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Abstract

This paper explains the observed characteristics in the leverage and debt structure of Korean firms during the period from 1981 to 1997. We find the financing decisions of Korean firms can be explained by the determinants suggested by corporate finance models. But, even when controlling for the proposed determinants, such as firm size, growth rate, tangible fixed assets, and profitability, there were major differences in the capital structure choices between chaebol and non-chaebol firms. The empirical findings show that chaebol-affiliated firms have higher leverage than non-chaebol firms in Korea. We also find that since 1989 the leverage of the 6-30th largest chaebol firms has continued rising to a level much higher than that of the top five largest chaebol and non-chaebol groups, and the top five largest chaebol firms significantly increased leverage in terms of foreign financing.

Keywords: Corporate debt, Capital structure, Chaebol, Asia, Korea

JEL Classification: G32, O53

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I. Introduction

The high leverage of Korean firms has been a hot issue since November 1997 when the financial crisis erupted in Korea. Although initially triggered by sudden reversal of foreign capital flows and subsequent illiquidity of financial institutions, the unfolding crisis revealed that the economy had a number of structural weaknesses in the financial and corporate sectors. In particular, excessive investment, encouraged by financial institutions' reckless lending, and resultant low profitability and high leverage of Korean firms are noted as some of the structural problems that made the entire economy extremely vulnerable to financial panic and economic crisis. When the economy was heavily hit by the adverse terms of trade shocks in 1996 and 1997, the highly leveraged Korean firms, particularly the large chaebols, went into bankruptcy and thereby increased the fragility of the financial institutions that had excessive exposure to these conglomerates. These structural defects contributed to the sudden evaporation of foreign investors' confidence in the Korean economy and aggravated the situation by magnifying the adverse effects of foreign capital outflows. After the crisis, high leverage also deprived firms of the flexibility to adjust to adverse developments caused by the recession and credit crunch, and thus exacerbated the severity and depth of the crisis.

Korean firms, particularly large conglomerates, have extremely high leverage, particularly when compared to firms in other countries. As of the end of 1997, the total debt owed by Korean firms amounted to 811 trillion won, which is equivalent to US\$ 675 billion with a won/dollar exchange rate of 1,200, and about 1.9 times of that year's GDP (Nam et al. (1999)). The average debt/equity ratio of firms was over 300 percent, about four times higher than that of Taiwan (IMF (1998)). The ratio exceeded 500% for the 30 largest conglomerates and even reached 3,000 percent for some large chaebols.

Despite the economic significance of the high corporate leverage in the Korean economy, there have been few systematic studies on the amount of debt owed by the firms, the dynamics of leverage, and the differences in the debt structure between chaebol and non-chaebol

firms.¹ The purpose of this study is to fill this gap by analyzing the characteristics and determinants of capital structure choices of Korean firms. We investigate the characteristics of leverage and debt structures of Korean firms during the period from 1981 to 1997 and then empirically search for the determinants that can explain their financing decisions. Some existing studies, including Sunwoo (1990), Demirgüç-Kunt and Maksimovic (1994), Kim et al. (1997), Hahm, Ferri and Bongini (1998) and Wi (1998), examined the determinants of capital structure choices of Korean firms. But, while these empirical studies are based on the observations of either a single year or a short time period, this study is based on the most comprehensive firm-level panel data set available, consisting of over 10,000 firm-level observations over the 1981 to 1997 period. This study also focuses on the comparison of capital structure choices between chaebol and non-chaebol firms. We classify the sample firms into three categories by group affiliation—the five largest chaebols, 6-30th largest chaebols, and non-chaebol firms—and then assess the disparities of leverage and debt structure choices among them.

Our empirical results indicate that the capital structure choices of Korean firms can be explained by determinants such as size, growth rate, tangible fixed assets, and profitability of the firms, suggested by corporate finance theory. But, even when controlling for these proposed determinants, there are important differences in the capital structure choices between chaebol and non-chaebol firms. The empirical findings show that chaebol-affiliated firms had significantly higher leverage than non-chaebol firms over the period from 1981 to 1997. We also find that since 1989 leverage increased more quickly for the 6-30th largest chaebol firms, compared to that of the other two groups, and the top five largest chaebol firms significantly increased leverage in terms of foreign financing. These changing patterns of leverage and debt structure suggest that chaebol firms indeed acquired excessive financial vulnerabilities prior to 1997.

¹ Some recent studies analyze issues related to corporate debt in Korea. See IMF (1998), Nam et al. (1999), and Yoo (1998).

II. The Structure of Corporate Debt in Korea

This section provides a description of the firm-level data set and examines the trend of leverage and debt structure of Korean firms during the period from 1981 to 1997. It also compares capital structure choices among three groups--the five largest chaebols, 6-30th largest chaebols, and non-chaebol firms.

1. The Firm Data

The data used in this study consist of selected variables from the financial statements of Korean firms listed on the Korea Stock Exchange. The financial statements include major items on the annual balance sheets, income statements, and cost accounts of the firms under investigation. All the firms represented in the sample are non-financial companies. The source of the data is the database constructed by the Korea Listed Companies Association.

Because our data are based on the financial statements reported by the sample firms on a voluntary basis, one might doubt the reliability of the data. In particular, lack of transparency in the accounting standards applied by Korean firms and the cross-share holding and cross-payment practices predominant among the chaebol firms force us to take a conservative stance in interpreting the data. However, the data set used in this study remains the most comprehensive and reliable one available.

The size of the data varies in number each year, and the set is a panel data which pools the cross-sectional data from a total of 10,675 observations, including 308 firm level observations in 1981 and 661 in 1997.²

We then identified our sample firm's affiliation with business groups or "chaebols". Chaebols consist of many subsidiaries usually owned and controlled by a single family or by

² When cross-section data varies in observation number each year, one may use either a balanced panel data adjusted according to the number of observations in a certain year or an unbalanced one with varying cross-sectional observations. This study analyzes the unbalanced panel data, considering that it can better serve our purpose of exploring the characteristics of all the firms in an economy during a fixed time span.

companies within the family's control.³ In this study, we distinguish among the top five largest chaebols, 6-30th largest chaebols, and non-chaebol firms on the basis of asset size as of April 1, 1997. The 30 largest chaebols produced about 16 percent of GDP and more than 40 percent of manufacturing GDP, while the top five chaebols, including Hyundai, Samsung, Daewoo, LG, and SK, alone produced about 9 percent of GDP and accounted for 27 percent of manufacturing GDP in 1995 (Yoo (1998)). Over the time horizon under investigation, the number of observations of the top five chaebols is 739, 1,583 observations belong to the 6-30th largest chaebols, and 7,126 observations comprise the data for the non-chaebols.⁴ Of the total firm observations represented in the sample, 7,483 come from the manufacturing sector, out of which 1,299 and 2,010 observations represent the chemical product industry and the non-manufacturing sector, respectively.

2. Capital Structure of the Firms

The capital structure of a firm is determined by how the firm finances its investment decisions, and it shows the composition between debt and equity capital. This section explores the change in leverage of the firms represented in the samples and also assesses the financial structure of those firms in detail by classifying total debt into domestic and foreign debt by its source and long-term and short-term debt by its maturity.

As Figure 1 shows, the total debt to total assets ratio declined from 77.2% in 1981 to 66.1% in 1989, and then climbed up to 71.1% in 1997.⁵ A casual observation of the data suggests that the ratio is negatively correlated with rate of profits. The return on assets (ROA) for the firms in the sample rose from 1.5% in 1981 to 4.0% in 1989, and then steadily dropped from 1989 to 0.7% in 1997.

³ The Korean Fair Trade Commission (KFTC) legally defines a business group (chaebol) as “ a group of companies, more than 30 percent of whose shares are owned by some individuals or by companies controlled by those individuals.” The KFTC has identified business groups and has listed them every year since 1987.

⁴ The sum of the observations of all three chaebol group firms and non-chaebol firms is less than the size of the total sample. The missing observations come from the firms that had once operated during the sample period but did not exist at the end of 1996 which is our basis year for the classification of group affiliation.

⁵ We focus on the average debt-asset ratio as a measure of leverage of Korean firms, instead of debt-equity ratio. Balance sheet data show that some firms had very small equity capital or even negative capital. Thus, the debt-equity measures can render very biased estimates.

Figure 2 presents the trends of the domestic debt/total assets and foreign debt/total assets ratios.⁶ The domestic debt to total assets ratio dropped from 47.1% in 1985 to 36.9% in 1989. The ratio rebounded to 39.3% in 1991, and while hovering around 39.0% until 1996, it increased sharply to over 45 % in 1997. The foreign debt to total assets ratio plummeted from 8.2% in 1981 to 3.2% in 1989, but it took an upward turn after 1989, reaching 4.4% in 1997.⁷

As shown in Figure 3, the long-term debt to total assets ratio rose gradually, reaching 27.1% in 1997 from 21.5% in 1981, while the short-term debt to total assets ratio tumbled from 55.7% in 1981 to 41.8% in 1989, and then nudged up to 43.9% in 1997.⁸

Figure 4 shows the total debt to total assets ratios for the three groups of firms classified by their affiliation with chaebols. The debt/asset ratio for both the top five and the 6-30th largest firms fluctuated within a narrow band around 80% over the 1981 – 1987 time period, and both ratios decreased to around 72% in 1989. However, since 1989, the figures for both the top five and the 6-30th largest firms rose, with the figure for the latter group rising with a higher magnitude. The ratio for the non-chaebols also showed an upward trend since 1989. Prior to 1989, the gap of the total debt/total asset ratios between the five largest and 6–30th largest firms was negligible, but it started to rise since 1989. The ratio reached 79.4% for the 6–30th largest firms, and 76.1% for the five largest, compared to 68.6% for non-chaebols firms in 1997.

