The Management Characteristics of Korean *Chaebols* vs. *non-Chaebols:* Differences in Leverage and Its Ramifications: Myth or Reality?

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Abstract

The study investigates two prolonged controversial issues concerning Korean *Chaebol*s vs. *non-Chaebols*. The Korean *Chaebol* can be thought of, in a macro sense, as similar to the Japanese Keiretsu, although there are several differences which are noted in the paper. One of the issues investigated is whether firms belonging to the *Chaebol* in Korea have different market-value-based debt ratios (i.e., higher "leverage") than their counterparts not belonging to the *Chaebol*. If this is so, there are several managerial implications. Results indicate that, for the period studied, firms in the *chaebol* did have a higher mean leverage than their counterparts. The other issue addressed used logistic regression analysis to determine that firms belonging to the *chaebol* appeared to possess different levels of the following characteristics in comparison with firms not belonging to the *chaebol*: larger size measured by total sales, higher sales growth rate, lower profitability, and lower business risk (although the latter difference was not statistically significant, only directional). We focus on these results and their managerial implications. Few studies have focused systematically on these issues. Domestic policy-makers implementing managerial policies in Korea or many other developing nations may take into account the results of this study to prevent or minimize unanticipated mismanagement leading to financial turmoil.

Keywords: chaebols; financial characteristics; managerial characteristics, capital structure; logistic regression; Asian financial turmoil

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I. Introduction

This study investigates two longstanding issues in Korea: first, from a managerial perspective, do firms belonging to the *chaebol* maintain different debt ratios ("leverage") than those firms not belonging to the *chaebol*, and what are the managerial implications. Second, if, indeed, this is the case, how does this manifest itself in terms of standard management measures such as, for example, total sales, sales growth, and profitability? It can be potentially very important to interpret any significant differences between the two groups of firms in Korea, (the firms belonging to the *chaebol* vs. the firms not belonging to the *chaebol*).

Why would there be such differences? The first argument stems mainly from the belief that firms in the *chaebol* have maintained a relatively different status in Korea in comparison with firms not in the *chaebol*, especially preceding the 1997 financial crisis; this might also be said to be the case for the Japanese keiretsu, although the two "institutions," while having some similarities, are not identical .[1] The purpose of this empirical study is to confirm whether it is a myth or a reality that Korean *chaebol* firms received priority with respect to receiving financing from the Korean government and correspondingly, incurring lower costs of debt than those not belonging to the *chaebol*. This, in turn, if reality, would lead to differences between the two groups of firms with respect to managerial structures and tendencies. Institutional transitions toward the liberalization of capital markets, product markets, and labor markets in Korea increased the environment uncertainty for *chaebols* since the 1980s, as described in Lee et al. (2008). This had implications for marketing programs, unemployment rates, dominant manufacturing methods, and the rate of introduction of information system and other forms of technology. Thus, virtually every area of management

[1]. See Kim (2009) for general descriptions on the differences between the Korean *chaebol* and the Japanese *keiretsu*.

endeavor was affected. Yet, the largest 30 *chaebols* in terms of asset size continued to expand their investments through newly established subsidiaries. It appears that subsidized financing from government-owned financial institutions allowed them to continue their aggressive expansion. Fattouh et al.(2005) found that the high and increasing debt ratios for all Korean firms in the 1980s and 1990s, whether in the *chaebol* or not, lead to weak fundamentals and caused many firms (in the *chaebol* or not) to be vulnerable to the financial crisis suffered in 1997. Still, a key question is whether the *chaebol* firms had higher leverage and if true, whether the managerial implications of this was one of the significant factors resulting in the unprecedented financial turmoil in Korea in 1997. By utilizing the results obtained from the second part of our study, which is to identify the financial and managerial attributes of firms belonging to the *chaebol*, benefit may accrue to multinational corporations, especially those headquartered in U.S. or EU, and actively establishing or operating new businesses in Korea. This may be especially true given the on-going stage of the internationalization of Korean markets, including the Korea-America FTA(Free Trade Agreement) and the Korea-EU FTA. Korean multinationals which expand their foreign operations, may also take into account our findings for the *chaebols* and the non-*chaebols*, when they decide market selection with physically-closer countries (Erramilli et al., 1999). Moreover, our results may have implications for the implementation of managerial policies in Korea or other developing nations, in terms of preventing or minimizing any possibility of unanticipated financial turmoil.

This study specifically considered the 5-year period of 1987–1991, a period chosen due to the relative stability of the Korean capital market preceding the 1997 financial crisis. For example, foreign liabilities in Korea increased by only 17.2% from 1987 to 1991, while

increasing by 197.9% from 1992 to 1996.[2] Also, we used a five-year time period based on the findings of Bowen et al. (1982) that leverage ratios of firms had a statistically significant tendency to move toward their industry mean when considered over a five-year period.

This paper is composed as follows:

The next section illustrates the general description of Korean *chaebol* and our data-collection methodology. Then we test the hypothesis whether the capital structure is truly the same or different for the firms belonging to the *chaebol* vs. the *non-chaebol*. This is what we have referred to as the "myth vs. reality." Next we perform another test to determine which managerial characteristics can be identified as different between the two matching groups (the *chaebol* and the *non-chaebol*). For both tests, we include our methodologies and analyses. Our final section presents a summary and our conclusions.

