

Control, Ownership, and Firm Performance: the case of Korea

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1. Introduction

Since the Asian economic crisis in 1997, it has been argued that poor corporate governance system was a cause of the crisis along with other factors. This argument points out the weaknesses of minority shareholders' rights protection and the lack of market discipline for poor performing firms in this region. With weak corporate governance system, controlling shareholders and managers were not disciplined to maximize firm value. Rather, they invested corporate resources in wasteful projects and pursued their private interests. Consequently, the corporate sector suffered from poor performance and weakened the financial systems. Despite such claims, few studies have empirically examined the size of these conflicts of interests among shareholders and how they affect firm performance.

This paper investigates whether conflicts of interests among shareholders affect firm performance in a country with a weak corporate governance system. Conflicts of interests can occur when there is a disparity between ownership and control.¹ When a shareholder can exercise more control than her ownership warrants, she has an incentive to pursue her private benefits. She keeps all of the benefits and shares the cost with the other shareholders. This tendency increases when the controlling shareholder owns less

¹ Given the level of control, ownership might be endogenously determined as Demsetz and Lehn (1985)

according to Jensen and Meckling (1976). Therefore, as the disparity between control and ownership of the controlling shareholder increases, the conflicts of interests increase, diverting more firm resources from firm value maximization. So, the conflicts of interests will lower firm performance.² How large is this negative effect on the firm? Does the negative effect vary depending on firm organization patterns? Also, what mechanisms do controlling shareholders use? Can we find any mechanism that lowers the firm performance significantly and substantially and benefits the controlling shareholders?

Using the newly available ownership and financial information on Korean firms between 1993 and 1997, this paper examines whether disparity between ownership and control lowers firm performance. While most earlier studies have used ownership data of industrialized countries,³ this study uses data from Korea. I have selected the Korean case for the following reasons. First, the disparity between control and ownership rights in Korean companies is high. Controlling shareholders exercise immense power in investment decision making despite their low ownership. Controlling shareholders of the largest 30 conglomerates own less than 10 per cents of ownership on average.⁴ Second, the prevalence of business groups (*chaebols*) that consist of horizontally and vertically distributed firms may increase conflicts.⁵ Furthermore, the personal stake of

argue

² Morck, Shleifer and Vishny (1988) show that the relationship between management ownership and firm value measured by Tobin's Q is not linear.

³ Much of the literature has been focusing on the analysis of the data of US, Western Europe or Japan except Claessens et al. (1998).

⁴ According to the Fair Trade Commission of Korea, the weighted average ownership of the controlling shareholder and families is 10.3% in 1993, 9.7% in 1994, 10.5% in 1995, 10.3% in 1996 and 8.3% in 1997.

⁵ According to Joh (1999), more than 60% of all the Korean firms belong to business groups small or

controlling shareholder is typically small and varies across subsidiaries within a group. She manages to control the subsidiaries by exploiting strong interlocking institutional ownership. Subsidiaries in which the group-controlling shareholders holds few shares might suffer from a disparity between ownership and control rights. Third, until recently there was little market disciplines for poor performing firms. Hostile takeovers were forbidden and the legal system provided little protection for the minority shareholders. As a result, few obstacles prevented controlling shareholders from pursuing their private interests⁶. Therefore, the analysis provides an opportunity to examine how the disparity between ownership and control in poorly working corporate governance system affects firm performance.

Based on financial information on 5858 firms subject to outside auditing, including publicly-traded ones, this paper investigates whether controlling shareholders' ownership concentration has a negative relationship with firm performance. It also tries to identify a mechanism through which controlling shareholders divert the firm resources for their benefits. Also, I explore whether firm organizational differences, namely conglomerates and independent firms, affect performance.

When firm size, capital structure, and industry and firm characters are controlled, the empirical tests show that firms with concentrated ownership by controlling shareholders exhibit a higher profitability than firms with less concentrated ownership. Publicly traded firms show a lower ownership concentration than privately held firms. The test

large. In 1989, the largest 30 business groups (chaebols) produce 35.4% of total shipments and 16.3% of GDP.

⁶ For the conflicts of interests among large shareholder and minority shareholders, see Joh (1999) and

also finds that business groups have a lower profitability than independent firms. Moreover, the study also identifies a mechanism through which firm resources are wasted. Firms that divert their assets through financial investment to their affiliated firms show lower performance. Transfer of resources from publicly-traded firms to other firms reduce performance further down. The results are consistent with the argument that controlling shareholders with a small stake pursue their private interests at the expenses of other shareholders.

