The Dark Side of Internal Capital Allocation: The Case of Korean Chaebols

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In this paper, we first briefly survey the theories of internal capital markets and then provide an empirical analysis of the efficiency of internal capital allocations among the chaebols in Korea. Our analysis of equity investment flow among the subsidiaries of the top 30 chaebols from 1997 to 2001 suggests that the chaebols' inter-affiliate equity investment during this period cannot be justified by sound economic rationale, and reveals the dark side of internal capital allocation. Furthermore, we find that a strong positive relationship does not exist between equity investment and real investment. In conclusion, the internal capital allocations among the chaebols have continued to be inefficient and therefore, the argument to loosen restrictions on inter-affiliate equity investments to increase real investment cannot be justified.

Keywords: Internal capital market, Inter-affiliate equity investment, Diversification

JEL Classification: G32, G38, L22, L40

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[**Seoul Journal of Economics** 2002, Vol. 15, No. 2]

I. Introduction

Corporate diversification and internal capital markets have been some of the most hotly debated issues surrounding recent financial and economic analyses. In this paper, we investigate the inter-affiliate equity investments made by Korea's chaebols, which are the main channel of internal capital allocation in Korea, and the efficiency of these investments.

We investigate the determinants and efficiency of inter-affiliate equity investments during 1997-2001, when the Korean economy faced the most dynamic changes. The restrictions placed on making equity investments in subsidiaries that belong to the same chaebol group, henceforth termed 'inter-affiliate equity investment,' were temporarily abolished in 1998 and were reintroduced in 2002. Therefore, we found it both interesting and necessary to observe the behavior of inter-affiliate equity investments during this period, especially in light of the regulatory changes.

There have been a number of intense debates, some of which are still unsettled, concerning the effectiveness and necessity of restricting inter-affiliate investments of Korea's chaebols. The proponents of the restrictions have argued that the chaebols' fleet-type management pattern, which is believed to have been the major cause of the Korean economic crisis, has not improved to a satisfactory level and that the chaebols' inter-affiliate investments increased to a dangerous level when the restrictions were temporarily lifted. Hence, the proponents argue that the chaebols' inter-affiliate investments should be reviewed thoroughly and consistently once again. On the other hand, the opponents of the restrictions have argued that the restrictions bar chaebols from engaging freely in investment activities, thereby, decreasing real investment and hampering the chaebols' future competitiveness.

In this paper, we use the inter-affiliate equity investment data, which were collected from the Korea Fair Trading Commission, to investigate the efficiency of internal capital allocation among the Korean chaebols. According to existing research, corporate diversification, which is thought to result in internal capital allocation among the divisions in a company, is marked by a diversification discount in the U.S. and other developed countries. This is attributed to the inefficiency of capital allocation or the 'socialism' in capital allocation (Scharfstein 1998). Unlike the conglomerates in

the U.S., the chaebols are a constellation of individual firms connected by inter-affiliated equity investments. Because the chaebols' subsidiaries are legally independent companies, it is easier to find the efficiency of capital allocation among them, in contrast to the U.S. conglomerates, which generally consist of multiple divisions that are not legally independent.

In this paper, we provide statistical analysis to elucidate the economic rationality of inter-affiliate equity investments and the relationship between inter-affiliate equity investment and real investment among the subsidiaries of Korea's top 30 chaebols. Our analysis of equity investment flow among the subsidiaries of the top 30 chaebols from 1997 to 2001 suggests that the chaebols' inter-affiliate equity investment during this period cannot be justified by sound economic rationale, and reveals the dark side of internal capital allocation.

This paper is organized as follows. In the next section, we briefly review the current theories of internal capital markets. In section III, we describe the legal and economic institutions related to the chaebols in Korea. In conjunction, we focus on the recent policy changes related to inter-affiliate equity investments. In sections IV and V, we take a look at the concentration of inter-affiliate investments, the proportion of related and unrelated investments, and the investment determinants from the perspectives of the investing and the investment recipient sides. The profitability of inter-affiliate equity investments will be analyzed in section V. In section VI, we analyze the relationship between inter-affiliate equity investment and real investment. Finally, we summarize and conclude the paper in section VII.

II. Theories of Internal Capital Allocation

Internal capital allocation is different from the obtainment of external financing, such as a bank loan, an initial public offering or a corporate bond issuance. Companies that employ internal capital allocation do not undergo the standard market tests offered by major lenders or independent credit rating companies to review their credit worthiness and growth potentials. In multi-divisional firms such as the U.S. conglomerates, capital allocation among divisions may not align with the individual division's performance

because the corporate headquarter can allocate capital investments according its own priority. For business types such as the Korean chaebols, internal capital allocations may also be made using inter-affiliate equity investments, loan guarantees as well as direct lending to affiliated companies.

There is a positive and a negative side to internal capital allocation. Let us examine these two sides by briefly reviewing the theories of internal capital market.[1]

The internal capital market theory was first introduced by Alchian (1969) and Williamson (1975). They assert that the advantage of an internal capital market stems from the in-depth information and monitoring benefits held by the insiders, which the external capital markets do not have access to and therefore cannot process effectively. Thus, Alchian et al. argue that it is possible for an internal organization to reallocate resources more efficiently because of the greater availability of insider information.

Enhanced efficiency due to internal capital markets was mentioned by Alchian (1969) as a strong advantage of the General Electric Company – one of the largest conglomerates in the US: "The investment funds (capital) market within General Electric is fiercely competitive and operates with greater speed to clear the market and to make information more available to both lenders and borrowers than in the external 'normal' markets. In fact, I conjecture that the wealth growth of General Electric derives precisely from the superiority of its internal markets for exchange and reallocation of resources – a superiority arising from the greater (cheaper) information about people and proposals."

There are generally perceived to be three primary benefits of internal capital markets.

First, Stein's (1997) observation of the projects selected by a conglomerate's headquarters suggests that when credit rationing is prevalent due to information asymmetry, internal capital market can create value by enabling the conglomerate to pick a better project. Unlike the conglomerates in the US where the internal

[1]We think that the terminology, 'market,' in the internal capital market theories is not suitable because the mechanism in the internal capital allocation is different from the commonly used markets in the economic literature. However, we will use 'the internal capital market' and 'the internal capital allocation' interchangeably because the internal capital market is already commonly used in the literature.

capital is allocated within a single business entity, the group structure in many countries is composed of legally independent entities. So the internal reallocation of capital in business groups may be more restricted than that in conglomerates. However, groups can transfer funds among member firms by using intra-group debt and equity participation.

Second, internal capital markets allow for better monitoring. Gertner *et al.* (1994) provide a formal model to illustrate this benefit. In the model, internal versus external capital market is differentiated according to the use of either equity or debt. The owner financed internal capital market leads to more monitoring than does the external capital market, which is usually financed by debt-type capital. The intensive monitoring by Japan's main banks, which provide both equity and debt type capital, has been considered a source of strength for Japanese firms (Hoshi 1994). In Korea, the main role of the groups' informal headquarters has been to evaluate the performance of member firms and to plan future investments.

Third, internal capital markets can create value by easing the financial constraints of the outside capital market (Lewellen 1971). Unlike independent firms that focus on perfectly correlated projects, diversified business groups can reduce the fluctuations of cash flows and smooth the returns of not-perfectly correlated projects. This coinsurance effect can increase both the outside debt capacity and the outside equity capital. When borrowers can cross-pledge the incomes of various projects, they can use the incomes of successful projects as collateral for other projects. However, perfectly correlated projects do not have such collateral and therefore cannot increase debt capacity.

However, there are also some negative effects of internal capital markets and the allocation of capital without outside market tests.

First, the internal allocation of capital may cross-subsidize inefficient projects and cause over-investment in unprofitable projects.[2] Scharfstein and Stein's (1997) model of divisional rent seeking and inefficient investment illustrates that if the headquarters are also an agent of outside investors, in order to limit rent seeking activities, they may provide preferential capital

[2]Also, refer to Rajan and Zingales (1998a) and Meyer, Milgrom and Roberts (1992).

budgeting to the inefficient divisions rather than grant cash. Overinvestment can also be found in Jensen's 'the agency costs of free cash flow' (Jensen 1986). Managers with large free cash flows are more likely to undertake value-reducing investments, according to Jensen. To the extent that divisions have access to more free cash flow as part of a diversified firm than on their own, Jensen's argument predicts that diversified firms invest more in value-decreasing projects than their divisions would if they operated independently.

Second, with greater diversification, the cost of monitoring is expected to increase in internal capital markets. This argument is similar to that made in 'the optimal scale of banks' by Freixas and Rochet (1997, p. 32). In Diamond's (1984) model, banking is assumed to be a natural monopoly because its unit cost of monitoring is assumed to decrease at a constant rate. However, in reality, the monitoring of the loan officers is also monitored by the officers' superiors. So as the size of the bank increases, this additional process adds costs to the bank, since more and more loan officers have to be hired and monitored. The same logic can be applied to the headquarters or controlling parties of diversified business groups. As the scope of diversification increases, the marginal cost of monitoring rises due to increased internal monitoring required by the added hierarchies.

Two different empirical studies test the efficiency of internal capital markets. First, the diversification discount or premium of conglomerates or business groups can test the benefits or costs of internal capital markets (Berger and Ofek 1995; Denis *et al.* 1997; Lins and Servaes 1998; Fauver *et al.* 1999; Claessens *et al.* 1999; and Lee 2001). Second, there are some researches on the cross subsidization of diversified conglomerates. Lamont (1997) shows that exogenous adverse shocks to cash flow in one division can affect an unrelated division's capital expenditures. Shin and Stulz (1997) find that capital expenditures of small divisions are positively related to the cash flow of other divisions. Scharfstein (1998) finds that divisions in high-q manufacturing industries tend to invest less than their stand-alone industry peers, while divisions in low-q manufacturing industries tend to invest more than their stand-alone industry peers, in his observation of a sample of 165 diversified conglomerates in the U.S. in 1979. Scharfstein calls this behavior in capital allocation the 'socialism in capital allocation.'

In the following sections we will investigate the efficiency of inter-affiliate capital allocation among the Korean chaebols. We will also take a look at the determinants of capital allocation and the characteristics of inter-affiliated equity investments. Before we proceed, let us briefly review some institutional features of the policies placed on chaebols and the changes in inter-affiliate equity investments for the 30 largest chaebols.