As shown in Figure 5, profit rates for both the chaebols (the 30 largest firms) and non-chaebol firms improved over the 1985 – 1988 period, but declined after 1989. The ROA for the top five dropped from 2.6% in 1988 to 1.0% in 1993, and then rebounded briefly from 1994 to 1995. However, the figure decreased to 0.7% in 1997. The ROA for the non-chaebol firms plummeted from 4.4% in 1988 to 0.4% in 1993. The figure briefly rose to 1.5% and 1.2% in 1994 and 1995, respectively, but it dropped again to 0.8% in 1997. Profitability for the 6–30th

⁶ Domestic debt is defined as the sum of trade payables, trade payables from affiliate firms, increase in other trade payables, short-term borrowings, trade finance, borrowings from banks, short-term borrowings from affiliate firms, other short-term borrowings, corporate bonds, convertible bonds, bonds with warrant, exchangeable bonds, long-term borrowings, long-term borrowings from affiliate firms, financial lease debts, and long-term trade payables. Foreign debt is defined as the sum of short-term foreign currency denominated borrowings, long-term foreign currency denominated borrowings, and foreign loans.

⁷ Foreign debt includes direct borrowings from abroad and excludes indirect foreign borrowings that are intermediated by financial institutions.

⁸ The long-term debt to total assets ratio is the ratio of fixed debt to total assets, while the short-term debt to total assets ratio is the ratio of liquid debt to total assets.

largest firms deteriorated further than that of the firms in the other two groups, decreasing from 1.3% in 1989 to -0.7% in 1991; the figure for 1997 was zero.⁹

Figure 6 suggests that the ratio of domestic debt to total assets for all the categories declined from 1985 to 1989, but fluctuated wildly later on. The ratio for the top five firms rose from 43.4% in 1989 to 45.7% in 1991, and climbed to 48.2% in 1997. The domestic debt to total assets ratio for the next largest twenty-five continuously rose from 45.2% in 1989 to 55.4% in 1997, and the figure for the non-chaebol firms also increased, reaching 45% in 1997.

The foreign debt to total assets ratio in Figure 7 presents a universal downward trend over the 1981–1989 period. The figure for the top five has spiraled downward since 1991, and reached 7.6% in 1997. The ratio for the 6–30 largest chaebols increased from 3.0% in 1989 to 4.7% in 1991 and then remained stable, while the figure for the non-chaebol firms stabilized within a narrow range at around 3% since 1989.

Figure 8 compares the three subgroups with respect to the long-term debt to total assets ratio. The ratios for both the top five and non-chaebol firms have risen gradually since 1989, reaching 29.6% and 26.2% respectively in 1997, while the figures for the 6–30th largest chaebols rose dramatically from 24.7% in 1984 to 32.4% in 1987, and remained at a high level.

As presented in Figure 9, the ratio of short-term debt to total assets for the five largest chaebols wildly fluctuated with a definite downward trend, while the figure for the 6–30th largest chaebols fell over the 1981 – 89 period and then rose. The figure for the non-chaebols fell prior to 1989 and then stabilized. The short-term debt to total assets ratios for both the top five and the next twenty-five largest firms are far larger than the figures for the non-chaebols.

In summary, the descriptive statistics in the above sample suggest the following debt structure characteristics of the firms represented in our sample. First, the ratio of total debt to total assets for Korean firms in general has remained very high. The figure fell from 1981 to 1989, but then rose again after 1989. Second, the leverage for the firms affiliated with the top thirty chaebols has always been higher than that for the non-chaebols over the whole period, and since 1989 the 6–30th largest chaebols had the highest total debt/total assets ratio. Third, for the top five chaebols the total debt to total assets ratio remained stable after 1991, despite a

⁹ Chang and Hong (1998) analyze the factors that led to the relative under-performance of the chaebol-affiliated firms compared with the non-chaebols in terms of profitability and suggest that the inefficiency caused by over-diversification lowered the profits of the affiliated firms.

significant change in their debt structure: the ratio of domestic debt to total assets and the ratio of short-term debt to total assets fell, while the foreign debt/total assets and long-term debt/total assets ratios rose. Fourth, for the 6–30th largest chaebols both the ratios of domestic debt/total assets and foreign debt/total assets increased over the 1989–91 period, and only the domestic debt to total assets ratio has risen since 1992. Since 1989, the ratio of long-term debt to total assets presents a downward trend, while the short-term debt/total assets ratio has continued to rise. Finally, the ratio of foreign debt to total assets for the five largest firms are relatively high compared with the other sub-groups over the entire period, with the figure rising significantly after 1991.

III. Determinants of Leverage and Financing Structure

In the previous chapter, we explored the debt structure characteristics of Korean firms using their financial profiles over the 1981 through 1997 time period. In this chapter, we investigate the determinants of the debt structure of the firms in the sample. We discuss some theoretical factors that determine their leverages and then we empirically explain the dynamics of Korean firms' capital structure. We focus on assessing the disparities in the debt structure among the five largest firms, the 6–30th largest, and the non-chaebols.

1. Determinants of Capital Structure Choices

This section discusses the factors that determine a firm's capital structure. Modigliani and Miller (1958) hypothesize that a firm's leverage is uncorrelated with its market value under a perfectly complete capital market. However, extensive literature explains that each firm can have a different optimal capital structure minimizing capital cost in reality, where there exist bankruptcy costs, agency costs, asymmetric information, and incompleteness in product and factor markets.¹⁰

¹⁰ As for recent survey papers on the theory of determination of optimal financial structure, refer to Harris and Raviv (1991) and Rajan and Zingales (1995).

The determinants of debt structure mentioned with great importance in the previous theoretical and empirical studies include firm size, growth rate, size of tangible fixed assets, profitability, and industry classification.¹¹

Size of the firm

The size of a firm has a close relationship with leverage since it affects the firm's risk of default and bankruptcy costs. As a firm becomes big and diversifies its operations, the risk of default decreases; therefore, it has better access to external financing, which might result in high leverage. Direct bankruptcy costs also influence a firm's leverage: large-scale firms can have higher leverage since bankruptcy costs account for a smaller portion of their capital (Titman and Wessels (1988)). Large firms are likely to obtain long-term loans more easily, since they have lower default risks and more assets to put up as collateral, compared with smaller firms.

On the other hand, large firms can easily finance their investments directly from capital markets because asymmetric information is less likely to occur as outside investors can obtain more information about large firms compared to small-sized firms. Then, larger firms can have lower leverage.

Growth Rate

Equityholders in highly leveraged firms might choose not to invest in the projects that would help increase the firm's value, if they consider that, while they bear the entire cost of the investment, the returns from the investment are captured mainly by the debtholders (Myers (1977)). If this agency cost of debts is significant, fast-growing firms operating in highly lucrative businesses would tend to have more equity and less debt financing. Therefore, the firm with higher growth opportunities has lower leverage, especially in terms of long-term debts. On the other hand, this kind of firm can reduce its agency cost by issuing short-term liabilities rather than long-term ones, and then its leverage in terms of short-term debt might be high.

¹¹ Empirical studies regarding the theory of the firm's capital structure include Titman and Wessels (1988), Rajan and Zingales (1995), and literature introduced in Harris and Raviv (1991).

Tangible Fixed Assets

The asset structure of a firm significantly affects the firm's capital structure. Since tangible fixed assets, serving as collateral, can lower the risk of the lender suffering the agency cost of debt, a greater portion of tangible fixed assets on the balance sheet leads to higher leverage. Grossman and Hart (1982), however, show that a firm's tangible fixed assets can be negatively correlated with its leverage. According to them, a firm with limited tangible fixed assets has less collateralized debts and more difficulty monitoring the extravagancy of its employees due to asymmetric information. In this case, a firm can attempt to reduce its agency costs by increasing leverage, which allows the firm to be more stringently monitored by creditors such as bondholders and financial intermediaries. Therefore, a firm with limited tangible fixed assets can raise its leverage. In addition, if the company has huge tangible fixed assets, then the portion of fixed operating costs, instead of flexible operating costs, in the total operating costs for the firm's production and sales activities increases, thus raising its operational risk and probability of bankruptcy. In this case, an increase in tangible fixed assets can also lead to lower leverage. If an increase in tangible fixed assets raises a firm's bankruptcy costs such as the cost of asset sales, the firm's leverage could be also lowered.

Profitability

According to the pecking order theory, which states that a firm prefers internal funds to external ones in terms of financing, its first preference is to use retained earnings over debts via financial intermediaries and rank the incurring of the debts over the issue of stocks or bonds (Myers (1977)). This is preferred because internal funding entails less transaction costs than external funding and the incurring of debts via financial intermediaries is less costly compared with external financing methods including the issuance of stocks and bonds (Myers and Mjaluf (1984)). This theory postulates that a firm's profitability significantly influences its debt structure—the improvement of profitability leads to the growth of retained earnings, thus lowering the firm's leverage.

Industry Classification

Unique features of a certain industry also affect the debt structures of the firms in that industry. Each industry might have industry-specific patterns of financing due to disparities in

product market structure and types of competitive actions between firms. To control for these industry effects, many empirical studies include dummies for industry. We classify the firms in the sample into 24 industries, first by classifying them into eight major categories including the manufacturing industry, and then reclassifying the manufacturing industry into seventeen minor categories.

Group Affiliation.

The previous chapter shows that there are many differences in the debt structure among the five largest, 6–30th largest, and non-chaebol firms. This observation shows that group affiliation can be a major factor in determining the leverage of Korean firms. We incorporate dummy variables for the group affiliation so as to ascertain whether the chaebols had higher leverage than the non-chaebols after controlling for other important factors determining the firm's debt structure.

