Comparative Analysis of Strategic Planning in Construction Firms

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Abstract
The dynamic nature of the construction industry, rapidly changing global market environments, and lowest cost competitive bidding make it difficult to survive in global construction markets. To understand global construction markets and find success factors regarding a firm's growth, this study was conducted to develop basic data related to establishing future business strategies for Korean firms by analyzing their current business strategies as well as other advanced firms in the global construction market. To select construction companies for a case analysis, construction firms listed in the "Top 225 Global Contractors" from Engineering News-Record from 1995 to 2007 were reviewed. The model of change of business structures was examined by selecting and classifying such firms using two analysis standards in terms of the size of revenues and competitors. It was found that those firms were proactive and responsive to changing markets by increasing their overseas revenues and enhancing their competency through more diversified products in order to stabilize their revenue structure.

Keywords: strategic planning; overseas projects; ENR; global construction firm

1. Introduction
The international construction market, prior to the current global economic crisis, was enjoying a significant boom due to a favorable business environment under the economic growth policies of developing nations and the rise of oil prices from oil-producing nations. According to research from Global Insight, the global construction market outlook institute, the average growth rate of the construction market from 2001 - 2006 was 7.8 percent. The international construction industry has changed greatly in terms of key products and emerging markets, the variety of delivery systems requiring the ability to cover the total services of a project phase, and a shift of leading contractors in revenue rankings, among others (Momaya and Selby 1998, Ofori 2000, Dikmen and Birgonul 2004, Han et al. 2005).

However, it is the view of the majority that the growth of Korean construction firms in the international construction market has been due to indirect effects caused by international market expansion rather than the firms' effectual business and technical competence. Moreover, as the recent economic downturn directly affects the international construction market, the establishment of survival strategies in the international market that can offset the downturn in the Korean construction economy are essential. In particular, since it is predicted that the growth of product groups (Infrastructure, Energy) that can replace the currently stagnant product groups will continue, it will be necessary for the top firms in Korea that have overseas revenue as their main business to adopt a strategy to understand business structure more precisely.

The initial analysis for a business strategy of a company in the context of the changing dynamic global market environment is examination of the related market and business strategies of advanced firms that will be competitors in the international market. This study analyzed the current international construction market and the path of growth of global engineering and construction firms through previous studies (Jang et al. 2004, Jang et al. 2005, Jang et al. 2006, Lee et al. 2007a, Jang et al. 2007b, Jang et al. 2007c and Lee et al. 2008).

However, there have been only a small number of analyses on the growth path of advanced construction firms that play the most important role in the

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(Received April 8, 2009; accepted December 21, 2009)
international construction market. Thus, this study attempts to provide data needed for the establishment of the Korean company business strategy by analyzing quantitatively the change in Korean construction firms and overseas construction firms in the international construction market over the last 10 years.

To select construction companies for a case analysis of business structure change of overseas advanced construction firms, the "Top 225 Global Contractors" in Engineering News-Record (ENR) from 1995 to 2007 were reviewed. The mode of change of business structure was examined by selecting and classifying the firms using two analysis standards.

The first analysis focused on how global firms with revenue similar to that of Korean firms in 1995 have changed their business structure. It analyzed how the firms that have increased or maintained their revenues or that have experienced a downgrade have changed their business structure and how they differ from that of Korean firms.

The second analysis focused on the firms that became competitors of Korean firms. Firms in developing countries, such as in China and India that have had rapid growth during the last 10 years were reviewed, to allow Korean firms to reflect on their current situation and to provide indications for their future.

2. Related Current Studies

There have been a number of similar studies of overseas construction companies, their market, and their current situation from the macroscopic viewpoint. McConvilee (1996) pointed out that there are prospects for sizeable growth and profits for organizations that enter the global arena just as there is a great potential for failure. According to Kagari and Lucas (1997), the difficulties of overseas construction are related to client communications, understanding a new culture, increasing local contents, and supervising a diverse group of professionals.

However, there have been only a few data analysis studies on construction firms that have been continuously working for over 10 years. Recently the Cheah et al. (2004) study dealt with the outcome of the strategies of advanced overseas firms. However, their research carried out analysis based on a financial index, not on an international/domestic revenue basis used as the estimate standard in this study. Also, Cheah's study limited the collection of data to 24 target firms and the time span to just 5 years. Therefore, there were some differences in this study in terms of the time frame and basic data concerning the analysis, even though it was similar in analyzing the performance of overseas advanced companies.

