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The Impact of Ownership and Capital structure on Korean Manufacturing Firms

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I. Introduction

Since the Korean economic crisis of 1997, corporate governance has become a subject of active academic and policy debate. Many have pointed out the deficiencies in the "Korean way" of corporate governance that lead to weakened fundamentals and the poor economic performance of Korean firms. However, direct evidence on the effects of different governance systems on corporate performance and competitiveness is still sparse. This paper provides empirical evidence on the link between corporate governance and productivity performance of Korean firms in the 1990s.

There are a number of existing studies that focus on the relationship between corporate governance and firm performance. Most studies are based on macro-level, cross-country comparisons that are rarely convincing because there is no single model of good corporate governance that holds across countries.[1] The effectiveness of different corporate governance systems is influenced by history, culture and differences in countries' legal and regulatory frameworks, as well as the structure of product and factor markets (Maher and Anderson 1999). Hence, it does not make much sense to debate whether the "Anglo-Saxon model" is superior to the "Japanese model," or to the "German model." Moreover, given that there are significant variations in corporate governance systems within each country, we cannot even be sure whether such countrywide comparisons are valid.

This study therefore joins small but growing literature that focuses on firm level data within countries. The search for good practice should be based on identification of

[1] See Grugler (1999) for a survey

what works within a given country; lessons for Korea's corporate governance reform need to draw on Korean data.

Using firm level data (from 1991 to 1998), we examine the impact of corporate governance structure on productivity.[2] While number of other studies on corporate performance focused instead on profitability, this paper uses productivity as the performance measure because it best reflects efficient investment by all stakeholders of the firm and their potential for long-term growth.[3] That is, productivity is a more fundamental measure, which is what, in part, *determines* profitability. In an era of global competition where technological superiority determines the competitiveness of firms and industries, it is of critical importance to understand the ways in which different systems of corporate governance affect innovative activities and entrepreneurship of corporations.

In the remainder of this paper, Section II discusses the analytical linkages between corporate governance structure and firm performance. Section III covers the data and sources used. Sections IV and V identify some stylized facts about Korean firms' corporate governance structure and performance focusing on ownership and capital structure respectively. Section VI analyzes corporate performance during the 1991-98 sample period. Section VII presents the estimation results of the relationship

[2] There are several previous studies of Korea that are related to this issue. For example, Chang and Choi (1988) focus on the impact of transaction costs on firm performance and Chang and Hong (1998) focus on performance consequences of resource sharing among group affiliated firms. Joh (2000) examines the relationship between firm profitability and corporate governance.

[3] There is a strong theoretical presumption in both traditional and new growth theories that the main engine of sustained long-run economic growth is productivity growth. The new endogenous growth theories in particular show a number of different ways in which productivity advances can occur: learning by doing, human capital accumulation, R&D. If corporate governance system affects any of these mechanisms, it would be an important factor in determining the rate of technological progress.

[5] Other features of governance often emphasized include the market for corporate control and the role of

between corporate governance structure and firm performance.

II. Corporate Governance and Firm Performance

While "corporate governance" could be defined in a number of different ways, it essentially defines rules, incentives and goals for various stakeholders in a firm (including management, capital suppliers, employees, etc) and hence determines the mechanism by which the firm's capital and resources are allocated, profits are distributed, and performance is monitored. According to this perspective, it is possible to identify a number of different dimensions of corporate governance structure for the purpose of understanding their impact on firm performance. However, in this paper, we focus our attention to two central aspects of Korea's corporate governance: ownership concentration and capital structure.[5]

There are many well-known hypotheses as to why both ownership and capital structures are important determinant of a firm's corporate governance. Unfortunately, however, there is no analytical clarity as to how these aspects of corporate governance impacts on corporate performance. For example, with regard to firm's ownership structure, a frequently heard debate is whether owner-controlled (insider) system is better than manager-controlled (outsiders) system. Concentrated ownership has an advantage that it provides better monitoring and thus able to overcome the agency problem posed by misalignment of interest between shareholders and managers. But, at the same time, the controlling shareholder, with privileged access to the management,

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boards of directors.

might be less concerned with firm performance but be more interested in the extraction of private rents at the expense of minority shareholders.

