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IS THE INVESTMENT OF KOREAN CONGLOMERATES INEFFICIENT?

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Inefficient major conglomerates have been partly blamed for the recent economic crisis in Korea. Although theoretically conglomerates may or may not be efficient, it is popular to attribute many economic illnesses to major conglomerates in Korea. This paper examines if Korean major conglomerates are indeed inefficient by examining their investments. Following Scharfstein (1998), this paper compares major conglomerates with the other firms. Specifically, if major conglomerates are indeed inefficient, major conglomerates invest less in productive opportunities (high Tobin's q) and more in less productive opportunities (low Tobin's q) than the other firms. This paper finds that major conglomerates invest inefficiently and therefore concludes that the recent reforms of major conglomerates in Korea are justified.

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1. INTRODUCTION

Korea has recently begun to overhaul major conglomerates since they have been blamed for many of the economic illnesses in Korea. Theoretically, conglomerates may or may not be efficient. But Korea claims that they are inefficient by providing only anecdotal evidence, and proceeds as if simply reforming major conglomerates will solve Korea's current economic problems. This paper examines if major conglomerates are indeed inefficient by specifically

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examining their investment efficiency.

In certain circumstances, conglomerates can be efficient. First, in underdeveloped markets and under uncertainty of market information, firms may find it less costly to deal with affiliates within their own conglomerate than outside firms. Second, if there exist economies of scope in producing numerous different goods, firms may find it economical to produce all of them within a conglomerate. Third, because of poor financial markets in Korea, financial institutions do not have the ability to screen good and bad investments. Therefore, no matter how good a project may be, a firm may not be able to obtain outside funding unless it can provide some form of guarantee. Conglomerates, on the other hand, can fund these promising projects internally, and can achieve greater efficiency.

On the other hand, conglomerates can certainly cause inefficiency. First, major shareholders of conglomerates often behave as if they own the conglomerates, and pursue the interests of conglomerates as a whole rather than each individual affiliate. Hence, major shareholders often subsidize unprofitable affiliates using funds from profitable affiliates. Namely, profitable investments may get reduced while unprofitable investments may get boosted, which will lead to a less efficient conglomerate as a whole. Samsung Electronics, for example, wasted valuable earnings from semiconductors by funding Samsung Motors, which was later sold off to Renault at a loss. Second, major shareholders may pursue their own interests over the interests of conglomerates. For example, major shareholders in Korea often transferred profits from the affiliate where they have smaller equity shares to the affiliate where they have larger equity shares. Third, historically the government has often implicitly or explicitly guaranteed conglomerates since they had great impact on Korean economy. This guarantee has caused moral hazard problems. Conglomerates often invested in risky inefficient projects and entered new markets because the government often bailed them out when their projects failed. When these risky projects failed and when their losses became too big to be bailed out, conglomerates became bankrupt as Hanbo Steel. Fourth, conglomerates have received the most favorable treatment from Korean financial institutions, and gained easy access to funds. Easy funds have often led to excessive investments which tended to be inefficient. Fifth, Korean corporate culture dictates that managers show absolute dedication to major shareholders of conglomerates rather than their own affiliated firm since major shareholders of conglomerates, not the affiliated firm, determine their promotion. Therefore, managers often sacrifice the interests of their own affiliated firm for the interest of conglomerates or major shareholders.

Recent reforms of conglomerates in Korea have mostly ignored the above advantages and disadvantages of conglomerates, and usually assumed that conglomerates are evil. This paper attempts to provide empirical evidence that major conglomerates are inefficient by examining their investment efficiency.

This paper follows Scharfstein (1998) who compares diversified conglomerates with stand-alone industry peers. Comparing major conglomerates with the other firms, this paper finds that major conglomerates invest too little in high q

industries and too much in low q industries as in Scharfstein. Namely, major conglomerates do a poor job of allocating capital across affiliated firms. Unlike Scharfstein, however, this paper finds that larger, not smaller, affiliates of conglomerates invest more inefficiently. Furthermore, this paper finds that conglomerates invest less efficiently when the equity stakes by major shareholders are lower. Hence, this paper provides empirical support for conglomerate reform in Korea.

Section 2 describes the data set. Section 3 presents empirical results. Finally, Section 4 concludes the paper.

