

CHINESE CONTRACTORS AND INTERNATIONAL CONSTRUCTION: TENTATIVE ANALYTICAL MODELS AND RESEARCH AGENDA

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Abstract: International construction has assumed great significance in recent years. There are indications that this trend will continue. The competition for international projects has also become more intense as the global marketplace has become crowded because firms from many “emerging countries” which used to import construction services and had no sizeable contracting firms have developed the expertise and capability to export their services, and to compete effectively with the established firms at home.

This paper considers the opportunities and challenges of international construction for Chinese construction firms at home and overseas. It is based on a review of the literature; the review is limited to works published in 2000 and later. Recent developments on the international construction scene are discussed, focusing on the determinants of competition. This is followed by a consideration of Chinese firms and international construction, discussing the strengths of these companies and how these strengths can be applied effectively, and further improved. It is suggested that Chinese construction firms have the potential to do well on international projects at home and overseas. A research agenda is proposed. It is noted that researchers have the responsibility to provide the knowledge to serve as the basis of greater efforts which should be made to develop the export capacity and capability of Chinese firms, using the internal strengths of the enterprises and the promotional, facilitating and supporting efforts of the government, and the professional institutions and trade associations.

Keywords: international construction; domestic market; China; special features; research

1 Introduction

1.1 Background

The construction industry in China and Chinese firms working overseas have attracted attention among the leading construction researchers. For example, the overwhelming majority of the country-based papers in the *Journal of Construction Engineering and Management* published by the American Society of Civil Engineers were on aspects of the construction industry in China, or the operations of Chinese firms on the global market (see, for example, Shen et al., 2006a, 2006b). Several authors highlight the large size, high rate of expansion and potential for further growth of the Chinese construction market. For example, Crosthwaite (2000) noted: What is perhaps most interesting is the combination of construction spending growth and market size. The country that stands out is China. Although ranked fifteenth with regards to construction spending growth, when this is compared with China’s position as the fourth largest construction market by volume the importance of the construction sector is clear (pp. 625-626).

As another sign of the growing importance and awareness of China’s construction industry and its firms, the US trade magazine, *Engineering News-Record (ENR)*, now publishes a list of the top 60 Chinese contractors. Table 1, which is drawn from this list, presents data on the top 20 contractors in 2004-06; the firms are ranked on the basis of their annual revenues from construction contracting. The data show that in 2005, three contractors had gross revenues from construction exceeding US\$10 billion. They were: China Railway Engineering Corporation; China Railway Construction Corporation; and China State Construction Engineering Corporation. The first two had domestic revenue exceeding US\$10 billion. China State Construction Engineering Corporation had overseas revenue of over US\$1.7 billion, and that of China Harbour Engineering Company (Group) was US\$925 million. Whereas overseas revenue was a relatively small proportion of the total for most of the firms, China National Machinery & Equipment Group earned over 62 per cent of its gross revenue from abroad.

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Finally, the scale and pace of construction in China has led to extensive coverage of the industry in newspapers in South-East Asia. *The Straits Times* (2005) of Singapore noted that in 2005 alone, Shanghai completed more towers with space for living and working than there was space in all the office buildings in New York City. Shanghai already had 4,000 skyscrapers, almost double the number in New York City, and there were plans to add another 1,000 by the end of 2010. In 2005, China as a whole was expected to complete 4.7 billion sq. ft. of construction. The article noted the adverse effects of this activity including: loss of prime farming land; possibility of social instability owing to the competition for land soaring prices; loss of “old China”; and high demand for energy and raw materials. The paper noted that China was the world’s largest consumer of steel, cement and coal.