In addition, a firm's ownership concentration is often argued to have an important impact on investment horizons. In outsider systems, widely dispersed ownership offers enhanced liquidity of stocks and better risk diversification for investors. Hence, diversified investors would be more likely to support firm's risky venture into innovative activities than those investors in outsider systems. Yet, from the firm's perspective, it is also possible that a governance system that allows high investor turnover may encourage managers to focus excessively on projects with short-term payoffs and provide weak incentives for stakeholders to make firm-specific investments (Mayer 1996). That is, projects with long-term payoffs, such as research and development and firm-specific human capital investments, may be undervalued as a result of stock market myopia. This, in turn, could lower the firm's innovation, technological development and long-term growth. In sum, there is no clear-cut analytical understanding as to how ownership affects corporate performance.

With regard to the debate on capital structure, it not most often recognized issue in the corporate governance literature but is nonetheless controversial. Clearly, under certain conditions, a firm's debt-equity structure should have no affect the firm's value (Modigliani and Miller 1958). But, there are also those who argue that changes in debt-equity mix can have important effects on a firm's behavior (Williamson 1988, Grossman

[8] We include a separate *chaebol* dummy variable to test whether the performance of *chaebol* is different from that of independent firms for reasons apart from differences in corporate governance structures. For example, the typical argument is that their ability to diversify risk allows them to be better innovators. On the other hand, there are also strong arguments suggesting that *chaebols'* growth mostly resulted from crony capitalism and had little to do with efficiency. In fact, their excessive diversification into unrelated

and Hart 1986, Jensen 1986, and Stulz 1990). Since a rise in debt increases default risk, debt financing could have a disciplinary effect on managers who fear bankruptcy. Bond covenants specifying the manager's discretionary use of funds can constrain management behavior. In general, a governance system based on debt financing can be characterized as one functioning through strict rules, while a governance system based on equity financing is one that allows greater flexibility and discretion.

These hypotheses about firms' ownership and capital structure offer testable conjectures about the relationship between firms' capital structure and firm performance. Since there are no clear analytical presumptions, the question of how ownership and capital structure affect corporate performance essentially become an empirical question. Furthermore, there is a number of reasons to believe that empirical tests of these hypotheses will reveal important aspect abut corporate governance specific to Korea. For example, in Korea, one could argue that, at least before the crisis, there was a widely held presumption that the government's implicit guarantee has virtually eliminated the default risk for the *chaebol*. Hence, *chaebols* with preferential bank financing could exhibit more risk-taking behavior than those non-*chaebol* firms with similar levels of debt financing. It would therefore be interesting to see whether capital structure has a different impact on the performance of *chaebol* and non-*chaebol* firms. For instance, if the risk-taking behavior made *chaebols* more innovative and entrepreneurial, their dependence on debt financing could be associated with *better*

firm performance. Also, with lower capital costs, they would be better able to purchase technology from abroad. On the other hand, if c*haebols'* risk-taking behavior is better explained by the recklessness associated with moral hazard and crony capital, debt financing would have quite the opposite impact on their performance. In our model, we introduce a separate chaebol dummy variable[8] and also interact it with corporate governance variables to see if the chaebol status has the impact hypothesized. [9]

To test these hypotheses, we must also control for a variety of other factors that can jointly affect corporate governance structure (measured in terms of ownership concentration and capital structure) and firm performance (measured by productivity). One obvious candidate would be to include exposure to trade (also measured as log of firm-level exports). Firms' exposure to trade, in particular, would be important to include in the analysis because it could not only affect productivity performance but also have nontrivial effects on shaping firms' corporate governance systems. A growing body of literature suggests that the globalization of capital markets and liberalization of trade could force convergence of corporate governance systems (Shinn 1999). If true, the exclusion of trade could lead to classic omitted variable bias.

In addition, there might be other factors, such as industry-specific characteristics (market or product-related) or political, and macroeconomic instability,

[9] The definition of chaebols can be quite illusive. See Lim (forthcoming). Our definition of chaebols simply follows those business groups designated by the Korea Fair Trade Commission as "Daegumo Guiup Gipdan" (which is literally translated as "big business groups).