2. Empirical Specification

This section builds on an empirical framework using the determinants mentioned in the previous section so as to discern the determinants of the debt structure of Korean firms in the sample.¹² We also explore differences in the source (domestic or overseas) and the term structure (long-term or short-term) of the debt. In addition, differences between the chaebol and non-chaebol firms are explored in terms of the level, the term structure and the financial structure of the debts.

The empirical analysis of this study hypothesizes the following equation, using the panel data discussed in Chapter 2:

$$Y_{it} = a_1 + \sum_{k=2}^K a_k X_{kit} + e_{it}, \quad i = 1, 2, \dots, T,$$

Where Y_{it} is the dependent variable pooling N cross-sectional observations and T time-series observations, and X_{kit} 's are the independent variables pooling N cross-sectional

¹² There are other important determinants of firms' capital structure, which are not mentioned in the previous section but may significantly affect corporate debt structure, including a wide variety of government regulations and tax policies. Since we do not have adequate measures of these factors, they are excluded in this study.

observations and T time-series observations. a_{it} is a constant term and e_{it} is random error with mean 0 and variance σ^2 .

Use of the panel data enables us to consider both the cross-sectional and time-series characteristics of our sample and helps identify the sources of possibly mingled effects. With our panel data set, the equation described above can be estimated by means of the Ordinary Least Squares techniques. However, assumptions concerning the constant term a_{it} in the estimation equation dictate the choice of estimation methods. If a_{it} varies over time (year by year), a_{it} can be rewritten as $a_{it} = \bar{a}_i + \mathbf{m}_i$, where \bar{a}_i is a constant term and \mathbf{m}_i denotes the time-specific fixed effect. In this case, the equation becomes a fixed effect model, which can be estimated with the OLS method by incorporating year dummies. Our empirical investigation includes two different cases, one with fixed a_{it} and the other with a time-varying constant.¹³ The empirical model of this study is as follows:¹⁴

$$\begin{aligned} \text{Leverage} = & a_1 + a_2 \log(\text{Size}) + a_3 \text{Growth} + a_4 \text{Fixed} + a_5 \text{ROA} \\ & + a_6 \text{Group1} + a_7 \text{Group2} + a_8 \text{Industry} + a_9 \text{Industry} + a_{10} \text{Year} + \mathbf{e} \end{aligned}$$

We have five different leverage measures for the dependent variable of our model as follows:¹⁵

- a) Leverage (Total Debt/Total Assets)
- b) Domestic Leverage (Total Domestic Debt/Total Assets)

¹³ If a_{it} is a random variable and, thus, \mathbf{m}_i is an independently distributed random variable with a zero mean and a constant variance, our estimation equation becomes an error component model and can be estimated by the Generalized Least Squares method. Estimation results of our equation using the error component model are not significantly different from those of the fixed effect model reported here. Furthermore, a_{it} can be rewritten as $a_{it} = \bar{a}_i + \mathbf{m}_i + v_i$, which incorporates both time-specific and firm-specific effects. Our model already has an industry dummy designed to incorporate an industry-specific effect; however, a firm-specific effect is not taken into account.

¹⁴ Although both dependent and independent variables use the values from the same year, we believe the reverse causality would not be a serious problem in these regressions because the dependent variables of our model, debt ratios, are year-end stock variables and most independent variables are flows during that year. When we estimated the equation using one-period lagged values of the ROA variable, taking into account the inverse causality between high debt ratios and low ROAs, the estimation results did not change much.

¹⁵ See Chapter II for the definitions of each debt ratio. The assets and debt of the sample firms are measured in terms of their book values.

- c) Foreign Leverage (Total Foreign Debt/Total Assets)
- d) Long-term Leverage (Total Long-term Debt/Total Assets)
- e) Short-term Leverage (Total Short-term Debt/Total Assets)

The dependent variables are defined as follows:

Size: Sales (Unit: thousand Korean won, log values)

Growth: Growth rate of sales

Fixed: Tangible fixed assets/Total assets

ROA: Net income /Total Assets

Group1: 1 for the five largest firms, 0 otherwise

Group2: 1 for the 6-30th largest firms, 0 otherwise

Industry: Industry dummy variables (a total of 24 dummy variables)

Year: Year dummy variables (a total of 17 dummy variables)

Year dummy variables are used when time-specific effects are assumed. The panel data set includes a total of 8,714 firms for the period from 1981 to 1997. The descriptive statistics for the variables used in this study are presented in Table 1.

3. Empirical Results

In this section we examine the determinants of the debt structures of the firms in our sample. In addition, we investigate, on the one hand, the effects resulting from difference in sources of debt by classifying our sample as foreign and domestic, and, on the other hand, the effects caused by differences in maturity structures of debt by dividing it into long-term and short-term debt. In order to analyze the effects from structural changes in the debt structures of our sample, we have divided our sample into two sub-periods-- 1981-1988 and 1989-1997.¹⁶ In order to explore the extent to which the status of the firm affects the determinants of debt structures, we classify the sample firms as the five largest, 6-30th largest and non-chaebol firms.

¹⁶ The division of the sample with 1989 as the center coincides with the fact that financial liberalization began in the late eighties in Korea (see Borensztein and Lee (1999)). When the sample is divided between 1981-91 and 1992-97, considering that the opening of the capital market started in 1992, the estimation results do not change much.

Leverage

Table 2 summarizes the empirical results on the determinants of leverage. The results of the fitness test are satisfactory: adjusted R^2 's for our models, which represent their fitness, range from 0.32 to 0.42. This suggests that the debt structures of the Korean sample firms are well explained by our model. Consider first firm size as a determinant of capital structure. When the whole sample period from 1981 to 1997 is considered, the coefficient of firm size is positive and significant at the 5% level. The positive relationship of firm size with leverage supports the hypothesis that large firms can at once reduce the possibility of bankruptcy by way of diversification and lower their direct bankruptcy costs. However, the effect of firm size on debt can differ depending on the source or maturity of the debt. Regression results on more disaggregated leverage are presented in the next sub-section. Table 2 also reveals that for the period from 1981 to 1988, the relationship between leverage and firm size is not significant, but for the latter half of the sample period the coefficient for firm size is positive and significant.

The effect of a firm's growth on its capital structure is also significantly positive, rejecting one of the agency cost hypotheses that firms with growth opportunities would have less debt. It confirms the results of existing research on the financial structure of Korean firms (see Sunwoo (1990) and Kim et al. (1997)). Kim et al. (1997) explain that since the stock market in Korea is not well developed, companies with growth opportunities are forced to resort to debt financing rather than capitalizing on equity financing. On the other hand, the positive association between growth rate and leverage may come from the fact that as the higher the expected growth rate of the firm becomes, the more the firm would depend on short-term indebtedness in order to reduce agency costs. Analyses on the determination of short-term and long-term leverage are presented in the next sub-section. For the two sub-periods—1981 to 1988 and 1989 to 1997—growth is positively related to indebtedness, and the effect is stronger in the latter period.

The relationship between the ratio of tangible fixed assets and leverage is significantly negative for the whole period as well as for the two sub-periods. This result implies that firms with more tangible fixed assets have less total debt than firms with fewer fixed assets. It is consistent with the predictions of the agency theory that tangible fixed assets act as the operational leverage which raises a firm's possibility of bankruptcy. It also implies that the monitoring of debt-holders and financial intermediaries forces a firm with limited tangible fixed

assets to reduce possible extravagant behavior of its employees. On the contrary, the role of fixed tangible assets, such as collateral value, diminishes the agency costs that outside investors should pay, which in turn raises the firm's leverage. This effect may be more significant for foreign and long-term debt since it is more difficult for outside investors to monitor the flow of foreign and long-term debt than that of domestic and short-term debts. In fact, our regressions on disaggregated measures of leverage, reported in the next sub-section, confirm this prediction.

Profitability is found to have a significantly negative relationship with leverage. These results imply that internal financing reduces transaction costs associated with external financing, so internal financing has priority over external financing. This inverse relationship between profitability and leverage holds throughout the two sub-periods.

The chaebol affiliation dummies, which are designed to test whether chaebol firms have significantly higher leverage than non-chaebol firms, appear significantly positive. As presented in Table 2, the chaebol-affiliated firms (regardless of whether they belong to the five largest group or to the 6-30th largest group) have higher debt/asset ratios than non-chaebol firms. In short, the chaebol firms have more leverage than their non-chaebol competitors, even after we control for other determinants of the firms' capital structure. However, the relationship between leverage and chaebol dummies is not significant at the 5% level for the 1981 to 1988 period, suggesting that there is no important difference between the firms in our study in terms of leverage. For the 1989 to 1997 period, the results show that there is no statistically significant (at the 5% level) disparity in leverage between the five largest and the non-chaebol firms. But, the coefficients for the 6-30th largest firms over the 1989 to 1997 period are estimated to be substantial (0.032) and significant at the 5% level.

Domestic and Foreign Leverage

We present the empirical results on the determinants of the composition of the debt structures in terms of the source of debt in Table 3. The dependent variable is either the ratio of domestic debt to total assets or the ratio of foreign debt to total assets. While the firm's size, as measured by sales, is negatively related to domestically financed debt, it is positively related to foreign debt. The theory of corporate finance predicts that the size of a firm affects the possibility of bankruptcy and the costs associated with bankruptcy so that large corporations would have more debt than smaller firms. Our findings show that this prediction is valid for the

foreign borrowings of our sample firms, but is not so for their domestic debt. Our interpretation of these results is that the larger firms have better and easier access to overseas capital resources, which thereby lowers their ratios of domestic debt over total assets.