The causes of low profitability provide important clues for finding the cause of the economic crisis. In Korea, for almost ten years before the crisis, the corporate sector showed very low profitability. As Figure 1 indicates, the aggregate performance shows that firms have not earned even the opportunity cost of the capital (roughly measured by the borrowing interest rate). The nearly decade-long poor performance of the corporate sector increased the vulnerability of the economy.

<Insert Figure 1 around here>

This paper is organized as follows. The following section discusses the ownership and control patterns in Korean firms, then briefly explains factors affecting firm profitability. The data are explained in section 5 followed by the results. Section 6 concludes.

2. Ownership and control in Korean firms

Many Korean firms are under the control of a family. Claessens et al. (1998) argue that over 48% of their sample firms have a family that own more than 20% of shares. However, the largest shareholder (usually the founder) and her family do not hold a majority of shares in general and still manage to control the firm. As Table I shows, on average, the largest shareholder and family in publicly traded firms own about 33% while their counterparts in privately held firms own 52%. Compared with other East Asian countries, the concentration in Korean firms is not high.⁷

<Insert Table I around here>

Family control has been possible despite their small ownership for at least two reasons. First, most shareholders are small individual shareholders who own less than 1% of total shares. In fact, most individual shareholders own less than 500 shares. The Korea Stock Exchange requires its listed firms to distribute at least 30 percent of total ownership among minority shareholders. For the first section of the Exchange, the minimum level increases to the 40 percent. The KOSDAQ (the Korean counterpart of NASDAQ) also requires for firms to distribute at least 20 percent of their shares to the small shareholders.⁸ However, the aggregate individual ownership has been large, 60% in the 1980s to less than 40% in 1997.⁹ About 97% of shareholders are small individual shareholders who own about 30% of shares. Second, many of large shareholders are either financial institutions or non-financial corporations. Banks hold around 10% of listed firm shares. Other non-bank financial institutions including insurance companies, security firms, and investment trust companies own more than 10%. Non-financial corporations hold around 20% of shares. Aside from ownership by banks that are virtually controlled by the government, most institutional ownership is cross-holding or interlocking ownership. Interlocking institutional ownership protects

⁷ See La Porta et al. (1998) and Claessens (1998)

⁸ Joh (1999) summarizes the requirement.

the incumbent large shareholder from potential outside threats.

The average ownership concentration of *chaebol*-affiliated firms under the influence of the same controlling investor is 28%,¹⁰ but 53% in independent firms. For larger *chaebols*, ownership by controlling shareholders and their families is smaller. They own less than 13% of shares for the largest 30 *chaebols* on average. Among firms that belong to the same group, larger firms show smaller ownership. For example, weighted average ownership by the magnitude of assets for the top 5 and top 30 *chaebol*-affiliated firms is 6% and 11%, respectively.¹¹ In *chaebol*-affiliated firms, a founder and her family maintain control through prevalent institutional ownership that constitutes a large portion of cross-holdings. The pattern of institutional interlocking ownership is complicated because of firms' efforts to avoid regulations on ownership. Holding companies were not allowed until 1998. Direct interlocking ownership which involves firm A owns firm B and in turn firm B owns firm A was only recently banned, and a ceiling was recently imposed on equity investment by the large conglomerates. To circumvent government regulations, interlocking ownership takes circular patterns while several multiple de facto holding firms own a large portion of the affiliated firms' stocks. According to the Korea Fair Trade Commission (KFTC), the average interlocking institutional ownership exceeded 33 percent in the 1990s (see table 2).

⁹ Source: Korea Stock Exchange

¹⁰ For more reliable and accurate information of the controlling shareholders' ownership it is necessary to trace the ultimate ownership using the method that La Porta et al. (1998) implemented for the analysis of the largest 10 firms. However, due to complicated interlocking ownership patterns in *chaebols*, such method is not utilized in this analysis as it requires a complete ownership pattern and information for all group affiliated firms in great detail which is very difficult when the number of firms analyze increases.

¹¹ The direct ownership understates the true ultimate ownership by the controlling shareholders as it does not take into account their stakes in other affiliated firms, which hold shares of the firm. However, as the

<Insert Table 2 around here>

3. Theories on firm profitability

Past research has identified several factors that affect firm performance. A firm's profitability depends on many factors such as size, financial structure, and industry and firm characteristics such as its market share and its business strategy. In addition, conflicts of interests among shareholders and conflicts between management and ownership can affect firm performance. The organizational form of the firm can also affect firm performance. This section briefly examines how these factors affect firm performance.