III. Recent Regulatory Policies for the Chaebols in Korea

The inter-affiliate investments by the member corporations, which are made to diversify the chaebols' business, have allowed the chaebols to maintain their *de facto* holding company structure. Moreover, inter-affiliate shareholding is the tool by which the controlling family is able to oversee all the affiliates with only a small amount of equity investment in each. The controlling shareholders in Korean chaebols need to own only a small number of stocks (In April 2000, the controlling shareholders in chaebols owned, on average, only 1.5 percent of the total number of stocks outstanding). In this shareholding structure, there is great possibility for the controlling shareholders' interests to have priority over those of the minority shareholders, as the controlling shareholders can have a greater influence on the whole group using the affiliated companies' stocks. Therefore, many people criticize the Korean chaebols as they will not maximize profits of all the shareholders, and particularly of the small shareholders.

After the financial crisis, there were several changes that addressed the need to improve corporate governance and transparency. There were many revisions to the Commercial Act, the Securities and Exchange Act, and the listed company regulations to strengthen the power of outside directors and audit committees and the right of minority shareholders to improve the corporate governance structure. However, there are also criticisms that the reforms were superficial and that the behavior of the chaebols have been basically unchanged.

Other than these corporate governance related regulations, there have been some regulations directly related to large business groups, including the Monopoly Regulation and Fair Trade Act by the Korea Fair Trade Commission and the credit regulations by

main-relationship banks, which are supervised by the Financial Supervisory Service. In the Monopoly Regulation and Fair Trade Act, there are three main regulations in regards to the large business groups in Korea. The regulations focus on reducing the excessive concentration of economic power: placing a ceiling on the total amount of inter-affiliate equity investment, and prohibiting cross shareholdings of and debt guarantees for affiliate companies. Among these regulations, the ceiling on the total amount of inter-affiliate equity investment has changed significantly since the financial crisis. Before the financial crisis, no company in the business groups was allowed to invest more than 25% of its net assets (=the total assets − the equity investment this company by other affiliates) in other affiliates. However, in February 1998, as the revised Securities and Exchange Act nullified several regulations that prohibited hostile takeovers, this regulation was abolished for fear of hostile takeovers by foreigners. The Act was revised again at the end of 1999 and the revised Act reintroduced the ceiling on the total amount of inter-affiliate equity investment, requesting the large business groups to meet the requirement by March 2002. The rationale for the reenactment was that inter-affiliate equity investments rose rapidly after the abolition of regulations and that there were no impending threats of hostile takeovers by foreigners. One reason for the rapid growth of inter-affiliate equity investment might be related to the new regulation to lower the debt ratio, at the request of the main-relationship banks. In 2001, there were fierce discussions surrounding the re-introduction of this regulation. At the end of 2001, the Act was revised again to reduce the number of large business groups covered, which changed from the 30 largest groups to groups with asset size over 5 trillion Won, with many clauses for the exceptions.

So the following investigation of the inter-affiliate equity investments made by the chaebols during a period when there was no regulation may be a natural experiment to test the efficiency of the internal capital markets. Due to strengthened corporate governance and prohibited debt guarantees, other channels for fund transfers, except for the use of inter-affiliate equity investments, have been harder to find after the financial crisis.

IV. Analysis of the Investing Companies

To analyze the inter-affiliate equity investment of Korean chaebols, we need to investigate some of the characteristics of the investing companies: the share of each leading chaebols in the total inter-affiliate equity investment; the factors that determine inter-affiliate equity investment by investing companies; and the extent inter-affiliate equity investment has promoted related diversification or unrelated diversification.

A. The Share of Leading Investing Companies

First, we need to investigate, for each chaebol, the degree of concentration of inter-affiliate equity investment by the leading companies. The reason we need to investigate the concentration ratio is to recognize the importance of the leading companies in the inter-affiliate equity investment and find out whether there have been any changes in the influence of these leading companies during the period of temporal abolition of restrictions on the inter-affiliate equity investment by the Monopoly Regulation and Fair Trade Act during 1998-2001.

In addition, the leading companies' importance in the total inter-affiliate equity investment has implication in the structure of business groups. There are several ways for an equity ownership to form a business group; pyramidal style, holding company style, and mutual share-ownership being few examples. With a relatively low concentration ratio, one can assume that the group operates several holding companies, which results in a pyramidal style ownership or long chain of ownership. On the other hand, a relatively high concentration ratio implies that the group's ownership structure is similar to that of a holding company. Moreover, there is an increase in the concentration ratio over time, one can assume that the group's ownership structure is becoming more like that of a holding company and that the leading companies are diverting their money to other affiliated companies rather than investing in their own competitiveness.

Tables 1, 2 and 3 report the concentration ratios of the top 1, 3 and 5 companies. The values are simple averages of each chaebol's concentration ratios of cumulative inter-affiliate equity investment. One can see that a small number of companies are investing most

TABLE 1

SHARE OF LEADING COMPANIES IN THE TOTAL CUMULATIVE INTER-AFFILIATE EQUITY INVESTMENT (THE 30 LARGEST CHAEBOLS)

	Top1	Top3	Top5
1997	0.516	0.820	0.913
1998	0.509	0.818	0.908
1999	0.633	0.877	0.941
2000	0.646	0.885	0.945
2001	0.675	0.890	0.951
Average	0.576	0.850	0.927

TABLE 2

SHARE OF LEADING COMPANIES IN THE TOTAL CUMULATIVE INTER-AFFILIATE EQUITY INVESTMENT (THE 4 LARGEST CHAEBOLS)

	Top1	Top3	Top5
1997	0.368	0.654	0.786
1998	0.328	0.607	0.739
1999	0.371	0.654	0.788
2000	0.362	0.684	0.804
2001	0.381	0.720	0.838
Average	0.357	0.650	0.779

TABLE 3

SHARE OF LEADING COMPANIES IN THE TOTAL CUMULATIVE INTER-AFFILIATE EQUITY INVESTMENT (THE 30 LARGEST CHAEBOLS EXCEPT FOR THE TOP 4 CHAEBOLS)

	Top1	Top3	Top5
1997	0.539	0.845	0.933
1998	0.537	0.850	0.934
1999	0.674	0.911	0.965
2000	0.690	0.916	0.967
2001	0.720	0.916	0.968
Average	0.632	0.888	0.953

of the group-wide equity investment. In the case of the 30 largest chaebols, the top 1, 3 and 5 companies invested 58%, 85%, and 93%, respectively, of the total inter-affiliate equity investment made during 1997-2001. In this paper, we use the years that the Korea Fair Trade Commission used when designating the 30 largest chaebols every April. So the years in this paper are in fact the next years of company's usual calendar years used in accounting books.

In the case of the 4 largest chaebols, the top 1, 3 and 5 companies of each chaebol invested 36%, 65%, and 78%, respectively, of the total inter-affiliate equity investments made during 1997-2001 (Table 2). The top 1, 3, and 5 companies in the 30 largest group excluding the largest 4 chaebols, invested 63%, 89% and 95% respectively (Table 3). The lower concentration ratio of larger chaebols seems to be related to the fact that they have numerous affiliates in diverse industries.

What one can also find in the tables above is the rapid increase in the concentration ratios after the abolition of 'the restrictions on inter-affiliate equity investment' by the Monopoly Regulation and Fair Trade Act in February 1998. For the top 3 companies, the concentration ratios of the largest 4 and largest 30 chaebols increased by 5 and 6 percentage points respectively. Similar changes also happened in the concentration ratio of top 5 companies in each chaebol group. The concentration ratio of the top company in each chaebol group also rose rapidly during 1998-9 when 'the restrictions on inter-affiliate equity investment' was abolished. The faster increase in the concentration ratios by the smaller chaebols shows that the leading companies among the smaller chaebols increased their financial support to their affiliates more than the larger chaebols did.

From the analysis of the concentration ratios, one can find that a few companies, the relatively large companies in each chaebol, in most cases, increased their inter-affiliate equity investment to support their financially weak subsidiaries rather than invest in their own competitiveness or productivity enhancements in response to the stricter regulations.

B. The Factors Determining Inter-Affiliate Equity Investment

To examine the determining factors of inter-affiliate equity investment decisions made by investing companies, one needs to

investigate the relationship between the amount of inter-affiliate investments made by the investing companies and their other characteristics, such as asset size, profitability and growth potentials. A larger company can invest more money to its affiliates by using its own fund or outside capital. When companies with low profitability and low growth potentials increase investment to other affiliates, the profitability and size of the group as a whole may increase at a faster rate than the groups without inter-affiliate investment.

Table 4 reports the correlation coefficients between the cumulative inter-affiliate equity investment made by investing companies and other variables in a given year. We first calculate correlation coefficients of each group and then get the simple averages for the entire groups.

In the table, one can observe that the size of variables such as asset and earnings are highly correlated with cumulative inter-affiliate equity investment. The correlation coefficient between cumulative inter-affiliate equity investment and assets was 0.82 during 1997-2001 and increased after the abolition of 'the restrictions on inter-affiliate equity investment.' On the other hand, the earnings to sales ratio, a proxy for profitability, does not seem to have any correlation with the cumulative inter-affiliate equity investment.

One also finds a positive correlation between the size of investing companies and the inter-affiliate equity investment, which is the difference between this year's and last year's cumulative investment. The correlation coefficient between profitability and inter-affiliate equity investment was almost 0.

One can also examine the multi-variable regressions to investigate the determinants of cumulative inter-affiliate investment. Assets and earnings are the variables that depict the company's size. Earning to sales ratio is the proxy for profitability and the sales growth rate is the proxy for growth potential. The increases in debt and equity capital are also included in the regressions. In addition, we run separate regressions for the companies and chaebols with a similar asset size to determine whether there is any difference between companies and chaebols according to their size. Separate year dummies are included in the regression but we do not report them here.