As far as the relationship between growth and leverage is concerned, our results show that fast growing firms would have higher ratios of both domestic- and foreign-originated debt than otherwise. But, while the coefficients for growth are statistically significant for domestic leverage during all periods, they are significant for foreign leverage only during the 1989 to 1997 period. These results imply that growth rate is an important determinant of domestic leverage regardless of the choice of sample periods while growth rate has affected foreign leverage only since the latter half of the 1980s when the Korean government started to undertake capital-liberalization measures.

The coefficients for tangible fixed assets have negative signs for domestic leverage. This can be interpreted to mean that the share of tangible fixed assets reduces leverage by increasing operational leverage and agency costs. However, the estimation coefficients have positive signs in the regressions with foreign leverage as the dependent variable. This is consistent with the theoretical prediction that the collateral value of the tangible fixed assets reduces the agency costs resulting from difficulties in monitoring foreign debt financing on the part of outside investors and thus raises leverage.

As for profitability as a determinant of a firm's capital structure, the coefficients are negative and significant at the 5% level in the case of domestic leverage for all the sample periods, implying that an increase in the level of retained earnings always reduces the level of domestic debt financing. Profitability also proves to be a statistically significant determinant of foreign debt for the whole sample period including the 1981 to 1988 sub-period.

Our analysis of the effects of a firm's group affiliation on its leverage gives contrasting results with regards to domestic debt and foreign debt. The coefficients for chaebol dummies 1 and 2 are positive and statistically significant in the case of domestic debt as the dependent variable, suggesting that domestic debt takes up more share in the debt structure of chaebol firms than non-chaebols. In addition, the coefficient for the 6-30th largest chaebols exceeds that for the top five largest chaebols, which means that domestic borrowing was a more important instrument of financing for the 6-30th largest chaebols than for the five largest. In the case of foreign debt, only the top five chaebol dummies are statistically significant, particularly in the

later period, which can be interpreted as indicating that the five largest chaebols relied more heavily on foreign borrowing than other firms over this period.

Long-term and Short-term Leverage

Table 4 presents the results of our analysis of the determinants of debt divided by its maturity. The observed positive relationship between firm size and long-term leverage implies that the size of a firm is positively correlated with the firm's ability to put up collateral so that large firms have a comparative advantage in long-term borrowing. This result holds the same for the two sub-periods. On the contrary, the relationship between short-term leverage and firm size is not statistically significant for the whole sample period, and it is significantly negative for the 1981-88 period while positive, though not statistically significant, for the 1989-97 period. This result can be interpreted as indicating that, for the former sub-period, high accessibility to information on large firms could reduce the problems resulting from information asymmetry and thus enable those firms to easily capitalize on the capital markets. But for the latter period, even large firms relied more on short-term borrowing than in the former period.

Growth rate as a determinant of long-term leverage is found not to be statistically significant for the three sample periods, while its coefficients in the case of short-term leverage as the dependent variable are all significant and positive. This result points to the proposition that fast growing firms issue short-term debt in preference to long-term debt in order to reduce agency costs.

The ratio of tangible fixed assets over total assets is significant and positively related to long-term indebtedness, but has a significant negative relationship with short-term indebtedness. This result may indicate that the role of tangible fixed assets as collateral value overrides other countervailing effects for long-term debt, but in the short run, asset specificity reduces the collateral value of fixed assets and increases operational risks and the probability of bankruptcy.

Profitability has a significant inverse relationship with both long-term and short-term leverage, suggesting that an increase in the share of net profit in total assets is associated with a decrease in the firm's indebtedness regardless of the maturity of debt.

The results of our study reveal that over the whole time period examined the 6-30th largest chaebol firms have more long-term debt than the other firms in the sample by about 2 percent. The disparity expands to 3.5 percent in the 1981 to 1988 period, but is not statistically

significant at the 5% level in the 1989 to 1997 period. In the case of short-term indebtedness, the five largest chaebol firms are more exposed to short-term indebtedness than the other firms by around 4 percent over the whole time span. During the 1981 to 1988 period in particular, the short-term leverage for the five largest firms is higher than for the non-chaebols, while during the same period short-term leverage for the 6-30th largest firms is smaller than that for the non-chaebols. For the 1989 to 1997 time period, both the top five and 6-30th largest firms had higher degree of short-term indebtedness than the non-chaebol firms, controlling for other factors.

Leverage by Firms' Group Affiliation

In the previous sections, we included dummy variables to test whether, with other variables controlled for, chaebol firms have higher leverage than non-chaebol firms. One of the possible pitfalls of this approach is that the proposed determinants (firm size, growth rate, tangible fixed assets, profitability) may have different effects on the capital structures of the sample firms depending on their group affiliation—namely, chaebol or non-chaebol. In this section we run our model after segmenting the sample firms into the three groups—the five largest, 6-30th largest, and non-chaebol firms.

Table 5 presents our regression results by group. Over the whole time period, all the estimation coefficients have the same signs as those in Table 2, and there is no significant group-wise difference. When we run our model separately for the two sub-periods, we find no significant difference in the determinants of capital structure: although several variables have signs contrasting the results shown in Table 2, they are statistically insignificant. Though not presented in this study, we obtain the same results as shown in Tables 3 and 4 when we regress domestic and foreign indebtedness as well as long-term and short-term indebtedness on the proposed determinants of capital structure for the sample disaggregated by group affiliation.

Taken together, these results suggest that the difference in leverage between chaebol and non-chaebol firms stem not from disparity in the effects of the proposed determinants, such as firm size, growth rate, tangible fixed assets, and profitability, on the extent of leverage, but rather from other institutional factors as reflected by the significant coefficients on dummy variables. We investigate these institutional factors in the next section.

IV. Institutional Factors for High Leverage of Korean Firms

The empirical results in previous sections show that the determinants of capital structure choices proposed by corporate finance theory are also relevant for Korean firms. However, the corporate finance models still miss the institutional and structural idiosyncrasies of the Korean economy that contributed to high leverage of Korean firms. For example, the substantial disparity between chaebol and non-chaebol firms in terms of leverage, which is revealed by the significance of dummy variables for chaebol firms, can not be explained without understanding the lavish debt-financed investment behavior of the chaebol firms or financial institutions' preferential lending practices toward them. This section provides a brief explanation of the institutional factors that have influenced capital structure in Korea.¹⁷

The major factor for the high leverage of Korean firms is the Korean government's long-lasting development strategy that has exerted crucial consequences on financial market development and corporate governance in the economy. Although the Korean government has tried to liberalize and deregulate the financial market and occasionally alleviate the predominance of chaebol firms in the economy, the legacies of the government's heavy intervention in the financial sector have persisted and added to the build-up of high leverage in the corporate sector.

The financial markets in Korea have been under tight regulation since the early 1960s when all commercial banks were nationalized and specialized state-owned banks were established to facilitate the government's development policy. The government has used allocation of credit with preferential interest rates as a powerful incentive to promote key industries (Lee (1996)). In the 1970s, the government strengthened its control over credit allocation in order to promote its heavy and chemical industries (HCIs). The HCI drive in the 1970s set the stage for the emergence of large chaebols and their heavy debt financing. The government provided chaebols in the targeted export sectors and HCIs with massive subsidized loans. The government's deep involvement in credit allocation continued to intensify throughout the 1970s, until a partial movement toward a limited abolishment of credit controls and deregulation of interest rates took place from the beginning of the 1980s.

¹⁷ See IMF (1998), Kim (1998), Nam et al. (1999), and Yoo (1998) for more detailed description of corporate debt issues in Korea.

In the 1980s, the government started to undertake a number of financial liberalization measures. Many restrictions on bank management were lifted, and entry barriers to the financial industries were significantly lowered. In particular, five of the six major commercial banks were placed in private hands in 1982, even though individual ownership of a nationwide commercial bank was restricted to below 4 percent. The requirements for establishment of new banks were eased, and many non-bank financial institutions (NBFIs) entered into competition with banks

Since the start of the 1990s, the government's liberalization efforts made more significant progress. A variety of measures were introduced to strengthen competition in the financial markets and therefore improve the competitiveness of the financial system. In reality, however, the government continued to influence the financial sector. For instance, it was very common for the Ministry of Finance to be directly involved in the appointment of commercial banks CEOs.

Along with persistent government intervention, the liberalization of the financial markets was not accompanied by the development of appropriate risk control and credit assessment techniques. Although leveraging in the corporate sector remained high and corporate borrowers were not creditworthy and productive enough to repay their loans, the banks' credit decisions still tended to be based on collateral and cross loan guarantees rather than the firms' future profitability.¹⁸ Furthermore, the government's implicit risk sharing with chaebols resulted in a serious problem of moral hazard. The government's frequent bailouts of troubled and insolvent companies, as in the Presidential Emergency Decree of 1972 and in industrial rationalization measures between 1984 and 1988, encouraged firms, large corporations in particular, to make reckless investments based on heavy debt financing, while demoralizing financial institutions to properly monitor the credit of borrowers and analyze the risk of the projects (see Nam et al. (1999)).

Although the government has in general encouraged the growth of chaebols with the belief that large-scale firms have an advantage in global competition, the government later became concerned about an excessive concentration of power and tried to check the dominance of chaebols in Korean society. For instance, the government stringently limited chaebols from becoming dominant shareholders in nationwide commercial banks. Yet the cozy relationship

¹⁸ Borensztein and Lee (1999) provide empirical evidence that credit was allocated to inefficient sectors for the period from 1970 to 1996.

between the chaebols and financial institutions seldom changed. Chaebols were able to obtain significant shares of local banks which were less subject to government restrictions. Furthermore, chaebols obtained controlling shares of non-bank financial institutions (NBFIs), since there were virtually no restrictions over ownership of NBFIs. As presented in Table 6, no large business group acquired considerable ownership of a commercial bank, but they were able to dominate in some of the local banks. More importantly, Table 7 reveals that many NBFIs were owned by chaebols. In fact, they acted as the financial arms of the chaebol firms by lending funds, underwriting securities issued by their related companies, providing preferential financial services, and exercising control of other firms via stock holdings (Kim, 1999). The dominance of chaebols in the NBFIs can explain the increase in the spread between the leverage of the chaebols, especially the 6 to 30th largest chaebols, and non-chaebols after the mid-1980s.

