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[발표 55]

The Boundaries of korea Chaebol: The Grand Unified Theory of the Firm  
Approach

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# The Boundaries of the Korean Chaebol: The Grand Unified Theory of the Firm Approach

## Introduction

The chaebol in Korea has become the focal point of debates as the Korean economy began to experience low economic growth in the 90s and sharp declines in 1997 due to the Asian financial crisis. It is natural for the Korean chaebol to draw criticism from many corners since the chaebol played significant roles in Korean economic development in the past and has been a dominant player in the Korean economic scene.

Some economists argue that the chaebol in Korea is too big and too diversified. Others point out problems associated with capital and governance structures. Scholars in business management indicate that chaebols lack core competency and management skills.

The central questions in the economics of all organizations are these: why do firms exist? What is their function, and what determines their scope? We can raise the same questions about the Korean chaebol. Why do chaebols exist? What is their function, and what determines their scope? These are also central questions for business executives and corporate strategies. In light of the exceptional levels of world-wide mergers and acquisitions in recent years, it is essential to study the forces determining boundaries of the Korean chaebol. This paper examines these questions on the Korean chaebol. In examination of these questions, the authors will develop an analytical framework based on the economics of organization.

## Theoretical Background

### Overview

This paper examines the boundaries of the Korean chaebol. We have proposed "the grand unified theory of the firm" to see the whole picture of the Korean chaebol. In the traditional approach, economists tend to focus on one aspect at a time. According to the neoclassical theory, the boundaries of the firm are primarily defined by the economies and diseconomies of scale and scope.

Benefits and costs of hierarchies and markets (transaction cost theory), ownership of assets (property rights approach), separation of ownership and control (agency theory), or the strengths of core competency are emphasized by various theories. However, these approaches lack the ability to pull these factors together. Therefore, we review these theories to highlight the key contributions to the boundaries of the firm, and then introduce "the grand unified theory of the firm" which builds on all of the factors indicated by these theories. We apply this new theory for our analysis of the Korean chaebol.

### **The Transaction Cost Theory**

The first theory on the study of firm boundaries originated with the famous essay by Coase (1937), who raised the question of why there are market transactions why and all production is not carried by one big firm. Coase's answer was in terms of the costs of transacting in a world of imperfect information: "A firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing in another firm" (1937). He then offers three explanations of the reason why the costs of organizing transactions internally are rising: (1) diminishing returns to management, (2) waste of resources, (3) factor price differentials.

First, as a firm gets larger, there may be decreasing returns to the entrepreneur function. Secondly, as the transactions which are organized increase, the entrepreneur fails to place the factors of production in the uses where their values are greater. Finally, the supply price of one or more of the factors of production may rise, because 'other advantages' of a small firm are greater than those of large firms (1937, P394).

Our understanding of firm boundaries has been sharpened by refining Coase's explanations and identifying the nature and sources of transaction cost in different circumstances, such as Williamson's asset specificity (1975, 1985), Grossman and Hart's investment incentives (1990), Demsetz's management cost (1988), Milgrom and Roberts' bargaining and influence cost (1990), Kreps' organizational culture (1990) and Hart's incomplete contracts (1991).

Williamson (1985) identifies three transaction characteristics that are critical to adoption of governance structure: frequency, uncertainty and asset specificity. Each of those characteristics is claimed to be positively related to hierarchal organization. The design of efficient governance structure matches these characteristics with the appropriate governance structure: hierarchy, varying degree of hybrid, and market.

Klein, Crawford and Alchian's work (1978) on why firms exist and what determines their boundaries has been centered on the hold-up problem. Klein, Crawford and Alchian (1978) explore the cost of post-contractual opportunistic behavior of the buyer as "appropriable quasi-rents." They argue that the presence of appropriable quasi-rents produces a threat of reneging on contracts. A high degree of asset specificity means a lower value of alternative uses when the asset is redeployed to alternative uses. Market contracting can be expensive because of reneging. Market contracting (buy) is supplanted by internal organization (make) as asset specificity progressively deepens. Therefore, the organization and the governance structure of a firm are viewed as a mechanism for dealing with hold-up problems.