3.1. Conflicts of interests

Conflicts of interests can occur among shareholders when a shareholder has more control than her ownership would warrant. Consider a shareholder with excessive control. She has an incentive to pursue her private benefits because she keeps all the benefits while sharing the costs with the other shareholders. As a controlling shareholder pursues her private interests at the cost of other shareholders, firm performance falls. As Jensen and Meckling (1976) argue, this tendency increases when the controlling shareholder's ownership decreases. In a firm with dispersed ownership, the largest shareholder can control the firm while owning few shares. In a firm belonging to a conglomerate with interlocking institutional ownership, the controlling

overall controlling shareholders' ownership in a group is small, it is expected that the difference is also small.

shareholder can control subsidiaries with only a small stake. Another type of conflict can occur between existing shareholders and investors in the market when there is information asymmetry. According to Myers and Majluf (1984), existing shareholders might forgo good investment opportunities when their stakes are diluted by new stock offerings. When stocks are overvalued or when their projects are not promising, existing shareholders might issue new stock. However, new investors in the market extract information from the firm's financing decision. New equity financing can send a negative signal to the market and lower the firm value. Therefore, when existing shareholders decide to go public despite of these problems, the firm might have earned lower profitability than the market expected.

3.2. Firm organizational pattern

Business groups (*chaebols*) are prevalent in Korea. More than 60% of all firms subject to outside auditing belong to loosely defined small or large *chaebols*.¹² Leff (1978) argues that business groups might have advantages over independent firms under some conditions.¹³ They can overcome imperfections of the markets through intra-group transactions and try to reduce the transaction costs that Williamson (1975) identifies. In addition, creditors have information on the large organization, which lowers the capital cost when the business groups want to borrow. Also, a business group with more information on the subsidiaries than outside investors can monitor more effectively and hence be more efficient. A business group can also operate an internal capital market for

¹² Joh(1999)

¹³ Leff (1978) argues that business groups in less developed countries benefit in two ways: appropriating quasi rents accrue from control of and access to scarce and imperfect market inputs, and reducing the risk and uncertainty. Through diversification, business groups can also reduce the risk and uncertainty in firm operation and lower default and bankruptcy risk.

its subsidiaries by acting as the headquarters of a multiple divisional firm according to Stein (1997). With lower transaction costs, lower capital costs, and an efficient internal capital market, the profitability of business groups can exceed that of independent firms. Chang and Choi (1990) showed that *chaebols* performed better than independent firms using 1975-1984 data.

The potential advantages that *chaebols* have over independent firms decrease when the economy develops, or when the controlling shareholder's ownership stakes vary across subsidiaries. As the markets develop and become competitive, an intra-group transaction loses its attractiveness. It reduces the supplier's incentive to lower the cost and improve the quality as it involves a stable business transaction with a captured buyer. In addition, development of an external capital market erodes the comparative advantage of the conglomerate's internal market. As the size of the business group increases, information collection, processing, evaluation and application become difficult and costly. Therefore, the efficiency associated with intra-group transactions will fall as an economy develops, thereby reducing the business group's advantage over independent firms. Moreover, pricing in intra-group trading can be distorted for large shareholders' interests. By selling goods at a lower price or buying goods at a higher price, intra-group trading can subsidize firms that are more closely related to the controlling shareholders' private interest rather than the group's total value.

In addition, the controlling large shareholder might have an incentive to allocate resources for her benefit when her ownership stakes of subsidiaries vary. Consider a case in which the resources from large listed firms are transferred to smaller non-listed

firms. The private benefit to the controlling shareholder can exceed her private costs when the resource is transferred. As the disparity between business group ownership and control increases (e.g., through interlocking ownership among subsidiaries), this problem increases. Firms in conglomerates can reallocate their capital from one firm to another similar to transfers from a division to another division in multi-divisional firms (see Lamont, 1996 and Shin and Stulz, 1996). The reallocation in diversified firms does not necessarily improve the efficiency of capital. Scharfstein and Stein (1997) and Scharfstein (1998) argue that multi-divisional diversified firms show lower profitability than specialized ones as their capital is over-invested in weak divisions and under-invested in stronger divisions. Similarly, capital can be transferred from strong firms to other weak ones in the group, or from a firm in which controlling shareholders have a small stake to one in which they have a large stake. When resources are invested in outside projects for the private benefit of the controlling shareholder rather than to maximize firm profitability, their marginal productivity of capital will be lower than otherwise. In general, when an opportunistic controlling shareholder pursues her own benefits rather than over-all profitability, resource allocation is distorted and efficiency is lowered.