Table 8 shows that as of 1997 the largest 30 chaebols' asset size became dominant over the whole economy. But, they also accumulated heavy debt and became financially vulnerable because of their heavy debt financing. Not surprisingly, when the financial panic broke out and lending was suddenly stopped, the high-indebted chaebols went into financial distress: four out of the largest 6-30th chaebols were officially bankrupt and many subsidiaries that belonged to the other chaebols also became insolvent.

V. Conclusion

After the outbreak of the East Asian economic crisis, the high leverage of Korean firms has been criticized as one of the major causes of the crisis. At this juncture, this study aims at tracking the changes in leverage and financing structures and then identifying the determinants of the capital structure of these Korean firms during the period from 1981 to 1997. We find the financing decisions of Korean firms can be explained by the determinants, proposed by corporate finance models, such as firm size, growth rate, tangible fixed assets, and profitability. We also find that as often argued, chaebol firms have higher leverage than non-chaebol firms, even after controlling for the proposed determinants. This result suggests that chaebol-affiliated firms more heavily relied on debt financing for investment than non-chaebol firms.

Our findings also show that since 1989, leverage increased more quickly for the 6-30th largest chaebol firms, compared to that for the other two groups. Additionally, chaebol firms

more heavily resorted to short-term and foreign loans than the non-chaebol firms did. These observed patterns of high leverage and short-term debt maturity show that the chaebol firms of the Korean economy continued to build up financial vulnerability prior to the financial crisis.

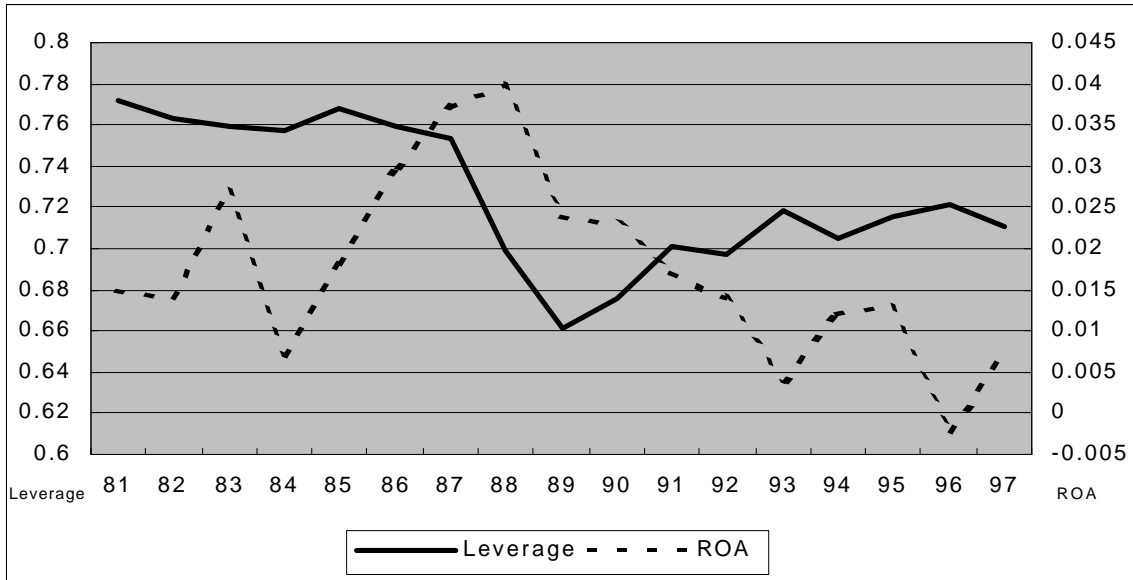
In the early stages of development, when capital markets are under-developed, firms can resort more to debt financing than to equity financing. However, leverage has been extremely high for Korean firms, in particular the largest chaebol firms. The high leverage of chaebol firms came from the Korean government's development strategy that favored the large firms. The close relationship between chaebols and financial institutions encouraged chaebols' over-diversification and excessive debt-financed investments, which in turn resulted in their high leverage and low profit levels. These structural weaknesses in the financial and corporate sectors were some of the most important contributing factors to the Korean financial crisis in 1997. More thorough investigation of the institutional factors that caused the structural defects of the Korean economy is the topic of other on-going research.

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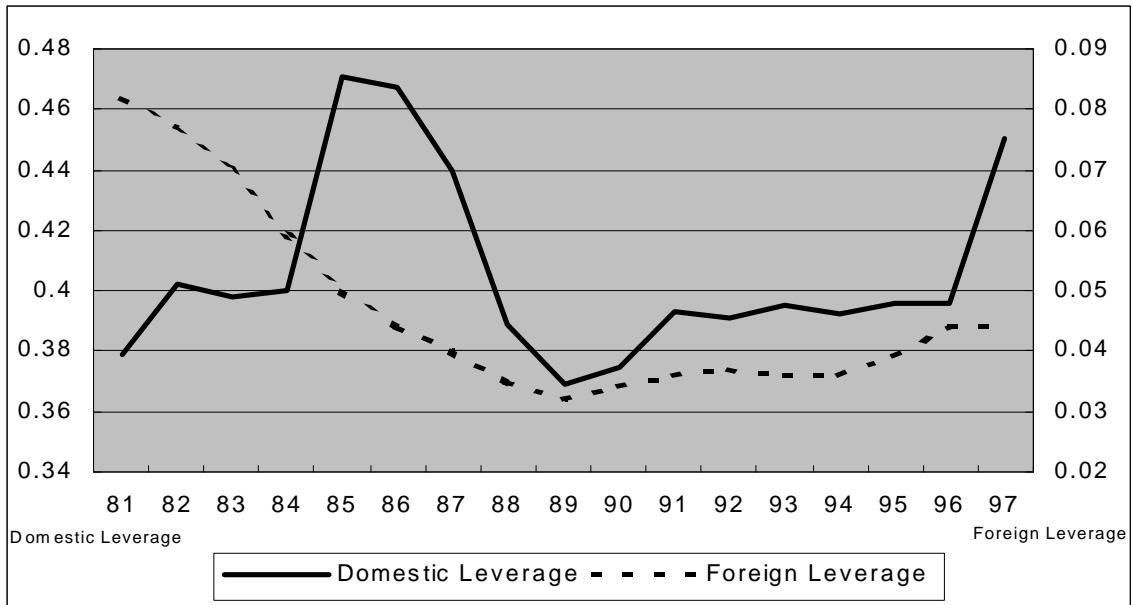
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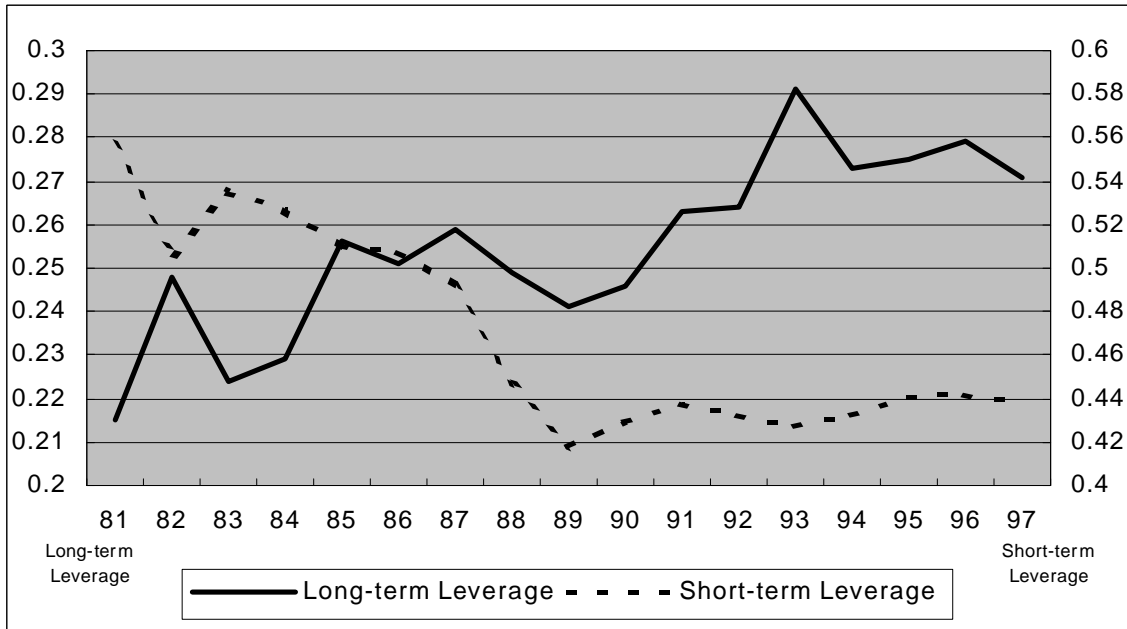
<Figure 1> Leverage and ROA