2. DATA

This paper compares major conglomerates with the rest of the firms, with stand-alone firms, or with minor conglomerates. Major conglomerates are defined as the 30 largest conglomerates because conglomerates in Korea often refer to the 30 largest conglomerates and because they are treated differently by the government. For example, Korea Fair Trade Commission imposes many restrictions on the 30 largest conglomerates such as restrictions on affiliate transactions, share ownership, debt guarantees, and entry into new businesses. This paper classifies the affiliates of the 30 largest conglomerates, as designated in April of each year by Korea Fair Trade Commission.[1] Stand-alone firms are defined as firms without any affiliate firms, and minor conglomerates are defined as firms with affiliate firms which are not included in the 30 largest conglomerates. The rest of the firms include stand-alone firms and minor conglomerates.

This paper uses the unbalanced panel data set from the Korea Information Service Financial Analysis System (KIS-FAS), which contains data on financial statements. We use non-financial firms that balanced accounts in December for the period of 1996 through 1999 and were listed on the Korea Stock Exchange. Although there are 557 firms in the sample, some firms are missing data for some periods. Hence, the data set has 2004 observations: 502 observations for the 30 largest conglomerates, and 1502 observations for the rest of the firms, out of which 251 observations are for stand-alone firms and 1251 observations are for minor conglomerates.

Firms are classified according to the two-digit level of Korea Standard Industry Classification, which have thirty-seven industries.[2] When a two-digit level industry has less than two samples in major conglomerates affiliates, in the rest of the firms, in stand-alone firms, or in minor conglomerates' the industry is omitted

[1] The list of the 30 largest conglomerates, the list of their affiliated firms and their total sales were obtained from the web site of Korea Fair Trade Commission, www.ftc.go.kr.

[2] Although Scharfstein (1998) argues that there can be horizontal as well as vertical connections between segments in different 2-digit Standard Industrial Classification code industries, this paper addresses the efficiency of conglomerates and therefore the connections would not present any problems in this paper.

from the regression.

Investment is computed as a change of fixed assets plus depreciation.[3] This paper uses *cash flows from operating activities* for cash flow.[4] Investment and cash flow are normalized by sales in previous years since sales are more difficult to manipulate than assets.

Tobin's q is a standard investment model in macroeconomics, as in Romer (2001). Assume a representative firm maximizes the present discount value of the firm's profits with costs of adjusting its capital stocks. Then we can show that Tobin's q summarizes all information about the future that is relevant to a firm's investment decision. Namely, Tobin's q shows how an additional dollar of capital affects the present value of profits. Tobin's q can be computed as the ratio of the market value to the replacement value of the capital. We calculate a variant of Tobin's q as the market value[5] of the firm divided by the book value[6] of its assets at the end of the previous year, following Scharfstein (1998) and Perfect-Wiles (1994). They show that adjustments for estimates of replacing cost of fixed assets and taxes do not make much difference. The market value of the firm is computed as the sum of the market value of equity plus the book value of total liabilities.[7]

Although Tobin's q is widely used as an indicator of future profitability, we need to be aware of its limitations in practice. First, Tobin's q defined as the above is average q rather than marginal q, which is a true indicator of returns to additional capital. Since marginal q is difficult to measure, this paper simply uses average q. Second, it is certainly possible for a high Tobin's q firm to invest in an inefficient project. But investments by higher Tobin's q firms are *on average* more productive than investments by lower Tobin's q firms, assuming all firms have an identical probability of having poor judgments. Third, the stock market must be efficient for it to serve as an indicator of true firm

[3] Using tangible assets plus intangible assets instead of fixed assets does not make a qualitative difference.

[4] According to Korean Financial Accounting Standards, cash flow is referred to as *cash flow from operating activities*, *cash flow from investing activities*, and *cash flow from financing activities*. *Cash flow from operating activities* is defined as net income+expenses without cash outflows - income without cash inflows ± changes in assets and liabilities from operating activities. This paper reports the case with *cash flow from operating activities* since it captures the performance of the firm better than *cash flow from investing activities* or *financing activities*. Using the sum of all cash flows, however, does not make a qualitative difference in this paper.

[5] The data on market value was obtained from the web site of Korea Stock Exchange, www.kse.or.kr.

[6] Calculating the correct replacement values would require much more data than this paper has and would be subject to more subjective judgment errors, and hence this paper simply uses the book value instead.

[7] Korean bond markets are thinly traded. Namely, once bonds are issued, they are usually held until they mature. Therefore, it would be difficult to estimate market values for bonds, and this paper simply uses book values instead.

value. Yet, there are many who doubt the efficiency of the Korean stock market. In spite of all these short-comings, this paper uses Tobin's q since there are no sound alternative variables which measure the profitability of investments.