A. General Description of Korean *Chaebol*

The *chaebol* in Korea is regarded as by-product of the rapid growth of the Korean economy. While there is no official definition or set of statistics regarding the *chaebol*, the definition that might come closest in meaning is: the Monopoly Regulation and Fair Trade Act's "large enterprise group".

The Fair Trade Commission of the Korean government announced the existence of 78 "large enterprise groups" having minimum assets of 400 billion won as of April 1, 1992. Another proxy for the definition may be the thirty largest "enterprise groups" selected by the

[2]. See The Bank of Korea, Kyoungje Tonggye Yeunbo: 1997 (Seoul, Korea, 1997) for more details.

Office of Bank Supervision and Examination (OBSE) of the Bank of Korea in the regulations relating to "Credit Operations on Enterprise Groups".[3]

In 1989, Steers et al. noted several differences between the Korean *chaebol* and the Japanese *keiretsu*. These differences have been updated by Kim (2009):

> (a) While most shares in the *chaebol* are held by family members, the ownership of the *keiretsu* is more diffused.
> (b) The *chaebol* is more hierarchical and centralized than the *keiretsu,* thus leading to large differences in managerial structure and style.
> (c) The nature of the business-government relationship is stronger in Korea than in Japan. This also has managerial implications.

Compared to the managerial structure of the Japanese *keiretsu*, there has been no bank in the *chaebol* similar to the lead bank in the *keiretsu*. Most borrowing for new businesses has been dependent upon the external financing through domestic banks directed by the government, while far more borrowing in Japan was derived from the lead banks of the *keiretsu* groups. This gives a more autonomous status to the managers of the *keiretsu* firms when dealing with the government, compared to the lesser ability of the managers of the Korean firms to exhibit independence of managerial style or substance.

Despite their contributions to the rapid growth of the Korean economy, the *chaebol* companies are viewed as having certain negative impact on the economy, due to their alleged receipt of unfair priority in receiving credit and having "special" government connections (Kim et al., 2004). As is sometimes the case, the "appearance" of a bias or unfairness or impropriety becomes more important than the actual facts of the situation. Indeed, a Korean

[3]. The selection criteria for the thirty largest groups were based on their total assets as of each fiscal year before the year of 1991 and total amounts of bank credit from 1991, respectively.

survey in 1990 indicated that 94.6% of those interviewed believed that the *chaebol* accumulated their wealth **illicitly** through speculation in real estate and government connections, while only 60.3% of those interviewed regarded the *chaebol* as positive contributors to the increase of the national economy (Kyeongje Jeongui, 1990).

From the view of policy maker, there have been several official measures taken by the Korean government to change the negative aspects and poor capital structures of the *chaebol* before the period of the Korean financial turmoil in 1997.[4] First, the Monopoly Regulation and Fair Trade Act (amended in 1986) prohibited a "large enterprise group" from structuring direct crossholdings of equity and investing more than 40% of its net assets (total assets minus liabilities minus investment from the other subsidiaries belonging to the same group) in other domestic corporations. This mechanism of crossholdings of equity had been attractive to the *chaebol*, since it made it possible to raise more debt financing without providing new equity for investment. Since this might have serious damaging effects on the national economy, its prohibition was a positive move in the government's management of *chaebol* companies. Second, since 1984, a "prime bank" system regulated by the OBSE was established to exercise overall credit control over the previously mentioned "enterprise groups," in addition to preventing them from maintaining a level of leverage that was considered too high for effective management process to take their natural course. Third, the Korean financial turmoil that began in December 1997, which primarily resulted from low foreign-currency reserves and resulted in many bankruptcies of large domestic corporations, lead the Korean government to pursue major changes in corporate-management restructuring. This took place on January 13, 1998, in cooperation with IMF, and five major restructuring

[4]. For well organized and chronological regulatory transitions of the government on the *chaebol*, see Korea Economic Research Institute, Hankuk ui Giup Jibdan (Seoul, Korea, 1995).

tasks occurred:[5] (i) Enhancement of management transparency: consolidated financial statements, were required for the thirty largest *chaebol* starting from the fiscal year of 1999. (ii) Elimination of cross guarantees: the existing guarantees of obligation among the thirty largest *chaebol* should be eliminated by March 2000. (iii) Improvement of capital structure: the sixty four largest *chaebol* and their lead creditor banks agreed on the "Capital Structure Improvement Plan (CSIP)" which demands that the *chaebol* lower their debt ratios, i.e. debt / equity, below 200% by the end of 1999. Moreover, for tax purposes, an interest tax-shield would not applicable to borrowings which are more than five times equity capital, starting in year 2000. (iv) Strengthening accountability: the corporate and legal rights of minority shareholders were strengthened by amending appropriate laws. v) Selection of core competence: a series of mergers and business swaps among the *chaebol*, the so-called Big Deal, was mandated by the government, to reduce "overcapacity" and "redundancy".[6]

B. Data Collection

We constructed the sampling criteria described in Table 1 to obtain a representative sample of firms in Korea, which has a less-developed capital market with a short history, compared to those of advanced capital markets like the U.S. First, equal sample sizes of thirteen firms ranked by 1991 asset size for each industry in Korea, were selected with the following criteria: (1) The largest corporations in size (instead of using a random sampling procedure) were chosen to generate an increased likelihood of obtaining more reliable and consistent financial data, especially from a country with a less developed capital market; this reasoning was embraced and utilized in Errunza (1979) and Kim & Lee (1990). Indeed, these

[5]. See Korea. The Korea Financial Supervisory Commission. (1998). Corporate Restructuring-Performance and Future Plan [Online], Available: http://www.fsc.go.kr [1998, December 4].