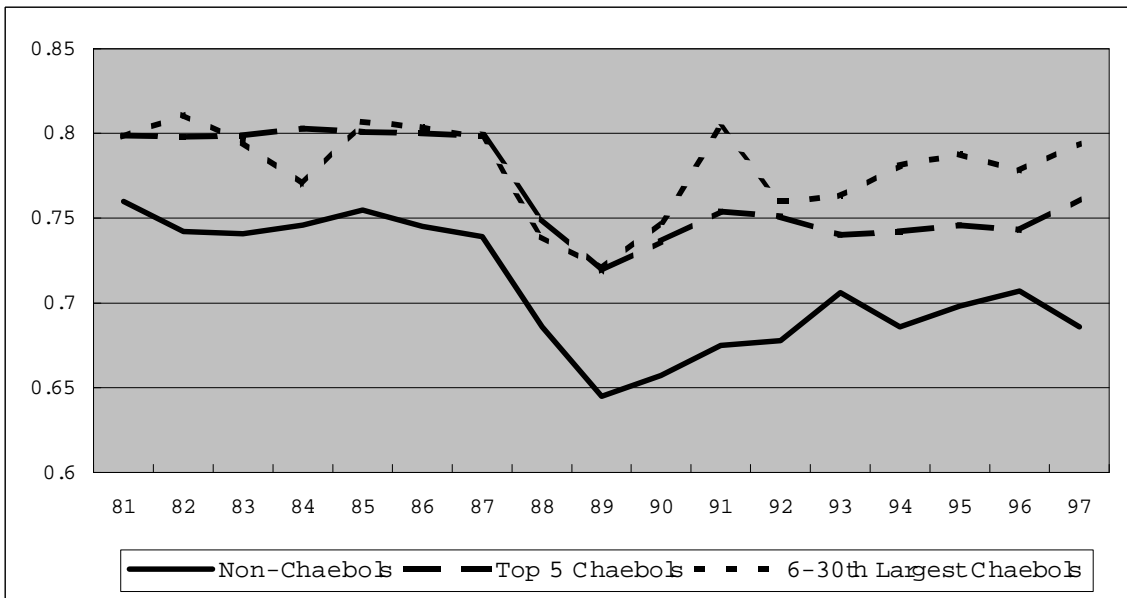
<Figure 2> Domestic and Foreign Leverage



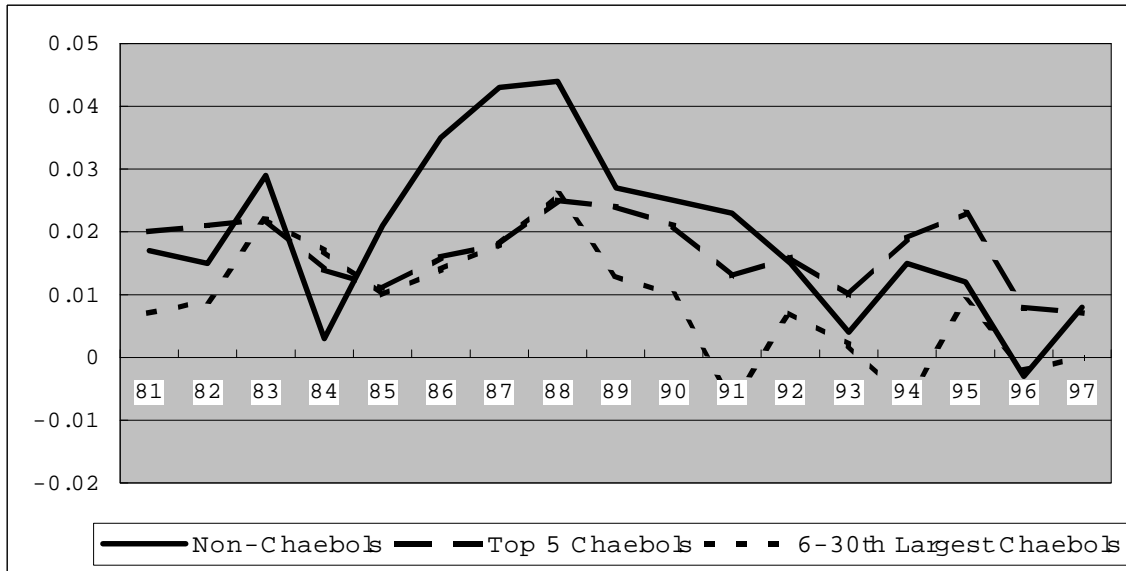
<Figure 3> Long-term and Short-term Leverage