TABLE 4

CORRELATION COEFFICIENTS (INVESTING COMPANIES)

		1997	1998	1999	2000	2001	Average
Assets – Cumulative Inter-affiliate Equity Investment	Mean	0.782	0.753	0.800	0.877	0.879	0.818
	Standard Deviation	0.210	0.216	0.242	0.167	0.133	0.194
	Number of Groups	30	30	30	30	30	-
Earnings to Sales – Cumulative Inter-affiliate Equity Investment	Mean	0.032	0.049	0.053	-0.064	0.014	0.017
	Standard Deviation	0.171	0.193	0.114	0.387	0.354	0.244
	Number of Groups	30	30	30	29	30	-
Earnings – Cumulative Inter-affiliate Equity Investment	Mean	0.245	0.164	-0.004	0.424	0.227	0.211
	Standard Deviation	0.444	0.444	0.566	0.649	0.731	0.567
	Number of Groups	30	30	30	30	30	30
Assets – Inter-affiliate Equity Investment	Mean	na	-0.005	0.147	0.386	0.279	0.201
	Standard Deviation	na	0.570	0.657	0.658	0.638	0.631
	Number of Groups	0	27	28	23	23	–
Earnings to Sales – Inter-affiliate Equity Investment	Mean	na	0.005	0.003	0.008	0.086	0.026
	Standard Deviation	na	0.166	0.163	0.247	0.374	0.238
	Number of Groups	0	27	28	23	23	–
Assets – Inter-affiliate Equity Investment	Mean	na	0.106	0.089	0.229	0.305	0.182
	Standard Deviation	na	0.457	0.550	0.652	0.633	0.573
	Number of Groups	0	27	28	23	23	–

TABLE 5

REGRESSION RESULTS OF CUMULATIVE INTER-AFFILIATE EQUITY INVESTMENT

		Company Size				Group Size			
	Total	less than 50 billion won	50-500 billion won	more than 500 billion won	0-5 trillion won	5-10 trillion won	10-30 trillion won	more than 30 trillion won	The Largest 4 Groups
<Cumulative Inter-affiliate Equity Investment>									
Equation (1)									
Assets	+*	-	+*	+*	+*	+*	+*	+*	+*
Earnings	+*	-	+**	+*	+*	+*	-*	+*	+*
Earnings to Sales	-	+	-	-	+	-	+	+	+
Sales Growth Rate	-	-	-	-	-	-	-	-	-
△Liabilities	-*	+	+**	-*	-	-	-***	-*	-*
△Equity Capital	-	-	+	-	-	-	+*	-	-
Equation (2)									
Assets	+*	-	+*	+*	+*	+*	+	+*	+*
Earnings	+*	+	+**	+*	+*	+*	-	+*	+*
Earnings to Sales	-	+	-	-	-	-	+	-	-
Sales Growth Rate	-	-	-	-	-	-	-	-	-
Equation (3)									
Assets	+*	-	+*	+*	+*	+*	+*	+*	+*
Earnings	+*	+	+	+*	+*	+*	+*	+*	+*
Earnings to Sales	+	+	-	+	+	-	-	+	+
<Inter-affiliate Equity Investment>									
Equation (4)									
Assets	+*	+	+*	+*	+*	+***	+**	+*	+*
Earnings	+*	+	+*	+*	+**	+*	+	+*	+*
Earnings to Sales	+	+	+	+	+	+	+	+	+
Sales Growth Rate	+	-	+	-	-	+	+	-	-
△Liabilities	-	+*	+*	-	+*	-	+	-	-*
△Equity Capital	+	+	+	-	-	+	+*	-	-
Equation (5)									
Assets	+*	+	+*	+*	+*	+**	+*	+*	+*
Earnings	+*	+	+**	+*	+	+*	+	+*	+*
Earnings to Sales	+	+	+	+	+	+	-	+	+
Sales Growth Rate	+	+	+	-	-	+	+	-	-
Equation (6)									
Assets	+*	+	+*	+*	+*	+*	+*	+*	+*
Earnings	+*	+	+*	+*	+	+*	+	+*	+*
Earnings to Sales	+	+	+	+	+	+	-	+	+

Notes: * Significant at the 1% level.
** Significant at the 5% level.
*** Significant at the 10% level.

Table 5 reports results from the regression analysis of cumulative inter-affiliate equity investment on some variables in various specifications. In table 5, the size variables, assets and earnings, are positively related to cumulative inter-affiliate equity investment and the coefficients are statistically significant at the 1% level in most of the regressions regardless of company size and group size. However, the coefficients of earnings to sales ratio and sales growth rates are not statistically significant. In equation (1), one can find that the increase in debt is negatively related to cumulative inter-affiliate equity investment. One also finds similar regression results when the dependent variable is an inter-affiliate equity investment (See equations (4)~(6)).

From the results obtained from the analysis of correlation and regression, one cannot determine any statistically significant relationship between cumulative inter-affiliate equity investment and profitability or growth potential. However the size of the investing companies has significance in determining the size of the capital invested.

C. Related and Unrelated Equity Investment

To investigate whether the inter-affiliate equity investment promotes related diversification or unrelated diversification, one has to examine whether inter-affiliate equity investments have been realized internally between industries of the same kind or externally between industries of different kinds. Industries are classified in 35 sectors, which are based on the KSIC (Korean Standard Industrial Classification) 2-digit code. The number of industries that we look at is less than that of KSIC 2-digit industries as we merge several related industries into one industry (See Appendix). The ratios in the shaded cells in the table below are the equity investments realized between the companies in the same industry.

Invested \ Investing	Industry1	Industry2	Industry3	Industry4	Industry5
Industry1					
Industry2					
Industry3					
Industry4					
Industry5					

TABLE 6

THE RATIO OF INTER-AFFILIATE INVESTMENTS MADE IN INDUSTRIES OF SAME KIND

	1997	1998	1999	2000	2001	Average
30 Largest	0.2483	0.1990	0.1914	0.2083	0.3060	0.2306
4 Largest	0.1779	0.1585	0.2204	0.1728	0.1428	0.1745
30 largest except for the top 4	0.2591	0.2053	0.1869	0.2138	0.3311	0.2392

Unlike the conglomerates in the U.S. where diversification occurs, generally, at the firm level, the Korean chaebols' diversification occurs frequently at the group level. Therefore, it is important to examine the industry distribution of inter-affiliate investments.

Table 6 shows that, in the case of the top 30 chaebols, investment between industries of the same kind covers only 23 % of the total amount of intra-group investments during 1997-2001. In the case of the 4 largest groups, the proportion dropped to 17%. Furthermore, comparing the values in the sample period, there were minimal fluctuations in the case of the 4 largest groups and an increase in the case of smaller groups. However, the increase relating to the smaller groups may be a result of the entrance of newly designated focused groups such as Hanaro, Taekwang and Dongyang Chemical groups rather than focused strategies of existing groups.

The results show that most of the inter-affiliate equity investments contributed to unrelated diversification and that the Korean chaebols did not narrow the scope of their businesses significantly even after the financial crisis.

V. Analysis of Investment Recipient Companies

In order to investigate whether the inter-affiliate equity investments of Korean chaebols could be justified as economically rational, one has to examine both sides of the investments, the investing side as well as the recipient side. The investing side was analyzed in the previous section. In this section the recipient side of the inter-affiliate equity investment will be analyzed.

TABLE 7

HERFINDAHL INDEX OF CUMULATIVE AMOUNT OF INTER-AFFILIATE EQUITY INVESTMENT SUBSIDIARIES RECEIVED

	1997	1998	1999	2000	2001	Average
30 Largest	0.1736	0.1697	0.2093	0.2941	0.2264	0.2146
4 Largest	0.1133	0.1022	0.0879	0.1267	0.1188	0.1098
30 largest except for the top 4	0.1829	0.1801	0.2279	0.3199	0.2430	0.2308

The main points of interest in this section are as follows; (i) whether chaebols' inter-affiliate equity investments have been focused on a small number of strategic companies and strategic industries; (ii) what are the factors that determined which companies will receive equity investment from other affiliated companies in the chaebol group; and (iii) the profitability of the inter-affiliate equity investments. In regard to the points mentioned above, if a small number of strategic companies in a small number of strategic industries receive most of the inter-affiliate equity investment on economically rational reasons and at the same time, are profitable, one can say that Korean chaebols' inter-affiliate equity investment could be economically justified. Otherwise, one has to seriously doubt economic soundness of the chaebols' inter-affiliate equity investment activities.

A. Focus of Inter-Affiliate Equity Investment

In order to examine how the chaebols' inter-affiliate equity investments have been focused on a sparse number of strategic companies, one has to calculate, for each chaebol, the Herfindahl index of the cumulative amount of equity investment that subsidiaries receive from their affiliates. Table 7 depicts the average Herfindahl indices of the 30 largest chaebols, the 4 largest chaebols, and the 30 largest chaebols excluding the top 4 during 1997-2001.

In the case of the 4 largest groups, the index in 2001 was very low and not significantly different from that in 1997. This implies that their inter-affiliate investments lacked strategic focus and that

no improvements were made during this period. In other words, one cannot observe any signs of core companies being built in their groups from inter-affiliate investment.

In the case of smaller chaebols, that is, the next 26 largest chaebols, the index is slightly higher and has increased somewhat during this period. However, as mentioned before, this may be the result of the new designation of chaebols as top 30 rather than the changed strategies of the existing groups.

Even though there were no signs that strategic core companies were being built through inter-affiliate investment, one cannot immaturely conclude that the core competences were not improving since there might have been numerous companies in the same or related industries which were getting the support of inter-affiliate investments. That is, one may be able to argue that the core competence of chaebols was improving even when most of the inter-affiliate investment has been directed to a small number of focused industries. Hence, one has to investigate how the chaebols' inter-affiliate equity investments have been focused on a sparse number of strategic industries.

Tables 8 to 10 report the proportion of the cumulative equity investments received by the top 1, 3 and 5 industries. The values in these tables are the simple averages of each chaebol's investment in each industry. In the case of the 30 largest chaebols, the top 1, 3 and 5 industries received 49%, 83% and 94%, respectively, of the total cumulative inter-affiliated equity investment in 2001, and there were no major improvements during 1997-2001 (Table 8). In the case of the 4 largest chaebols, the top 1, 3 and 5 industries received 30%, 65% and 82%, respectively, of the total inter-affiliated equity investment in 2001, and, like the 30 largest chaebols, there were minimal changes during 1997-2001 (Table 9). The top 1, 3, and 5 industries in the 30 largest groups except the top 4, received 51%, 86% and 95%, and there were no significant improvements during this period (Table 10).

From observing the value of the top industries' shares of the inter-affiliate equity investment, one may be able to state the following. Firstly, inter-affiliate investment was spread out amongst many industries, especially in the case of the top 4 chaebols. Secondly, it was somewhat more focused in the case of the next 26 largest chaebols, but this may be the result from the fact that smaller chaebols have fewer affiliates in fewer industries. If one

TABLE 8

SHARES OF CUMULATIVE INTER-AFFILIATE EQUITY INVESTMENT INDUSTRIES RECEIVED (THE 30 LARGEST CHAEBOLS)

	Top1	Top2	Top3
1997	0.436	0.778	0.907
1998	0.408	0.762	0.896
1999	0.433	0.775	0.918
2000	0.503	0.809	0.936
2001	0.485	0.827	0.936
Average	0.453	0.790	0.919

TABLE 9

SHARES OF CUMULATIVE INTER-AFFILIATE EQUITY INVESTMENT INDUSTRIES RECEIVED (THE 4 LARGEST CHAEBOLS)

	Top1	Top2	Top3
1997	0.322	0.652	0.822
1998	0.303	0.662	0.815
1999	0.276	0.627	0.801
2000	0.311	0.638	0.808
2001	0.299	0.647	0.823
Average	0.302	0.645	0.814

TABLE 10

SHARES OF CUMULATIVE INTER-AFFILIATE EQUITY INVESTMENT INDUSTRIES RECEIVED (THE 30 LARGEST CHAEBOLS EXCEPT FOR THE 4 TOP CHAEBOLS)

	Top1	Top2	Top3
1997	0.453	0.798	0.920
1998	0.424	0.778	0.909
1999	0.457	0.798	0.936
2000	0.532	0.835	0.956
2001	0.513	0.854	0.953
Average	0.476	0.813	0.935

takes into account the financial capability of the smaller chaebols, one may still argue that their limited financial resources were too spread out over diverse industries. Finally, and most importantly, there have been no major improvements during this period.