[6]. See Far Eastern Economic Review, September 17, 1998, p.48 for more details.

larger companies seemed to provide more consistent data due to the high degree of their involvement in international transactions. (2) In less efficient capital markets, the information asymmetries between management and outside investors, as presented in Myers & Majluf (1984), may be less severe for large corporations, due to their larger number of shareholders and higher proportion of minority interests, as also argued in Kester (1986). (3) In terms of the degree of "persistence" (staying in the same industry over time), larger firms are more likely to remain in the same product lines over time.[7] (4) The employment of an equal number of firms (thirteen) in each treatment may reduce the possible bias resulting from unequal variances when the equality of means is tested by the F-test (Neter et al., 1990). In addition, we took into account that many industry-classification systems in Korea are similar to those in the U.S.[8] For example, the U.S. Standard Industrial Classification (SIC) revised in 1987, was generally matched with the Korean SIC revised by the National Statistical Office in 1991, in their structures and definitions. Since there have been several previous studies on advanced capital markets that include major industries in the U.S. on the issue of capital structure and/or its determinants, we believe that results obtained in this study for Korean firms may be compared to results utilizing U.S. equivalent sample industries with their matching definitions.[9]

[7]. For instance, regarding the final sample companies in this paper (in 7 industries), the percentage of the largest 13 firms and the other remaining firms which later changed their original SIC codes into another, was 3.3% (3/91) and 6.17% (19/308) between the fiscal year-end of 1991 and 4/13/94 (Compustat Company Coverage)

[8]. See Appendix 1 for major comparison in accounting principles between U.S and Korea.

[9]. A list of the final sample selected for this study is available upon request from the author.

TABLE 1: Data for the Korean Sample Firms

1. The corporations should be in the population of the PACAP (Pacific-Basin Capital Markets) database for Korea.
2. Only corporations in each industry which had a matching definition between the U.S. SIC and the Korean SIC codes were included.
3. The corporations were listed on the First section of the Korea Stock Exchange at the end of December 1991.
4. The largest 13 corporations ranked by 1991 assets size were selected for each industry.
5. All the data for each corporation should be available for at least 5 years (1987-1991).
6. Financial and regulated industries were not included in the sample.

II. Time-series and Cross-sectional Analysis of Leverage: *chaebols* vs. non-*chaebols*.

A. Methodology

In light of the government's ambivalent financial management policies toward the *chaebol,* as well as their positive or negative influences on the national economy since the Korean economic boom in the early 1970s, it is useful to ask whether firms belonging to a *chaebol* have higher or lower leverage than firms not belonging to a *chaebol*. Few studies have researched this issue. It is clearly an important issue, for in a survey performed by Kook et al. (1997), the majority of Chief Financial Officers of the top fifty *chaebol* responded that maintaining the largest stockholders' equity was the top priority, when management made a decision to fund internal or external capital. This may not be the general case in financial management theory, which would suggest that funds with the lowest cost of capital among possible funding alternatives should be the first choice to maximize the shareholders' equity. Therefore, it would be very interesting to academicians and practicing managers, if the results in this study show that firms belonging to *chaebol* have higher leverage than that of firms not

belonging to *chaebol*. In other words, management considerations other than a lowest funding cost may be prevalent in the Korean capital markets or in similar emerging economies.

A corresponding hypothesis for the period under study (as earlier noted: 1987-1991) may thus be postulated as follows:

H_0: *Korean firms belonging to chaebol did not have different mean market value based debt ratio (i.e., leverage) from their non-chaebol counterparts.*

H_1: *Korean firms belonging to chaebol did have different mean market value based debt ratio from their non-chaebol counterparts.*

The hypothesis test was carried out using multiple regression analysis. We used the stepwise regression procedure to take advantage of its ability to derive a parsimonious model that was relatively free of multi-colinearity, in the sense that every variable in the final model would be guaranteed to add significant incremental predictive value. The model stated below contains the *eligible* variables (not all of which were chosen by the stepwise process, as we report in the next section):

$$LMLEV_{it} = \beta_0 + \beta_1 CBOL_{it} + \beta_2 T88_{it} + \beta_3 T89_{it} + \beta_4 T90_{it} + \beta_5 T91_{it} + \varepsilon_{it},$$

where $i = 1, 2, ..., 91$ (companies), and $t = 1987, 1988, ..., 1991$.

LMLEV = the arcsine transformed market value based leverage ratio
$= 2 \arcsin[(y)^{1/2}]$

CBOL = 1 if a firm belongs to the *chaebol*.
0, otherwise.

T88 = 1 if the year = 1988.
0, otherwise.

T89 = 1 if the year = 1989.
0, otherwise.

T90 = 1 if the year = 1990.
0, otherwise.