To measure the value of investing in an industry, this paper calculates the median end-of-the-previous-year q of all firms for two-digit level industries. This paper computes median industry q for all firms instead of only stand-alone firms as in Scharfstein (1998). Scharfstein (1998) does not have data on market values for segments, and therefore computes median industry q only for stand-alone firms. In other words, Scharfstein has to infer the value of investing for diversified segments from the value of investing for stand-alone firms since there exist no market values for diversified segments. Since this paper examines firm-level investment rather than segment-level investment, this paper can use data on market values for conglomerates' affiliated firms, and therefore does not need to infer the value of investing for major conglomerates from the other firms.

Table 1 presents basic statistics. Major conglomerates' investment/sales ratio is substantially higher than that of the other firms, while major conglomerates' q is lower than that of the other firms. Table 1 already indicates that major conglomerates' are investing substantially more than the other firms even if major conglomerates' q is lower.

3. EMPIRIRICAL ANALYSIS

Scharfstein and Stein (2000) present a model where major conglomerates will practice a kind of "socialism" in capital budgeting: they underinvest in divisions with relatively good investment opportunities and overinvest in divisions with relatively poor investment opportunities. Specifically, the marginal return to productive activity is lower in divisions with poor investment opportunities, which lead their managers to devote more time trying to capture corporate rents and perks for themselves. Headquarters try to induce these managers not to rent-seek by giving them an excessive capital budget.

Lamont (1997) shows that the oil shock in 1986 led diversified oil companies to cut investment in their non-oil divisions. Lamont shows that there exist internal subsidies in these oil conglomerates, but does not tell us whether these internal subsidies are efficient or not. If the divisions were investing inefficiently, the oil shocks would have reduced inefficient investments, which would have enhanced their efficiency. If the divisions were investing efficiently, on the other hand, the oil shocks would have reduced efficient investments, which would have reduced their efficiency.

Shin and Stulz (1998) show that investments of smaller segments are positively related to cash flow of other segments, while those of larger segments are not. This is another evidence of internal subsidization within conglomerates. They also point out that the internal subsidization may be inefficient since

reductions in the cash flow of other segments do not reduce investments of lower q segments more than those of high q affiliates. Berger and Ofek (1995) show that over-investments in low q segments lead to higher conglomerate discounts.

Examining Korean conglomerates, Shin and Park (1999) argue that there is an internal market in Korean conglomerates, which reduces the financing constraints of the conglomerates. But they argue that the internal market does not improve the allocation efficiency of scarce funds in Korea. They show that conglomerates invest more than the industry average regardless of their investment opportunities compared to non-conglomerate firms in the same industry.

Han (1999) shows that the five largest conglomerates invest more when the investment risks are higher due to the moral hazard problem of "too big to fail" policy. Since Korean government has often rescued failed investment projects in the past, conglomerates can invest in high-risk projects without worrying too much about losing money.

Joh (2000) shows that firms in conglomerates have lower rates of return than independent firms by examining profitability/asset ratios, and argues that major shareholders have pursued their own interests over the interests of the firm. Joh, however, ignores future profitability of investments by examining current profitability only.

Lee, Lee and Yoo (2001) find that the five largest conglomerates invest efficiently while the remaining 25 conglomerates in the 30 largest conglomerates invest inefficiently, compared to the rest of the firms.[8]

Scharfstein (1998) shows 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. He shows that this sort of "socialism" is more pronounced when divisions are smaller and when management has smaller equity stakes.

Following Scharfstein (1998), this paper examines if investments of major conglomerates are inefficient by comparing with those of the other firms. If major conglomerates were indeed inefficient, major conglomerates would invest less in good investment opportunities (high q) and more in poor investment opportunities (low q) than the other firms. This paper will extend Shin and Park (1999) by showing that conglomerates invest more in poor investment opportunities, Hahn (1999) by directly examining the efficiency of investment, and Joh (2000) by considering future as well as current profitability of investment.

As discussed in Shin and Park (1999), analyzing Korean conglomerates has several advantages over analyzing segment-level data in the US or *keiretsu* in

[8] My paper and Lee, Lee and Yoo (2001) were simultaneously presented at Korea Money and Finance Association Meeting in June 2001. Footnote 8 notes the difference between this paper and their paper.