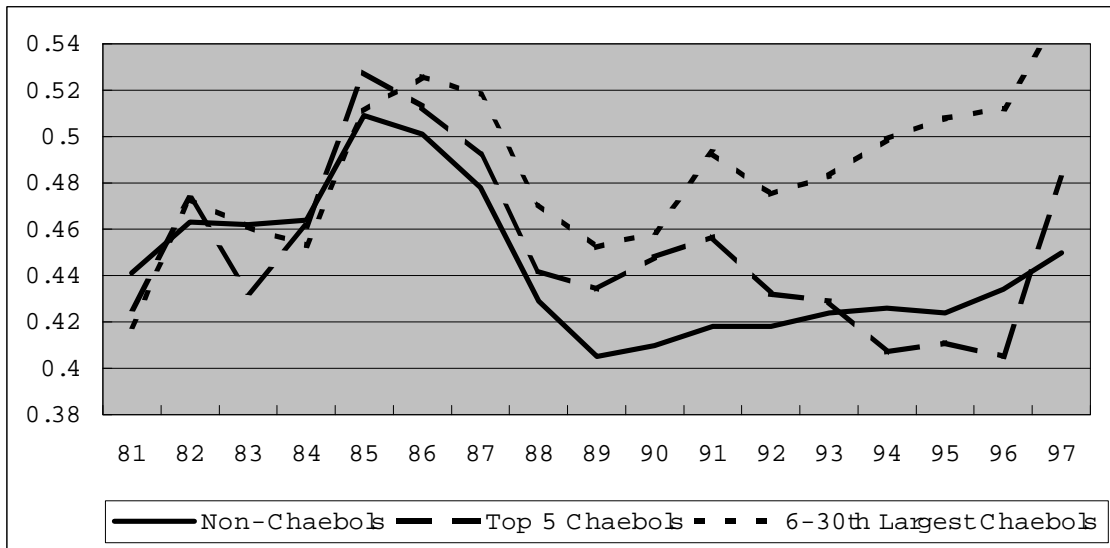
<Figure 4> Leverage by Group



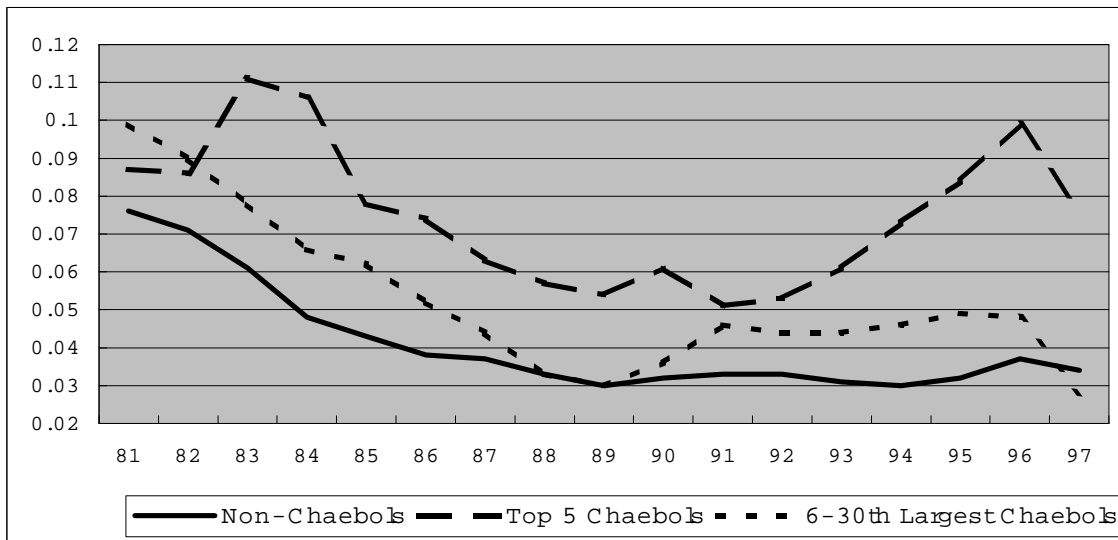
<Figure 5> ROA by Group



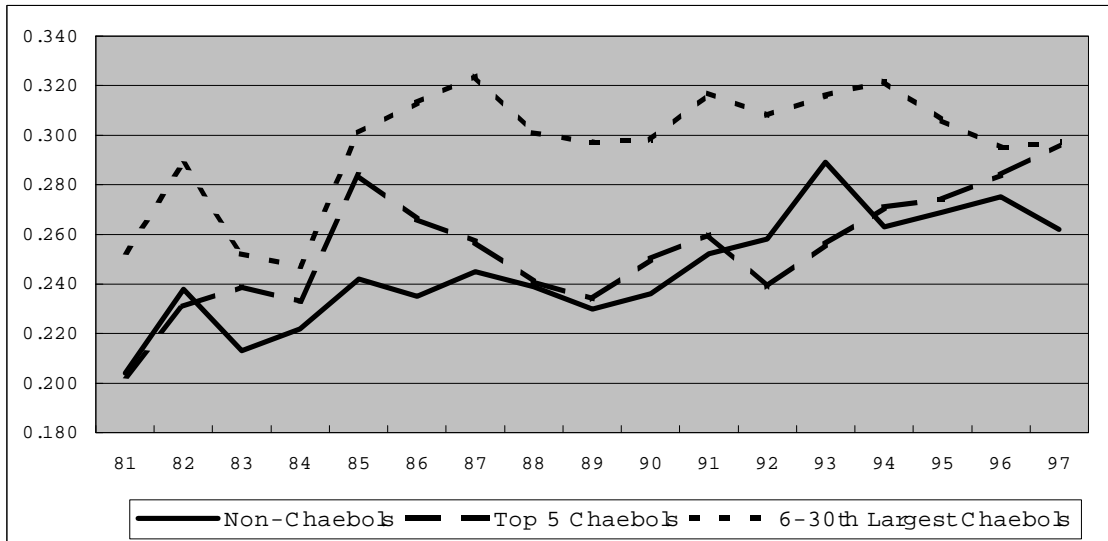
<Figure 6> Domestic Leverage by Group



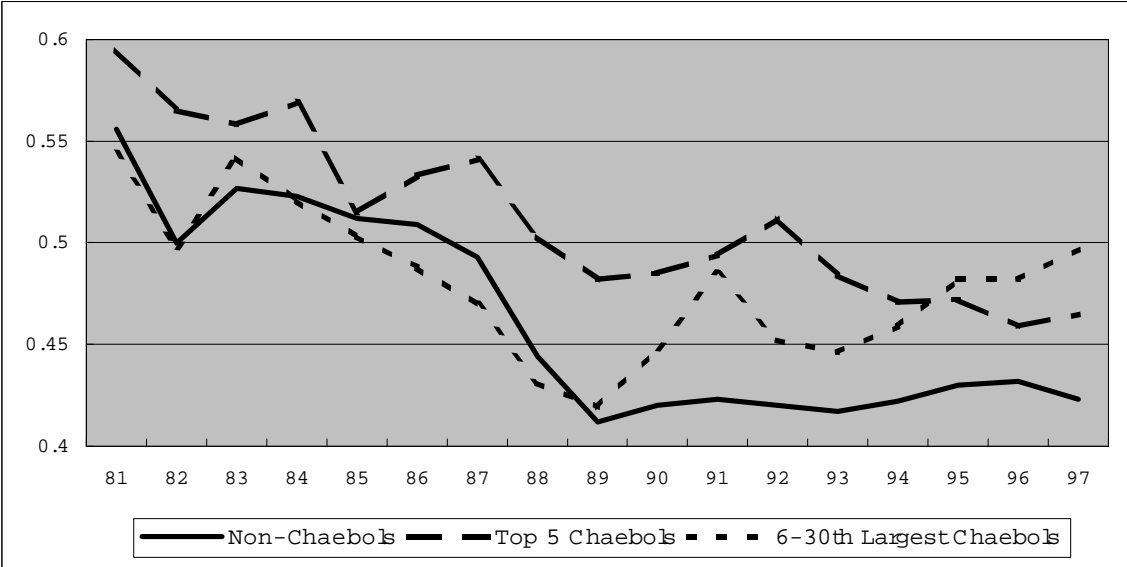
<Figure 7> Foreign Leverage by Group



<Figure 8> Long-term Leverage by Group



<Figure 9> Short-term Leverage by Group



<Table 1> Summary of Descriptive Statistics

Periods	1981-1997		1981-1988		1989-1997	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Debt/Total Assets	0.695	0.310	0.733	0.249	0.677	0.333
Domestic Debt/ Total Assets	0.403	0.240	0.421	0.233	0.394	0.243
Foreign Debt/ Total Assets	0.035	0.060	0.042	0.073	0.032	0.053
Long-term Debt/ Total Assets	0.262	0.250	0.250	0.217	0.267	0.264
Short-term Debt/ Total Assets	0.442	0.203	0.491	0.189	0.420	0.205
Firm Size (Log of Sales)	18.220	1.361	17.835	1.261	18.402	1.369
Growth	0.163	0.515	0.239	0.615	0.127	0.456
Tangible Fixed Assets/ Total Assets	0.316	0.169	0.316	0.164	0.316	0.172
Net Profit/Total Assets	0.017	0.084	0.027	0.070	0.012	0.089

<Table 2> Empirical Results on Leverage

Dependent Variables	Total Debt / Total Assets					
	1981-1997		1981-1988		1989-1997	
Equations	(1)	(2)	(1)	(2)	(1)	(2)
Firm Size (Log of Sales)	0.005* (0.002) ¹⁾	0.013* (0.002)	0.006 (0.004)	0.006 (0.004)	0.015* (0.003)	0.015* (0.003)
Growth	0.034* (0.005)	0.027* (0.006)	0.019* (0.007)	0.017* (0.0073)	0.026* (0.007)	0.030* (0.008)
Tangible Fixed Assets /Total Assets	-0.108* (0.018)	-0.112* (0.018)	-0.187* (0.028)	-0.184* (0.028)	-0.070* (0.030)	-0.070* (0.023)
Net Profit/Total Assets	-2.007* (0.030)	-2.049* (0.030)	-1.727* (0.054)	-1.730* (0.054)	-2.141* (0.036)	-2.145* (0.036)
Chaebol Dummy 1 (1-5th largest)	0.048* (0.011)	0.025* (0.011)	0.026 (0.016)	0.025 (0.016)	0.024 (0.015)	0.023 (0.015)
Chaebol Dummy 2 (6-30th largest)	0.039* (0.007)	0.028* (0.007)	0.019 (0.010)	0.018 (0.010)	0.033* (0.010)	0.032* (0.010)
Industry Dummy	O ²⁾	O	O	O	O	O
Year dummy	X ²⁾	O	X	O	X	O
R-squared (adjusted)	0.379	0.039	0.317	0.321	0.419	0.419
Number of Observations	8,714	8,714	2,816	2,816	5,898	5,898

Note: 1. The numbers in parentheses are the standard deviations of each coefficient. The coefficients with an asterisk (*) are statistically significant at the 5 percent level.

2. O for equations with year and industry dummies and X for equations without dummies.

<Table 3> Empirical Results on Domestic and Foreign Debt

Dependent Variables	Domestic Debt/Total Assets			Foreign Debt/Total Assets		
	1981-97	1981-88	1989-97	1981-97	1981-88	1989-97
Periods						
Firm Size (Log of Sales)	-0.008* (0.002)	-0.024* (0.003)	-0.002 (0.002)	0.011* (0.001)	0.015* (0.001)	0.009* (0.001)
Growth	0.028* (0.004)	0.014* (0.006)	0.034* (0.006)	0.003* (0.001)	-0.000 (0.003)	0.006* (0.002)
Tangible Fixed Assets /Total Assets	-0.209* (0.014)	-0.286* (0.024)	-0.175* (0.017)	0.083* (0.004)	0.118* (0.010)	0.070* (0.005)
Net Profit/Total Assets	-1.151* (0.023)	-0.981* (0.046)	-1.211* (0.027)	-0.006 (0.007)	-0.042* (0.019)	0.006 (0.007)
Chaebol Dummy 1 (1-5th largest)	0.026* (0.009)	0.034* (0.014)	0.020 (0.011)	0.004 (0.003)	-0.000 (0.005)	0.006* (0.003)
Chaebol Dummy 2 (6-30th largest)	0.046* (0.006)	0.033* (0.009)	0.051* (0.007)	-0.002 (0.002)	0.000 (0.004)	-0.004 (0.002)
Industry Dummy	O	O	O	O	O	O
Year dummy	O	O	O	O	O	O
R-squared (adjusted)	0.321	0.301	0.340	0.210	0.234	0.217
Number of Observations	8,714	2,816	5,898	8,714	2,816	5,898

Note: See Table 2.

<Table 4> Empirical Results on Long-term and Short-term Debt

Dependent Variables	Long-term Debt/Total Assets			Short-term Debt/Total Assets		
	1981-97	1981-88	1989-97	1981-97	1981-88	1989-97
Periods						
Firm Size (Log of Sales)	0.011* (0.002)	0.011* (0.004)	0.011* (0.003)	0.001 (0.002)	-0.006* (0.003)	0.004 (0.002)
Growth	(0.007 (0.006)	0.006 (0.008)	0.003 (0.008)	0.021* (0.004)	0.012* (0.006)	0.027* (0.005)
Tangible Fixed Assets /Total Assets	0.101* (0.018)	0.199* (0.029)	0.071* (0.023)	-0.212* (0.013)	-0.378* (0.023)	-0.142* (0.016)
Net Profit/Total Assets	-1.186* (0.030)	-1.005* (0.056)	-1.241* (0.035)	-0.861* (0.022)	-0.725* (0.044)	-0.902* (0.025)
Chaebol Dummy 1 (1-5th largest)	-0.015 (0.011)	-0.016 (0.016)	-0.016 (0.014)	0.041* (0.008)	0.044* (0.013)	0.040* (0.0102)
Chaebol Dummy 2 (6-30th largest)	0.021* (0.007)	0.035* (0.011)	0.014 (0.009)	0.006 (0.005)	-0.019* (0.008)	0.018* (0.007)
Industry Dummy	0	0	0	0	0	0
Year dummy	0	0	0	0	0	0
R-squared (adjusted)	0.189	0.166	0.210	0.286	0.311	0.274
Number of Observations	8,714	2,816	5,898	8,714	2,816	5,898

Note: See Table 2.

<Table 5> Empirical Results on Leverage by Firm Group

Dependent Variable	Total Debt / Total Assets								
	1981-1997			1981-1988			1989-1997		
Groups	1-5th largest	6-11th largest	Non-chaebol	1-5th largest	6-11th largest	Non-chaebol	1-5th largest	6-11th largest	Non-chaebol
Firm Size (Log of Sales)	0.022* (0.003)	0.005 (0.003)	0.011* (0.003)	0.027* (0.004)	-0.004 (0.005)	0.006 (0.005)	0.018* (0.004)	0.006 (0.005)	0.013* (0.004)
Growth	0.014 (0.009)	0.009 (0.007)	0.031* (0.007)	-0.007 (0.008)	0.012 (0.010)	0.019* (0.010)	0.073* (0.020)	0.005 (0.010)	0.032* (0.010)
Tangible Fixed Assets / Total Assets	-0.056* (0.028)	-0.024 (0.027)	-0.122* (0.024)	-0.238* (0.041)	0.027 (0.044)	-0.200* (0.037)	0.027 (0.036)	-0.013 (0.034)	-0.084* (0.030)
Net Profit/ Total Assets	-1.590* (0.109)	-1.875* (0.051)	-2.047* (0.036)	-1.892* (0.209)	-1.853* (0.150)	-1.706* (0.062)	-1.538* (0.135)	-1.902* (0.057)	-2.156* (0.044)
Industry Dummy	O	O	O	O	O	O	O	O	O
Year dummy	O	O	O	O	O	O	O	O	O
R-squared (adjusted)	0.412	0.604	0.371	0.565	0.497	0.302	0.401	0.648	0.397
Number of Observations	686	1,474	6,554	237	535	2,044	449	939	4,510

Note: See Table 2.

