abid and N. Naifar, "The Determinants of Credit Default Swap Rates: An Explanatory Study," *International Journal of Theoretical and Applied Finance*, Vol.9, pp.23-42, 2006.
- [40] C. A. Greatrex, "Credit Default Swap Market Determinants," *Journal of Fixed Income*, pp.18-32, Vol.18, No.3, 2009.
- [41] H. Kim, "Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.13, No.9, pp.1-15, 2012.
- [42] D. Avramov, and Gergana Jostova, Alexander Philipov, "Understanding Changes in Corporate Credit Spreads," *Financial Analyst Journal*, Vol.64, pp.90-105, 2007.
- [43] R. Ramanathan, *Introductory Econometrics with applications*(2nd ed.), Harcourt Brace & Company, 1992.
- [44] J. Neter, W. Wasserman, and M. Kutner, *Applied Linear Statistical Models*(3rd ed.), Irwin, 1990.
- [45] F. Abid and N. Naifar, "The Determinants of Credit Default Swap Rates: An Explanatory Study," *International Journal of Theoretical and Applied Finance*, Vol.9, pp.23-42, 2006.
- [46] H. Kim, "Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.13, No.9, pp.1-15, 2012.
- [47] Y. S. Park and H. Kim, "Determinants of Credit Default Swap: The Case of Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.12, No.10, pp.4359-4368, 2011.
- [48] H. Kim, "Further Investigations on the Financial Characteristics of Credit Default Swap(CDS) spreads for Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.13, No.9, pp.1-15, 2012.
- [49] H. Kim and P. D. Berger, "A Comparison of Capital Structure Determinants: the United States and the Republic of Korea," *Multinational Business Review*, Vol.16, pp.79-100, 2008.
- [50] H. Kim, "Determinants of Bank Mergers & Acquisitions in the U.S.," *The Korean Journal of Finance*, Vol.20, No.1, pp.77-123, 2007.
- [51] W. Yang, "Eunhaeng Hapbyoung ui Donggi wa Eunhaeng Jeonyak," Working Paper, Hankuk Keumyung Yeunguwon, 1996.
- [52] T. Gilligan, M. I. Smirlock, and W. Marshall, "Scale and Scope Economics in the Multi-Product Banking Firm," *Journal of Monetary Economics*, Vol.13, pp.393-405, 1984.
- [53] T. W. Koch, *Bank Management* (2nd ed.), New York : The Dryden Press, 1992.
- [54] H. Kim, "Determinants of Bank Mergers & Acquisitions in the U.S.," *The Korean Journal of Finance*, Vol.20, No.1, pp.77-123, 2007.

- [55] J. Hwang, "Management Efficiency of Korea Financial Investment Institutions," Journal of the Korea Contents Association, Vol.11, No.6, pp.397-406, 2011.
- [56] S. Jeon and C. Kang, "Impact of Foreign Currency Derivative Usage on Firm Value," Journal of the Korea Contents Association, Vol.12, No.2, pp.285-294, 2012.
- [57] H. Kim, "Further Investigations on the Financial Characteristics of CreditDefault Swap(CDS) spreads for Korean Firms," The Korea Academia-Industrial Cooperation Society, Vol.13, No.9, pp.1-15, 2012.
- [58] The data employed in this study are available upon request from the author.

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