3. Methodology and Its Limitation

This study adopted the methodology used in a previous study by Jang et al. (2004) and Han et al. (2009) but used a different time frame and different types of firms. A concrete illustration of the analysis method is as follows:

(1) Analysis Method

The analysis method examined how construction companies have specialized or diversified their products in the domestic and international markets. For distribution of the market, ratio of the domestic market and overseas market, and the degree of specification of the product (diversification vs. specification), the following numerical formula (1) was used:

\[ Y_j = \sum_{i=1}^{n} |X - a_{ij}| \] .......................... (1)

where, \( Y_j \): level of specification of contractor \( j \) (%); \( i \): \( i \)th product categories (\( i=1,2,...,9 \)); \( j \): \( j \)th contractors (\( j=1,2,...,225 \)); \( a_{ij} \): each percentage share of revenue associated with product type \( i ' \) of contractor \( j ' \); and \( X \): average percentage share of each product as to a total revenue (= 100/9 = 11%).

As shown in Eq. (1), the level of specification refers to the revenue structure concerning how much the firm relies on diverse products rather than focusing on a specific category. Ideally, this value is “0%” if a contractor holds a perfectly even portfolio along the nine products (perfect diversification). Total revenue on a specific product only reaches “177%” limit value (perfect specification). Hence, the lower the value of Eq. (1) the higher the degree of diversification.

(2) Analysis Model

Whether a difference in change mode has occurred between company groups was examined through analysis of the change in revenue weight of the products of each company and the change in the domestic and overseas revenue weight (Fig.1.).

Fig.1. Framework of Firm's Growth Dimension

The frameworks in this structure are conceptualized in the following ways:

- Firms that grow through entry into international markets rather than domestic markets (A→C or D, B→C or D)
- Firms that capture domestic markets rather than international markets (D→A or B, C→A or B)
- Firms, based on pre-existing markets, invest actively in both specification and diversification products (A \rightarrow B, B \rightarrow A, C \rightarrow D, D \rightarrow C).
- Firms with various domestic businesses maintain growth and enter into international markets (A \rightarrow C, B \rightarrow C).
- Firms which used experience and technology acquired in international markets to capture domestic markets (C \rightarrow A or B, D \rightarrow A or B).

(3) Limitation

The ranking in *ENR* was classified by the real increase and decrease in the revenue of each company. For a more objective analysis, the factors related to the global construction market and environmental change, the characteristics of the firms by country, and the economic index such as the inflation rate should be taken into consideration. However, the concrete data approach is not easy, and this study compared each on the assumption that all the firms in *ENR* have the same market and environment.

Another limitation of this study is that although there was a need to conduct an in-depth analysis of overseas advanced construction firms that are highly ranked in revenue size, the different firms were analyzed as a whole rather than examining each company's features. This limits the approach towards data needed for a focused analysis on each company and the utilization of analysis outcome for the purpose of benchmarking of a particular company.

4. Selection of Top Global Contractors

There were seven Korean firms in the list of the Top Global Contractors in 1995, as shown in Table 1.

Table 1. Korean Firms, *ENR* Rank in 1995

<table>
<thead>
<tr>
<th>Rank</th>
<th>Firm</th>
<th>Group</th>
<th>Revenue (M)</th>
<th>Markets (% of Revenue)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td></td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>49</td>
<td>Samsung</td>
<td>Higher Group</td>
<td>2,333.0</td>
<td>266.0 620 2 2 3 6 4 2 1</td>
</tr>
<tr>
<td>51</td>
<td>Dongah</td>
<td></td>
<td>2,251.8</td>
<td>1,112.6 338 2 142 0 9 0 9 0 2</td>
</tr>
<tr>
<td>52</td>
<td>Daewoo</td>
<td></td>
<td>2,243.9</td>
<td>575.4 659 9 3 2 10 1 10 0 0 0</td>
</tr>
<tr>
<td>84</td>
<td>Ssangyong</td>
<td></td>
<td>1,158.0</td>
<td>257.0 69 1 2 0 11 18 0 0 0</td>
</tr>
<tr>
<td>117</td>
<td>Samsung Group</td>
<td>Lower Group</td>
<td>603.6</td>
<td>157.6 67 0 7 36 0 7 1 1</td>
</tr>
<tr>
<td>133</td>
<td>Doachin</td>
<td></td>
<td>459.0</td>
<td>395.0 0 0 0 0 2 8 4 2 0 0 0</td>
</tr>
<tr>
<td>140</td>
<td>Keangnam</td>
<td></td>
<td>432.0</td>
<td>69.0 75 1 0 1 10 21 0 0 0</td>
</tr>
</tbody>
</table>


Firms that were much the same in size in terms of their revenues as Korean firms in 1995 were classified into two groups by rank and revenue size difference. The first group, i.e. the higher-ranked group, includes 36 firms ranked between 48 and 84, and the second group, i.e. the lower-ranked group, includes 23 firms ranked between 117 and 140.