Therefore, it may be concluded that the Korean top chaebols' core competence improvements in the few strategically chosen industries has shown no significant progress during 1997-2001, even though their inter-affiliate equity investment increased tremendously.

B. Reason for Receiving Inter-Affiliate Equity Investment

Chaebols' inter-affiliate equity investment may be regarded as economically rational if it is made in profitable or booming business areas or markets, as such could result in profit generation and increase sales in the investing companies as well as the investment recipient companies. In other words, the chaebol groups would benefit as a whole. One of the major arguments made by the chaebols for lifting the ceiling limit on inter-affiliate equity investment is that it hinders chaebol corporations from investing in profitable and growing markets. Thus, it would undermine the Korean chaebols' dynamism in free corporate activities, and would lower their competitiveness in the long run.

To examine the validity of this argument, one has to perform thorough correlation and regression analyses. The analyses show that the variables representing profitability and growth were not only unsatisfactory in explaining the inter-affiliate investment of Korean chaebols, but also showed some results contrary to rational behavior.

a) Correlation Analysis

Earnings and earnings to sales ratio will be used as proxies for profitability, and sales growth rate as a proxy for growth of investment recipient companies. For each chaebol, the correlation coefficients between these variables and the amount of inter-affiliate investments that each company received will be calculated. Table 11 shows the mean and standard deviation of these correlation coefficients of the top 30 chaebol groups from 1998 to 2001.

The average correlation coefficients between inter-affiliate investment and earnings to sales ratio were negligible. Nonetheless,

TABLE 11

KEY CORRELATION COEFFICIENTS

(INTER-AFFILIATE EQUITY INVESTMENT RECIPIENT COMPANIES)

		1998	1999	2000	2001	Average
Earnings to Sales Ratio – Equity Investment Received	Mean	0.00594	-0.00951	-0.06322	-0.04103	-0.02700
	Standard Deviation	0.20028	0.24648	0.36587	0.39322	0.30147
	Number of Groups	27	28	23	23	–
Earnings – Equity Investment Received	Mean	-0.01176	0.03182	0.09542	0.09951	0.05375
	Standard Deviation	0.34714	0.44293	0.51366	0.31736	0.40527
	Number of Groups	27	28	23	23	–
Sales Growth Rate – Equity Investment Received	Mean	-0.04153	0.05686	-0.06314	-0.02894	-0.01920
	Standard Deviation	0.27717	0.25000	0.31160	0.30583	0.28615
	Number of Groups	27	28	23	23	–
Debt Ratio – Equity Investment Received	Mean	-0.04361	0.01982	0.10255	-0.09377	-0.00380
	Standard Deviation	0.15709	0.24107	0.33528	0.34712	0.27014
	Number of Groups	27	28	23	23	–
Debt Ratio for the Last Year – Equity Investment Received	Mean	0.02706	-0.01536	0.04274	-0.01622	0.00955
	Standard Deviation	0.09929	0.16568	0.25460	0.32702	0.21165
	Number of Groups	27	28	23	23	–
Equity Investment Received in the previous year – Equity Investment Received	Mean	-0.18324	-0.12448	0.28778	0.07244	0.01312
	Standard Deviation	0.38010	0.51900	0.52854	0.45098	0.46965
	Number of Groups	27	28	23	24	–
Liabilities – Equity Investment Received	Mean	-0.00923	-0.02150	-0.16162	-0.06821	-0.06510
	Standard Deviation	0.45249	0.41291	0.51560	0.42809	0.45227
	Number of Groups	27	28	23	23	–
Equity Capital – Equity Investment Received	Mean	0.29700	0.40853	0.32359	0.15030	0.29485
	Standard Deviation	0.41642	0.55493	0.42756	0.46033	0.46481
	Number of Groups	27	26	23	22	–
Earnings to Sales Ratio – Equity Investment Received to Equity Capital	Mean	-0.02007	0.03852	-0.13995	-0.10115	-0.05570
	Standard Deviation	0.22189	0.27876	0.30809	0.46707	0.31895
	Number of Groups	27	28	23	23	–
Earnings – Equity Investment Received to Equity Capital	Mean	-0.01301	-0.02734	-0.06763	0.08998	-0.00450
	Standard Deviation	0.24619	0.18219	0.25814	0.33286	0.25484
	Number of Groups	27	28	23	23	–
Sales Growth Rate – Equity Investment Received to Equity Capital	Mean	-0.02430	0.14505	-0.00040	-0.11476	0.00140
	Standard Deviation	0.28902	0.24400	0.33318	0.35850	0.30617
	Number of Groups	27	28	23	23	–

in general, they were negative over the recent years. The average correlation coefficients between inter-affiliate investment and earnings, on the other hand, were still small but positive. However, it is interesting to note that the inter-affiliate investment to equity capital ratios (inter-affiliate investment normalized with respect to company's equity size) were, on average, negatively correlated with earnings, although they were still small. In other words, after the normalization for size has been taken into account, the average coefficients turned negative, as in the case of the earnings to sales ratio. In addition, sales growth rates were also negatively correlated, albeit not by much, with inter-affiliate investment. Furthermore, the standard deviations of all these correlation coefficients were large.

These results show that most of Korea's top 30 chaebols, in contrast to their claims, did not make investments in their affiliates on economically rational grounds, as far as profitability or growth potentials were concerned. Furthermore, judging from the negative but small correlation coefficients and large standard deviations, one can conjecture that substantial numbers of chaebol groups directed their valuable financial resources into negative-profit-making or declining business areas or markets probably in order to save uncompetitive subsidiaries.

b) Regression Analysis

Regressions show similar results as the correlation analyses (See Table 12). While variables related to the size of the investment recipient companies – *e.g.*, asset size and earnings – showed positive coefficients at statistically significant levels, variables related to profitability and growth – *e.g.*, earnings to sales ratio and sales growth rate – showed negative coefficients, although the statistical significance levels were low. These results are consistent across all the categories ranging from subsidiary companies' asset sizes to groups' asset sizes. Furthermore, the significance levels are especially high in the categories relating to companies with asset sizes over 500 billion won and groups with asset sizes between 5 and 10 trillion won.

The observations mentioned above suggest that larger subsidiaries receive greater amount of investments from other affiliate companies. Similar to the results from the correlation coefficient analysis, profitability and growth potentials of the investment recipient companies were not key factors – or even discouraging

TABLE 12

REGRESSION RESULTS OF THE INTER-AFFILIATE EQUITY INVESTMENT OF RECIPIENT COMPANIES

Independent Variables	Total	Company Size			Group Size				
		less than 50 billion won	50-500 billion won	more than 500 billion won	0-5 trillion won	5-10 trillion won	10-30 trillion won	more than 30 trillion won	The Largest 4 Groups
Equation (1)									
Assets	+**	+**	-	+	-**	+	+	+	+***
Earnings	+*	+	+	+**	+*	+*	-	+***	+
Earnings to Sales Ratio	-	-	-	-**	+	-*	-	-	-
Sales Growth Rate	-	+	+	-*	-	-	-	-	-
△Liabilities	+	-*	+	+***	-*	+	-*	+**	-*
△Equity Capital	+*	+*	+*	+*	+*	+*	+*	+*	+*
Equation (2)									
Assets	+*	+*	+*	+*	+	+*	+	+*	+*
Earnings	+	+	-*	+	+*	+*	-	+	+
Earnings to Sales Ratio	-	-	+	-**	+	-**	-	-	-
Sales Growth Rate	+	+	+	-	+	+	-	-	-
Equation (3)									
Assets	+*	+*	+*	+*	+	+*	+	+*	+*
Earnings	+	+	-*	+	+*	+*	-	+	+
Earnings to Sales Ratio	-	-	-	-**	-	-*	-	-	-
Equation (4)									
Assets	+*	+*	-	+***	-*	+***	+	+**	+**
Earnings	+*	+	+	+**	+*	+*	+	+	+**
Earnings to Sales Ratio	-	-	-	-**	+	-**	-	-	-
Sales Growth Rate	-	+	+	-**	-	-	-	-	-
△Debt Ratio	-	+	-	+	-	-*	+	-	+
△Equity Capital	+*	+	+*	+*	+*	+*	+*	+*	+*
Equation (5)									
Assets	+*	+*	-	+***	-*	+***	+	+**	+***
Earnings	+*	+	+	+**	+*	+*	+	+	+***
Earnings to Sales Ratio	-	-	-	-**	+	-**	-	-	-
Sales Growth Rate	-	+	+	-	-	-	-	-	-
△Debt Ratio (-1)	+	-	+	-	+	+**	-	-	-
△Equity Capital	+*	+	+	+*	+*	+*	+*	+*	+*

Notes: 1) Plus and munus signs represent the sign of estimated coefficients in equations.

2) * Significant at the 1% level.
** Significant at the 5% level.
*** Significant at the 10% level.

TABLE 13

INTER-AFFILIATE EQUITY INVESTMENT RECEIVED BY THE 30 LARGEST CHAEBOLS' SUBSIDIARIES DURING 1998-2001

(Unit: billion won, %)

	1998	1999	2000	2001	Total
Inter-Affiliate Investment Received	2,805.9 (8.6)	11,778.5 (36.1)	13,619.1 (41.8)	4,418.5 (13.5)	32,621.9 (100.0)

Note: The figures in parentheses are the weights in the total.

factors – in the selection process of subsidiaries for new capital injections.

These observations may imply that chaebol groups, especially the mid-sized ones, have shown a tendency to direct capital investment resources toward the subsidiaries which were large but could not function on its own due to lack of profits or growth. It is clear that the results from the regression analyses are consistent with the correlation coefficient analysis.

C. Profitability of Inter-Affiliate Equity Investment

In the previous section, it was shown that the inter-affiliate investment of chaebols was not motivated by sound economic rationale, as indicated by profitability or growth. In this section, the profitability of inter-affiliate invested capital will be analyzed in more detail.

a) Overview

From 1998 to 2001, the total inter-affiliate investment received by the top 30 chaebols' subsidiaries amounted to 32.6 trillion won. In 1999 and 2000 alone, 25.4 trillion won, 78% of the total, was invested. This is roughly 4.5 times the pre-crisis level of 1998 (See Table 13).