T91 = 1 if the year = 1991.
0, otherwise.

ε_{it} is the error term assumed to be normally distributed, homoscedastic, and, after a check for autocorrelation which came out not significant, independent.

In order to test this hypothesis, the arcsine transformed market value based leverage ratio, $y' = 2 \arcsin[(y)^{1/2}]$ was employed as the dependent variable in the regression model along with a key qualitative (dummy) independent variable with 2 categories, taking on the value of 1 for a Korean firm belonging to a *chaebol* or 0 for a non-*chaebol*.[10] We also included four dummy variables for the five categories (i.e., years) of time, with 1987 as the base year (i.e., "dummy category"). In previous research, historical capital market conditions, which are closely related to the availability of capital, were considered one of the most important determinants of debt ratios in Japan, France, and Norway, and affected managerial decision-making along virtually the entire spectrum of managerial functions (Stonehill et al., 1975). These countries had relatively less developed equity markets in comparison with the U.S. Likewise, Korean firms traditionally faced severe supply constraints in equity financing with a shallow market and short history of public distribution of shares since 1973, as described in Choi et al.(1983). This motivated including the time dummy variables. These variables also may be viewed as controlling for changing market conditions.[11] In previous literature, the time (year) dummy variables were frequently utilized to account for economic,

[10]. The criteria to classify a firm belonging to a *chaebol* were those of the OBSE definitions described earlier. In particular, these definitions seemed to be more relevant to this model than those of the Monopoly Regulation and Fair Trade Act since the OBSE was directly related to the credit allocation policy and the improvement of the financial structures of Korean firms. Therefore, all sample firms belonging to the largest thirty "enterprise groups" based on their total assets or bank loans in each year, were assigned the value, 1, for the *chaebol* dummy variable in the model.

[11]. Without the inclusion of the time (year) dummy variables in the regression model, the study found the same basic results, as described subsequently in the Analysis section

managerial, or financial phenomena changing over time. Hannan & Rhoades (1987) employed time dummies in their study to account for any omitted macroeconomic and other possible variables which may have effects on the level of merger activity during the years from 1971 to 1982. Bruner (1988) also utilized the (calendar year) time dummy variables to take account of variations in a firm's debt ratio over time. Moreover, Kang (1992) tested the changes of the financing sources of Japanese firms by employing a single time dummy variable, in order to investigate the monitoring role of Japanese financial institutions over the two time periods consisting of 1975-1981 and 1982-1988.

To account for the possibility of the sample firms changing rankings year by year, our study employed panel data (both cross-sectional and time series data) to classify companies into the thirty largest *chaebol*. One reason the issues of heteroscedasticity and autocorrelation were not present was, indeed, the use of the panel data. This procedure is suggested in Palenzuela & Bobillo (1994).

B. Analysis

The following "best" regression model was obtained by the stepwise regression procedure for the Korean sample firms.[12]

[12]. The significant levels for entry into the model and deletion form the model were both .05. The regression was performed by the stepwise procedure in SAS. The underlying regression model showed a small departure from the normality assumption by the Shapiro-Wilk test. However, given the robustness of the normality assumption, and the fact that the Shapiro-Wilk test (W) is more sensitive than other major tests of detection of the violation of normality, we do not believe that this is a material issue in our study.

LMLEV = 1.9332 + 0.0884CBOL - 0.1631T88 - 0.1500T89 + 0.1768T91

(t-statistic) (92.475)* (3.894)* (-5.250)* (-4.826)* (5.690)*

F-value* = 33.521, R^2 = 22.96%, Adjusted R^2 = 22.27%

*Significant at $p < .01$

The positive and significant estimated coefficient of .0884 for the CBOL dummy variable leads to the conclusion that Korean firms belonging to the *chaebol* do, indeed, have higher market value based leverage, on average, than firms not belonging to the *chaebol,* given that the other explanatory variables in the model were controlled (i.e., held constant).[13] From the managerial perspective, the *chaebols*' high leverage compared to their non-chaebol counterparts may have resulted mainly from the following *managerial* advantages they had over their counterparts. First, as described in Cho (1991), the mechanism of extensive and direct crossholdings of equity helped the *chaebols* have managerial control of their entire organization more strongly until the Amendments to the Monopoly Regulation and Fair Trade Act became effective in 1986. This mechanism was originally used by the owners of the *chaebols* since it was attractive to raise more debt financing without providing new equity for investment, which might cause damaging effects on the national economy. For instance, if a *chaebol* wanted to establish a new subsidiary called "A" to raise more debt financing from banks, its existing subsidiary, "B", might invest some amount of capital, e.g. $10 million, in the subsidiary of A. In turn, A could purchase B's stock for the same amount later and thereby, the $10 million invested in A might return to B without increasing real capital (Kim, 2009).

[13]. One may argue that the higher leverage of firms in the *chaebol* during the sample period may be attributed in part to less effective implementations of the aforementioned government's policies against the *chaebol* than originally intended and shorter time-lag which, as a result, could not fully reflect the significant effect of the policies. Unfortunately, these factors could not be incorporated in the regression model due to data limitations.