Japan. First, segment-level data present problems in that firms reorganize their segments over time and allocate overhead costs and assets arbitrarily among segments and inconsistently over the years. On the other hand, Korean conglomerates are composed of individual public and private firms, and therefore their accounting information is in principle less arbitrary. Second, Tobin's q cannot be computed using segment-level data, while it can be computed using conglomerates' affiliates data. Third, Korean conglomerates, *chaebol*, are more closely knitted than Japanese conglomerates, *keiretsu*, which Hoshi, Kashyap and Scharfstein (1991) analyzed. Firms in a *keiretsu* group act more independently than firms in a *chaebol* group. *Keiretsu* just coordinates the activities of member firms while *chaebol*s control actual management. Members of *keiretsu* can switch groups while members of *chaebol* cannot. Therefore, internal market will be more important for *chaebol* than for *keiretsu*.

Table 2 presents the following regression:

$$(I/S)^{c}-(I/S)^{MO}= \beta_0+ \beta_1 \text{ Industry } q+ \varepsilon \quad (1)$$

where $(I/S)^{c}$ = Investment/sales for major conglomerates,

$(I/S)^{MO}$ = median Investment/sales for the other firms in the same two-digit industry, and

Industry q = median q for all firms in the industry in December of the previous year.[9]

All regressions include year dummies and the individual effects are estimated using random effects estimators. This paper drops any observations for which the residual is larger than three standard errors.

Table 2 shows that β_1 is significantly negative, which implies that major conglomerates invest more in low industry q investment and less in high industry q investment than the other firms. On average, major conglomerates invest 2.8% more than the rest of the firms, 6.3% more than stand-alone firms, and 2.9% more than minor conglomerates. For example, Table 2 implies that major conglomerates with one standard deviation above the mean industry q -- i.e. a q of 1.108 as compared to 0.980 -- invest 0.083 less than the average of the rest of the firms. On the other hand, major conglomerates with one standard deviation below the mean industry q -- i.e. a q of 0.851 as compared to 0.980 -- invest 0.14 more than the average of the rest of the firms. Given that the average investment/sales for the rest of the firms is 13.6%, this indicates that major conglomerates in one standard deviation higher q invest 61.3% less than the rest of the firms while major conglomerates in one standard deviation lower

[9] Lee, Lee and Yoo (2001) use the difference between q for conglomerates and q for the rest of the firms instead of Industry q, and find similar results.

industry q invest 103.1% more than the rest of the firms.

The first objection to the above interpretation can be that major conglomerates in low industry q industries have better investment prospects than the median other firms in the industry, and hence major conglomerates invest more in low industry q industries than the other firms. In order to capture the relative performance of major conglomerates and the other firms, this paper includes cash flow differences between major conglomerates and the median of the other firms. This regression can also address different abilities to raise funds for investment if financial markets are imperfect. Table 2 shows that adding cash flow differences does not make a qualitative difference in the above result.[10]

The second objection can be that the negative coefficient is spurious. Since there exist more other firms than major conglomerates, industry median q's are more likely to be drawn from the other firms. Hence, the median investment/sales ratios for the other firms are likely to be more correlated with industry median q's than a random firm, which may cause β_1 in regression (1) to be negative. To address this issue, Table 3 regresses the following regression, throwing out the firm with median Industry q:

$$(I/S)^c = \beta_0 + \beta_1 \text{ Industry } q + \varepsilon^c,$$

$$(I/S)^O = \beta_2 + \beta_3 \text{ Industry } q + \varepsilon^O,$$

where $(I/S)^O$ is the investment/sales ratios for the other firms. If β_1 is less than β_3, investment is sensitive to industry q more for the other firms than for major conglomerates, and therefore it implies that major conglomerates invest too much in low q industries and too little in high q industries. Table 3 shows that β_1 is insignificantly different from 0 and β_3 is significantly positive, which are significantly different from each other. Therefore, Table 3 suggests that the inefficient investment by major conglomerates is not spurious.

Table 3 also includes cash flow for each firm in the regression in order to control for firm specific differences in investment opportunities and differences in resources available for investment. They do not make much qualitative difference in the above result.