During 1999 and 2000, the chaebols, after the economic crisis, were allegedly undergoing dramatic restructuring in order to improve their financial structures. One can conjecture, from the astronomical amount of inter-affiliate investment made by the chaebols during this period, that the chaebols were using inter-affiliate investment to preserve the uncompetitive subsidiaries,

TABLE 14

THE PROFITABILITY DISTRIBUTION OF THE INTER-AFFILIATE EQUITY INVESTMENT RECEIVED

(Unit: billion won, %)

Earnings to Sales Ratio		1998	1999	2000	2001	Total
	More Than 0.25	41.6 (1.5)	42.9 (0.4)	874.6 (6.4)	112.2 (2.5)	1,071.3 (3.3)
	0.15~0.25	-	27.5 (0.2)	530.2 (3.9)	221.3 (5.0)	778.9 (2.4)
	0.05~0.15	243.8 (8.7)	615.6 (5.2)	3,346.8 (24.6)	729.8 (16.5)	4,936.1 (15.1)
	Subtotal	285.4 (10.2)	686.0 (5.8)	4,751.6 (34.9)	1,063.2 (24.1)	6,786.3 (20.8)
(Daewoo-adjusted)[1]		182.9 (6.5)	570.0 (4.8)			6,567.7 (20.1)
0.00~0.05		1,395.7 (49.7)	7,531.6 (63.9)	5,210.0 (38.3)	1,417.2 (32.1)	15,554.4 (47.7)
(Daewoo-adjusted)[1]		1,291.4 (46.0)	4,683.4 (39.8)			12,602.0 (38.6)
	-0.05~0.00	194.7 (6.9)	1,456.6 (12.4)	273.6 (2.0)	620.3 (14.0)	2,545.3 (7.8)
	-0.15~-0.05	366.6 (13.1)	478.1 (4.1)	1,571.2 (11.5)	114.3 (2.6)	2,530.3 (7.8)
	-0.25~-0.15	39.7 (1.4)	515.6 (4.4)	194.5 (1.4)	95.4 (2.2)	845.1 (2.6)
	Less Than -0.25	523.7 (18.7)	1,110.5 (9.4)	1,618.2 (11.9)	1,108.0 (25.1)	4,360.4 (13.4)
	Subtotal	1,124.7 (40.1)	3,560.9 (30.2)	3,657.5 (26.9)	1,938.0 (43.9)	10,281.1 (31.5)
(Daewoo- adjusted)[1]		1,331.5 (47.5)	6,525.1 (55.4)			13,452.1 (41.2)
Total		2,805.9 (100.0)	11,778.5 (100.0)	13,619.1 (100.0)	4,418.5 (100.0)	32,621.9 (100.0)

Notes: 1) Earnings to sales ratio of Daewoo's inter-affiliated equity investment is adjusted to less than 0%.
2) Figures in the table do not include equity investment to non-affiliated subsidiaries.
3) The figures in the parenthesis are the weights in the total.

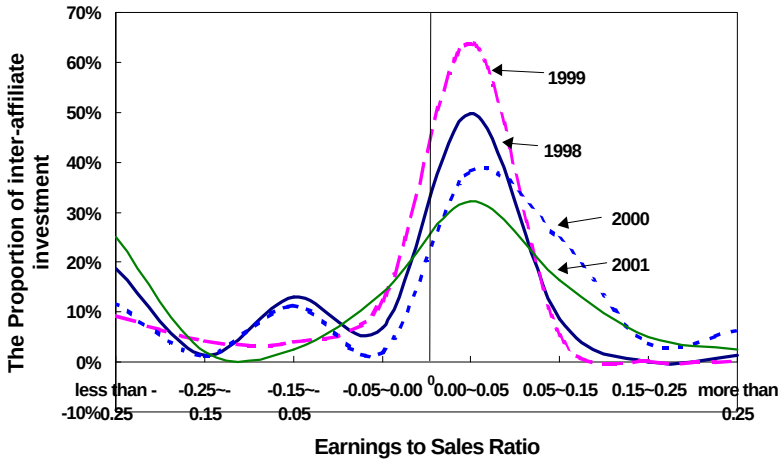


FIGURE 1
THE PROFITABILITY DISTRIBUTION OF THE INTER-AFFILIATE EQUITY INVESTMENT RECEIVED

which should have been the prime target of restructuring. This is unfortunate, as the uncompetitive subsidiaries should have been bailed out, rather than restructured, with the help of the capital earned or raised by other affiliates. This suspicion over the chaebols' misuse of inter-affiliate equity investment could be substantiated by the large portions of inter-affiliate investments allocated to subsidiaries whose earnings were negative or in substandard levels.

The profitability distributions of the total inter-affiliate investment of 32.6 trillion won during the period from 1998 to 2001 are summarized in Table 14. The table is divided into 8 classes, according to the earnings to sales ratio of the recipient company: less than -25%, -25%~-15%, ··· , 15%~25%, and over 25%. Table 14 shows that companies that recorded a loss received 13.5 trillion won (41.2% of the total) and companies whose earnings to sales ratios were in black but less than 5% secured 12.6 trillion won (38.6% of the total) during this period. Since the earnings to sales ratio of 5% is generally considered the minimum acceptable level in

TABLE 15

INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: CLASSIFIED BY ASSET SIZE OF GROUPS

(Unit: billion won, %)

	Asset Size of Groups				Total
	Less Than 5 trillion won	5-10 trillion won	10-30 trillion won	More than 30 trillion won	
Inter-Affiliate Investment Received	2,370.0 (7.3)	2,335.2 (7.2)	2,981.6 (9.1)	24,935.1 (76.4)	32,621.9 (100.0)

Notes: 1) The groups in each category of asset size are listed in the notes of Table 16.
2) The figures in the parenthesis are the weights in to the total.

the market, 26.1 trillion won of inter-affiliate investment by chaebols during this period, roughly 80% of the total, may be regarded as unprofitable in terms of earnings.

For every year from 1998 till 2001, the proportions of substandard – that is, earnings to sales ratio of less than 5% – inter-affiliate investment by chaebols were as follows; 2.6 trillion won (93.5% of the total) in 1998, 11.2 trillion won (95.2%) in 1999, 8.9 trillion won (65.2%) in 2000, and 3.4 trillion won (76.0%) in 2001. See Table 14 and Figure 1 for more details.

b) Profitability Distributions of Inter-Affiliate Investment; Classified by Asset Size of Chaebols

In this subsection, the top 30 chaebols will be divided into 4 classes depending on their asset sizes; less than 5 trillion won, 5 to 10 trillion won, 10 to 30 trillion won and over 30 trillion won. Using this partition, the profitability distribution of inter-affiliate investment for each class of chaebols will be shown. Distinctive features, if any, in inter-affiliate investment for each of these classes of chaebol will be examined.

As shown in Table 15, most of the inter-affiliate investments of the top 30 chaebols were executed by the top 5 chaebols, the class of chaebols with asset size over 30 trillion won. These top ranked chaebols accounted for 76.4% of the 32.6 trillion won total inter-affiliate investments during 1998 and 2001. The other 3 classes of chaebols accounted for around 7% to 9% each.

TABLE 16

PROFITABILITY DISTRIBUTION OF THE INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: CLASSIFIED BY ASSET SIZE OF GROUPS

(Unit: billion won, %)

Earnings to Sales Ratio		Less Than 5 trillion won	5-10 trillion won	10-30 trillion won	More than 30 trillion won	the largest 4 groups
	More Than 0.25	7.1 (0.3	83.2 (3.6)	58.0 (2.0)	922.9 (3.7)	912.9 (4.2)
	0.15~0.25	13.1 (0.6)	1.2 (0.1)	271.9 (9.1)	492.8 (2.0)	492.8 (2.3)
	0.05~0.15	341.0 (14.4)	512.4 (21.9)	511.4 (17.2)	3,571.4 (14.3)	3,362.9 (15.5)
	Subtotal	361.2 (15.2)	596.8 (25.6)	841.3 (28.2)	4,987.1 (20.0)	4,768.6 (22.0)
(Daewoo-adjusted)[2]					4,768.6 (19.1)	
0.00~0.05		588.0 (24.8)	384.1 (16.5)	1,304.0 (43.7)	13,278.3 (53.3)	10,325.8 (47.6)
(Daewoo-adjusted)[2]					10,325.8 (41.4)	
	-0.05~0.00	289.7 (12.2)	443.2 (19.0)	95.5 (3.2)	1,716.9 (6.9)	1,716.9 (7.9)
	-0.15~-0.05	211.1 (8.9)	283.7 (12.2)	107.4 (3.6)	1,928.2 (7.7)	1,925.4 (8.9)
	-0.25~-0.15	423.5 (17.9)	136.4 (5.8)	131.5 (4.4)	153.9 (0.6)	152.0 (0.7)
	Less Than -0.25	496.9 (21.0)	490.9 (21.0)	501.8 (16.8)	2,870.8 (11.5)	2,800.7 (12.9)
	Subtotal	1,420.8 (60.0)	1,354.2 (58.0)	836.2 (28.0)	6,669.8 (26.7)	6,595.0 (30.4)
(Daewoo-adjusted)[2]					9,840.8 (39.5)	
Total		2,370.0 (100.0)	2,335.2 (100.0)	2,981.6 (100.0)	24,935.1 (100.0)	21,689.3 (100.0)

Notes : 1) The groups included in each category are as follows;

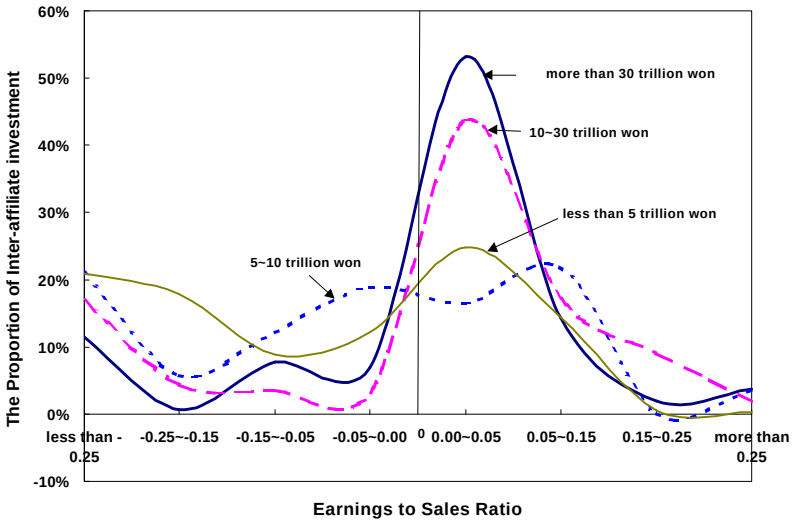
* Groups having asset less than 5 trillion won: 17 groups including Hyosung Corp., Dong Kuk Steel Mill, Dongbu corp., Kolon Ind. Inc., Dong Yang, Kohap Corp., Jinro, Cheil Jedang Corp., Anam, Haitai, Saehan Ind. Inc., Shinsegae, Kangwon ind., Young Poong Corp., Kerpuyoung, Shinho, and Dae Sang Corp. (Excluding 9 groups, such as Hyundai Development Company, Hanaro