3.3. Capital structure

Although Modigliani and Miller (1958) argue that capital structure does not affect firm value under some conditions, DeAngelo and Masulis (1980) show that it does when personal and corporate taxes are considered. As discussed earlier, when new projects generate acute information asymmetry problems between existing shareholders and new investors, Myers and Majluf (1984) argue that debt financing can be preferred to equity

financing. Moreover, Jensen (1986) and Stulz (1990) show that debt has disciplinary effects when free cash flow exists. As a rise in debt increases default risk, firms can reduce the threat to firm survival by reducing wasteful investment and increasing firm performance. However, as Jensen and Meckling (1976) argue, conflicts of interests between the debt holders and equity holders might lead the firm to take riskier projects when the firm has a high level of debt. Moreover, high debt can reduce the profitability rather than increase it. Stiglitz and Weiss (1981) argue that firms with high debts face high capital costs that induce more risk taking. These firms can choose high-risk projects that yield a lower expected return because shareholders have limited liability. Therefore, the disciplinary effect of debt is unclear. Indeed, Hall and Weiss (1967), and Gale (1972) find a positive impact of the equity-asset ratio on profitability while Hurdle (1974) finds a negative impact. In general, equity ratio (equity/assets) can have two effects. When firm risk is decomposed into business risk (industry common risk) and financial risk (idiosyncratic risk), Gale (1972) argues that increasing the business risk increases profitability while increasing financial risk lowers profitability when equity ratio increases.

3.4 Other factors

Gale (1972) argues that a firm with a high market share yields high profitability because it is more likely to have a product market differentiation advantage, more influence in the market interaction outcomes in an oligopoly market, and economies of scale if they exist. For a brief summary of previous studies that incorporated factors such as size, and other factors that affect firm profitability, see Martin (1993).

4. Data

This study uses the National Information and Credit Evaluation Inc (NICE)'s collection of financial information on firms. Each firm reports its financial statement to the Korea Securities Supervisory Board. Upon receiving the financial data from the board, the NICE checks the integrity of the data. All the firms in the database have at least 6 billion won in assets in 1997. Among the firms available in the database, I only use firms that are subject to outside auditing. The data cover over 6000 firms in standard three to four digit Korean industrial classifications between 1992 to 1997. Financial institutions and state-controlled firms are omitted.

The ownership information used in this study also comes from the data set that the NICE has compiled. The information set includes the names of large individual and institutional shareholders, their family members and their shareholdings. After identifying all institutional owners and their shareholdings, I subtracted them from the sum of large shareholders' ownership. Through this calculation for each firm, controlling family's direct ownership stake is derived.

Most firms in Korea belong to one of over 200 business groups. The selection of the thirty largest *chaebols* follows KFTC classification based on the size of their total assets. These groups are subject to several restrictions on bank loans and a ceiling on the groups' equity investment. I also identify forty additional *chaebols* based on the magnitudes of their debts. Using debt size rather than asset size to choose *chaebols* results in nearly the same choices. Among Korean firms, an average of 13% of total

assets are not used for production but for financial investment including financial securities, long-term deposits, and loans. About 4% of total assets are invested in affiliated firms' financial securities. By definition, this number increases among business groups members. At the end of 1997, there were 1135 publicly-traded firms,¹⁴ and 21% of the firms in this data set were publicly traded.

<Insert Table 3 around here>

5. Empirical Tests and Results.

In this section, I examine predictors of firm profitability. As discussed earlier, firm profitability depends on several factors such as size, financial structure, and industry and firm characteristics including a firm's market share and its business strategy. Also organizational form may also affect firm profitability. In addition, the conflicts of interests of shareholders can affect firm performance.

Three variables measure profitability: operating income divided by assets used in production, ordinary income ratio over assets, and net income ratio over assets. Because a large portion of total assets, 13%, is used not for production at the firm, but invested in financial securities, I calculated the operating income rate using the assets employed in production by subtracting financial investment amount from total assets. The difference between operating income and ordinary income lies in the financial income and cost including return from financial assets such as interest payments and

¹⁴ Out of 1135 firms, 776 firms are listed in the Korea Stock Exchange and the rest are registered in the

dividends.