Table 4 examines if socialism depends on the relative size of the affiliates within the conglomerate. Larger affiliates may have more power within the conglomerate and therefore more influence on how to allocate resources within the conglomerate. In this case, larger affiliates would invest more in low q industries. On the other hand, there is less resource to subsidize larger affiliates

[10] In aggregate data, Barro (1990) shows that stock price outperforms Tobin's q in explaining the growth rate of aggregate investment. In a panel data, individual stock price is on a different scale and hence high individual stock price does not imply high individual investment across firms. Hence, using stock price without some scaling, such as dividing by the book value of its assets, would not be appropriate in this paper.

since other affiliates have fewer resources available. In this case, larger affiliates would invest less in low q industries. Table 4 includes the affiliates sales share in the conglomerates' total sales and its interaction with industry q. Table 4 shows that the coefficient on the interaction term is negative (significantly negative only when comparing with the rest of the firms or minor conglomerates). In other words, as the share of the affiliate's sales increases, its investment becomes more negatively dependent on industry q. Also, the coefficient on the sales share is positive (significantly positive only when comparing with the rest of the firms or minor conglomerates), which suggests that larger affiliates invest more. Namely, contrary to what Scharfstein (1998) finds, socialism prevails in larger affiliates: larger affiliates invest less efficiently.

Table 4 also includes cash flow differences and their interaction with the sales share in the regression, but they do not make much difference in the above result. Since affiliates of major conglomerates are larger and large firms may be inefficient due to bureaucracy, they may appear to invest inefficiently. To control for the size effect, Table 4 also includes the natural log of sales and its interaction with q. Yet, they do not make much difference in the above result.

The third objection could be that it is the other firms, not major conglomerates that make wrong investment decisions. Korean stock markets are not as efficient as those of developed countries, and therefore the Korean stock market may systematically underestimate low q investments and overestimate high q investments. In other words, the other firms in high q industries may raise funds easily and over-invest while the other firms in low q industries may not be able to raise enough funds and hence underinvest. Major conglomerates, on the other hand, can redistribute funds from high q affiliates to low q affiliates and hence can increase undervalued investments and decrease overvalued investments, which would increase the overall investment efficiency.

One way to check for the above possibility is to examine the major shareholder's equity stakes, since higher equity stakes by the major shareholder would reduce agency problems between the headquarters and investors, as suggested by Scharfstein and Stein (2000). As the equity stake by the major shareholder becomes higher, it becomes more profitable for the major shareholder to invest efficiently, which reduces the incentive to subsidize other affiliates. Table 5 includes ownership variable and its interaction with Industry q to the basic regression (1). Ownership variable used is the equity stake by the major shareholder, which is obtained from KIS-FAS data set[11] Using the equity stake by minor shareholder produces similar results and is omitted here. The mean and median of ownership variables are 21.82%, 20.2% for major conglomerates,

[11] The equity stakes by major owner families may be more appropriate, which KIS-FAS data set does not have. Hence this paper simply uses the equity stakes by major shareholders or by minor shareholders instead.

27.54%, 26.7% for the rest of the firms, 26.84%, 26% for stand-alone firms, and 27.68%, 26.9% for minor conglomerates.

Table 5 shows that the coefficient on Ownership×Industry q is significantly positive. It implies that at higher ownership levels, major conglomerates respond more closely to Industry q. Therefore, higher ownership affiliates would behave more efficiently than lower ownership affiliates, as implied by agency problems of Scharfstein and Stein (2000). This finding casts doubt on the view that it is the other firms, not major conglomerates, that make wrong investment decisions, in which interpretation the equity stakes by major shareholder should have no effect or the opposite effect. Table 5 also shows that the coefficient on ownership variable is significantly negative. Namely, with higher ownership, investment differences between major conglomerates and the other firms become smaller and hence major conglomerates behave more like the other firms. Adding cash flow differences does not make a qualitative difference.

A problem with the above results can be that ownership may be proxing for size since larger firms tend to have lower ownership percentages. Therefore, it is possible that investment by small firms is more sensitive to q than investment by larger firms. To control for this effect, ownership is first regressed on market value of the firm, and the residual from the regression is used as ownership variables. Table 5 shows that using the residual ownership does not make much qualitative difference.

Since larger conglomerates are highly leveraged, it is possible that investment by highly leveraged firms is less sensitive to q than less leveraged firms. Hence, Table 6 adds leverages of firms and their interactions with Industry q to the basic regression (1). Leverages are computed as a ratio of total liabilities over total assets in the previous year. Table 6 shows that coefficients on Industry q are still significantly negative, and therefore the basic results still hold here. Coefficients on leverages are negative and coefficients on the interaction terms are positive, although most of them are insignificant. This result mildly suggests that lenders may play some role in watching out for inefficient investment. Once again, adding cash flow differences does not make a qualitative difference.