[12] A study by Zeckhauser and Pound (1990), for example, found that owner-controlled firms outperform manager-controlled firms in industries with relatively low asset specificity (e.g. machinery and paper products) but found no difference in industries with relatively high asset specificity (e.g. computers). Hence there might be some interactive relationships, which also should be explored.

which are important determinants of firms' productivity. Because they are difficult to measure on a firm-level basis, we employ a dummy-variable approach. An industry-specific dummy is introduced to capture the effects of all omitted attributes that vary across-industries but do not change over time.[12] A time-specific dummy captures discrete productivity shocks specific to the period in which they occur but common to all firms (such as macroeconomic and political shocks).

III. Data

This study employs detailed financial information on publicly traded firms between 1991 and 1998, collected by National Information and Credit Evaluation, Inc. (NICE). Each firm reports its financial statement to the Korea Securities Supervisory Board. Upon receiving the financial data from the board, NICE checks the integrity of the data. All dependent and independent variables used in this paper (with a few exceptions such as price deflators) are based on NICE data. After excluding financial institutions and state-controlled firms from the analysis, our data set includes 18,356 observations on manufacturing firms, of which 731 observations belong to *chaebols*.

A few comments about some of the explanatory variables are in order. As for ownership information, the NICE data set includes the names of large individual and institutional shareholders, their family members and their shareholdings. After identifying all institutional owners and their shareholdings, we subtracted them from the sum of large shareholders' ownership. Through this calculation for each firm, we derived the controlling family's direct ownership stake.[13]

[13] Because it is not always possible to identify whether an individual shareholder identified in the NICE

The selection of the *chaebols* follows KFTC classification based on the size of total assets. These groups are subject to several restrictions on bank lending and a ceiling on the groups' equity investment.

As for dependent variables, productivity performance (TFP) will be estimated using a multilateral index approach originally developed by Caves, Christensen, and Diewert (1982) and later extended by Good, Nadiri, and Sickles (1996).[14] The index provides a measure of the proportional differences in TFP for each firm in each year relative to a hypothetical firm in the base year. This multilateral productivity index is particularly useful in panel-data applications because it provides a consistent way of summarizing the cross-sectional distribution of firm productivity, using only information specific to that time period and how the distribution moves over time.[15]

Measurement of firm level productivity performance requires data on output, intermediate, capital, and labor input, and factor shares (see Haggard and Kim 1997). For manufacturing firms listed in Korea's stock exchange, detailed financial information included in the NICE dataset provides most of the data required for the measurement of productivity index. We have constructed estimates of TFP indexes for the period from 1991 to 1998, for which we have matched ownership data.

Firm output is defined as total sales deflated by a wholesale price index at the two-digit industry level. As for labor inputs, we used the total number of both production and non-production workers, adjusted by annual changes in average work

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data is related to the controlling family, our approach can be considered an upward estimate of the overall controlling family's direct ownership.

[14] The approach has been used recently by Aw, Chung, and Roberts (1998) to estimate TFP of Taiwanese and Korean plant-level data and this study follows the same methodology to calculate the Korean firm level TFP estimates.

hours per day in the manufacturing sector and by two digit-level average monthly workdays. The measure of capital input is the book value of capital stock of the firm. Following Aw, Chung, and Roberts (1998), we have adjusted the book values for yearly price changes in addition of new capital equipment. The measure of material input includes raw materials and manufacturing costs (such as electricity, water, fuel and subcontracting costs), and it is deflated by an intermediate input price index. All price indices used come from the Bank of Korea's yearly publication of price statistics.

For factor shares, labor income share is measured as total salaries (including retirement benefit payments) to total workers divided by the value of output. The intermediate share is measured as the expenditure share of intermediate input in the value of output. Applying the standard assumption of constant returns, the capital income share is obtained as a residual by subtracting labor share and intermediate input share from one. Kim(2000) actually showed that constant returns is not such a bad assumption in the Korean case.

Using the data on Korean firms, the index of the proportional difference in TFP for plant *f* in year *t* relative to the hypothetical plant in the base year can be calculated using the following equation (following Aw, Chung, and Roberts 1998) :

$$\begin{aligned}\ln TFP_{ft} = (\ln Y_{ft} - \overline{\ln Y_t}) + \sum_{s=2}^{t}(\overline{\ln Y_s} - \overline{\ln Y_{s-1}}) \\ -[\sum_{i=1}^{n}\frac{1}{2}(S_{ift} + \overline{S_{it}})(\ln X_{ift} - \overline{\ln X_{it}}) \\ + \sum_{s=2}^{t}\sum_{i=1}^{n}\frac{1}{2}(\overline{S_{is}} + \overline{S_{is-1}})(\overline{\ln X_{is}} - \overline{\ln X_{is-1}})\end{aligned}$$

where Y_{ft} is the output of firm *f* in year *t*; X_i is the input i; and S_i is the factor income

[15] Good, Nadiri, and Sickles (1996) provide a detailed discussion on methodology.

share of input *i*. The overbars denote the average value over all firms in year *t*.