Second, coupled with the more autonomous status of the Japanese *keiretsu* in management structure described earlier, guarantees of obligation were also major tools utilized by most subsidiaries of the *chaebols* to get more bank financing for other subsidiaries belonging to the same groups, by guaranteeing the debt in case of the default of the debtor subsidiaries. While intra-group lending in the Japanese *keiretsu* was composed of trade credits among member firms (Berglöf & Perotti, 1994), the guarantees of obligation were utilized as a long-term and effective way to provide risky capital internally. On average, the amount of guarantees was estimated to reach 361.1% of the amount of the total shareholders' equity for the thirty "largest enterprise groups" as of March 31, 1992 (Jeonguk Kyeongjein, and Yeunhaphoe, 1992). Finally, as described in Lee et al. (2008), the group-affiliated firms were found to borrow more debt in order to take advantage of interest tax shields. Thus, managers of the *chaebol* companies had lot of additional flexibility in allowing the tentacles of the financial benefits to flow to other managerial activities, such as operations, marketing, and entrepreneurship, to, in turn, allow yet additional profitability.

Regarding the results of the effects of the expectations of the stock market conditions by using the four time dummy variables, the coefficients of T88 and T89 were negative and significant, while T91 was positive and significant (all at the 1% level.) As expected, these results confirm the hypothesis of an inverse relationship between the expectation of a favorable stock market condition (a bullish market) and the market value based leverage ratio. In fact, the domestic stock markets were explosive in 1988 and 1989, with the Korea Composite Stock Price Index (KOSPI) of 907.20 and 909.72 at the end of 1988 and 1989, respectively, in comparison to the 1987 KOSPI of 525.11. However, the markets in 1990 and 1991 continued to be sluggish with KOSPI values of 696.11 and 610.92, respectively.

III. The Characteristics of the Korean *Chaebols* vs. the *Non-chaebols* From a Managerial Perspective

A. Methodology

Our previous results found that Korean firms in *chaebol*, on average, had higher market value based leverage ratio than firms not in *chaebol* during the period studied (1987-1991). Therefore, from a global management point of view, it may be interesting to investigate which managerial characteristics of a Korean firm increase the probability that the firm is, indeed, classified as a subsidiary of a *chaebol* group. In other words, what are the attributes of Korean firms belonging to the *chaebol* in comparison with those firms not belonging to one?

We utilized a logistic (logit) regression analysis to address this issue. The basic functional form of the logistic regression model is as follows:

$$P\,(Chaebol) = e^{\alpha+\beta' x} / (\,1+ e^{\alpha+\beta' x}) \,,$$

where P(*Chaebol*) is the probability that a firm in Korea will be classified as a member firm in the chaebol; this probability is, of course, bounded between 0 and 1. We label . and as the intercept and vector of slope parameters, respectively. And, x is a vector of independent variables at each studied year.

The logistic regression is modeling the previously mentioned probability by assigning the dummy variable CBOL=1 (if a firm in the sample was in the *chaebol*) and CBOL=0 (otherwise) to the dependent variable. Recall that this dummy variable played the role of an

independent variable in the previous analysis. Six variables (characteristics of the company) were used as independent variables in this phase of our research. First, profitability **(PFT)** was measured by the ratio of earnings before interest and taxes to book value of assets at the fiscal year-end of each firm in the tested year. Second, for each firm, the proxy for size **(SIZE)** was determined by the total sales amount as of the fiscal year-end. Third, the measure for non-debt tax shields **(NDTS)** as a possible substitute for interest tax shield in debt financing, was estimated by deducting interest payments and also total income tax (which was then divided by the [federal] corporate tax rate) from operating income. This was able to be derived by the following equation that "corporate income tax = (federal) corporate tax rate multiplied by (operating income - interest payments - NDTS)". Each resulting amount was then scaled by book value of assets.

Fourth, a proxy for growth **(GROWTH)** was calculated by using the annual average compound growth rate in sales. We next considered business risk **(RISK)** and used as a proxy the standard deviation of the changes in EBIT during the sample period. Finally, another variable to represent the agency cost of debt **(AGENCY)** measured by ((advertising expense + R&D expenses) / annual sales) was utilized. In particular, a first-order lagged independent variable was employed for this variable, since there seems to be a longer-term effect of this proxy to reflect the agency costs of debt.[14] Table 2 summarizes the definitions of our independent variables:

[14]. That is, the data in the years 1988 and 1990 were adopted for this proxy variable, respectively, to estimate the logistic model in 1989 and 1991. Under Korean Generally Accepted Accounting Principles (GAAP), R&D charges are deferred and amortized over 3 to 5 years using the straight-line method while, in the U.S., these items are expensed in the year they are incurred.

TABLE 2: The Definition of the Independent Variables

DEFINITION	*PROXY VARIABLE*	*MEASUREMENT*
Profitability	**PFT**	Earnings before interest and taxes (EBIT) / Book value of assets at the fiscal year-end
Size	**SIZE**	Total sales amount at the fiscal year-end
Non-debt tax shields	**NDTS**	Corporate income tax = A federal corporate tax rate multiplied by (operating income - interest payments - NDTS)
Growth Rate	**GROWTH**	Annual average compound growth rate in sales during the sample period
Business risk	**RISK**	Standard deviation of the changes in EBIT during the sample period
Agency cost of debt *	**AGENCY**	{(Advertising expense + R&D expenses) / annual sales} at the fiscal year-end

* A first-order lagged variable is employed for **AGENCY**.