### **The Property Rights Approach**

Grossman and Hart (1986) and Hart and Moore (1990) pioneered a second approach, the modern property rights approach to the boundaries of the firm. A major strength of their property rights approach is that they clearly identify the costs and benefits of integration without relying on the presence of an impersonal market.

A firm is a set of assets under common ownership, according to their theory. If two different assets are owned by the same person, we have a single firm. If they are owned by two owners, there are two firms. Dealings between two firms are market transactions. The ownership allocation has no effect on the level of efficiency achieved.

Because ownership affects the division of the benefits from renegotiation, it can affect the incentives of the two parties to make relationship-specific investments. Ownership encourages parties to make more relationship-specific investments. Their model therefore offers an answer when to integrate. A should own B when A's relation-specific investments are considerably more important than those of B; B should own A when the reverse is true; and there should be no integration when both make important relationship-specific investments. This property rights approach defines the benefits and costs of integration.

### **The Principal Agency and Separation of Ownership and Control**

A third theory on the boundaries of the firm was introduced by Berle and Means (1932). Berle and Means made two main contributions: then observed that large corporations make up a sizable share of corporate activity, and that ownership and control were separated in many of these companies. This separation of ownership and control may lead managers to pursue their own objectives at the expense of owners. A large literature has tried to examine and expand Berle and Means' ideas. Jensen and Meckling (1976) show that managers with small ownership stake in dispersed ownership companies will overindulge in perquisites since they get all of the benefits. Authors analyze ownership and capital structures and conclude that capital structures mitigating these "agency costs" rely more on debt financing, because debt financing allows managers to retain a greater portion of the company's equity and gives them the incentive not to consume excess perks.

In the Grossman–Hart–Moore property rights approach the defining factor of the boundaries of the firm is the benefits and costs of ownership of physical assets. In the principal–agency model, however, human assets and incentives are defining factors of the boundaries of the firm. The firm is a multi–layer of principal–agency relationships. Managers are agents of the stock owners. When the manager hires a group of workers to perform a task for the firm a principal–agency relationship is established between them.

The theory of incentives is concerned with the problem that a manager (principal) faces when his own objectives do not coincide with those of the employees (agents) of the firm. Companies have to expend resources (agency costs) to mitigate the incentive incompatibility problem. Employee stock ownership (ESOP: asset ownership), company's performance based bonuses and employees' participation in decision making (process ownership) are incentive devices. Park found that the U.S. firms are more prone to use asset ownership than Japanese firms, whereas Japanese firms rely on bonuses and participation in decision making (process ownership) (Park, 1996).

In principal–agency relationship problems stem from asymmetric information, moral hazard and adverse selection. Information is asymmetric, and moral hazard and adverse selection problems may result in less than optimal outcomes in the firm. Monitoring can mitigate these problems, but there will be monitoring costs.

### **The Evolutionary Theory of the Firm**

A fourth theory was advocated by Nelson and Winter (1982). Nelson and Winter explore the evolutionary and dynamic aspects of the firm. This theory focuses on the organization's structure, strategy and core competency. The unit of analysis under this view is the firm and its productive processes.

Firms are able to survive if they change in response to changing market demands and technologies. Firms must find new productive and valuable outlets for their core competencies (the things they do well). Determining factors of the boundaries of the firm are the firm's learning about its costs and abilities relative to other firms.