IV. The Ownership Structure of Korean Firms.

The long held convention about East Asian corporations had been that they have concentrated ownership structures (Rajan and Zingales 1998; La Porta et al. 1998a).[16] However, Korea (along with Japan) has been noted as an exception, with a widely dispersed ownership structure (La Porta et al. 1998a; La Porta et al. 1998b; Claessens et al. 1998).[17] Our data also confirms the view that control of Korean corporations can be achieved with significantly less than an absolute majority of the stock. In our sample, controlling family members in firms listed in Korean stock exchanges owned 22.4 percent on average[18] and 54.9 percent in non-listed firms. There was also a vast difference in the ownership between the chaebol firms and non-chaebol firms. Among listed firms, the ownership in chaebol firms averaged 16.7 percent, compared to 28.4 percent in non-*chaebol* firms.

//Table 1 here//

The large ownership difference between chaebol firms and non-chaebol firms

[16] Most recent studies show that a highly concentrated ownership is quite common throughout developed countries as well (Demsets 1983; Shleifer and Vishny 1986; Mork, Shleifer, and Vishny 1988; and La Porta et al. 1988a).

[17] Among 356 publicly-trade Korean corporations in their sample, Claessens et al. (1998) finds that less than four percent of the firms were controlled by families that own at least 40 percent of the shares, while 20 percent of all firms were controlled by families with less than 30 percent of the shares. Families with at least 10 percent of the total shares controlled more than 67 percent of Korean firms. La Porta et al. (1998a) studied a sample of the ten largest non-financial corporations from a cross-section of 49 countries and found that the average ownership by the three largest shareholders in Korean corporations was 23 percent, much lower than the ownership concentration of 46 percent found for the whole sample.

found in our sample is quite consistent with the findings by Claessens et al. (1998) and La Porta (1998b) that size matters in explaining the distribution of ownership concentration. In most countries, these studies found that the share of family ownership was higher for smaller firms. Claessens et al. (1998) for example show that only four of the largest twenty Korean firms in their sample had family ownership above 20 percent while forty-eight of the smallest fifty companies had ownership exceeding 20 percent.

Family control with low ownership concentration is possible for a number of reasons. First, relatively weak laws protecting small shareholders allows controlling shareholders to maintain low ownership stakes. According to the Korea Stock Exchange, about 97 percent of the shareholders in listed firms are small individual shareholders. Small shareholders together owned 60 percent of total shares in the 1980s and 40 percent in 1997. With a wide dispersion of ownership among small shareholders, the free-rider problem in monitoring the controlling shareholder is severe. Moreover, during the 1993-1997 period, Korean law required at least five percent ownership for a shareholder to exercise rights such as demanding convocation, inspecting account books, and filing derivative suits.[19]

In Korea, the restriction on the voting rights of institutional investors in listed companies is an additional factor allowing effective control with low ownership stakes. For example, with shadow voting regulations, institutional investors always had to take a neutral stance by casting their votes proportionate to other votes. Despite their

[18] The estimate is an weighted average by total assets.
[19] The minimum ownership requirements for shareholders' rights have been lowered since 1998.

significant ownership stakes in Korean corporations, institutional investors posed no threat to the controlling shareholder despite their low ownership stake.

Controlling families in *chaebol*-affiliated firms are also able to exercise control through interlocking ownership among subsidiaries. The patterns of institutional interlocking ownership found in *chaebol* affiliated firms are complicated because of their need to circumvent regulations on ownership which prevent direct circular interlocking ownership (firm A owns firm B, and firm B in turn owns firm A).[20] Nonetheless, according to the Korea Fair Trade Commission (KFTC), the average interlocking inter-subsidiary ownership exceeded 33 percent in the 1990s. Interlocking shareholdings imply that in-group ownership friendly to the controlling family could be quite high, making any challenges to management virtually impossible.