Table 1 Top 20 Chinese contractors, 2004-05

2005	Rank	Firm	General Contracting Gross Revenue (\$m)	Domestic Revenue (\$m)
	2004			
1	2	China Railway Engineering Corporation	11,645	10,967
2	3	China Railway Construction Corporation	11,272	10,892
3	1	China State Construction Engineering Corporation	11,092	9,384
4	4	China Metallurgical Construction (Group) Corporation	6,003	5,806
5	5	China Harbour Engineering Company (Group)	4,430	3,505
6	6	Shanghai Construction (Group) General Co.	3,811	3,430
7	7	SinoHydro Corporation	2,990	2,687
8	9	China Road & Bridge Corporation	2,778	2,489
9	10	Beijing Construction Engineering Co. Ltd (Group)	2,116	2,084
10	11	Zhejiang Construction Investment Group Co. Ltd	1,909	1,790
11	8	Beijing Urban Construction Group Co. Ltd.	1,686	1,671
12	13	GuangSha Construction Group Ltd	1,592	1,568
13	**	Guangzhou Municipal Construction Group Ltd	1,418	1,386
14	17	Dongfang Electric Corporation	1,380	1,190
15	20	Jiangsu Nantong No. 3 Construction Group Co. Ltd.	1,342	1,278
16	12	Shanghai Urban Construction (Group) Corporation	1,312	1,284
17	18	Hunan Construction Engineering Group Corporation	1,261	1,247
18	15	Tianjin Construction Engineering Group (Holding) Co. Ltd.	1,260	1,257
19	14	China National Machinery & Equipment Group	1,138	430
20	16	Sichuan Huashi Group Corporation Ltd.	1,123	1,099

Source: McGraw Hill Construction ENR, <http://www.enr.com/people/topLists/chinaCont> (compiled by ENR and *Construction Times of Shanghai*)

1.2 Aim and Objectives of Paper

The objectives of this paper are:

- to consider the factors which influence competition for international construction projects
- to discuss recent developments on the international construction market and their implications for Chinese enterprises, given the strengths and weaknesses of these firms
- to recommend a research agenda which would lead to the development of initiatives for improving the capability of Chinese construction enterprises to compete for, and successfully undertake, international projects.

The paper is based on a review of the literature. Owing to the dynamism of the international construction market and that of the construction industry in China in particular, the review is limited to works published in 2000 and later.

2 International Construction: The literature

2.1 A definition

There are several definitions of “international construction”. A common definition of an international construction project is: “A project undertaken by a company outside the country where the company is based”. This definition is used in the collection of information on “international construction” such as the data in *ENR*. In the past, this definition was appropriate. The process of globalisation has introduced much complexity in the construction market and its projects. First, ownership structures, nationalities and corporate domiciles are no longer simple. For example, the Skanska Group of Sweden is the largest contractor in a number of European countries. Some of the larger Australian and British contractors are foreign owned. Second, the cross-border trade in construction services such as the procurement of materials, equipment, finance and insurance, and outsourcing of design and development activities means that parts of the work on one project may be spread over many countries. Third, with the large number of firms of different ‘nationalities’ which are involved in the sizeable projects, if the definition of international construction outlined above is applied, there would be situations where the same project is “international” when some of the firms involved in it are considered, and not so with respect to the domestic firms working on it.

For the purpose of the discussion in this paper, an international project is considered to belong to a category of works which are of a special scale in terms of: (i) physical and financial size; (ii) technological complexity; and, as a result, (iii) resource and expertise requirements. These projects attract interest from firms from around the world, and there is intense competition for them. It is neither practical nor useful to delineate the quantum of each of the features of international construction projects, as they differ from country to country, given project values and risks.

2.2 Relevance of the definition to this paper

The definition offered above is relevant in the context of this paper. For example, Chinese firms would compete for international projects in China and overseas and they must have certain capacities and capabilities to succeed in such competition. Moreover, their success in winning and undertaking such projects at home will enhance their ability to do well in the more demanding markets overseas (including the home countries of the foreign firms in China).

The paper considers the following:

- i. China as a home-country of Chinese international construction companies
- ii. China as a host-country for international foreign contractors based in, or wishing to venture into, China
- iii. the relationship between (i) and (ii), for example, how the home base of Chinese firms, including their alliances with foreign firms based in China, can be used to build them up into world beaters at home and abroad.