### **The Neoclassical Theory of the Firm**

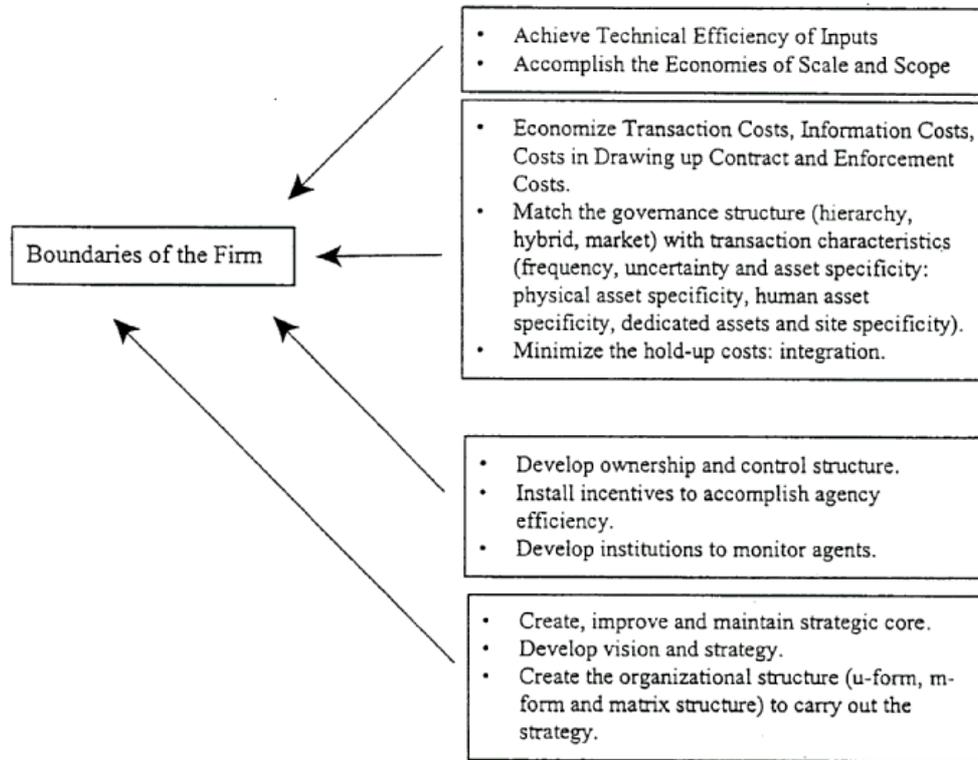
The neoclassical theory of the firm is a fifth theory of defining the boundaries of the firm. The unit of analysis in the transaction cost is the individual transaction underlying the contractual agreements between parties. The firm is therefore a nexus of contracts. In the principal-agent theory the firm is multi-layers of principal-agent relationships. In the evolutionary theory the unit of analysis is the firm and its productive processes. In contrast the unit of analysis in the neoclassical theory of the firm is exchange. The horizontal integration of the firm helps accomplish the scale and scope of the economy. The firm produces a large variety of outputs using various combinations of inputs. The firm maximizes the profit by accomplishing technical efficiency of inputs, and every economic agent has perfect information. Information is distributed symmetrically. The boundaries of the firm can be defined by the economies and diseconomies of scale and scope.

## The Grand Unified Theory of the Firm

In this brief survey of the extant theories defining the boundaries of the firm, each theory identifies some elements that define the boundaries of the firm. However, no single theory is comprehensive enough to include all elements in defining the boundaries of the firm. As Bolton and Scharfstein (1998) also indicate what we lack and what we need is a more unified theory of the firm based on the insights of Coase and Berle and Means. We need to pull together all factors to unify the theories, because each theory contributes some relevant elements for defining the boundaries of the firm.

We may call this "the grand unified theory of the firm." We have borrowed the term "grand unified theory" from physics (Feynman, 1965; Yun, 1984). Physicists studied the forces determining high energy separately until Feynman unified them. The boundaries of the firm in "the grand unified theory" depend on transaction costs of hierarchy and market, technical efficiency and the economies of scale and scope, agency costs, and the core competency, strategy and structure of the firm. The firm that economizes transaction costs; achieves technical and agency efficiency; accomplishes the economies of scale and scope; creates, improves and maintains strategic core, can amass more resources and expand the boundaries of its organization, according to "this unified theory of the firm." The operational or strategic aspects of the grand unified theory of the firm are presented in Figure 1.