V. The Financing of Korean Firms

The financial crisis of 1997 clearly revealed how vulnerable the Korean economy was to the high leveraging of its corporate sector. In 1997, the average debt-equity ratio for Korea was 396 percent, while the comparable figures for US was 154 percent, Japan 193 percent, and Taiwan 86 percent.[21] Although Korea's debt dependency increased somewhat during the crisis period, Korea's debt-equity ratio had been high throughout its development history. Hence, it is not simply a change in the level of debt financing, a sudden credit expansion and lending boom that caused the 1997 crisis.[22] Nor was it a simple liquidity crisis due to mismatched term structure in

[20] Moreover, holding companies were not allowed in Korea until 1998.
[21] The Taiwanese figure is based on 1996 data.
[22] It is now well known fact that the portion of short-term debt in the overall debt portfolio did rise

the corporate debt financing. We want to know whether Korea's high reliance on a debt-based corporate governance system, as opposed to equity-based financing, can be linked to fundamental weaknesses in the Korean corporate sector.

Why did Korean corporations overwhelmingly choose a debt-based corporate governance structure instead of an equity-based one? Joh (1999) argues that the high level of debt is the outcome of past governments' policies, particularly subsidized credit in support of the government's industrialization drive. However, firms that received preferential finance were not always profitable and faced periodical financial distress.[23] In these instances, the government rescued troubled companies with favorable loans from government-controlled banks.

The practice of government-bailouts continued long after policy lending had stopped, weakening banks and exacerbating moral hazard for firm managers. This problem of moral hazard was particularly severe for *chaebol* firms. The average equity ratio (i.e., equity divided by assets) in our sample was 33.3 percent in publicly traded firms and 19.1 percent in non-listed firms. Table 2 also shows that the ratio for the *chaebol* was much lower than that for the non-*chaebol* firms in all years.

//Table 2 here//

Chaebol-affiliated firms were particularly capable of raising bank financing

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significantly and exposed the Korean corporate sector to term structure risk. But, analytically there is no reason to presume that this change in term structure would lead to fundamental weakness in corporate performance. Our focus, however, is on whether a debt-based corporate governance structure is intrinsically worse than equity-based corporate governance in terms of performance.

[23] The Korean corporate sector faced extreme difficulties in 1972, following the second oil shock in 1979, and during the 1984-1988 recession in the overseas construction, shipping, textile, machinery, and lumber industries.

because of interlocking ownership and debt payment guarantees. The logic of "too-big-to-fail" created incentives for firms to exaggerate their size to facilitate bank financing; this was particularly easy for *chaebols* engaged in intra-group inter-subsidiary transactions.[24] As seen in Table 3, the average equity investment ratio (equity investment over equity) exceeds 20 percent in the top 30 *chaebols*.

//Table 3 here//

The wide-spread use of debt payment guarantees also made it possible for large *chaebol*-affiliated firm to gain easy access to bank credits. Debt payment guarantees can reduce information asymmetry when the firm that provides guarantees has more information than creditors. However, debt payment guarantees can also lead to over-borrowing and chain bankruptcies. Table 4 shows that the amount of payment guarantees exceeded the level of equity.[25]

//Table 4 here//

VI. Performance of the Korean Corporate Sector Prior to the Crisis

Using the data on Korean manufacturing firms, we have constructed estimates of total factor productivity (TFP) indexes for the period from 1991 to 1998. Table 5

[24] For example, through interlocking ownership, firm A invests its assets in an affiliated firm B. As a result, the sum of the assets of firm A and firm B can exceed the total assets of the group. At least 60 percent of firms subject to external auditing report that they have legally affiliated firms. See Joh (1999).

[25] For example, Korea Express filed for bankruptcy in November 2000 because of its debt payment guarantee to Dong Ah Construction, which went under a month prior to the filing. It is quite likely that the level of debt payment guarantees is higher than indicated in Table 4.2. The amount of payment guarantee reported does not include guarantees for money borrowed abroad and prevalent interlocking ownership among affiliated firms exaggerates much of the equity in the same group. In many of the recent cases of *chaebol* bankruptcies, firms failed because they had overextended debt guarantees.

summarizes the movement in the firm productivity distribution by reporting the 25th, 50th, and 75th percentiles for each year. For example, the estimate of .0984 for the median firm in 1995 means that productivity performance was 9.84 percentage points higher than that of our hypothetical benchmark firm in the 1993 base year. In other words, the output performance of the median firm in 1995 was higher by 9.84 percentage points than that of the benchmark firm, for the given changes in the factor inputs. Likewise, it is important to note that the negative signs in Table 5 imply that estimated productivity *differentials* are negative, not *levels* of productivity.