One may question the validity of the cut-off line at the 30 largest conglomerates since the number 30 is arbitrary. Although there may not be a difference between the 30th and 31st largest conglomerates *ex ante*, there may be a difference *ex post* since Korean government implicitly defines conglomerates as the 30 largest conglomerates and imposes many restrictions on them. In order to get around the arbitrary number 30, Table 7 repeats the basic regression (1), now comparing between the 5 largest conglomerates and stand-alone firms, between the next 25 largest conglomerates and stand-alone firms, and between minor conglomerates and stand-alone firms. They do not qualitatively change the results of this paper.

4. CONCLUSION

Major conglomerates have been blamed for the Korean economic crisis of 1997. This paper examines if major conglomerates are indeed inefficient in terms of investments they make. This paper presents a quantitative measure of how inefficient their investments have been, and shows that major conglomerates' investments were substantially higher for less promising industries and lower for more promising industries. This paper concludes that current reforms of major conglomerates in Korea are mostly justified.

This paper needs to be extended in several directions. First, we can examine conglomerates over time. If they are more efficient than the other firms, they should be thriving. Second, if conglomerates maximize some combination of profits and risk diversification, lower profitability at individual firm level might have been compensated by low variance of the group-level profitability. Therefore, group-level profits and risk diversification need to be examined. Third, it is possible that major conglomerates invest inefficiently because the government imposes many restrictions on them. Therefore, we need to examine the effects of these restrictions on conglomerates before reaching a definite conclusion. These issues will be examined in my future work.

[Table 1] Summary Statistics

	Mean	Median	Standard Deviation
(1) Major Conglomerates (Number of Observations = 502)			
q	0.977	0.931	0.266
Investment/Sales	0.212	0.131	0.473
(2) The Rest of the Firms (Number of Observations = 1502)			
q	1.060	0.962	0.486
Investment/Sales	0.136	0.081	0.404
(3) Stand-Alone Firms (Number of Observations = 251)			
q	1.090	0.978	0.550
Investment/Sales	0.096	0.061	0.297
(4) Minor conglomerates (Number of Observations = 1251)			
q	1.054	0.958	0.472
Investment/Sales	0.144	0.083	0.421
(5) Median Industry q			
For Major Conglomerates and the Rest of the Firms			
	0.980	0.951	0.129
For Major Conglomerates and Stand-Alone Firms			
	0.947	0.951	0.048
For Major Conglomerates and Minor Conglomerates			
	0.980	0.951	0.129

[Table 2] Industry-Adjusted Investment vs. Industry q

$(I/S)^c - (I/S)^{MO} = \beta_0 + \beta_1$ Industry q $+ \beta_2$ $((Cash/Sales)^c - (Cash/Sales)^{MO}) + \varepsilon$

β_0	β_1	β_2	Adjusted R^2
(1) Comparing with the Rest of the Firms			
0.881	-0.870		0.431
(0.000)	(0.000)		
0.913	-0.904	0.025	0.428
(0.000)	(0.000)	(0.699)	
(2) Comparing with Stand-Alone Firms			
1.537	-1.556		0.438
(0.000)	(0.000)		
1.505	-1.538	0.155	0.458
(0.000)	(0.000)	(0.062)	
(3) Comparing with Minor Conglomerates			
0.856	-0.844		0.430
(0.000)	(0.000)		
0.884	-0.877	0.068	0.431
(0.000)	(0.000)	(0.371)	

Year dummies are included in all regressions, and the individual effects are estimated with random effects estimators. P-values are in parentheses.