Proxy variables for the conflicts of interests are measured using the controlling shareholders' ownership stake and the listing status of a firm (listed or unlisted). When the controlling shareholder's ownership is small while her control is strong, the disparity between ownership and control will lower firm performance. Also, the listing status can be a proxy for the conflicts between existing shareholders and new investors. Listed firm dummy is 1 when the firm is listed and publicly traded, 0 otherwise. For size of the firm, I use the log value of assets. Although large firms might benefit from scale economy, their advantage might disappear after some level. To control the capital structure, the equation includes equity ratio, measuring a firm's equity over total assets. Four measures of firm characteristics are used: market share, R&D intensity (measured as R&D expenses over sales), advertisement over sales ratio and export over sales ratio. The 5 chaebol dummy is 1 for firms affiliated to the 5 largest conglomerates. The 6-30 chaebol dummy is 1 for the firms that belong to 6th to 30th largest *chaebols* based on asset size. Similarly, the 31-70 chaebol dummy is 1 for the firms that belong to the 31st to 70th *chaebols* based on debt size. To measure whether resource allocation among subsidiaries yields inefficiency, I distinguish financial investment in affiliated firms from that in non-affiliated firms. *Inv_aff* refers to the investment in affiliated firms divided by total assets while *Inv_non* refers to investment in non-affiliated firms divided by total assets. For unobserved industry effects and time effects, I include industry dummies and time dummies. Then, using the within-unit estimation, I subtracted the industry mean of each variable from the original equation specification. Therefore, each

coefficient measures the effect of deviation of each explanatory variable from the industry mean.

Table 4 summarizes the results. The following results hold for all three measures of performance. Firms with low ownership concentration, publicly-traded firms, and *chaebol*-affiliated firms all show lower profitability than their counterparts. Moreover, financial investment in an affiliated firm lowers both ordinary income ratio over assets and net income ratio. *Chaebol*-affiliated firms performed worse than independent firms.

The negative coefficient on the listed dummy variable and the positive coefficient on the size of controlling shareholder's ownership implies that firm performance falls when there is a large disparity between ownership and control. Therefore, these results are consistent with the argument that controlling shareholders pursue their private interests rather than firm value maximization. The result also shows that an increase in the equity ratio increases the profitability. This implies that the disciplinary effect of debt is low.

<Insert Table 4 around here>

The equation above implicitly assumes that the effect of financial investment on profitability is the same for publicly-traded firms and for privately-held firms. To test whether reallocation of resources occurs for the controlling shareholders' personal interests, I also include the interaction term between Listed and Inv_aff and between Listed and Inv_non_aff. The results are summarized in Table 5. Listed firms' financial investment in affiliated firms show an even larger negative effect. Meanwhile, the

effect does not differ for financial investment in non-affiliated firms. Because the controlling shareholders' personal stake is low in the listed firms, this result suggests that an increase in disparity between control and ownership further lowers profitability.

<Insert Table 5 around here>

I also examine whether the results hold for smaller sets of firms with similar financial structure. As the previous results show, capital structure has a very strong effect on the firm profitability. Also, firm's capital structure changes depending on whether the firm is listed or not in the market. Publicly traded firms have a higher equity ratio as they can raise money in the stock market. Moreover, equity ratio might change the firm's risk taking; high-debt ridden firms can take high-risk projects. I divide the data into two groups based on the equity ratio; one group with 15% of equity ratio or higher and the other with less than 15% of equity ratio. Table 6 includes firms that have at least 15% of equity ratio and Table 7 includes firms with less than 15% of equity ratio.

The results using firms with high equity ratios are similar to the previous ones as Table 6 summarizes. *Chaebol* affiliated firms show lower profitabilities than independent firms. Profitability of publicly-traded firms is lower than that of privately-held firms. Financial investment in affiliated firms lowers firm performance while that in unrelated firms increases the profits. The difference is that the profitability does not depend on size among firms with relatively sound capital structure. In addition, table 7 shows that firms with low equity ratios exhibit results similar to the previous tests when all the data are used. However, firms with low equity ratios generate negative returns from their

financial investments in both cases, to affiliated-firms and to unaffiliated firms.

<Insert Table 6 around here>

<Insert Table 7 around here>

In summary, firms with lower ownership by the controlling owners show lower profitabilities. Publicly traded firms and business group affiliated firms have lower ownership by controlling shareholders. Moreover, financial investment in affiliated firms lowers profitability. These results suggest that firm profitability suffer conflicts of interests by controlling shareholders.

6. Conclusion

Since the Asian crisis, many people have tried to identify its causes. This paper addresses the question in the case of Korea. I argue that the low profitability of the corporate sector contributed to the economy's vulnerability. Then, I identify some sources of low profitability. When other things are equal, firms with low ownership concentration by controlling shareholders show lower firm performance. This results implies that greater disparity between control and ownership lowers firm performance. It also shows that publicly-traded firms exhibit lower profitability than privately-held firms. Transfer of resources from publicly-traded firms to other affiliated firms lower firm performance. These findings are consistent with the argument that with little minority shareholders' rights protection, controlling shareholders pursue their own benefits. In addition, this study provides evidence that *chaebol*-affiliated firms perform worse than independent firms. These results are consistent with the argument that when

controlling shareholder's ownership decreases, her incentive to divert firm resources for her own personal benefit increases. In short, these results are consistent with the argument that the disparity between control and ownership might cause conflicts of interest among shareholders, thereby contributing to lower corporate sector profitability.