Figure 1: Factors Affecting Boundaries of the Firm in the Unified Theory



The first author of this paper previously developed a framework for the make-or-buy decision based on the transaction cost theory (Park et al. 2000). Here we expand this framework on the basis of "the grand unified theory of the firm." Benefits and costs of an expansion of the boundaries of the firm can be assessed by other combined benefits and costs, including the economies or disconomy of the scale (neoclassical theory), making or buying (transaction cost theory), ownership of assets (property rights theory), agency costs and culture (agency theory), and strategic positioning (evolutionary theory) for effective competition. These factors can be complementary to each other in some cases, but there may be trade-off between them.

## **Korean Chaebol as Diversified Conglomerates**

We apply the grand unified theory of the firm to examine the boundaries of the Korean chaebol. A conglomerate is a group of independent companies. This type of economic organization is a puzzle to economists. However, most large Korean chaebols are diversified conglomerates (Jung and Yang, 1992), the three largest of which are Hyundai, Samsung and LG. Hyundai is the largest in asset size and Samsung is the largest in 1999 sales. Hyundai consists of 35 companies; 45 independent companies make up the Samsung group. The LG group is the third in both assets and sales, but the current profits are highest among the big three groups in 1999.

When we analyze the Korean chaebol in light of the grand unified theory of the firm, new understandings emerge.

## **The Economies of Scale and Scope**

The most prominent business historian, Alfred Chandler, Jr.(1990), has concluded that the important attribute of modern enterprises in the U.S. is the ability of the modern industrial enterprise to exploit the economies of scale and scope. Such enterprises are able to take unprecedented cost advantages of the economies of scale and scope.

At its early stage the Korean chaebol faced limited market because of a relatively small domestic market. Today, global firms are competing worldwide. Therefore, the domestic market limitation has been less problematic in achieving economies of scale and scope for the Korean chaebol.

We to offer three reasons for the diversification of Korean chaebol: (1) market limitation, (2) close family orientation, and (3) oligopoly behavior of large chaebols. Because of a small domestic market, the chaebol has to seek unrelated businesses for its growth. Secondly, since the founder of the chaebol needs to provide businesses as an inheritance to all children and family, he has to establish many businesses to meet this need. Thus several large chaebols (oligopoly) in Korea tend to compete in every field of business. For instance, Samsung entered into the automobile business because Samsung was the only one that did not have an automobile company among the big three (Samsung, Hyundai and Daewoo). This ill-fated venture has been very costly to Samsung and the nation.

The economy of scope is stemming from the synergy effects of related businesses. Because the Korean chaebol is a diversified conglomerate and transactions within the chaebol are relatively small (Jung and Yang, 1992). The economy of scope in Korean chaebols may, therefore, be limited.

### **Ownership Structure and Control**

The ownership structures of Korean chaebol vary with on each chaebol. structures in general have the following three characteristics:

1. A large concentrated ownership with a small percentage of dispersed ownership (Cho, 2000).
2. High debt/asset ratio (See Table 1).

### 3. No separation of ownership and control.

Characteristics (1) and (3) were observed at the early stage of large U.S. companies, when managers of new start-up businesses tend to be the own& and manager. As the business grows and the first generation owner retires, control is likely to be divorced from the ownership. The principal–agency problem associated with the separation of ownership and control is well documented in the literature (Berle and Means, 1932; Jensen and Meckling, 1976).