2.3 Success Requirements of International Construction

To succeed on international construction projects, firms must address certain factors, and possess certain resources and corporate strengths. These include:

- a. technical expertise (integration of new, complex technologies; finding solutions to rare problems; strategic and innovative application of information and communication technology)
- b. managerial expertise (procurement of inputs and logistics; project programming and control; materials, human resource and equipment management)
- c. financial resources and expertise (large size of projects; need to provide financial packages)
- d. risk management (experience in anticipating and dealing with risks; access to insurance at reasonable rates)
- e. management of cultural issues (involvement of firms from several countries; cross-cultural issues)

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f. ability to deal with political issues (multiplicity of nationalities involved; need to deal with political issues).

In a study of “United States-based international contractors”, Gunhan and Arditi (2005a) consider the factors affecting international construction as the strengths, threats, and opportunities of the companies. They identify these as (p. 281):

- a. *company strengths* including track record on similar international projects; specialist expertise in a particular line of work that requires sophisticated know-how; capability to deliver project management services; a network of contacts that can provide critical information on international projects
- b. *threats facing companies* including loss of key personnel (with special talents and skills such as knowledge of foreign languages and cultures, in addition to technical and managerial skills); shortage of financial resources; inflation and currency fluctuations; interest rate increases
- c. *opportunities offered by international markets* including increased long term profitability; ability to maintain shareholders’ return; openness of the markets; availability of new service areas.

The features described above are evident in the corporate strategies and strengths of the leading international construction firms, as indicated by the annual *ENR* survey of top international contractors. Table 2 shows that most of the top 20 international contractors in 2004-06 from the *ENR* survey were European firms. This represents a major shift. Until the mid-1980s, most of the top firms in the *ENR*’s list were American. It is worth noting that the China State Construction Engineering Group appeared in the top 20 list in all three years although it slipped to the 20th position (from 17th). It must be noted that the *ENR* survey has many weaknesses. First, it is voluntary, and some large firms may not participate in it, at least in some years. Second, norms for determining the values of the data collected may differ from one country to another. However, the *ENR* survey provides the most comprehensive data on the world’s top contractors.

Table 2 Top 20 international contractors, 2004 to 2006

Rank			Firm
2006	2005	2004	
1	1	2	Hochtief AG, Germany
2	2	1	Skanska AB, Sweden
3	4	3	Vinci, France
4	8	8	Strabag SE, Austria
5	6	5	Bouygues, France
6	3	6	KBR, USA
7	5	4	Bechtel, USA
8	12	13	Fluor Corp, USA
9	7	7	TECHNIP, France
10	10	10	Bilfinger Berger AB, Germany
11	9	9	Royal BAM Groep, The Netherlands
12	11	16	Ferrovial, Spain
13	14	12	Bovis Lend Lease, UK
14	13	11	AMEC plc, UK
15	16	15	JGC Corp, Japan
16	15	20	Grupo ACS, Spain
17	18	19	Consolidated Contractors Int’l Co, Greece
18	27		Chiyoda Corp., Japan
19	24		Balfour Beatty plc, UK
20	17	17	China State Construction Engineering Group, China
27	19	18	Snamprogetti, Italy
23	20	24	Kajima Corp., Japan

Source: *ENR*

Some examples of corporate strengths of international construction firms may be discussed. The Skanska Group (2005) considers its strengths as: the Skanska brand, built up in over a century of operations (especially its Code of Conduct including policies on employee relations, health, safety and the environment, and business ethics); highly skilled, dedicated employees and the ability to transfer knowledge between geographical markets; and financial strength which helps maintain the confidence of customers and banks. Skanska’s “strategy for profitability” comprises: focus on core business; being an international company with local businesses that have leading positions in selected home markets; taking advantage of the collective resources and strengths of the Group – brand, employee expertise and financial strength; foreseeing and managing risks in its business; being an industry leader in sustainability, particularly in safety, ethics and the environment; and coordinating purchasing and industrialisation.