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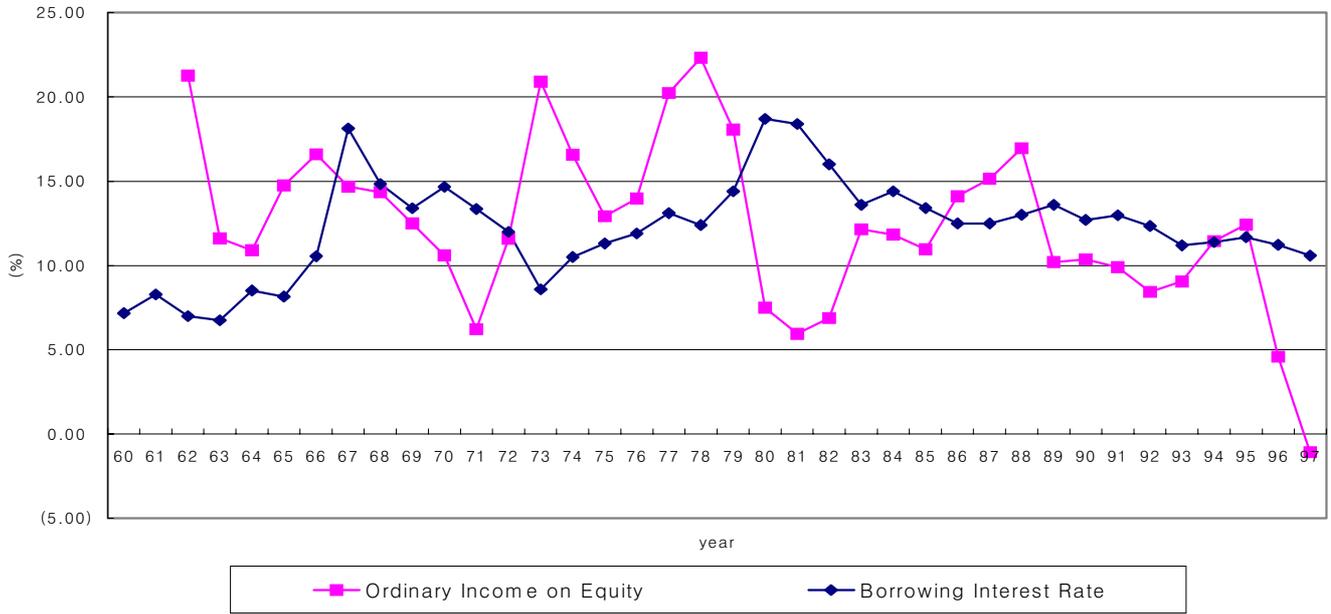
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< Figure 1 > Profitability of Korean Firms



SOURCE : Financial Statement Analysis, various issues

< Table 1> Controlling shareholders Ownership Concentration

(unit:%)

Type	Mean	STD	Weighted Mean
Publicly traded firms	32.46	28.13	13.82
Privately held firms	51.22	34.92	40.27
Independent firms	52.54	32.96	43.69
Business Groups			
1-5 Chaebols	11.64	22.14	6.19
1-30 Chaebols	12.67	22.26	10.56
1-70 Chaebols	27.83	32.15	24.92

Note: STD = Standard deviation

Source: Author's calculation based on the NICE data set

<Table 2> In-group ownership trends in the largest 30 chaebols

(%)

	83	87	89	90	91	92	93	94	95	96	97	98	99
30 chaebols	57.2	56.2	46.2	45.4	46.9	46.1	43.4	42.7	43.3	44.1	43.0	44.5	50.5
Controlling shareholders	17.2	15.8	14.7	13.7	13.9	12.6	10.3	9.7	10.5	10.3	8.5	7.9	5.4
Group affiliated firms	40.0	40.4	31.5	31.7	33.0	33.5	33.1	33.0	32.8	33.8	34.5	36.6	45.2
5 chaebols	n.a.	60.3	49.4	49.6	51.6	51.9	49.0	47.5	n.a.	n.a.	45.2	46.6	53.5
Controlling shareholders	n.a.	15.6	13.7	13.3	13.2	13.3	11.8	12.5	n.a.	n.a.	8.6	n.a.	n.a.
Group affiliated firms	n.a.	44.7	35.7	36.3	38.4	38.6	37.2	35.0	n.a.	n.a.	36.6	n.a.	n.a.

n.a. = not available

Source : Fair Trade Commission Korea (1999).