B. Major Managerial Implications on the Results

Two separate logistic regressions, one based on 1989, a year with the favorable stock-market conditions, the other based on 1991 with unfavorable stock-market conditions, were performed in order to control for changing market conditions (as mentioned earlier.) Table 3 presents the results from each logistic regression model:

TABLE 3: Logistic Regression Analysis Results

Variable \ Year	1989	1991
PFT	-31.1640 (5.7344)*	-62.6024 (7.6369)*
SIZE	0.0059 [15] (12.1029)*	0.0068 (12.0887)*
NDTS	3.3837 (0.0261)	0.8243 (0.0006)
RISK	-1.1982 (1.3896)	-2.9422 (3.5283)
GROWTH	8.1365 (6.7106)*	10.1030 (5.8613)*
AGENCY	-6.5021 (0.2255)	-43.3327 (2.7141)
Intercept	-0.8650 (0.4313)	1.1811 (0.4204)
Goodness of Fit	(66.670)*	(86.874)*

Note : Chi-square values are in parentheses.
* Significant at the 5% level with respect to the chi-square test.

Having controlled for the effect of the historical stock market condition, the same results were found for both years. Each model was explained significantly by the six variables

[15]. 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.

as shown by the significance of the overall goodness of fit test at the 5% level of significance. Also, PFT, SIZE, and GROWTH were significant in both regression models. SIZE and GROWTH were both significantly positive, while PFT was significantly negative.

The followings are major managerial implications on the results obtained from the model:

(1) SIZE

The positive and significant coefficient for the size variable **(SIZE)** measured in total sales amounts across the two investigated years indicated that the larger the size of a firm is, the higher the probability that a firm will be classified as one of the member firms belonging to the *chaebol*. Kang et al.(1991) suggested that the size of an individual firm in the *chaebol* may be above or below its optimal level which otherwise would be achieved by (technical) economies of scale in competitive markets. The main reason explained by Kang et al. is that the relative size of the firm in the *chaebol* seemed to be affected arbitrarily by other major businesses belonging to the same *chaebol.* With consideration of this argument, the findings of the positive size effect in this study might be caused, in large part, by a possible sampling bias. In other words, the sample firms classified into the *chaebol* groups in the analysis were limited to the companies listed on the First section of the Korea Stock Exchange, most of which might well engage in the major businesses of each *chaebol*. Given the fact that the most important goal for Korean firms across industries was to maximize their market share (Lee & Chung, 1989), another plausible reason for firms in the *chaebol* having larger size may be the relatively strong bargaining power of their customers against them. That is, from a management perspective, the customers who purchased products made by any member firm in the *chaebol*, may have a put option which can be exercised against the *chaebol* as a whole

in the case of lower quality products which could be exercised without being involved in a time-consuming legal procedure.

From a marketing perspective, most *chaebol* in Korea were more sensitive to maintaining higher reputations in the eyes of the government and customers, in order to overcome their negative image in the national economy, especially since the 1980s. Therefore, increased public relations/marketing activity was implemented, which suggests that the *chaebol* firms often chose a different level of marketing mix variables than *non-chaebol* firms. This phenomenon may, in turn, have contributed to increasing the sales amounts of firms in the *chaebol* compared to those of their *non-chaebol* counterparts. Du & Dai (2005) also found that firm size serves as an inverse proxy for unobservable credit risk, which implies that larger firms should be more highly leveraged. Their findings may support the positive relationship between firm size and leverage for the *chaebol* firms tested in the previous sections of this study. However, as described in Lee et al. (2008), conglomerates such as Korean *chaebol*s, with their larger size, may in turn have lower profitability than their non-conglomerate or non-*chaebol* counterparts; this may be due to inefficient management strategies in an uncertain and complex environment, especially during the 1980s and the 1990s. This aspect is explained in the following section.

(2) PROFITABILITY

The negative and strongly significant coefficient for profitability **(PFT)** indicated that a more profitable firm is more likely to be classified as a **non**-*chaebol* firm. These results were consistent with the findings presented in Cho (1991), in that Korean firms belonging to the fifty largest *chaebol* had relatively lower profitability, on average, in comparison with firms comprising all domestic industries. He argued that firms in the *chaebol* were heavily

engaged in capital-intensive industries during the 1980s, but the investments in these industries could not generate the forecasted net present values (NPVs), which in turn lower the profitability of firms in the *chaebol*. Also, the study by Chang (2003) found that, when the profit rates for the *chaebol* firms were high, lower debt ratios would result.

