

An Empirical Study of Core Capability and International Performance for Construction Firms in China

Yan Shigang, Ph.D

Associate Professor

College of International Economics
China Foreign Affairs University, Beijing
P.R. China

Liu Guozhi, Ph.D

Managing Director

Alpine Mayreder Construction Co., Ltd, Beijing
P.R. China

Abstract

As an important participant in the international construction market, Chinese construction firms are confronted with the tasks of keeping themselves competitive. To help construction firms maintain and improve their competitiveness, this research builds a conceptual model to investigate the relationship between core capability and international performance within Chinese construction firms. Based on data collected from construction firms in China, this research has confirmed the importance of marketing capability, financial capability, project management capability, innovation capability, HR management capability, and reputation/brand to achieve their superior performance.

Keywords: construction firms, China, core capability, international performance

1. Introduction

With the rapid development of the Chinese construction industry, increasing support from the government, and China's internationalization, Chinese construction firms (CCFs) have been given great opportunities in venturing abroad and acquiring wide-ranging experience, enhancing their knowledge and skills. Some CCFs have made significant achievements in the global construction market. The number of CCFs that have emerged in the Engineering News Record (ENR) Top 250 International Contractors list has increased from a mere 4 in 1992 to 65 in 2014. The gross contracting revenue of the 65 Chinese contractors reached \$ 89.55 billion in 2014 and accounted for 17.17% of the top 250 contractor's revenue (ENR, 2015).

The rapid emergence of CCFs in international markets has generated much interest in their competitors around the globe as well as in researchers (Cheah et al., 2007; Chen & Orr, 2014; Co, 2014). Although CCFs have had great achievements in recent years, their international market share is still relatively small compared to the more established contractors from advanced industrialised countries (AICs). International competitiveness must be improved significantly if they want to make a bigger foray into international markets. However, based on extensive literature review, it was found that there are few empirical studies on how to improve CCFs' international performance, especially from the corporate perspectives. The purpose of this study is to understand the determinants of CCFs. Drawing on the resource-based view; the study focuses on investigating the core capability in affecting CCFs' international performance.

2. Literature Review

The resource-based view focuses on the firm's resources and capabilities to understand business strategy and to provide direction to strategy formulation. Resources include financial resources, tangible resources (such as plant, equipment, buildings), and intangible resources (such as patent, know-how, brand) (Barney, 1991).

According to Teece et al. (1997), resources are firm specific assets that are difficult to imitate because of transaction costs and tacit knowledge. These resources are the basis of the company's superior economic performance, and constitute organizational routines or core competence (Prahalad & Hamel, 1990). Through the internationalization process, firms gradually expand their business activities beyond their national authority and launch operations in other countries (Ahmad & Kitchen, 2008). Resources and core capabilities are important for the internationalization of any firm (Tallman & Fladmoe-Lindquist, 2002). The presence of resources and capabilities could provide a firm the discretion or motivation (strategic choices) to pursue a strategy of internationalization thereby increasing its size and profitability (Knight & Kim, 2009). Moreover, a firm can develop new capabilities as they expand internationally. These new capabilities, along with their existing resources, help the firm compete in the international market (Kumaraswamy et al., 2012; Gaur et al., 2014).

3. Research Hypotheses

With the globalisation of the world economy, construction markets in most countries are gradually opening to foreign contractors. International contractors from different countries tend to adopt different strategies to compete internationally. To achieve success in the international construction market, CCFs need to upgrade their organizational capabilities through operations in new countries and markets. Cheah et al. (2007) identified seven strategic fields and two internal mechanisms of organisation for large global engineering and construction firms. These issues exist at the corporate level and are embedded in the very lifeblood of the organisation, and hence reflect the corresponding firm-specific resources and capabilities. Chen & Orr (2014) analyzed the mechanisms of Chinese contractors' entry into Africa and stated Chinese contractors' performance in Africa in terms of business revenue actually hinges upon availability of financing sources and availability of natural resources. Gaur et al. (2014) identified three critical resource/capability variables, namely international experience, marketing and technological capabilities to study the competitive advantage of Chinese firms in the international market. Thus, it expects CCFs with a wide variety of capabilities, including marketing capability, financial capability, project management capability, innovation capability, HR management capability, reputation/brand and organizational culture, to have a broader range of possible actions and to be able to exploit numerous resources, thus enhancing CCFs' international performance.