[Table 3] Investment vs. Industry q

$(I/S) = \beta_0 + \beta_1$ Industry $q + \beta_2$ (Cash/Sales) + ε

β_0	β_1	β_2	Adjusted R^2	χ^2
(1) Comparing with the Rest of the Firms				
Major Conglomerates				
0.071	0.088		0.453	
(0.754)	(0.708)			
0.144	-0.008	0.227	0.459	
(0.527)	(0.973)	(0.006)		
The Rest of the Firms				
-0.406	0.533		0.366	5.203
(0.000)	(0.000)			(0.023)
-0.405	0.518	0.191	0.375	6.958
(0.000)	(0.000)	(0.000)		(0.008)
(2) Comparing with Stand-Alone Firms				
Major Conglomerates				
0.663	-0.545		0.440	
(0.055)	(0.133)			
0.637	-0.534	0.216	0.445	
(0.067)	(0.142)	(0.015)		
Stand-Alone Firms				
-0.385	0.513		0.033	4.907
(0.061)	(0.018)			(0.027)
-0.399	0.529	-0.036	0.273	4.596
(0.109)	(0.042)	(0.626)		(0.032)
(3) Comparing with Minor Conglomerates				
Major Conglomerates				
0.071	0.088		0.453	
(0.754)	(0.708)			
0.144	-0.008	0.227	0.459	
(0.527)	(0.973)	(0.006)		
Minor Conglomerates				
-0.430	0.559		0.399	5.543
(0.001)	(0.000)			(0.019)
-0.419	0.527	0.255	0.398	6.681
(0.001)	(0.000)	(0.000)		(0.010)

χ^2 tests the hypothesis that β_1 is the same for major conglomerates and the other firms. Year dummies are included in all regressions, and the individual effects are estimated with random effects estimators. P-values are in parentheses.

[Table 4] Industry-Adjusted Investment vs. Industry q with Sales Share

$$(I/S)^{c} - (I/S)^{MO} = \beta_0 + \beta_1 \text{ Industry q} + \beta_2 (\text{Saleshare} \times \text{Industry q}) + \beta_3 \text{ Saleshare} + \beta_4((\text{Cash/Sales})^{c} - (\text{Cash/Sales})^{MO}) + \beta_5 (\text{Saleshare} \times ((\text{Cash/Sales})^{c} - (\text{Cash/Sales})^{MO})) + \beta_6 (\ln(\text{Sales}) \times \text{Industry q}) + \beta_7 \ln(\text{Sales}) + \varepsilon$$

β_0	β_1	β_2	β_3	β_4	β_5	β_6	β_7	Adjusted R^2
(1) Comparing with the Rest of the Firms								
0.360	-0.329	-5.920	5.656					0.544
(0.344)	(0.408)	(0.058)	(0.058)					
0.448	-0.421	-5.765	5.509	0.063	-0.044			0.532
(0.247)	(0.297)	(0.064)	(0.063)	(0.512)	(0.918)			
4.873	-5.027	-18.309	16.997	-0.092	0.978	0.282	-0.268	0.610
(0.562)	(0.561)	(0.010)	(0.012)	(0.509)	(0.097)	(0.510)	(0.521)	
(2) Comparing with Stand-Alone Firms								
1.059	-1.058	-3.443	3.292					0.538
(0.060)	(0.073)	(0.331)	(0.329)					
1.146	-1.170	-3.307	3.213	0.204	-0.524			0.536
(0.042)	(0.049)	(0.354)	(0.343)	(0.101)	(0.371)			
3.410	-3.777	-7.483	6.785	0.176	-0.010	0.158	-0.136	0.568
(0.763)	(0.748)	(0.187)	(0.208)	(0.260)	(0.988)	(0.791)	(0.812)	
(3) Comparing with Minor Conglomerates								
0.335	-0.302	-5.927	5.664					0.545
(0.383)	(0.449)	(0.059)	(0.059)					
0.383	-0.356	-5.777	5.508	0.070	0.070			0.539
(0.311)	(0.368)	(0.062)	(0.062)	(0.520)	(0.894)			
3.887	-4.229	-15.303	14.374	-0.070	0.171	0.233	-0.211	0.610
(0.598)	(0.578)	(0.017)	(0.018)	(0.614)	(0.790)	(0.536)	(0.564)	

Year dummies are included in all regressions, and the individual effects are estimated with random effects estimators. P-values are in parentheses.

[Table 5] Industry-Adjusted Investment vs. Industry q with Ownership

$$(I/S)^c - (I/S)^{MO} = \beta_0 + \beta_1 \text{ Industry q} + \beta_2 \text{ Ownership} + \beta_3 (\text{Ownership} \times \text{Industry q}) + \beta_4((\text{Cash/Sales})^c - (\text{Cash/Sales})^{MO}) + \varepsilon$$