(3) BUSINESS RISK and GROWTH

The coefficients for business risk **(RISK),** as proxied by the volatility of a firm's earnings (EBIT), were all insignificant during the studied years; however, directionally, they were negative. Deesomsak et al. (2004) suggested that firms may ignore the volatility of earnings if ownership is concentrated and family-based, as in Thailand. Regarding the insider ownership of Korean sample firms listed in the Korea Stock Exchange, the average ownership in 1986 of the largest shareholders of the firms belonging to the *chaebol* and the non-*chaebol* were highly concentrated at 39.09% and 32.59%, respectively (Lim, 1989). The earlier mentioned Cho study also found a negative coefficient for business risk in an one-way ANOVA, indicating that firms belonging to the *chaebol* had lower business risk than those of their non-*chaebol* counterparts, at a somewhat weaker significant level ($.05 < p < .10$) during the period of 1981 to 1987. In practice, member firms in the *chaebol* seemed to be able to adapt their management strategy to the vast majority of international and domestic environmental change more flexibly than their *non-chaebol* counterparts by utilizing information obtained through their own worldwide-based foreign subsidiaries and their advantageous status in dealing with the government. This might allow the *chaebol* firms to maintain more stable earning-streams. Just as many member firms of the Japanese *keiretsu* rely heavily on intra-group trade as presented (Berglöf & Perotti 1994), firms in the Korean *chaebol* may also have engaged in intra-group trade more than their counterparts (Cho, 1991).

Gupta (1969) found that growth at the firm level was proportional to leverage ratio because growth firms may have more flexibility in capital structure, and debt may also be financed and liquidated more easily than equity funds. As shown in Table 3, the coefficient of GROWTH, measured by the annual average compound growth rate in sales, was positive and statistically significant during the selected years, indicating that *chaebols* had high growth rates in comparison with their non-*chaebol* counterparts. Chang (2003) argued that the following three management strategies of the *chaebol* groups lead to their high growth rates: (1) Managing the taking advantage of government policies, (2) Managing thir exploitation of internal and external capital markets, and (3) Managing their pursuit of diversification and vertical integration. Until the 1990s, the *chaebols* seemed to take advantage of domestic government's policies that were especially favorable toward the status of increasing their growth rates. For example, the government made large domestic mergers & acquisitions (M&A) transactions in manufacturing and financial industries in Korea a high priority, and favorable government's subsidies were usually given to the *chaebol* groups as acquirers. This ongoing M&A activity may have what made it possible for the *chaebols* to increase their market shares in their domestic industries, similar to the case of U.S. banking industry (Kim, 2007).

(4) AGENCY COST OF DEBT and NON-DEBT TAX SHIELDS

The coefficient of **AGENCY** was not significant (i.e., $p > .05$) for each year, but were negative in both years, which indicated, at least directionally, that Korean firms not belonging to the *chaebol* may have higher agency costs of debt than their *chaebol* counterparts. This issue is addressed by Kim & Sorensen (1986). They suggest that a firm with high insider ownership has lower agency costs of debt since debt covenants which may reduce the

possible problem of moral hazard by the shareholders of the firm are more effective than in a firm with low insider ownership. As mentioned earlier, Lim (1989) determined that among the sample firms listed in the Korea Stock Exchange at the end of 1986, the average insider ownership of the largest shareholders of the firms belonging to the *chaebol* was 39.09%, larger than that of the firms not belonging to the *chaebol*, 32.59%. However, should be cautious in interpreting this finding about agency costs of debt. The frequently used proxy for the agency costs of debt, (advertising expense + R&D expenses) / annual sales, which was also employed in this study, may be affected by economies of scale achieved by the member firms belonging to the same *chaebol* as well, since the expenses such as advertising and R&D can be reduced by sharing among the member firms, as described by the Korea Economic Research Institute (1995). These benefits from economies of scale are not usually expected from the smaller and less diversified firms which do not belong to the *chaebol*. Therefore, due to the possible measurement error resulting from this proxy to capture the true and unobservable agency costs of debt, the above logic may not be fully applicable, since the effects of cost efficiency are not able to be controlled in the logistic regression analysis, due to simple lack of information about such things as degree or type of diversification.

Our study also found non-significant results between the two comparison groups in terms of non-debt tax shields (NDTS) during the sample years. This finding is generally consistent with the results described in Boquist & Moore (1984) which showed a non-significant effect between NDTS and leverage ratios at the firm level. Therefore, from a managerial point of view, this proxy variable may not be an important factor in discriminating the management characteristics between the firms belonging to the *chaebol* and the *non-chaebol.*

In summary, with the exception of the possible problem incurred by the proxy variable for the agency costs of debt, the results obtained from the above logistic-regression analysis seem to verify that firms belonging to the *chaebol* are more highly leveraged, on average, than their counterparts. Most findings obtained from our managerial-characteristic analysis, in which larger values for the size and growth variables, and small values for the profitability and business risk variables are indicated to increase the probability that a firm is classified as belonging to the *chaebol*, seem to support why higher market-value-based leverage did exist for firms belonging to the *chaebol*.

IV. DISCUSSION AND FUTURE RESEARCH

Based upon the results of this study, it was found, for the period studied, that firms belonging to the *chaebol* in Korea had higher average market-value-based debt ratios, relative to their counterparts not belonging to the *chaebol*. In addition, historical stock market conditions in Korea seemed to affect and improve the capital structures of Korean firms. Therefore, the Korean government may wish to pay more attention to overcoming and expanding its traditionally shallow stock market. Moreover, other management considerations or strategies not to dilute their largest shareholders' equity in the *chaebol* groups may be a more important factor than a lower funding cost, for management decision-making concerning the degree of leverage. This is likely to be true not only for Korea, but also for similar emerging economies.