< Table 3 > summary statistics

Variables	Number	Mean	Std Dev
Net income to assets	19142	0.3483	10.2724
Operating income to assets	19142	0.0526	0.0938
Ordinary income to assets	19142	0.0132	0.1112
Log(Asset)	19142	3.1652	1.1834
Equity ratio	19142	19.4098	33.0634
Inv_non_aff	19142	0.0949	0.0786
Inv_aff	19142	0.0333	0.0655
Market share	19142	0.0451	0.1224
R&D/sales	19142	0.0079	0.0580
Export/sales	19142	0.0707	0.1955
Advertisement/sales	19142	0.0084	0.0389
Ownership concentration	19142	46.6313	34.3734
Listed firm dummy	19142	0.2427	0.4287
1-5chaebol dummy	19142	0.0253	0.1570
6-30 chaebol dummy	19142	0.0501	0.2182
31-70 chaebol dummy	19142	0.0460	0.2095

Ownership concentration is the sum of largest shareholder and family ownership

Inv_non_aff: financial investment to non-affiliated firms over total assets

Inv_aff: financial investment to affiliated firms over total assets

< Table 4> Firm Profitability I

Effects on firm profitability using within unit (industry) estimation with time fixed effect and industry fixed effects.

	Operating income To assets		Ordinary income to assets		Net income to assets	
Log(Asset)	0.0058	(7.35)	0.0051	(6.43)	0.5255	(6.75)
Equity ratio	0.0010	(51.07)	0.0020	(100.98)	0.1674	(85.80)
1-5 chaebol dummy	-0.0003	(-0.07)	-0.0122	(-2.68)	-0.8935	(-5.04)
6-30 chaebol dummy	-0.0123	(-3.92)	-0.0200	(-6.21)	0.0181	(9.02)
31-70 chaebol dummy	-0.0004	(-0.15)	-0.0066	(-2.14)	-1.0359	(-2.34)
Ownership concentration	0.0002	(8.50)	0.0002	(11.16)	-2.1513	(-6.87)
Listed firm dummy	-0.0093	(-5.23)	-0.0132	(-7.24)	-0.5561	(-1.84)
Inv_non_aff	0.0430	(5.17)	0.0481	(5.66)	5.1920	(6.29)
Inv_aff	-0.1218	(-12.10)	-0.1011	(-9.80)	-5.7910	(-5.78)
R&D/sales	-0.0291	(-2.74)	-0.0603	(-5.55)	-6.1098	(-5.80)
Advertisement/sales	-0.1216	(-7.31)	-0.0937	(-5.50)	-12.3615	(-7.45)
Export/sales	-0.0116	(-3.40)	-0.0051	(-1.46)	0.1557	(0.46)
Market share	0.0622	(6.13)	0.0858	(8.26)	7.3018	(7.25)
Year dummy	Yes		Yes		Yes	
Industry dummy	Yes		Yes		Yes	
R ²	0.2258		0.4228		0.3622	
# of obs.	19142		19142		19142	

* Numbers in parentheses are t value.

< Table 5> Firm Profitability II

Cross-sectional difference of financial investment effects on firm profitability using within unit (industry) estimation with time fixed effect and industry fixed effects.

	Operating income to assets		Ordinary income to assets		Net income to assets	
Log(Asset)	0.0060	(7.62)	0.0053	(6.64)	0.5338	(6.86)
Equity ratio	0.0010	(51.23)	0.0020	(101.02)	0.1726	(87.02)
5 chaebol dummy	-0.0002	(-0.04)	-0.0122	(-2.69)	-0.6936	(-1.58)
6-30 chaebol dummy	-0.0124	(-3.95)	-0.0201	(-6.24)	-1.9833	(-6.34)
31-70 chaebol dummy	-0.0008	(-0.26)	-0.0068	(-2.19)	-0.3020	(-1.00)
Ownership concentration	0.0002	(8.36)	0.0002	(11.05)	0.0152	(7.63)
Listed firm dummy	0.0026	(0.87)	-0.0071	(-2.32)	0.1578	(0.54)
Inv_non_aff	0.0569	(6.22)	0.0536	(5.72)	5.0982	(5.61)
Inv_aff	-0.1059	(-9.53)	-0.0884	(-7.77)	-5.5558	(-4.97)
R&D/sales	-0.0290	(-2.73)	-0.0602	(-5.55)	-16.0613	(-8.25)
Advertisement/sales	-0.1200	(-7.21)	-0.0930	(-5.46)	-12.0515	(-5.89)
Export/sales	-0.0110	(-3.22)	-0.0047	(-1.34)	0.2464	(0.73)
Market share	0.0637	(6.29)	0.0866	(8.34)	6.8641	(6.78)
Year dummy	Yes		Yes		Yes	
Industry dummy	Yes		Yes		Yes	
R ²	0.2269		0.4230		0.3661	
# of obs.	19142		19142		18943	

* Numbers in parentheses are t value.