The second firm whose features may be highlighted is Bechtel Corporation (US). It cites its core competences as (<http://www.bechtel.com/core.htm>): (i) construction – experience in the art and science of construction and construction management; (ii) engineering – more than a century ranked as a world leader in engineering; (iii) development, financing and ownership – one of the largest and most successful development and financing entities in the industry; (iv) procurement – acquiring the right goods at the lowest total cost, on time anywhere in the world, faster and better than anyone else; (v) project management – highly skilled and experienced teams capable of organising, scheduling and integrating all individual elements of a project; (vi) safety – a key value and fundamental to the firm’s culture; and (vii) technology – state of the art technology to deliver engineering and construction projects to customers worldwide.

The final firm to be highlighted here is the Bouygues Group (France). The firm considers “The Bouygues Way” as involving: talented people – with the commitment, skills and team spirit; competencies and resources – enabling the firm to provide a global offer, and a quality, time and cost guarantee; and satisfaction of its clients by being proactive and anticipating the clients’ needs (<http://www.bouygues-UK.com>).

It is also worth noting that even in the most advanced nations with the most sophisticated construction industries, foreign firms are active, and are significantly present in some sectors. For example, in 2002, the two top firms on the *ENR*’s Top 225 International Contractors list, Skanska and Hochtief, owed their ranking largely to their huge US-based subsidiaries. More than half of Skanska’s international revenue came from its US operating group, Skanska (USA) Inc, while around two-thirds of Hochtief’s total international revenue in 2002 was accounted for by its chief US subsidiary, Turner Corporation (Reina and Tulacz, 2003).

To win international projects at home and abroad, where they compete with foreign firms, Chinese firms must possess the success factors discussed above. In the next section, some relevant topics which have recently been discussed in the literature are considered.

2.4 International Construction: Recent developments

The features of international construction and the determinants of success are discussed above. The literature also considers the difficulties that international projects pose, especially those undertaken outside the firm’s home base. The risks faced on such projects are often discussed (see Wang et al., 2000; Fang, et al, 2004). Also highlighted are the differences between a firm’s home-country market and those overseas. Firat and Huovinen (2005) note that:

In the context of construction markets, a contractor, a supplier or a designer, as an entrant, must face and penetrate an extremely ‘hard’ wall surrounding the targeted competitive arena consisting of local clients, architects, contractors, and other stakeholders that are glued together with local contracting rules, building regulations, traditions, and practices (p. 58).

Frameworks for analysing the competitiveness of international construction firms are offered by many authors. Ofori (2003) provides a review. Among the recent models is that of Firat and Huovinen (2005). They propose the “spearhead strategy” comprising: (i) choosing a competitive arena; (ii) identifying the potential clients and influencers; (iii) adapting the entrant’s existing offering; (iv) differentiating the company’s approach towards potential clients; (v) localising the entrant’s capabilities; and (vi) tailoring the entrant’s sales arguments. Drawing inspiration from Porter’s (1990) Diamond framework, Ericsson *et al.* (2005) offer the Hexagon framework which comprises the following factors: (i) factor conditions; (ii) demand conditions; (iii)

government; (iv) industry characteristics; and (v) firm strategy and management; and (vi) human resources. There are two exogenous factors: chance; and culture. Their framework has two hexagons, the inner one representing the national situation and the other, the international dimension.

Finally, some authors project the future of international construction (see Bon and Crosthwaite, 2000). Flanagan (2005) identified and mapped business drivers over the next five years against global drivers which will have the greatest impact on the construction industry. He notes that the latter should be seen as business opportunities. The global drivers which obtain the highest scores are: (i) Governance and legislation; (ii) Globalisation of economies and businesses; (iii) Rapid technological and organisational change; and (iv) Information, knowledge and communication. He notes: “Our recommendation is that enterprises must incorporate futures thinking into their plans and understand the complex interactivity that will ultimately influence their business (Flanagan, 2005, p. 14)”.