Comminucation, Daewoo Electronics, Hyundai Deparement Store, Oriental Chem., Tae Kwang Ind., Newcore, Hanil, and Samyang, because of insufficient data).
* Groups having asset size of 5~10 trillion won: 7 groups including Kumho, Doosan, Hyundai Oil, Dong-A, Halla, Hansol, and Daelim (Excluding S-oil because of insufficient data).
* Groups having asset size within the range of 10~30 trillion won : 4 groups including Han Jin, Ssang Yong, Kia, Han Wha Corp., and Lotte(Excluding 3 groups, such as Pohang Iron & Steel, Daewoo Inc., and Kia, because of insufficient data).
* Groups having assets more than 30 trillion won: 5 groups including Samsung, Hyundai, LG, SK, and Daewoo(Excluding Hyundai Motor Company because of insufficient data)
* The top 4 groups : Samsung, Hyundai, LG, SK.

2) Earnings to sales ratio of Daewoo's inter-affiliate investment is adjusted to less than 0%.
3) Figures in the table do not include equity investment to non-affiliated subsidiaries.
4) The figures in the parenthesis are the weight in the total.

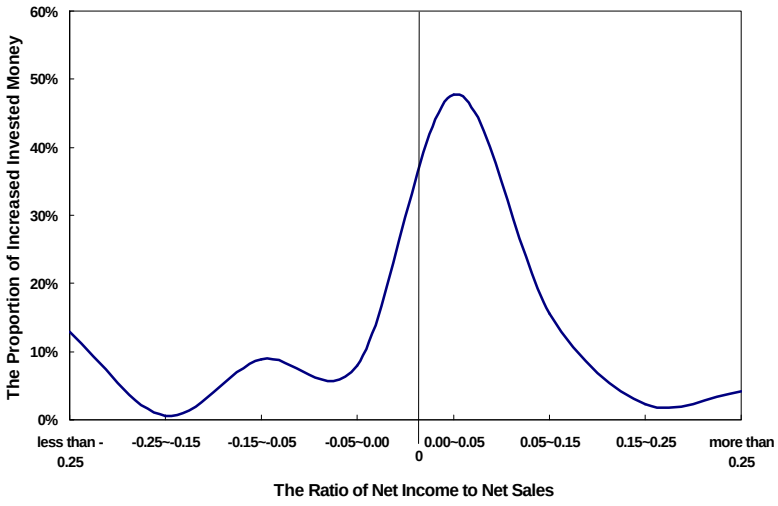
Table 16 shows the profitability distributions for each of the 4 classes of chaebols defined above. For the chaebols with asset sizes less than 5 trillion won, their subsidiaries with earnings to sales ratio below 0% got 60% of the total inter-affiliate investment during 1998 to 2001, and those with earnings to sales ratios between 0% to 5% received about 25% of the total. For other classes of chaebols, the total inter-affiliate investments received were as follows; 58% and 17% respectively for chaebols with asset sizes of 5 to 10 trillion won; 28% and 44% respectively for chaebols with asset sizes of 10 to 30 trillion won; and 40% and 41% respectively for chaebols with assets size over 30 trillion won.

The proportion of the total sub-market standard inter-affiliate investment – the sum of earnings to sales ratios of below 0% and from 0% to 5% – did not fluctuate significantly between the different classes of asset sizes. All four classes had values somewhere between 72% and 85%. However, the difference was more conspicuous for inter-affiliate investment provided to subsidiaries that are suffering losses. The proportion of inter-affiliate investment received by subsidiaries whose earnings to sales ratio was less than 0% were exceptionally high for chaebols with asset sizes less than 10 trillion won: 60% for chaebols of asset sizes less than 5 trillion won and 58% for chaebols of asset sizes of 5 to 10



FIGURES 2

PROFITABILITY DISTRIBUTION OF THE INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: CLASSIFIED BY ASSET SIZE OF GROUPS



FIGURES 3

THE PROFITABILITY DISTRIBUTION OF THE INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: THE TOP 4 GROUPS

trillion won. In contrast, the proportion of inter-affiliate investment received by subsidiaries whose earnings to sales ratio was less than 0% were low for chaebols with assets sizes of over 10 trillion won − 28% for chaebols with asset sizes of 10 to 30 trillion won and 40% for chaebols with asset sizes over 30 trillion won. The relatively high percentage for chaebols of asset sizes over 30 trillion was mainly due to Daewoo. Excluding Daewoo, the relevant figures drop to 30%. See Table 16 and Figures 2 and 3 for more details.

These figures imply that low-ranking chaebols were using inter-affiliate investment more actively, compared to the high-ranking chaebols, to save uncompetitive subsidiaries. In other words, many uncompetitive subsidiaries were, no doubt, bailed out or supported by the precious financial resources earned or raised by other affiliates.

c) Profitability Distributions of Inter-Affiliate Investment; Classified by Asset Size of Investment Recipient Companies

In this subsection, the chaebols' subsidiaries will be divided into 3 classes depending on the company's asset sizes; less than 50 billion won, 50 to 500 billion won, and over 500 billion won. The profitability distribution of inter-affiliate investment for each size of companies will be summarized in order to unravel the distinctive features in inter-affiliate investment depending on the sizes of the companies.

As shown in Table 17, most of the inter-affiliate investments were given to large companies whose asset sizes were over 500 billion won. They received 79% of the 32.6 trillion won total inter-affiliate investment during 1998 and 2001. However, medium-sized subsidiaries got 19% and small subsidiaries got only 2%.

Table 18 shows the earnings to sales ratio distributions for each class of company size. The proportion of the total sub-market level of earnings to sales ratios, in other words, less than 5% of sales, were high but consistent between 75% and 80% across all the different classes of company sizes. However, the proportion of negative earnings was markedly different for different company sizes. The proportion of inter-affiliate investment that the subsidiaries in deficits received was 46% for small companies (*i.e.*, asset sizes under 50 billion won), 54% for medium-sized companies (*i.e.*, asset sizes of 50 to 500 billion won), but 26% for larger companies

TABLE 17

INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: CLASSIFIED BY ASSET SIZE OF CORPORATIONS

(Unit: billion won, %)

	Asset Size of Groups			Total
	Less Than 50 billion won	50-100 billion won	More than 500 billion won	
Inter-Affiliate Investment Received	748.4 (2.3)	6,153.9 (18.9)	25,719.6 (78.8)	32,621.9 (100.0)

Note: The figures in the parenthesis are the weight in the total.

TABLE 18

THE PROFITABILITY DISTRIBUTION OF THE INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: CLASSIFIED BY ASSET SIZE OF CORPORATIONS

(Unit: billion won, %)

		Asset Size of Corporations			Total
		less than 50 billion won	50-500 billion won	more than 500 billion won	
	more than 0.25	57.6 (7.7)	158.0 (2.6)	855.6 (3.3)	1,071.3 (3.3)
	0.15~0.25	10.9 (1.5)	92.8 (1.5)	675.2 (2.6)	778.9 (2.4)
	0.05~0.15	120.5 (16.1)	957.4 (15.6)	3,858.2 (15.0)	4,936.1 (15.1)
	Subtotal	189.1 (25.3)	128.3 (19.6)	5,389.0 (21.0)	6,786.3 (20.8)
	0.00~0.05	214.3 (28.6)	1,622.5 (26.4)	13,717.6 (53.3)	15,554.4 (47.7)
	-0.05~0.00	49.5 (6.6)	394.4 (6.4)	2,101.4 (8.2)	2,545.3 (7.8)
	-0.15~-0.05	51.5 (6.9)	530.0 (8.6)	1,948.8 (7.6)	2,530.3 (7.8)
	-0.25~-0.15	16.4 (2.2)	583.7 (9.5)	244.9 (1.0)	845.1 (2.6)
	less than -0.25	227.6 (30.4)	1,815.1 (29.5)	2,317.8 (9.0)	4,360.4 (13.4)
	Subtotal	345.0 (46.1)	3,323.1 (54.0)	6,613.0 (25.7)	10,281.1 (31.5)
	Total	748.4 (100.0)	6,153.9 (100.0)	25,719.6 (100.0)	32,621.9 (100.0)

Notes: 1) Figures in the table do not include equity investment to non-affiliated subsidiaries.

2) The figures in the parenthesis are the weight in to the total.

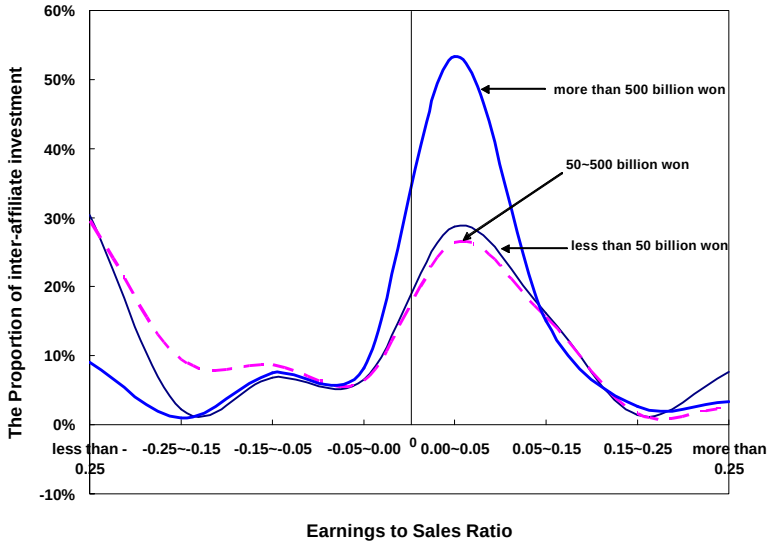


FIGURE 4

THE PROFITABILITY DISTRIBUTION OF THE INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: CLASSIFIED BY ASSET SIZE OF CORPORATIONS

(*i.e.*, asset sizes over 500 billion won).