3.1 Marketing Capability and International Performance

The business risk is higher in the construction industry when compared with other types of businesses. Thorpe & McCaffer (1991) emphasized that contractors must have a proper marketing capability in finding opportunities that are advantageous to the company. The related strategic area can be a choice of type of work, client, size of contract, type of contract that can provide opportunities to reduce competition and risk. Marketing capability can help CCFs build good relationship with various external parties in the international market, which enable them to achieve better performance. In some newly industrialized countries, a large number of construction contracts were traditionally secured through personal contacts and repeated business. A large amount of resources and information could flow through personal relationships due to institutional and environmental uncertainties. Such relationships could reduce transaction costs and improve efficiency of resource allocation. Effective marketing could help firms find more business opportunities in international markets, both in their core business and related businesses, and even unrelated businesses (Gaur et al., 2014). Thus the first hypothesis is:

H1: Marketing capability is positively related to CCFs' international performance.

3.2 Financial Capability and International Performance

Financial capability is the ability of firms to use financial resources as medium of exchange for other productive resources (Chatterjee & Wernerfelt, 1991). In construction industry, several innovative financing techniques used to finance international engineering and construction projects have emerged in the international marketplace. Among these techniques, project finance and countertrade are the most dominant. It is evident that strong financing capability could help contractors achieve bigger market share by participating in such projects. At the same time, good financial/accounting management and effective strategic investment could increase financial benefits (Low & Jiang, 2003). Contractors with strong financial capability can differentiate themselves from their competitors by providing various financing packages to benefit clients. Effective financial management can also reduce operational costs. Thus, the financial capability of contractors can influence CCFs' international performance:

H2: Financial capability is positively related to CCFs' international performance.

3.3 Project Management Capability and International Performance

Project management can be defined as the process of controlling the achievement of the project objectives (Munns & Bjeirmi, 1996). The function of project management includes defining the requirement of work, establishing the extent of work, allocating the resources required, planning the execution of the work, monitoring the progress of the work and adjusting deviations from the plan. Effective project management is very critical for the successful accomplishment of sophisticated projects (Isik et al., 2009). The growth of project management is attributed to its ability to help organisations do work more efficiently, effectively, and productively (Guenzi & Troilo, 2006). Apparently, effective project management capability can reduce project costs and increase working efficiency and hence increase firm's financial benefits. Also, with strong project management capability, a firm can undertake complex projects in regions where local firms have weaker capabilities to execute the job. Therefore:

H4: Project management capability is positively related to CCFs' international performance.

3.4 Innovation Capability and International Performance

Innovation capability can be considered as a subset of dynamic organizational capabilities. Hamel (1998) defined innovation as the capacity to re-conceive the existing business model in ways that create new value for customers and stakeholders and advantages over the competition. In the construction industry, process innovation is deemed to be able to help contractors achieve better financial performance, while product innovation can help contractors to increase market share (Levy, 2011). On the other hand, product innovation is an important advantage for creating a higher quality product, and also produces qualitatively superior output (David et al., 2008). The use of IT technology and e-commerce cope with increasing complexity of production, communications and technology. Innovation capability offers the potential benefits for construction enterprises to reduce the cost of production, increase the technical feasibility of construction undertakings, and further improve market growth. Thus, innovation capability is the key ingredient for CCFs to achieve success.

H4: Innovation capability is positively related to CCFs' international performance.