< Table 6> Firm Profitability III

Effects on firm profitability using within unit (industry) estimation with the time fixed effect and the industry fixed effect. All the firms in these regressions have equity over total assets ratio greater or equal to 15%.

	Operating income to assets		Ordinary income to assets		Net income to assets	
Log(Asset)	0.0010	(1.12)	0.0009	(1.05)	0.2559	(3.02)
Equity ratio	0.0003	(6.58)	0.0013	(28.90)	0.1170	(27.30)
5 chaebol dummy	0.0035	(0.76)	-0.0113	(-2.41)	-0.6761	(-1.53)
6-30 chaebol dummy	-0.0175	(-4.81)	-0.0248	(-6.79)	-2.0090	(-5.84)
31-70 chaebol dummy	-0.0072	(-2.10)	-0.0088	(-2.55)	-0.7089	(-2.19)
Ownership concentration	0.0001	(5.72)	0.0002	(6.95)	0.0167	(7.71)
Listed firm dummy	-0.0066	(-3.54)	-0.0120	(-6.43)	-0.9358	(-5.34)
Inv_non_aff	0.0417	(4.48)	0.0619	(6.62)	4.6935	(5.33)
Inv_aff	-0.0837	(-7.49)	-0.0612	(-5.45)	-6.9353	(-6.56)
R&D/sales	-0.0243	(-1.90)	-0.0561	(-4.35)	-5.4736	(-4.51)
Advertisement/sales	-0.0120	(-0.37)	-0.0431	(-1.32)	-8.9195	(-2.91)
Export/sales	-0.0106	(-3.01)	-0.0033	(-0.94)	-0.3045	(-0.91)
Market share	0.0730	(6.48)	0.0853	(7.54)	5.1317	(4.82)
Year dummy	Yes		Yes		Yes	
Industry dummy	Yes		Yes		Yes	
R ²	0.1618		0.1871		0.1639	
# of obs.	11804		11804		11804	

* Numbers in parentheses are t value.

< Table 7> Firm Profitability IV

Effects on firm profitability using within unit (industry) estimation with the time fixed effect and the industry fixed effect. All the firms in these regressions have equity over total assets ratio less than 15%.

	Operating income to assets		Ordinary income to assets		Net income to assets	
Log(Asset)	0.0117	(7.75)	0.0107	(6.87)	0.8712	(5.62)
Equity ratio	0.0011	(34.80)	0.0021	(64.32)	0.1533	(48.45)
5 chaebol dummy	-0.0059	(-0.61)	-0.0098	(-0.98)	-0.5594	(-0.56)
6-30 chaebol dummy	-0.0050	(-0.85)	-0.0092	(-1.53)	-1.4411	(-2.41)
31-70 chaebol dummy	0.0098	(1.75)	-0.0014	(-0.24)	-0.1554	(-0.27)
Ownership concentration	0.0002	(4.53)	0.0003	(7.21)	0.0199	(5.06)
Listed firm dummy	-0.0140	(-3.31)	-0.0172	(-3.94)	-1.6196	(-3.74)
Inv_non_aff	0.0187	(1.18)	0.0015	(0.09)	2.0988	(1.29)
Inv_aff	-0.1677	(-8.76)	-0.1519	(-7.66)	-4.2699	(-2.17)
R&D/sales	-0.0262	(-1.48)	-0.0547	(-2.99)	-5.0710	(-2.79)
Advertisement/sales	-0.1390	(-6.29)	-0.1043	(-4.56)	-12.6240	(-5.56)
Export/sales	-0.0068	(-0.91)	-0.0042	(-0.54)	1.6449	(2.15)
Market share	0.0460	(1.96)	0.0798	(3.28)	11.4939	(4.76)
Year dummy	Yes		Yes		Yes	
Industry dummy	Yes		Yes		Yes	
R ²	0.2529		0.4674		0.3749	
# of obs.	7338		7338		7338	

* Numbers in parentheses are t value.