This may imply that smaller and medium-sized subsidiaries, especially the medium-sized ones, were the main recipients of the bailouts or support via inter-affiliate financial investments in the chaebol groups. This may be due to the fact that smaller and medium-sized subsidiaries were easier to bail out or support. However, one should not underestimate the financial aid given to large subsidiaries in financial difficulties. The total amount of financial aid given to larger subsidiaries by other member companies in the form of inter-affiliate investments reached 6.6 trillion won during the 4-year period from 1998 to 2001. See Table 18 and Figure 4 for more details.

d) Profitability Distributions of Inter-Affiliate Investment; Bankrupt *vs.* Surviving Chaebols

In this subsection, the earnings distributions of inter-affiliate

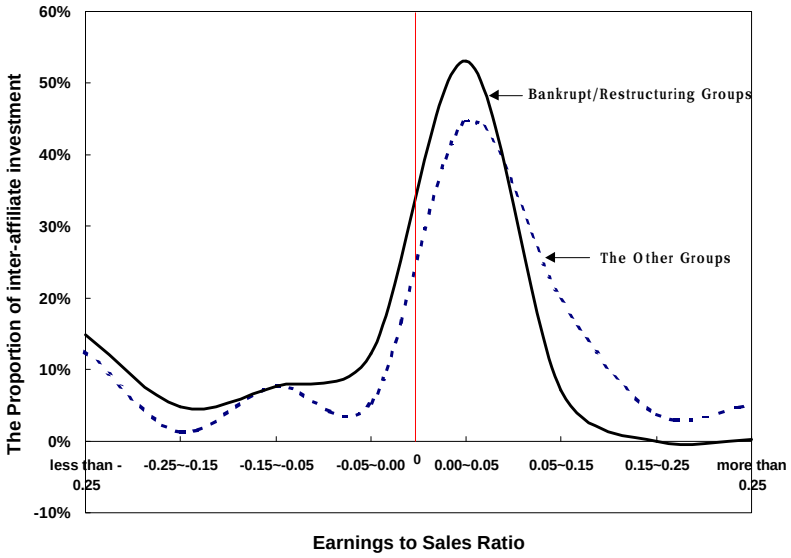


FIGURE 5

THE PROFITABILITY DISTRIBUTION OF INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: BANKRUPT *VS.* SURVIVING GROUPS

investments between bankrupt/restructuring chaebols and normal/surviving chaebols will be compared. One can observe that these two groups of chaebols had shown significant divergence in their distribution of the earnings to the subsidiaries, which received inter-affiliate investment. While the bankrupt/restructuring chaebols' percentage distribution of inter-affiliate investment were 5.5% for those with earnings to sales ratio over 5%, 28.1% for those with earnings to sales ratio of 0% to 5%, and 66.4% for those with earnings to sales ratio under 0%. The percentages for normal/surviving chaebols were 28.4%, 44.6% and 27.0%, respectively.

There is no doubt that even normal/surviving chaebols used a substantial amount of capital during this period – roughly 5.6 trillion won for earnings below 0% – in supporting their subsidiaries which were in deficits and hence probably in financial distress. But the proportion given to the subsidiaries in deficits by the normal/surviving chabols, of about 1/4, was small compared to

TABLE 19

THE PROFITABILITY DISTRIBUTION OF INTER-AFFILIATE EQUITY INVESTMENT RECEIVED DURING 1998-2001: BANKRUPT *VS.* SURVIVING GROUPS

(Unit: billion won, %)

Earnings to Sales Ratio	Bankrupt/Restructuring Groups[1]	The Other Groups[2]	Total
more than 0.25	31.2 (0.3)	1,040.1 (5.0)	1,071.3 (3.3)
0.15~0.25	-	778.9 (3.7)	778.9 (2.4)
0.05~0.15	835.7 (7.1)	4,100.5 (19.7)	4,936.1 (15.1)
Subtotal	866.9 (7.4)	5,919.5 (28.4)	6,786.3 (20.8)
(Daewoo-adjusted)	648.4 (5.5)		
0.00~0.05	6,260.5 (53.1)	9,294.0 (44.6)	15,554.4 (47.7)
(Daewoo-adjusted)	3,308.0 (28.1)		
-0.05~0.00	1,449.9 (12.3)	1,095.4 (5.3)	2,545.3 (7.8)
-0.15~-0.05	898.6 (7.6)	1,631.7 (7.8)	2,530.3 (7.8)
-0.25~-0.15	560.8 (4.8)	284.3 (1.4)	845.1 (2.6)
less than -0.25	1,756.3 (14.9)	2,604.2 (12.5)	4,360.4 (13.4)
Subtotal	4,665.6 (39.6)	5,615.5 (27.0)	10,281.1 (31.5)
(Daewoo-adjusted)	7,836.6 (66.4)		
Total	11,792.9 (100.0)	20,829.0 (100.0)	32,621.9 (100.0)

Notes: 1) 14 groups including Kangwon Ind., Kerpuyoung, Kohap Corp., Newcore, Daewoo, Dong-A, Saehan Ind. Inc., Shinho, Ssang Yong, Anam, Jinro, Halla, Haitai, and Hyundai (Hyundai is classified as the bankrupt/restructuring groups because of its financial difficulties.)

2) 22 groups including Kumho, Daelim, Dae Sang, Daewoo Electronics, Dong Kuk Steel Mill, Dongbu Corp., Dong Yang, Doosan, Lotte, Samsung, Shinsegae, SK, LG, Young Poong Corp., Cheil Jedang Corp., Kolon Ind. Inc., Hansol, Han Jin, Han Wha Corp., Hyundai Development Industry, Hyundai Oil, and Hyosung Corp., etc.

3) Figures in the table do not include equity investment to non-affiliated subsidiaries.

4) The figures in the parenthesis are the weight in the total.

that of the bankrupt/restructuring chaebols. The bankrupt/restructuring chaebols spent about 2/3 of total inter-affiliate investment on the subsidiaries in deficit (See Table 19 for details).

One cannot tell whether this irrational behavior of unprofitable inter-affiliate investment caused the financial difficulties for the bankrupt/restructuring chaebols, or the financial difficulties induced this reckless inter-affiliate investment as desperate moves to save the groups already in financial risks. It is quite clear, however, that the financial predicament could have been aggravated by the reckless inter-affiliate investment, and that the groups couldn't resolve these deepening financial difficulties on their own.

VI. Inter-Affiliate Equity Investment and Real Investment

A. Data and Method

The relationship between equity investment and real investment has been one of the most fiercely debated issues between the opponents and proponents of 'the restrictions on inter-affiliate equity investment' clauses of the Monopoly Regulation and Fair Trade Act. The opponents of the restrictions argued that the physical investments were weakened by the restrictions and that the restrictions should be abolished or, at least, loosened to boost real investments. If there is a strong positive relationship between equity investments and real investments, the argument of the opponents of the restrictions is plausible and it will be desirable to loosen the restrictions in order to boost the economy. However, if one cannot find any strong relationship, it will be unreasonable to assume that the equity investments are used to finance other affiliate's real investments. In this section of the report, the correlation coefficients of various equity investment variables and real investment variables will be investigated.

In addition, a detailed investigation will be performed to examine whether there have been differences between chaebol affiliated companies and stand-alone companies in relation to real investments, especially focusing on the period after the abolition of 'the restrictions on the gross amount of investments' in February, 1998. As mentioned previously, the inter-affiliate equity investments increased rapidly after the abolition of restrictions. So, if any

distinct differences are found between the real investment behavior of chaebol-affiliated companies and the stand-alone companies after the abolition of the restrictions, one can infer a positive relationship between equity investments and real investments in the chaebols.

In this analysis, the financial data provided by the Korea Information Service were used. The companies that were taken into account were those listed on the stock markets, companies registered with the Financial Supervisory Service, and companies audited by outside accounting firms. Therefore, a number of small chaebol affiliated firms were excluded, as they did not qualify as a part of the data set. Only non-financial firms will be investigated and the growth in tangible assets will be used as a proxy for real investments. When we examine the relationship between equity investments and real investments, only the companies with positive increase in invested capital will be investigated. In addition, for the calculation of the industry average investment rate, only the companies with a growth rate of tangible assets from −100% to 300% and companies with increase-in-tangible assets to sales ratio from −100% to 100% will be included in order that the results will not be influenced by extreme values.

In the following analysis, the growth rate of tangible assets is the increase in tangible assets divided by last year's tangible assets. Increase-in-tangible assets to sales ratio is the increase in tangible assets divided by sales. Excess growth rate of tangible assets is the difference between the company's growth rate of tangible assets and the industry's average growth rate of tangible assets. Excess increase-in-tangible assets to sales ratio is also the deviation from the industry average increase in tangible assets to sales ratio.

B. Relationship Between Inter-Affiliate Equity Investments and Real Investments

a) Correlation Analysis

Table 20 reports the correlation coefficients between equity investments and real investments. In addition, the medians of correlation coefficients of groups are also reported. As one can see from the table, most coefficients are positive. However, the values do not deviate significantly from 0. Therefore, it is hard to argue that there is a strong positive correlation between inter-affiliate

TABLE 20

KEY CORRELATION COEFFICIENTS OF EQUITY INVESTMENT AND REAL INVESTMENT

		1998	1999	2000	2001	Average
Growth Rate of Tangible Assets — Growth Rate of Inter-affiliate Investment Received	Mean	0.036	0.112	0.145	-0.008	0.071
	Median	-0.020	0.085	0.109	-0.079	0.024
	Standard deviation	0.431	0.3183	0.473	0.362	0.396
	Number of Groups	17	20	18	18	–
Increase-in-Tangible-Assets to Sales Ratio — Growth Rate of IInter-affiliate Investment Received	Mean	0.034	0.049	0.196	0.012	0.073
	Median	-0.138	-0.113	0.190	0.014	-0.012
	Standard deviation	0.469	0.445	0.402	0.455	0.443
	Number of Groups	17	20	18	17	–
Increase-in-Tangible-Assets — Inter-affiliate Investment Received	Mean	0.152	0.205	0.148	0.113	0.154
	Median	0.047	0.112	0.064	0.081	0.076
	Standard deviation	0.558	0.406	0.543	0.541	0.512
	Number of Groups	17	21	18	18	–
Excess Growth Rate of Tangible Assets — Growth Rate of Inter-affiliate Investment Received	Mean	0.020	0.097	0.177	0.050	0.086
	Median	-0.014	0.041	0.138	0.014	0.045
	Standard deviation	0.441	0.3246	0.468	0.322	0.389
	Number of Groups	17	20	18	18	–
Excess Increase-in-Tangible-Assets to Sales Ratio — Growth Rate of Inter-affiliate Investment Received	Mean	-0.012	-0.032	0.198	0.149	0.075
	Median	-0.118	-0.122	0.236	0.160	0.039
	Standard deviation	0.462	0.441	0.393	0.483	0.444
	Number of Groups	17	20	18	18	–

Note: We exclude groups that have companies less than 2 in the sample.

equity investment and real investment.