The combination of the three characteristics of ownership structure in the Korean chaebol presents a different challenge. Particularly, the interests of small dispersed owners may not be well guarded because the owner of the chaebol controls the company and pursues his own interest. Furthermore large government–sponsored debt is likely to contribute to siphoning off the cash flow from the chaebol to the owner. This may weaken the chaebol, but makes the manager wealthy. Financial institutions have neglected monitoring because the loans are sponsored by the government.

As the chaebol grows, the separation of ownership and control may become a common practice. The chaebol needs to protect the well–dispersed owners' interests as well as its own, and economize agency costs. Aligning the interests of agents to owners is not costless. Therefore, the chaebol has to establish effective incentive devices and a good monitoring mechanism.

As Coase suggested, management costs would rise because of the diminishing returns to management and waste of resources. The division of power between the headquarters of the chaebol and managers of its member companies will play an important role in this matter. Baker and Montgomery (1994) have identified a number of diversified conglomerates that appear to manage their businesses quite well by delegating substantial authority to their business unit managers.

A well documented source of the waste in a diversified conglomerate is the capital misallocation. There are three competing views about the effectiveness of internal capital markets:

(1) Internal capital markets are more effective than external capital markets (Williamson, 1970 and Alchian, 1969); (2) Internal and external capital markets will result in the same resource allocation; and (3) Internal capital markets are less efficient than external markets because they replace profit-based decision-making of investors with bureaucratic decision-making of corporate executives. Bolton and Scharfstein (1998) cite many empirical works favoring the third view. They believe that corporate politics may be the ultimate reason that the internal capital markets do not work well. This is referred to as the "influence cost," the cost born by mis-allocation of resources because of politics or influence of the authority. Samsung's huge investment venture in automobile production is a good example of such influence costs. Cross-subsidizing among business units is also known to be inefficient practice of capital allocation in Korean chaebol.

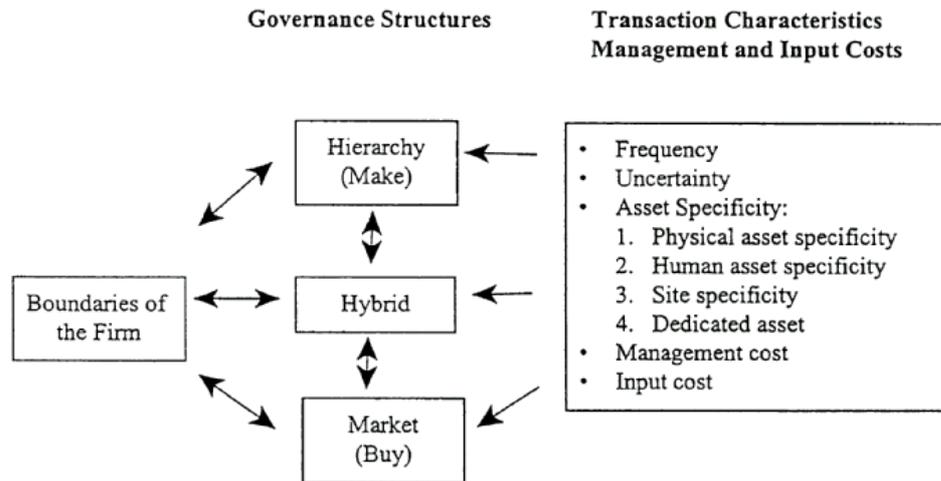
Another source of waste is bureaucracy and waste in a large conglomerate. Elimination of unneeded bureaucrats and wasteful bureaucratic practices improves economic efficiency of the diversified conglomerate.

### **Transaction Costs**

The unit of analysis in transaction cost economies is the transaction and transaction costs consist of information costs, costs associated with drawing contracts (internal and external) and contract enforcement costs. Behavioral assumptions on transaction cost economics are bounded rationality (intendedly rational, but limitedly by so) and opportunism (self-interest seeking with guile). The main tenet of transaction cost economics is this: align transactions, which differ in their attributes, with governance structure, which differ in their costs and competencies, in a discriminating (mainly, transaction cost economizing) way (Williamson, 1991).