3.5 HR Management Capability and International Performance

Human resource (HR) is one of the most important firm assets that can help to form sustainable competitive advantage. Barney and Wright (1998) outlined the way that human resources provide competitive advantage using what they called a VRIO (value, rareness, limitability, and organisation) framework. Human resources need to be managed very carefully to ensure that only the best people are selected, and are given high quality and appropriate training and development. High quality human resources and effective HR management could help firms improve their working efficiency, and hence increase their financial returns (Langford & Male, 2008). CCFs have abundant human resources, which lead to low labour costs and overhead, and have positive impact on firm's performance. Thus; cultivating and recruiting versatile managers for multiple business management would enable CCFs to expand their business scope. Based on the above analysis, the hypothesis for the relationship between HR management capability and performance is developed as follows:

H5: HR management capability is positively related to CCFs' international performance.

3.6 Reputation/Brand and International Performance

Reputation/brand reflects the core capabilities and comprehensive strength of a firm. Reputation/brand creates shareholder's value and produces significant long-term competitive advantage (Gray & Balmer, 1998). It impedes rivalry, enhances the license to operate and is a protective shield against downturns and crisis. Reputation/brand influences stakeholders to provide or withhold support (Fombrun, 1996). It could result in premium prices for their products and leverage in negotiations with suppliers, creditors and distributors. Many large CCFs that have pursued horizontal diversification strategy and vertical integration strategy have strong reputations in their fields and regions. The reputation of completing high quality projects may be known within network of clients in different markets, regions and industries, thus the next hypothesis is developed as follows:

H6: Reputation/brand is positively related to CCFs' international performance.

3.7 Organizational Culture and International Performance

The organizational culture is defined as a system of shared meaning held by members that distinguishes the organization from other organizations (Schein, 2010). The primary characteristics of organizational culture include: innovation and risk-taking, attention to details, outcome orientation, people orientation, team orientation, aggressiveness, and stability (Ashkanasy et al., 2000). Organizational culture sustains a firm's competitive advantage through its maintenance of firm-specific capabilities and socialization of new workers. Differences in organizational culture among competing firms are identified as important sources of sustainable competitive advantage. As for CCFs, most of them have formulated rules and procedures to handle project management. These rules and procedures covered most of the activities, including quality management, cost management, contract management, and technology management. Effective organisational culture could minimize bureaucracy, and hence increasing operational efficiency and reducing operational costs. Thus the seventh hypothesis is:

H7: Organizational culture is positively related to CCFs' international performance.

4. Research Methodology

4.1 The Sample and Survey Instrument

The survey method used a structured questionnaire. The questionnaire survey targeted large CCFs which were undertaking international construction projects. The sample was selected based on the ranking of the firms in the ENR Top 250 International Contractors list and their reputation in China. The questionnaire was completed by middle or senior managers of these firms. Altogether 260 sets of questionnaire were sent out, and a total of 92 sets of answered questionnaire were received. The rate of return is 35.4%. The general information of the respondents is summarized in Table 1. Among these respondents, 37 were from top management, and 55 were department managers and project managers. There were 48 respondents from civil engineering firms and 44 from general building firms. Most of the respondents were from HQs, whereas 28 were from their subsidiaries which were involved in international construction. All respondents were experienced and well familiar with the research area. After sending out the questionnaire, further contacts through email and telephone were also made to confirm and probe further several respondents' views if such respondents had provided contact information in the returned questionnaire.

TABLE 1: General Information of the Respondents

		Number of Respondents	
Classified by Designation	President/general manager/ /director	37	
	Department manager/project manager	55	
	Total	92	
Classified by CCFs' Business Nature	Civil engineering	HQ	35
		Subsidiary	13
	General building	HQ	29
		Subsidiary	15
	Total	92	

4.2 Measurement

Most of the factors in the questionnaire are self-developed to suit the practice in the industry. The instrument has been tested for face-to-face validity on contractors. All key variables in the study were assessed using multiple measures. Such measures are necessary to capture the domain of the constructs adequately and accurately (Churchill, 1979; Nunnally, 1978). In addition, this approach is believed to reduce measurement error and increase the reliability and validity of the measures (Churchill, 1979).