The average correlation coefficient between growth rate of tangible assets and growth rate of invested money was 0.071 a value very close to 0, during 1998-2001. Similarly, other correlation coefficients had values ranging from 0.07-0.09, indicating the lack of a strong positive correlation. The average correlation coefficients of increase in tangible assets and invested capital during 1998-2001 was 0.154. However, the average of each year's medians was 0.076, once again, very close to 0.

Therefore, it is hard to describe that there has been a strong positive relationship between equity investments and real investments. It could be inferred that the increased inter-affiliate equity investments were not to be used for real investment but for other purposes such as repayment of previous debt.

b) Comparison Between Chaebol and Non-Chaebol

In this section, the difference between chaebol affiliated companies and stand-alone companies in relation to real investment will be investigated especially focusing on the period after the abolition of 'the restrictions on the gross amount of investments' in February 1998. The growth rate of tangible assets of these two different groups during 1997-2001 will be compared in detail (See Table 21). The growth rates of tangible assets of chaebol-affiliated companies were higher than those of stand-alone companies until 1999 (1998 in the accounting year). However, in 2000 and 2001, the period when the restrictions on the gross amount of investments were suspended, the growth rates of tangible assets of stand-alone companies were higher than that of chaebol affiliated companies. Similar results were also found in the comparison of increase-in-tangible assets to sales ratios (See Table 22).

The excess growth rate of tangible assets and excess increase-in-tangible assets to sales ratio for the chaebol affiliated companies during 1997-2001 were also calculated. It was found that during 2000 and 2001, the chaebols had a low investment performance.

Table 23 reports the trend of excess growth rate of tangible assets of chaebol affiliated companies. As previously mentioned, the excess values are the deviation from the industrial average for each company in each year. The reason for using these measures is to take into account the state of the industry in each specific year.

TABLE 21

COMPARISON OF GROWTH IN TANGIBLE ASSETS OF CHAEBOL-AFFILIATE COMPANIES AND STAND-ALONE COMPANIES

	Mean (Unit: %)		Method (The figures in the parenthesis are P-value)	Number of Samples	
	Chaebol	Non-Chaebol	*t*-test	Chaebol	Non-Chaebol
1997	31.150	16.113	5.693 (0.000)	348	4630
1998	20.720	12.701	3.276 (0.001)	354	4884
1999	17.914	12.765	1.945 (0.051)	383	5659
2000	10.856	17.341	2.325 (0.020)	387	5642
2001	10.701	17.419	2.412 (0.015)	402	6086
average	17.897	15.342	2.123 (0.033)	1874	26901

Note: We only include companies with investment rate from -100% to 300%.

TABLE 22

COMPARISON OF GROWTH IN TANGIBLE ASSETS TO SALES RATIO OF CHAEBOL-AFFILIATE COMPANIES AND STAND-ALONE COMPANIES

	Mean (Unit: %)		Method (The figures in the parenthesis are P-value)	Number of Samples	
	Chaebol	Non-Chaebol	*t*-test	Chaebol	Non-Chaebol
1997	8.031	3.298	5.815 (0.000)	341	4586
1998	6.907	2.422	5.747 (0.000)	350	4824
1999	6.236	2.316	4.210 (0.000)	360	5488
2000	0.661	3.300	2.995 (0.002)	364	5581
2001	0.569	2.699	2.447 (0.014)	382	6048
1997-2001	4.373	2.799	4.070 (0.000)	1797	26527

Note: We only include companies with investment-to-sales ratio from -100% to 100%.

TABLE 23

TREND OF EXCESS GROWTH RATE OF TANGIBLE ASSETS IN CHAEBOLS

	1997	1998	1999	2000	2001
Excess Growth rate of Tangible Assets	0.161	0.066	0.026	-0.062	-0.006
Excess Growth in Tangible Assets to Sales Ratio	0.046	0.060	0.037	-0.029	-0.012

As one can see in table 23, there were positive excess values for chaebol affiliated companies until 1999 and negative excess values in 2000 and 2001.

Summarizing the relationship between inter-affiliated equity investment and real investment, there is not yet any convincing evidence indicating a positive relationship. Considering the massive increase in inter-affiliated equity investment after the abolition of 'the restrictions on the gross amount of investments,' one can infer that the increased equity investments were used for other purposes such as repayment of previous debts. More research is needed to see the exact usages of inter-affiliated equity investment. We do not investigate those here.

VII. Summary and Conclusion

In this paper, we briefly review the theories of internal capital markets and test the efficiency of internal capital allocation in Korean chaebols. We focus on the chaebols' inter-affiliate equity investments as an example of internal capital allocation. Moreover we investigate the relationship between equity investment and real investment. We examined both sides of investment, the investing side as well as the recipient side, in detail.

We found several interesting features of inter-affiliate equity investments during 1997-2001.

On the investing side, it was found that a sparse number of the large leading companies in the group were the major source of inter-affiliate equity investments, and that their shares in the inter-affiliate investment have increased since the restrictions were temporally abolished in 1998. Moreover, the inter-affiliate equity investment realized in related industries covered only 23 percent of the total intra-group equity investment in the case of the top 30 chaebols during 1997-2001, and this ratio has not changed significantly even after the financial crisis. Therefore, it can be argued that there weren't any significant changes in the chaebols' pursuit of unrelated diversification.

On the investment recipient side, it was found that the chaebols' inter-affiliate equity investments have not been focused on a small number of core strategic companies or industries. As the results from the correlation and regression analyses show, there weren't

any sound economic rationality, such as profitability and growth potential, for equity investments to be made in the affiliated companies. The equity investments in affiliated companies show negative (though, statistically insignificant) or even an absence of corresponding correlations with the profitability and growth potential of those companies. Only the variables related to the size of the affiliated companies have reasonable statistical significance in determining the volume of the capital invested.

Investigating the profitability distribution of the total inter-affiliate equity investments, which amounted to 32.6 trillion won during 1998-2001, it was found that 41 percent of the total amount injected, 13.5 trillion won, was given to those affiliates whose earnings to sales ratios were negative. Moreover, 13.4 percent of the total amount injected, 4.4 trillion won, was invested in affiliates whose earnings to sales ratio recorded below -25 percent. This shows that a considerable amount of equity investments have flown into affiliates that did not make net profits. Among the 30 largest chaebol groups, the smallest groups with assets less than 10 trillion won, were the worst investors, pouring around 60 percent of their total equity investments into affiliates making negative profit. By dividing the chaebols into two; the bankrupt/restructuring group and the remaining group, it was found that the bankrupt/restructuring group injected more into non-profitable affiliates.

A further investigation was performed to examine the relationship between inter-affiliate equity investment and real investments in the chaebols. According to the correlation analysis, no strong positive relationship between equity investment and real investment was found. Comparing the chaebol-affiliate companies and stand-alone companies in relation to real investment, it was found that the chaebols had lower real investment rates than stand-alone companies during the periods of massive increase in chaebols' inter-affiliate equity investment.

So it can be concluded that the chaebols have continued to practice fleet-type management style rather than focus on a few strategic industries. In addition, the role of a few leading companies as a source of capital injection increased after the temporal abolition of the restrictions on inter-affiliate equity investment. One of the major themes of corporate reforms in Korea, which is to build core competence by focusing on a small number of strategically chosen industries, did not improve chaebols' behavior

significantly even after the financial crisis and the subsequent restructuring. So we can conclude that the internal capital allocation in chaebol groups have not been efficient. Furthermore, it is difficult to justify the argument that loosening the restrictions on inter-affiliate equity could increase real investment.

There are some limitations in this paper. The main concern of this paper is to examine whether commonly used economic rationale such as profitability and growth potential are key determining factors in the chaebol's investment making process. Hence, we have not attempted to find the exact determinants of inter-affiliate equity investment. There will be some economic rationales for inter-affiliate equity investment; such as reputation, private benefits of managing families, or economic power. Further research will be needed to expose these determinants.

As the period that is covered in the report was a very turbulent time for the Korean economy, it will take time to observe the exact financial effects of the inter-affiliate equity investments in 'normal' conditions. Moreover, we do not know whether the intra-group allocation of capital in the rapid growth period had also been inefficient. Therefore, it would be wise to extend the time period to control the short-term economic fluctuations in future research.

Appendix

INDUSTRIAL CLASSIFICATION

Code	Name of Items
1	Agriculture, Forestry, Fishing
2	Mining and Quarrying
15	Manufacture of Food Products and Beverages
16	Manufacture of Tobacco Products
17	Manufacture of Textiles, Except Sewn Wearing apparel
18	Manufacture of Sewn Wearing Apparel and Fur Articles
19	Tanning and Dressing of Leather, Manufacture of Luggage and Footwear
20	Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials
21	Manufacture of Pulp, Paper and Paper Products
22	Publishing, Printing and Reproduction of Recorded Media
23	Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel
24	Manufacture of Chemicals and Chemical Products
25	Manufacture of Rubber and Plastic Products
26	Manufacture of Other Non-metallic Mineral Products
27	Manufacture of Basic Metals
28	Manufacture of Fabricated Metal Products, Except Machinery and Furniture
29	Manufacture of Other Machinery and Equipment
30	Manufacture of Computers and Office Machinery
31	Manufacture of Electrical Machinery and Apparatus n.e.c.
32	Manufacture of Electronic Components, Radio, Television and Communication Equipment and Apparatuses
33	Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks
34	Manufacture of Motor Vehicles, Trailers and Semi-trailers
35	Manufacture of Other Transport Equipment
36	Manufacture of Furniture; Manufacturing of Articles n.e.c.
37	Recycling
40	Electricity, Gas, Steam and Hot Water Supply

(Table Continued)

Code	Name of Items
45	Construction
50	Wholesale and Retail Trade, Repair Services of Personal and Household Goods
55	Hotels and Restaurants
60	Land Transport ; Transport Via Pipelines
	Water Transport
	Supporting and Auxiliary Transport Activities; Activities of Travel Agencies
62	Air Transport
64	Post and Telecommunications
65	Financial Institutions and insurance
70	Real Estate and Renting and Leasing
75	Public Administration and Defense and Compulsory Social Security
	Education
	Health and Social Work
	Other Community, Repair and Personal Service Activities
	Private Households With Employed Persons
	Extra-Territorial Organizations and Bodies

(*Received 29 August 2002; Revised 7 February 2003*)

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