//Table 5 here//

With respect to the changes in the shape of the distribution from year to year, there is no evidence of substantial widening or narrowing until the mid 1990s. In comparison, the dispersion in the interquartile range increased in the latter portion of 1990s. It is interesting to see that the interquartile range continued to increase in 1998 while the median firm's productivity dropped whopping 5 percentage points, reflecting Korea's economic crisis in full bloom. Before the crisis, however, the productivity in general did increase over time, averaging about 3 percentage-point increases per year.

//Table 6 here//

Table 6 shows the average productivity differential between chaebol and non-chaebol firms. Although these figures represent comparisons of simple averages, it is interesting to note that chaebol firms' productivity performances were consistently lower than that of non-chaebol firms throughout our sample period. In the latter half of 1990s, the difference became quite substantial, leading to about 40 percentage point differential in 1998. The question we would like to address is whether any portion of

these differences in productivity performance between different groups of firms and over time can be accounted for by the corporate governance structure of Korean firms.

VII. Empirical Tests and Results

The call for corporate governance reform in Korea is rarely based on a solid empirical foundation. Simple cross-country benchmark case comparisons serve as the bases for policy recommendations without any consideration of the context under which different governance systems operate. In this section, we evaluate the relationship between corporate governance structure (as characterized by each firm's ownership concentration and capital structure) and firm performance using a sample of manufacturing firms in Korea.

//Table 7 here//

Table 7 presents the estimated impact of corporate governance on relative productivity differences of Korean firms using the full sample of 18356 for which all the relevant data is available. The benchmark regression (1) shows that productivity is significantly and positively related to ownership concentration. The coefficient of 0.13 implies that a 10 percentage point increase in the ownership will increase productivity by about 1.3 percent. Even with changes in specification, we can see that the impact of controlling shareholder's ownership concentration on corporate performance is quite robust.

As we had expected, the equity ratio also has a significant and positive impact on productivity performance, which is consistent with the presumption that an equity-based governance structure is more conducive to innovative activities than a debt-based governance structure. The result shows that 10 percentage point increase in the equity

ratio would result in about 3 percent increase in the productivity performance. As with ownership concentration, this is result is quite robust with respect to various other specifications.

In regressions (2), (3), and (4), we introduce two control variables, chaebol dummy and exports.[26] It is important to note that the *chaebol* dummy is highly significant and negative. The common presumption that *chaebol*s' cost advantages and ability to diversify risk make them better innovators and acquirers of technology turns out to be wrong; *chaebol* underperform non-*chaebol* firms with productivity as the performance measure. The interaction variables introduced in regressions (3) & (4) tell us that, for chaebol firms, the impact of equity ratio on productivity is less than that for non-chaebol firms. With the benefit of the government guarantees and subsidies, debt financing for chaebols was not perhaps constraining as it would be for non-chaebols in financing risky but innovated projects. When ownership is interacted with chaebol dummy, a significant result is only obtained in Regression (4). The positive coefficient implies that the ownership concentration is more important for chaebols' performance than for non-chaebol firms' performance. If diversified, inter-locked ownership structure of Chaebol firms creates greater opportunities for controlling families to expropriate from other shareholder. The greater would be the benefit from the

[26] Joh and Kim (forthcoming), on which much of this paper is based, also introduced the R&D ratio as control variable. It was found to have a significant and negative impact on productivity in their sample. This puzzling outcome could perhaps be attributed to a specification problem. For example Regression (1) in Table 7 is in reduced form; we do not specify the precise mechanism through which corporate governance impacts productivity performance. But if ownership and capital structure affect productivity performance by encouraging firm-specific investments such as R&D, then measuring the impact of R&D on firm performance, apart from what is already captured by corporate governance variables, may produce a spurious result. Moreover, a reliable data on the R&D stock is very hard to come by, not alone finding an appropriate price deflator.

reduction of such incentives.