The core capability variables were measured using five-point Likert scales ranging from 1 "not at all important" to 5 "extremely important". Marketing capability included six items: (1) using experienced international marketing professionals, (2) sufficient information channels, (3) top management's overall guidance, (4) promotion through various marketing channels, (5) good relationship with various external parties, and (6) internal marketing. Financial capability can be measured and developed in five areas: (1) building good relationship with banks and financial institutions, (2) public-listing, (3) cooperation with firms from AICs, (4) strategic investment, and (5) financial/accounting management.

Project management capability is structured to ensure that a project is completed on time, within budget and with a desirable level of quality. The measure of project management capability was partly adopted from Levy (2011) and included six items: (1) schedule/progress control, (2) cost control, (3) quality management, (4) contract management, (5) procurement management, (6) safety and environmental management. The measures of innovation capability included five items as follows: (1) new materials and products, (2) new machinery and equipment, (3) new technology and techniques, (4) design capability, and (5) IT application. The measure of HR management capability was partly adopted from Langford & Male (2008), and included six items: (1) training for international business, (2) reward management, (3) level of international recruitment, (4) international experience and ability of expatriate managers, (5) quality (job skills and international experience) of management and technical staff, and (6) quantity of technical and managerial staff (proportion of staff with higher education). Reputation/brand included six items as follows: (1) fulfillment of contract obligations, (2) awards of good quality projects, (3) reputation for superior management, (4) social responsibility, (5) international recognition by scale, and (6) international recognition by scale. The measurement of organizational culture was partly adopted from Flamholtz & Kannan-Narasimhan (2005), and were measured by six items, including (1) customer-orientation, (2) people-orientation, (3) identification with the firm, (4) internal communication, (5) organizational learning, and (6) pursuit of innovation.

4.3 Firm's Performance

The performance was often measured by the business volume (including sales, profit) (David, et al., 2008), efficiency (productivity, return on equity) (Davies & Walters, 2004), and the overall performance (Kale & Ardit, 2002). The overall performance can be measured by a multi-dimensional method or by averaging the sales growth and profit growth. This research adopted the latter, which means that the sales growth and profit growth were treated as equally important for the international performance of CCFs.

5 Analysis and Results

5.1 Reliability Analysis

The reliability of data is the basis of the quality of research findings. The internal consistency of scales is usually assessed by the Cronbach Alpha method. Cronbach's coefficient alpha was used to measure the degree of co-variation among core capability variables. Table 2 shows the Cronbach Alpha values for the research variables of these constructs. The resulting values range from 0.52 to 0.82, indicating an acceptable level of internal consistency (Churchill, 1979; Nunnally, 1978).

Table 2: Variables and Their Reliability

Variables	Retained number of items	Reliability (Cronbach's Alpha)
Marketing capability	6	0.52
Financial capability	5	0.55
Project management capability	6	0.82
Innovation capability	5	0.61
HR management capability	6	0.54
Reputation/brand	6	0.65
Organizational culture	6	0.62

5.2 Research Findings

Regression analysis is used to determine the degree to which selected independent variables were able to predict Chinese CCFs. The measure of "overall performance" is given by the average of sales and profit growth rates. As indicated, these three related models are all statistically significant at 0.01 levels. The values of the adjusted R^2 for Model a, b and c are 0.50, 0.42 and 0.64 respectively, which are deemed acceptable. It indicated that these seven resource/capability variables can explain 50%, 42% and 64% of the variance in the sales growth, profit growth and overall performance of CCFs. The results showed that marketing capability has significantly positive relationship with overall performance with a coefficient of 0.21 at 0.05 levels, indicating that H1 is supported. Financial capability, project management capability and innovation capability had significantly positive relationship with overall performance with coefficients of 0.25, 0.16 and 0.22. Thus H2, H3 and H4 are supported.

HR management capability and reputation/brand had significantly positive relationship with overall performance with coefficients of 0.21 and 0.13. Thus H5 and H6 are supported. Organization culture is not significantly related to overall performance with $p > 0.1$, thus H7 is rejected.