This study also found that firms belonging to the *chaebol* may possess the following characteristics in comparison with firms not belonging to the *chaebol*: larger size measured by

total sales, lower profitability, higher growth rate in sales, and lower business risk (even if our results for the last variable were not statistically significant at $p < .05$.) From a management point of view, firms belonging to business conglomerates such as Korean *chaebol*s with their larger size in the 1980s and the 1990s, may, in turn, face with lower profitability than their non-conglomerate or non-*chaebol* counterparts, due to their inefficient management or capital allocations, given uncertain and complex environments. Each of these findings seems to be supported by management theory (especially financial management theory) to account for the fact that firms belonging to the *chaebol* in Korea maintained higher leverage than their counterparts in the choices of their optimal capital structures.

With respect to data collection, this research used more strict criteria than those in most of the previous literature, in order to obtain a more reliable and representative sample. The dependent variable measured the arcsine transformed market-value-based debt ratio, rather than a book-value-based measure.

Our study, just as any study, has some limitations. We studied only one time period (although a carefully chosen one) and chose measures of the variables that we thought were appropriate. However, different results might result from using different measures of the dependent and explanatory variables and/or a different time period. As a direction for future research, it would be may be interesting to test the leverage and/or the characteristics of firms belonging to the *chaebol* using data covering the post-Korean-financial-crisis period. Glen & Singh (2004) compared capital structures in developed vs. emerging markets using data from 7968 firms from 44 countries (22 developed markets vs. 22 emerging markets) during the period of 1994-2000. They 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. This supports

the attractiveness of an investigation of how the Korean *chaebol* firms have changed with respect to their financial attributes after the 1997 financial turmoil.

Despite the limitations of our study, this paper sheds new light on the analysis of the prolonged arguments that the Korean firms belonging to the *chaebol* may have maintained different debt ratios than those firms not belonging to the *chaebol*. Moreover, after statistically significant results were found concerning the leverage of the *chaebol* firms vs. *non-chaebol* firms, we followed up with an additional analysis to discriminate management characteristics between the two matching groups (the *chaebol* and the *non-chaebol*).

The results of our study may be beneficial to multinational corporations, especially those headquartered in U.S. or EU, and actively establishing or operating new businesses in Korea. This is especially true, given the current stage of the internationalization of Korean capital markets. Additionally, domestic policy makers implementing financial or economic policies in Korea or in those countries with less advanced capital markets may take into account the results of our study to prevent or minimize possibilities of unanticipated future financial crisis. Also, the Korean government seems to place higher priority on the reforms of corporate governance which include increasing accounting transparency and limiting the controlling capacity of the largest and/or inside shareholders in the *chaebol* groups since the Asian financial crisis (Haggard et al., 2003). Therefore, from a managerial perspective, when the need exists to decide the levels of leverage between funding with a lower cost of capital and maintaining the inside shareholders' ownership, managers in the conglomerates in Korea or emerging economies may wish to pay more attention to finding effective procedures toward maximizing their shareholders' interests.

APPENDIX 1. Major Comparisons in Accounting Principles between U.S. GAAP and Korean GAAP (as of 1 / 1 / 91)

Comparison	U.S.	Korea
(1) Consolidated Accounts	Required	Optional
(2) Consolidated Method	Purchase method and Pooling of Interest	The Same
(3) The equity method in Consolidated F / S	Required	Required[1]
(4) Revaluation for PP & E	No	Yes[2]
(5) Foreign Currency Translation[3]		
1) Foreign Currency Transaction	Recognized in Income	The Same
2) Self - sustaining Foreign Operations	Taken to Reserves	The Same
(6) Depreciation Method		Declining balance method
	Straight-line method	Straight-line method
	Sum of the Year's digits	Unit of Production method (or
	Unit of Production method	Additional Accelerated depreciation is permitted)
(7) Financial Leases	Capitalization is compulsory	The Same
(8) Investments		
1) Current Investments	Lower of Cost or Market	The Same
2) Non-current Investments	Lower of Cost or Market	The Same
	Cost adjusted for permanent decline in value	N/A
(9) Inventory Valuation	Lower of Cost or Market	The Same
Are both FIFO & LIFO permitted ?	Yes	Yes
(10) Discretionary Provisions allowed in Current Liabilities ?	No	Yes
(11) Retained Earnings appropriated for specific purposes of reserves ?	Possible	Compulsory
(12) Imputed Interest	Yes	Yes[4]
(13) Pension Plans based on PBO	Yes	No
(14) Industry Segment Information	Yes	No
(15) Companies required to disclose EPS	Public	All[4]
(16) Inflation Accounting	Optional	No

(17) Accounting Criteria of Forward Transaction	Hedge vs. Speculative Transaction	Short-term (Up to 1 year) vs. Long-term Transaction[5]

Footnotes :

1. The equity method is not required in non-consolidated financial statements (F / S) in Korea.
2. Under the Asset Revaluation Law, fixed assets may be revalued up to market value when the BOK Wholesale Price Index (WPI) has increased by more than 25% since the last valuation.
3. Before the revision of Korean GAAP in 1990, some kinds of gains or losses from foreign currency translations such as those in long-term monetary accounts and overseas business translation accounts were treated as deferred charges or deferred liabilities.
4. This is a new regulation under Korean GAAP revised in 1990.
5. This guideline has been established under the " Rules for Korean GAAP " in April 1, 1988.

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