β_0	β_1	β_2	β_3	β_4	Adjusted R^2
(1) Comparing with the Rest of the Firms					
With Original Ownership					
2.055	-2.103	-5.952	6.277		0.569
(0.000)	(0.001)	(0.009)	(0.008)		
2.131	-2.183	-5.930	6.249	0.622	0.568
(0.000)	(0.000)	(0.009)	(0.008)	(0.443)	
With Residual Ownership					
0.892	-0.876	-8.045	8.287		0.452
(0.000)	(0.000)	(0.048)	(0.052)		
0.896	-0.880	-8.002	8.263	0.004	0.449
(0.000)	(0.000)	(0.050)	(0.053)	(0.956)	
(2) Comparing with Stand-Alone Firms					
With Original Ownership					
2.569	-2.635	-5.488	5.781		0.558
(0.001)	(0.001)	(0.021)	(0.019)		
2.680	-2.762	-5.567	5.846	0.135	0.557
(0.000)	(0.000)	(0.020)	(0.018)	(0.153)	
With Residual Ownership					
1.614	-1.630	-2.406	2.402		0.452
(0.000)	(0.000)	(0.602)	(0.618)		
1.700	-1.734	-2.039	2.006	0.132	0.454
(0.000)	(0.000)	(0.659)	(0.677)	(0.108)	
(3) Comparing with Minor Conglomerates					
With Original Ownership					
2.037	-2.085	-5.986	6.313		0.569
(0.001)	(0.001)	(0.009)	(0.008)		
2.058	-2.109	-5.948	6.266	0.065	0.568
(0.000)	(0.001)	(0.009)	(0.008)	(0.471)	
With Residual Ownership					
0.867	-0.850	-8.070	8.313		0.451
(0.000)	(0.000)	(0.048)	(0.051)		
0.882	-0.867	-7.855	8.087	0.034	0.450
(0.000)	(0.000)	(0.056)	(0.059)	(0.656)	

Year dummies are included in all regressions, and the individual effects are estimated with random effects estimators. P-values are in parentheses.

[Table 6] Industry-Adjusted Investment vs. Industry q with Leverages

$$(I/S)^{c} - (I/S)^{MO} = \beta_0 + \beta_1 \text{ Industry q} + \beta_2 \text{ Leverage} + \beta_3 (\text{Leverage} \times \text{Industry q}) + \beta_4 ((\text{Cash/Sales})^{c} - (\text{Cash/Sales})^{MO}) + \varepsilon$$

β_0	β_1	β_2	β_3	β_4	Adjusted R^2
(1) Comparing with the Rest of the Firms					
2.383	-2.407	-2.199	2.263		0.483
(0.015)	(0.018)	(0.104)	(0.110)		
2.389	-2.415	-2.112	2.172	0.052	0.484
(0.015)	(0.018)	(0.120)	(0.127)	(0.462)	
(2) Comparing with Stand-Alone Firms					
2.587	-2.624	-1.565	1.603		0.457
(0.042)	(0.050)	(0.337)	(0.349)		
2.262	-2.332	-1.044	1.095	0.149	0.472
(0.085)	(0.090)	(0.535)	(0.536)	(0.081)	
(3) Comparing with Minor Conglomerates					
2.409	-2.434	-2.272	2.339		0.483
(0.014)	(0.017)	(0.093)	(0.098)		
2.391	-2.425	-2.198	2.267	0.082	0.484
(0.015)	(0.018)	(0.105)	(0.110)	(0.305)	

Year dummies are included in all regressions, and the individual effects are estimated with random effects estimators. P-values are in parentheses.

[Table 7] Industry-Adjusted Investment vs. Industry q
for the 5 Largest, the Next 25 Largest, and Minor Conglomerates

$$(I/S)^{c} - (I/S)^{MO} = \beta_0 + \beta_1 \text{ Industry q} + \beta_2 ((\text{Cash/Sales})^{c} - (\text{Cash/Sales})^{MO}) + \varepsilon$$

β_0	β_1	β_2	Adjusted R^2
(1) The 5 Largest Conglomerates vs Stand-Alone Firms			
0.881	-0.888		0.493
(0.134)	(0.143)		
1.159	-1.187	0.353	0.550
(0.049)	(0.051)	(0.006)	
(2) The 6th through 30th Largest Conglomerates vs Stand-Alone Firms			
2.049	-2.086		0.472
(0.000)	(0.000)		
2.074	-2.117	0.034	0.471
(0.000)	(0.000)	(0.758)	
(3) Minor Conglomerates vs Stand-Alone Firms			
0.794	-0.834		0.454
(0.000)	(0.000)		
0.835	-0.887	0.095	0.460
(0.000)	(0.000)	(0.021)	

Year dummies are included in all regressions, and the individual effects are estimated with random effects estimators. P-values are in parentheses

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