Transaction cost economics provides a theoretical basis for the boundaries of the firm and the make-or-buy decision. We show the possible alignment of contractual interfaces between the governance structures and transaction characteristics in Figure 2. Sometimes net gains

**Figure 2: Aligning Transaction Characteristics with Governance Structures**



can be realized by switching the mode of governance structures. Lately, large U.S. automobile firms are increasingly disintegrating (outsourcing), and they are taking advantage of relatively low wages of smaller firms. The switch can be caused by changing transaction characteristics as well as input costs. Japanese automobile companies are known to match well the characteristics of transaction and production inputs with the governance structures, such as subcontracting, cross-ownership and joint ventures.

One of the significant sources of wastes in Korean chaebol or firms in general is high transaction costs. Agents are seeking their self-interests and capturing quasi-rents by themselves. The Korean chaebol needs to safeguard these activities and develop better organizational form; better internal incentives and control; better alignment of the contractual interfaces and monitoring. Park found elsewhere that monitoring of suppliers improves quality, cost and on-time delivery of supplies in U.S. firms (Park et al. 1996).

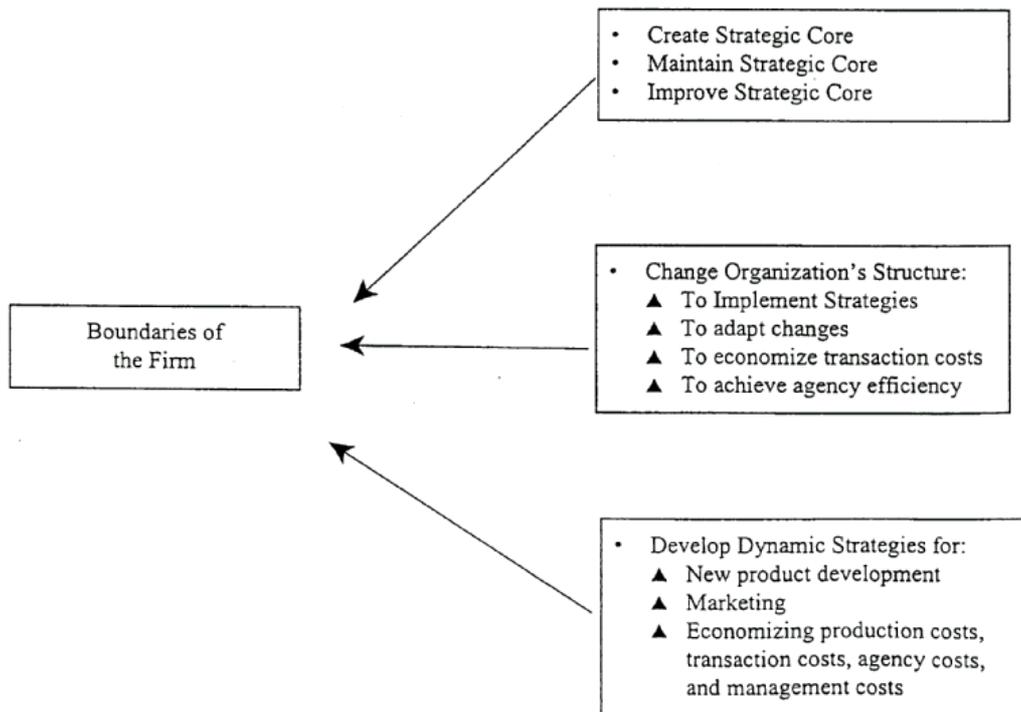
### **Organization's Strategy, Structure and Core Competency**

The evolutionary theory of the firm is dynamic and offers an understanding of the reasons firms succeed or fail. Because the firm is an organization facing changes in environment and competition, its survival depends on learning about its costs and abilities to adapt to ever-changing demand and supply, and competition. A successful adaptation to these changes will result in establishing effective strategies, changing the organization's structure and developing core competency.