<Table 6> Shares of Banks Owned by the Chaebols

(As of the end of 1996, Unit: %)

Chaebols ¹⁾	Ownership Share
1. Hyundai	Korea First Bank (2.20), Hanil Bank (2.00), Seoul Bank (1.99), Kangwon Bank (11.89)
2. Daewoo	KorAm Bank(18.56)
3. Samsung	Cho Hung Bank (2.81), Commercial Bank (7.03), Korea First Bank (3.96), Hanil Bank (4.76), Seoul Bank (3.77), Korea Exchange Bank (1.05), Shinhan Bank (3.36), KorAm Bank(18.56), Hana Bank (3.42), Peace Bank (1.28), Daegu Bank (5.65), Pusan Bank (1.02), Kyonggi Bank (1.57), Jeonbook Bank (1.20), Kangwon Bank (1.22), Kyungnam Bank (2.38)
4. LG	Korea First Bank (3.03), Hanil Bank (2.47), Boram Bank (7.58), Cheju Bank (1.80)
5. SK	Kyonggi Bank (3.42)
6. Hanjin	Kyonggi Bank (5.63)
7. Kia	Korea First Bank (1.04)
8. Ssangyong	Cho Hung Bank (1.98), Korea Exchange Bank (1.04), Hana Bank (1.52), Kookmin Bank (1.96)
9. Hanwha	Chungchong Bank (16.49)
10. Lotte	Pusan Bank (23.93)
11. Kumho	Kwangju Bank (7.87)
12. Halla	
13. Dong Ah	Seoul Bank (1.50), Cheju Bank (2.31)
14. Doosan	Boram Bank (11.34)
15. Daelim	Hanil Bank (3.57)
16. Hansol	
17. Hyosung	Hana Bank (5.16), Kyungnam Bank (11.57)
18. Dongkuk	Seoul Bank (1.27), Pusan Bank (3.85), Kyungnam Bank (3.92)
19. Jinro	Hana Bank (3.51)
20. Kolon	Boram Bank (5.80)
21. Kohap	
22. Dongbu	Cheju Bank (1.06), Chungbuk Bank (1.74)
23. Tong Yang	Donghwa Bank (1.03)
24. Haitai	
25. New Core	
26. Anam	NA
27. Hanil	
28. Keopyung	NA
29. Miwon	NA
30. Shinho	NA

Source: The Bank Supervisory Board and Nam et. al (1999).

Note: 1) The Fair Trade Commission designated the rankings of the chaebols based on their asset size as of April 1, 1997.

<Table 7> NFBIs owned by the Chaebols (As of the End of 1996)

Chaebols	Non-Bank Financial Institutions
1. Hyundai	Hyundai Securities, Hyundai Fire & Marine Insurance, Hyundai Investment Trust & Securities, Hyundai Finance & Factoring, Hyundai Capital, Hyundai Capital Service, Hyundai Futures
2. Samsung	Samsung Securities, Samsung Life Insurance, Samsung Fire & Marine Insurance, Shinsegae Merchant Bank, Shinsegae Finance, Samsung Capital, Samsung Card
3. LG	LG Securities, LG Insurance, LG Merchant Banking, Pumin Mutual Savings & Finance, Mirae Credit Information, LG Installment Finance, LG Investment Consulting, LG Futures, LG Capital Service, LG Venture Investment
4. Daewoo	Daewoo Securities, Korea Financial Service, Daewoo Capital Management, The Diners Club of Korea, Daewoo Venture Capital, Daewoo Futures, Seoul Investment Trust
5. SK	SK Securities, SK Life Insurance, Sunkyung Investment Consulting, Korea M&M Finance
6. Ssangyong	Ssangyong Investment & Securities, Ssangyong Fire & Marine Insurance, Ssangyong Merchant Banking, Ssangyong Capital, Ssangyong Finance, Ssangyong Investment Management
7. Hanjin	Hanjin Investment & Securities, Oriental Fire & Marine Insurance, Korean French Merchant Banking, Seoul Investment Consulting
8. Kia	Kisan Mutual Savings and Finance, Kia Ford Finance, Ahsin Venture Capital
9. Hanwha	Hanwha Securities, Hanwha Merchant Banking, Hanwha Finance, Hanwha Investment Trust Management
10. Lotte	Lotte Finance
11. Kumho	Kumho Life Insurance, Kumho Merchant Banking, Kumho Mortgage & Finance
12. Halla	Halla Investment
13. Dong Ah	Dong Ah Securities, Dong Ah Life Insurance, Dong Ah Finance
14. Doosan	
15. Daelim	Seoul Securities, Taehan Savings and Finance
16. Hansol	Hansol Merchant Banking, Hansol Mutual Savings & Finance, Hansol Finance, Hansol Capital Investment
17. Hyosung	
18. Dongkuk	Central Investment & Finance, ShinJungAng Mutual Savings & Finance
19. Jinro	Woosin Investment Consulting
20. Kolon	Kolonm-Met Life Insurance, Kolon Finance
21. Kohap	Kohap New York Life Insurance, Seoul Finance
22. Dongbu	Dongbu Securities, Dongbu Axa Life Insurance, Dongbu Insurance, Dongbu Mutual Savings & Finance, Dongbu Mortgage & Finance, Dongbu Venture Capital, Dongbu Investment Trust Management
23. Tong Yang	Tong Yang Securities, Tong Yang Life Insurance, Tong Yang Merchant Bank, Tong Yang Finance, Central Investment Trust, Tong Yang Card, Tong Yang Venture Capital, SEI Asset Korea, Tong Yang Futures
24. Haitai	
25. New Core	New Core Finance
26. Anam	KorAm Anam Finance
27. Hanil	
28. Keopyung	Hannam Investment Trust & Securities, Saehan Merchant Banking, Kangnam Mutual Savings & Finance, Keopyung Finance
29. Miwon	Taehan Merchant Banking, Taehan Venture Capital
30. Shinho	Onyang Mutual Savings and Finance, Shinho Finance, Kyungin Venture Capital, Hanshin Rental

Source: Park (1997) and Nam et al. (1999)

Note: NFBIs (Non-Bank Financial Institutions) include securities companies, insurance companies, merchant banks, mutual savings and finance companies, installment credit companies and others.

<Table 8> 30 Largest Chaebols in Korea: July 1997¹⁾

Chaebols ²⁾	Total Assets (billion wons) ³⁾	Equity-Assets Ratio (%)	Number of Subsidiaries	Number of Listed Subsidiaries
1. Hyundai	59,325 (7.25%)	17.9	57	20
2. Samsung	82,438 (10.08%)	17.9	80	16
3. LG	45,482 (5.56%)	21.1	49	11
4. Daewoo	37,497 (4.58%)	24.1	30	10
5. SK	23,998 (2.93%)	20.4	46	6
6. Ssangyong*	18,305 (2.24%)	20.5	25	11
7. Hanjin	17,594 (2.15%)	14.3	24	9
8. Kia+	14,508 (1.77%)	16.3	28	6
9. Hanwha*	14,388 (1.76%)	11.3	31	7
10. Lotte	7,925 (0.97%)	33.8	30	4
11. Kumho	8,551 (1.05%)	15.4	26	4
12. Halla+	6,657 (0.81%)	4.8	18	4
13. Dong Ah*	8,873 (1.08%)	13.2	19	4
14. Doosan	6,402 (0.78%)	12.6	25	8
15. Daelim	6,810 (0.83%)	21.2	21	5
16. Hansol	6,431 (0.79%)	18.8	23	7
17. Hyosung	6,131 (0.75%)	21.3	18	2
18. Dongkuk*	6,764 (0.83%)	21.0	17	7
19. Jinro+	3,881 (0.47%)	2.7	24	4
20. Kolon	4,638 (0.57%)	20.5	24	4
21. Kohap*	3,810 (0.47%)	14.7	13	3
22. Dongbu	4,638 (0.57%)	17.6	34	6
23. Tong Yang	3,810 (0.47%)	13.6	24	4
24. Haitai+	3,398 (0.42%)	13.2	15	3
25. New Core*	2,803 (0.34%)	7.6	18	0
26. Anam*	2,792 (0.34%)	17.1	21	2
27. Hanil	2,599 (0.32%)	14.8	7	2
28. Keopyung*	4,963 (0.61%)	14.0	22	5
29. Miwon	2,235 (0.27%)	19.4	25	5
30. Shinho*	2,237 (0.27%)	17.0	25	6
	425,226 (52.0%)	18.2 ⁴⁾	819	185

Source: Fair Trade Commission. Quoted from Yoo (1998) and Nam et al. (1999)

Note: 1) See Table 6.

2) * denotes the business groups whose subsidiaries were subject to corporate workout after the financial crisis of 1997 and + denotes the business groups that became insolvent.

3) Figures in parentheses indicate the share of each chaebol's assets out of total assets of the corporate sector in Korea.

4) Average.