Table 3: Impact of Core Capability on CCFs' International Performance

Independent variable	Dependent variable		
	Model a Sales growth	Model b Profit growth	Model c Overall performance
Marketing capability	0.23**	0.12	0.21**
Financial capability	0.28***	0.14	0.25***
Project management capability	0.07	0.21**	0.16**
Innovation capability	0.23**	0.14	0.22**
HR management capability	0.10	0.27***	0.21
Reputation/brand	0.15*	0.07	0.13*
Organizational culture	-0.07	-0.01	-0.05
Adjusted R ²	0.50	0.42	0.64
F-Value	12.28***	9.32***	20.93***

* $P < 0.1$; ** $P < 0.05$; *** $P < 0.01$

5.3 Discussion of the Findings

The results revealed that four firm-specific resources and capabilities directly influenced CCFs' international growth. As indicated, marketing capability contributed to sales growth instead of profitability. The positive relationship of marketing capability to sales growth is understandable. Those CCFs with strong marketing capability could establish good relationship with international clients, contractors, financing institutions, and other parties. Such a network would enable them to secure more projects and hence increase their sales volume. However, cultivating and sustaining relationship could be costly in terms of the reciprocal and utilitarian demands (Park and Luo, 2001). As such, it offset the benefits derived from marketing capability. Financial capability was also confirmed to have direct impact on sales growth. The increasing financing requirements for international construction allowed only firms with strong financial capability to undertake such projects. Such strategic investments had helped these CCFs generate more sales. However, strategic investments of CCFs in international markets were still limited. Thus its impact on profitability had not been achieved. Project management capability was proved to be positively related to profit growth. Although most of the CCFs were latecomers to international markets, they nonetheless had accumulated extensive project management experience at home, especially in progress and cost control. Such a capability increased their working efficiency and hence led to better financial performance.

Innovation capability contributed to sales growth due probably to its role in helping CCFs increase their chances in winning projects with high technological requirements. However, developing proprietary technology requires large amount of capital injection, which offsets the benefits derived from a higher level of sales, thus reducing the impact on profit growth. HR management capability also contributed to profit growth. It indicated that cost advantage could be amplified by those CCFs with strong HR management capability. CCFs with strong HR management capability possessed apparent advantages over these international competitors. However, the lack of experienced managerial staff for international operations is a weakness of CCFs. It implies that those CCFs with more experienced staff would reduce risks in international operations, thereby increasing their profitability. On the other hand, HR management capability did not contribute to sales growth. However, it might indirectly contribute to sales growth through its influence on marketing capability, i.e., engaging experienced marketing professionals.

The results also indicated that reputation/brand directly led to higher sales volume. For international construction, reputation is usually very important for contractors to be pre-qualified, besides technology capability and financial capability. For international projects that are not administrated through open tender, reputation becomes even more important to contractors for securing clients. Thus it is logical that reputation plays an important role in increasing the sales volume of CCFs. However, building reputation and branding take much time, effort and cost.

The financial benefits from reputation might not be obvious in the short-term. Organisational culture was not proved to be significantly related to sales growth and profit growth. It might be possible that the organisational structure could influence performance in an indirect way. On the other hand, valuable organisational culture is usually seen as an intangible asset and needs to be cultivated in the long-run. This might be the reason why the positive impact of organisational culture on firm's performance had yet to be realised.

6. Conclusions

This study has taken a step toward delineating the dimensions of core capability adopted by construction firms through comprehensive literature and preliminary interviews, the CCFs' core capabilities could be characterized by seven dimensions: marketing capability, financial capability, project management capability, innovation capability, HR management capability, and reputation/brand and organization culture. Based on data collected from CCFs in China, this study has confirmed the importance of core capabilities to achieve their superior performance. Moreover, there are positive relationships among marketing capability, financial capability, project management capability, innovation capability, HR management capability, and reputation/brand with CCFs' international performance. The findings of this study also have implications for management practice. Specifically, the result of this research may be useful for management practitioners who are involved in the development of CCFs. Top management of CCFs should give first priority to cultivate the fundamental firm-specific resources and capabilities, as these variables could directly or indirectly influence their international performance.

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