A firm is said to have a core competency in a business area if it has an advantage not only in producing a good or service, but also in producing new and related products. The organization that has a core competency will compete well because of its advantage.

The Korean economy has comparative advantages in manufacturing. Korean chaebols seem to create their core competencies in varied product manufacturing. They use vertical specialization to access new technologies and markets in the U.S. Korean chaebols have experienced many changes in recent years. One good thing about them is they have learned how to adapt to the continuing changes in the global economy. The survival and continuing expansion of the Korean chaebol depends on the creation of a strategic core, changes in organization structure, and development of dynamic strategies for new product development, marketing and economizing costs. Figure 3 shows the interaction between the boundaries of the firm and strategic factors of the successful Korean chaebol.

**Figure 3: Strategic Core, Organization's Structure and Strategies and Boundaries of the Firm**



## A Model for the Profitability of Asset

We need to build a model to study the impact of diversification and the size of the Korean chaebol on the profitability of assets.

A regression model is built to examine the profitability of assets. The variables included in the model are the number of business units in each chaebol, assets, capital–asset ratio, debt–asset ratio, sales–asset ratio. We ran a separate model for capital–asset ratio and debt–asset ratio variables. The specifications of the model are as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

where  $Y = \frac{NetProfit}{Asset}$

$$X_1 = \text{number business units in a conglomerate}$$

$$X_2 = \log(\text{size of assets})$$

$$X_3 = \frac{Owners'Capital}{Asset}$$

$$X_4 = \frac{Debt}{Asset}$$

$$X_5 = \frac{Sales}{Asset}$$

The data for the model has been obtained from the Korean Fair Trade Commission and empirical results are reported in Table 2. Daewoo, Daewoo Electronics and Jinro have not been used in estimation of the model because they do not have complete information for all variables

Table 1: Korea's Top 30 Chaebol's Assets, Debts and Profits

Ranking	Chaebol Group	Number of Companies	Assets	Asset-Debt Ratio	Debt-Asset Ratio	Sales Unit: 100,000,000 Won	Current Profits
1	Hyundai	35(62)	88,649	39.7	152.0	95,047	934
2	Samsung	45(49)	67,384	40.6	146.2	108,827	2,450
3	LG	43(48)	47,612	40.4	147.6	62,016	3,840
4	SK	39(41)	40,147	42.8	133.4	38,039	727
5	Hanjin	18(21)	20,771	35.2	183.9	13,198	462
6	Lotte	28(28)	15,791	56.7	76.3	10,191	319
7	Daewoo	2	13,144	-	-	22,378	-20,220
8	Kumho	20(29)	11,532	31.1	221.7	7,360	-232
9	Hanwha	23(21)	11,430	43.1	131.8	6,091	467
10	Ssangyong	22	9,749	13.6	633.6	11,072	-108
11	Hansol	19(19)	9,397	33.5	198.1	4,588	184
12	Doosan	16(14)	7,646	38.7	158.7	3,656	591
13	Hyundai Refinery	3	7,150	22.3	347.8	7,097	-118
14	Dong-A	16(15)	6,519	7.6	1212.3	3,296	144
15	Dongkook Steel	14(16)	5,903	42.2	136.9	4,129	-8
16	Hyosung	13(17)	5,716	43.1	131.7	3,847	102
17	Daelim	18(17)	5,674	35.8	179.0	5,675	156
18	Esoil	2	5,495	27.1	269.0	5,752	288
19	Dongbu	19(32)	5,331	35.3	183.6	5,530	101
20	Korong	17(19)	4,616	39.9	150.5	3,995	287
21	Dong yang	25(21)	4,564	30.3	229.7	4,139	57
22	Kohap	6(8)	3,711	10.4	858.4	1,002	-645
23	Jeil sugar	18(15)	3,538	49.7	101.0	3,161	51
24	Daewoo Electric	3	3,525	-	-	4,008	-2,923
25	Hyundai Sanup	7	3,420	34.9	186.3	2,111	81
26	Anam	14(15)	3,073	2.3	4234.3	1,499	-57
27	Saehan	12(15)	3,052	29.0	244.5	1,753	-94
28	Jinro	16(17)	2,915	-	-	971	-552
29	Shinsege	10	2,723	34.8	187.6	2,983	28
30	Youngpoong	21	2,620	53.0	88.8	2,071	72
		544(686)	422,797	31.4	218.7	445,482 (419,096)	-13,984 (9,159)