In the higher-ranked group, 21 of 36 were listed in *ENR* from 1995 to 2007, and 4 were merged into other firms; 9 firms raised their rank since 1995. In the lower-ranked group, 12 of 36 have grown as of 2007, and 1 company has been merged.

Table 2. Changed Rank of Global Construction Firms

<table>
<thead>
<tr>
<th>Group</th>
<th>1995 Rank</th>
<th>1995 Revenue (M)</th>
<th>2007 Revenue (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher</td>
<td>1-21</td>
<td>2,333.0</td>
<td>1143</td>
</tr>
<tr>
<td>Group</td>
<td>22-48</td>
<td>560.0</td>
<td>368.0</td>
</tr>
<tr>
<td>Lower</td>
<td>49-60</td>
<td>1,158.0</td>
<td>603.6</td>
</tr>
<tr>
<td>Group</td>
<td>61-84</td>
<td>603.6</td>
<td>157.6</td>
</tr>
<tr>
<td>Other</td>
<td>85-117</td>
<td>157.6</td>
<td>45.9</td>
</tr>
<tr>
<td>Company</td>
<td>118-140</td>
<td>45.9</td>
<td>13.8</td>
</tr>
</tbody>
</table>

As shown in Table 2., the respective 9 firms in both groups that have continuously increased revenue size have been chosen and analyzed in this study.

5. Strategic Planning Analysis of Top Global Firms

Firms in the higher-ranked group had, on average, revenues of $1,564.5 M in 1995 and $9,058.5 M in 2007, an average of 580 percent revenue growth. Firms in the lower-ranked group had, on average, revenues of $517.8 M in 1995 and $2,118.6 M in 2007, a 400 percent revenue growth. This is a very high revenue growth, considering that the revenue growth of all 225 firms from 1995 to 2007 was 180 percent.

(1) The Higher-Ranked Group

The overseas market rate of the higher-ranked group among the firms that had the same revenue size as the Korean firms in 1995 increased by 7.6 percent from 1995 to 2007 (Fig.2.). These higher-ranked firms are those that were ranked 50 - 80 in 1995 (average rank 65.5); although they were in the 1 - 60 rank in 2007, most of them were within the 40 rank (average rank 32). The higher-ranked group's revenue in 2007 can be virtually valued as the revenue in the top group if judged by the *ENR* ranking. The fact that the firms whose revenue size was similar to that of the Korean firms in 1995 have grown into global firms over 10 years should be of interest to the Korean firms.

Comparing the revenue of product types illustrated in Fig.2., it is found that the weight of General Building and Hazardous Waste has decreased and the weight of Power Plants and Transportation has increased in the higher-ranked group firms.
The changes in the firm's evolutionary dimensions show that such firms have increased their revenue by attempting to specialize in the global market and have made an attempt to diversify their business into the international market.

(2) The Lower-Ranked Group

The lower-ranked group's firms that had the same revenue size as the Korean firms in the 1995 ENR list include those that were ranked between 120 and 140. Although their average rank was 127 in 1995, it changed to 86 in 2007, meaning they have also grown enormously during the 12 years.

The weight of domestic and overseas revenue of the lower-ranked group is illustrated in Fig.3. Although their overseas market weight increased by 3.9 percent from 1995 to 2007, they have given more weight to the domestic market than the overseas market compared to the higher-ranked group. And moreover three of five U.S. firms have no real revenue in the overseas market, but have a focus on the domestic market; in fact, there are a number of firms with no overseas market revenues in the ENR Top 225 Global Contractors.

As seen in Fig.3, comparing the product revenue rate of the lower-ranked group, it is shown that General Building's weight was heavier than other products, as with a decreased international weight in 2007 compared to 1995. However, in the higher-ranked group, it is found that plant development became specialized and the weight of engineering works such as transportation was raised, while the ratio of business specification and diversification in 2007 compared to 1995 was revealed to be 2.6 percent.

Since the overseas market weight was shown to be 26.7 percent, which is a lower percentage than that of the higher-ranked group, it can be concluded that the lower-ranked group tended to pursue diversification in the domestic market rather than the international market.

6. Strategic Planning Analysis of Korean Firms

On average there were 6 Korean firms ranked in the ENR list of "Top Global Contractors" from 1995 to 2007. While there were Korean firms ranked continuously over the 12 years, there were others that were weeded out of the market after the IMF crisis in 1997. For the analysis of strategic planning change, six firms were selected, three from the 1995 ENR list, three from 1997, and one from 1999. The overseas market weight of the six Korean firms decreased by 5.6 percent, as illustrated in Fig.4.