Finally the export variable introduced in Regression (4) tests the conventional wisdom in the growth and development literature that exposure to trade is one of the most determinants of productivity performance. The relation is positive and significant, suggesting a greater exposure to international trade helps productivity enhancement. With introduction of export variable, the coefficient on ownership concentration is reduced by almost half, but retains its significance.

Table 8 reports the result from a sub-sample of publicly traded firms. The main purpose here is to see if the result obtained in Table 7 is robust across sub-samples.

//Table 8 here//

Here, we see that ownership maintains significance in regressions (1), (2), and (3). Equity ratio does not appear significant in this sub-sample. On the other hand chaebol dummy is consistently highly significant and negative. With substantial loss of degrees of freedom, the result is not as clear-cut as that of Table 7, but the variables that are significant conveys the same message as before.

VIII. Conclusion

This paper has examined the relationship between corporate governance structure, measured by controlling shareholder's ownership concentration and financial structure, and performance. In a panel data of manufacturing Korean firms from 1991 to 1998, we have identified a quite robust impact of both ownership concentration and equity ratio on productivity. Higher ownership concentration is associated with stronger firm performance. We interpret this result to confirm the hypothesis that

higher ownership concentration leads not only to greater convergence of interest between the controlling shareholder and other shareholders, but also to greater investment in firms specific investments that results in a better productivity performance. The significant positive impact of equity ratio on firm performance suggests that equity governance, rather than one that based on debt, is more conducive to innovative activities.

In addition, we found a significant and negative impact of *chaebol*-affiliation on corporate performance, both directly and also indirectly by affecting the governance variables. Despite many possible *chaebol* advantages, this study shows that *chaebol*-affiliated firms have inferior performance when compared to non-*chaebol* firms in terms of productivity.

Our findings suggest that the problem with Korean *chaebols* is that their controlling shareholders have too little ownership stake in the firms and their capital structure relies too much on debt financing. When controlling shareholders own large stakes in the company, their incentive to expropriate from minority shareholders is checked by the fact that too much expropriation would negatively affect the total profit of the company. The controlling shareholders in Korean *chaebols* do not have adequate ownership stakes in the companies they control, so the incentive for expropriation is greater. While there are no simple solutions to problems in Korea's corporate governance system, it seems that the most crucial reform must be directed at the laws and practices that allow unchallenged management control in *chaebol* firms despite relatively minor ownership stakes of the controlling family.

There are, however, a number of reasons to be cautious about taking these

conclusions too far. This paper has not dealt with several important issues which might help us better understand the importance of corporate governance. Our ownership data is limited in that it only accounts for direct ownership by controlling shareholder. Our results might change if one could get at the "ultimate" ownership data. Also, we have not explored the possibility that the relationship between corporate governance data might be nonlinear or more importantly, endogenous. Corporate performance might determine corporate governance structure.

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Table 1

Estimated Family Control in Korean Firms

		Average Ownership Share 1991-1998 (Weighted by total assets)
Listed Firms	All Listed	.224 (2853)
	Chaebol	.167 (376)
	Non-Chaebol	.284 (2477)
Non-listed Firms	All Non-listed	.549 (15502)
	Chaebol	.352 (355)
	Non-Chaebol	.625 (15147)
Total Sample		34.5 (18356)

Source: NICE; The number of observations are in the parenthesis.

Table 2

Equity-Asset Ratio in Korean Manufacturing Firms

		1991	1992	1993	1994	1995	1996	1997	1997
Listed Firms	All Listed	.344 (308)	.349 (418)	.347 (432)	.334 (381)	.345 (351)	.360 (332)	.307 (257)	.273 (374)
	Chaebol	.275659	.2742480	.243648	.245236	.228932	.232334	.1686231	.1848556
	Non-Chaebol	.3606249	.3667338	.3601384	.3430345	.3562631 9	.3740298	.3260226	.2888831 8
Non-listed Firms	All Non-listed	.183 (2039)	.195 (1931)	.193 (2013)	.186 (2082)	.178 (2066)	.173 (2129)	.173 (1749)	.269 (1494)
	Chaebol	.1411863	.136680	.0947033	.0802540	.123043	.047736	.094334	.180526
	Non-Chaebol	.1844219 76	.1975818 51	.195119 80	.1879720 42	.1793020 23	.1753020 93	.174417 15	.2708314 68