Data: Fair Trade Commission

Table 2: Profitability of Assets

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$Y = -6.36 + 0.080X_1 + 0.37X_2 + 0.145X_3 - 2.571X_4$				
(.57)	(.59)	(.26)	(2.11)	(0.80)
R <sup>2</sup> = .30		F = 2.37		
$Y = 4.0 + 0.191X_1 - 0.249X_2 - 0.001566X_4 - 4.16X_5$				
(.34)	(1.42)	(.17)	(1.39)	(1.22)
R <sup>2</sup> = 22.8		F = 1.63		
<hr/> n = 27,      the numbers in the parentheses are t-ratios <hr/>				

\*: significant at  $\alpha = .05$

The results show that the owner's capital asset ratio has a positive impact on asset profitability, and debt-asset ratio reveals a negative sign. The owners' capital-asset ratio ranged from 2.3% (Young poong) to 56.7% (Lotte). Firms well-endowed with capital realize net profits, and firms with high debts are severely burdened by them. The number of business units is a proxy variable for diversification, and the size of an asset is a scale variable. Both the number of business units and the size of assets of a conglomerate are not statistically significant.

However, the diversification variable has a positive impact on asset profitability on both models, and the scale variable has a positive sign in the first model and a negative sign in the second model. The sales-asset ratio variable shows an inverse relationship with the asset profitability on both models. LG ranked highest with 8.1 percent in asset profitability, and Doosan (7.7%), Korong (6.2%), Esoil (5.2%) and Hanwha (4.1%) followed LG in a descending order.

The results indicate that the composition of assets (owner's capital or debt) have significant effects on the profitability of assets.

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Data: Fair Trade Commission

## Concluding Remarks

This paper was to examine the boundaries of the Korean chaebol and to find out reasons for the diversification and to study the function of the Korean chaebol. In our study we have developed a new theoretical framework which includes all factors from extant theories: the neoclassical theory, the transaction cost theory, the property rights approach, the principal–agency theory and the evolutionary theory. "The grand unified theory of the firm" is proposing a way to pull all of these factors together. The organization will generate new energies when these factors are working toward the same direction. The new energies of the organization will be an impetus for the continuous expansion of the firm boundaries. Therefore, Korean chaebol needs to address the following aspects for its prosperity and survival in global competition:

- create strategic core and establish a sense of direction
- accomplish the economies of scale and scope
- establish proper ownership and control structure
- economize on transaction costs
- install energizing incentives
- achieve agency and technical efficiency
- establish a better corporate culture

Therefore, the boundaries of the Korean chaebol will be defined by not just the transaction cost at the margin, but all of the factors proposed in the grand unified theory of the firm.

Results of the model show that the size of assets shows a mixed sign whereas the number of business units in conglomerates shows a positive effect on the profitability of assets. The owner's capital ratio has a positive impact and the debt–asset ratio has an adverse effect on the asset profitability of the Korean chaebol. The results imply that because the Korean chaebols are plagued by heavy debts, they must change strategies to ensure future success.

We conclude that the Korean chaebol includes too many business units under the chaebol. The Korean chaebol needs to develop a different form of organization to match the characteristics of transaction with the governance structures. We believe that the transaction costs are too high in the Korean chaebol.



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