Although there has recently been an increased number of orders in the overseas construction market, especially in the Middle East and Asian Market, with an expected increase of $30+ billion, the revenues in the overseas market compared to that in the domestic market have decreased.

Changes in Revenue Shares via Product Types

Note: GEN BLDG (general building), MFG (manufacturing facilities), POWER (power plants), INDUST/PETRO (industrial process/petroleum plants), TRANSP (transportation facilities), HAZ WASTE (hazardous waste)
This was due to the decline in credit of Korean firms followed by the IMF foreign exchange crisis in 1997 as well as the lack of faculty for risk and project management in their overseas business. However, there is a growing tendency recently among Korean overseas contractors to expand and diversify their business in foreign markets, because of the recent increase in overseas ordering caused by oil dollars and the effort of the firms to launch actively into the overseas market in order to brace themselves for a downturn in the Korean construction market.

In the entire global market including the Korean market, the product weight of Industrial Process or Petroleum Plants has decreased, while the Construction and Engineering sections in the Korean market has greatly increased. Moreover from the product revenue standpoint, there is an increase in overseas revenue prompted by the weight increase of Industrial Process and Petroleum Plants while revenue weight in the Korean market has decreased. It is also seen that overseas market revenue weight has significantly decreased with the strong tendency towards specification rather than diversification. It can be said that Korean firms have concentrated on the domestic market and have been making less strategic efforts in terms of their foreign business compared to the advanced firms. And it is also found that the global firms have progressed in the direction of diversification and strengthening of inroads into the overseas market, while the Korean firms have favored the direction of specification with a decrease in overseas market revenue.

7. Synthesis and Its Implication

Fig. 5 shows the analyzed arrangement of each group including Korean firms using key markets and level of diversification and specification as criteria. Firms in the higher group (1) focused on product diversification in the domestic market and successfully entered the international market. Firms in the lower group (2) gained experience in domestic markets through specification products and entered the international markets with specification products. Finally, Korean firms (3) that did not possess specification products, took comfort in a few products in the domestic market, and did not actively seek entry into the international market.

For Korean construction firms to grow to the level of the global firms, it is necessary for them to increase their weight in the overseas market. Also, they must keep an eye on the trends of the advanced firms, which have focused on the international market rather than the domestic and implemented a strategy of diversification rather than specification.

The main implications gained through this study directly and indirectly are as follows. First, there have been continual inroads into the international market due to the limited domestic market and its competitive system. Yet, it is seen that support from the domestic market is necessary to cope with the shifting market environment. Second, due to the little difference in technological level among global contractors, the advanced firms favor implementing diverse business strategies such as diversification and specification in order to avoid severe competition. Third, it is found that the most popular strategy adopted by the top advanced firms for survival and growth in the global
market is strategic coalition and M&A. Fourth, the construction companies from developing nations such as China and India are growing rapidly, thereby threatening established firms. They are expanding their businesses through technology coalitions and subcontracting with advanced construction firms, thus securing a revenue network needed for product orders and building their reputations.

8. Conclusion
The purpose of this study is to determine the success factors of firms which are responding appropriately to the rapidly changing environment of global construction, and provide suggestions concerning the future survival and growth of domestic design and engineering firms which have recently faced difficulties.

In order to compare and analyze the business strategies of Korean and globally advanced construction firms, this paper used the rank, revenue, and market share data of the ENR Top 225 Global Contractors.

First, construction firms that were much the same in size in terms of their revenues as Korean firms in 1995 are classified into two groups by rank and revenue size difference. Their strategic change in the global market was then examined in terms of rank and revenue. In addition, the market entry strategies of emerging firms from developing countries in the global market were investigated. Based on the growth paths of each group shown in Fig.5, Korean firms should pursue simultaneously the growth path of the higher rank group (A→B and B→D) as well as the growth path of lower rank group (A→D). The reason for such pursuit is that the Korean domestic market is small and markets for specific products are not big enough to accumulate technology and experience. Considering such Korean construction circumstances, to promote survival and growth, domestic construction firms should carry out complete restructuring in order to cultivate technical capability through which they can nurture competitiveness. Also, the government should set the conditions for active nurturing and enlargement of engineering firms.

Such trend analyses will be useful as data for establishing the future strategic planning of Korean overseas contractors in the global market. It should be noted that the Korean firms need to reconsider the organic relation of the overseas and domestic market, to diversify their construction products from various viewpoints, and to develop mutually complementary roles and functions among global players in order to secure a competitive edge over the top global construction firms.

Acknowledgement
The authors gratefully acknowledge the support of this research by the Chung-Ang University Research Scholarship Grants in 2008.

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