Source: NICE; The number of observations are in the parenthesis

Table 3

Equity Investment in the 30 Largest *Chaebols*

	1995	1996	1997
Equity investment (A)	1.13	1.36	1.69
Equity (B)	5.07	6.29	7.04
Ratio (A/B)	22.3	21.6	24.0

Source: Fair Trade Commission. (unit: trillion won, percent); Joh and Kim (forthcoming)

Table 4

Debt Payment Guarantees of the 30 Largest *Chaebols*

Year	Equity (A)	Amount of Debt Payment Guarantee			Ratio (%)	
		Restriction (B)	No Restriction (C)	Sum (B+ C)	B/A	(B+ C)/A
1993	3.52	12.06	4.49	16.55	342.4	469.8
1994	4.28	7.25	3.82	11.07	169.3	258.1
1995	5.07	4.83	3.38	8.21	95.2	161.9
1996	6.29	3.52	3.23	6.75	55.9	107.3
1997	7.04	3.36	3.13	6.49	47.7	92.2

Source: Fair Trade Commission. (unit: trillion won) ; Joh and Kim (forthcoming)

Table 5

Percentile of the Distribution of lnTFP across Firms

	1991	1992	1993	1994	1995	1996	1997	1998
25^{th} Percentile	-.3687	-.3511	-.3398	-.3007	-.2727	-.2306	-.2046	-.3125
Median	-.0170	.007	.0091	.0544	.0984	.13234	.16406	.1143
75^{th} Percentile	.3275	.3593	.3532	.4042	.4831	.50966	.5719	.56688

Table 6

Average Productivity Differential Between Chaebol and Non-Chaebol Firms

	1991	1992	1993	1994	1995	1996	1997	1998
Non-Chaebol	-.018	.024	.0217	.080	.124	.159	.212	.163
Chaebol	-.172	-.219	-.213	-.116	-.187	-.089	-.131	-.244
Productivity Differential	0.154	0.243	0.2347	0.196	0.311	0.248	0.343	0.407

Note: simple averages.

Table 7

Impact of Corporate Governance on Firm Level Productivity Difference

(Full Sample)

Dependent Variable					
		(1)	(2)	(3)	(4)
Corporate Governance Variables	Ownership concentration	0.131 (8.95)	.107 (7.13)	.101 (6.73)	.047 (2.85)
	Equity ratio	0.289 (12.62)	.284 (12.46)	.294 (12.47)	.328 (12.55)
Control Variables	*Chaebol* dummy		-.218 (-9.240)	-.227 (-5.91)	-.325 (-6.00)
	Ownership*Chaebol			.162 (1.49)	.277 (2.04)
	Equity-ratio*Chaebol			-.270 (-3.61)	-.358 (-4.27)
	lnExport				.027 (5.57)
	Dummy Controls	Industry /Time dummies	Industry /Time dummies	Industry /Time dummies	Industry /Time dummies
	Number of Observations	18356	18356	18356	16276
	R^2	0.0889	0.0936	0.0943	0.0963

Note: numbers in parentheses are t-values controlling for White's heteroskedasticity.

Table 8

Impact of Corporate Governance on Firm Level Productivity Difference

(Listed Firms)

Dependent Variable		(1)	(2)	(3)	(4)
Corporate Governance Variables	Ownership concentration	.260 (6.22)	.218 (5.20)	.206 (4.65)	-.087 (-0.91)
	Equity ratio	.118 (1.68)	.100 (1.44)	.108 (1.49)	.082 (0.75)
Control Variables	*Chaebol* dummy		-.157 (-5.86)	-.139 (-2.29)	-.258 (-2.12)
	Ownership*Chaebol			.107 (0.74)	-.050 (-0.13)
	Equity-ratio*Chaebol			-.187 (-1.18)	-.279 (-1.37)
	lnExport				.002 (0.25)
	Dummy Controls	Industry /Time dummies	Industry /Time dummies	Industry /Time dummies	Industry /Time dummies
	Number of Observations	2853	2853	2853	782
	R^2	0.1983	0.2088	0.2095	0.2432

Note: numbers in parentheses are t-values controlling for White's heteroskedasticity.