3 International Construction and Chinese Firms

Similar threads to those highlighted above run through research on Chinese international construction firms. There has been a greater volume of work on the Chinese construction market and subjects of interest to foreign firms operating or wishing to operate, in China than there has been on Chinese international contractors operating overseas

3.1 Chinese construction firms overseas

Much of the work on Chinese contractors operating overseas has been done in Singapore. Low et al. (2004) compared the strengths and advantages of British and Chinese international construction firms. They found that the international involvement of British firms had declined from a peak in 1996 while that of Chinese firms had grown since the 1980s. The strengths of the British firms were: technical expertise; track record of large, sophisticated projects throughout the world; ability to differentiate their activities in different markets to focus on niche markets; diversification outside construction; extensive financial and technical capabilities; formation of mergers, and acquisitions to create larger entities; experience on private finance initiative works; world-wide reach of UK consultancy firms; and extensive political and diplomatic links of UK government. Contributors to Chinese contractors’ success were: abundant supply of cheap, skilled labour; high degree of working in different environments; strong government support and financing flexibility; historical links with developing countries; low cost of materials and equipment procured in China; and access to funding support from state-owned banks.

Low and Jiang (2003) note that, as shown in the annual ENR surveys of the top 225 international firms, the number of Chinese contractors operating overseas was steadily increasing (it reached 35 in 2000, second only to the US – with 79 firms – although their proportion of the total volume by turnover was rather small at only 4.6%), making the Chinese firms “one of the strongest contenders in the field” (p. 589). Low and Jiang (2003) find that 10 of these firms could be considered to be “truly global” (p. 598). However, they note that there was little coverage of Chinese international contractors in the literature. They trace the historical development of these firms, noting three stages:

- before 1979 – *undertaking of construction projects overseas as a result of Chinese government’s economic and technical aid*: the organisations worked on a non-profit basis on projects agreed on a government-to-government basis under the direction of the authorities of the two countries
- 1980-1990 – *emergence of Chinese international construction enterprises*: an Act was introduced by China’s State Council on 13 August 1979 to allow specialised Chinese companies to invest in other countries. The firms evolved gradually from their initial state-owned status to commercial entities. China Construction Engineering Corporation was the first international construction enterprise to be set up, in November 1978
- early 1990s to date – *development of multinational enterprises*: larger Chinese firms expanded their operations overseas. Provincial-level firms were also granted licenses to go abroad. In 1997-98, many

large contractors separated from the government. Large volumes of equipment and materials made in China were also exported.

3.2 China as a market for international construction

The prospects for foreign firms in China and the challenges they face are popular subjects in the literature. Ling et al. (2005) study market entry modes for penetrating China, and the effective business strategies for managing the projects. They find that establishing a wholly owned subsidiary is the most effective entry mode. They advise foreign firms to adopt both a differentiation and low-cost strategy. They should also “innovate so that they can be more cost competitive and at the same time deliver high quality” (p. 519). They recommend that (p. 509):

Foreign AEC firms need to adopt a differentiation strategy by providing niche and superior service. ... pay great attention to customer satisfaction to gain competitive advantage and clinch and manage projects. To succeed in China, foreign AEC firms need to set up a physical office there, to develop a good understanding of local by-laws, understand client requirements better and therefore provide them with superior product or service.

Ling et al. (2006) suggest that the determinants of the success of international AEC firms on projects in China are: cost performance; schedule performance; performance in terms of technical quality; performance in terms of functional quality; level of quality of workmanship; architectural (aesthetic) quality; owner satisfaction; profit level performance. They suggest:

The variable that affects most number of success measures (five out of eight) is the firm’s ability to understand the client’s requirement. Achieving this brings about good project quality performance and owner satisfaction. Two other variables affected project success in four areas: AEC firms’ product quality and AEC firms that set out to acquire an international reputation. Firms that have superior product quality would have better functional and architectural quality, high owner satisfaction, and profitability (p. 214).

Several works have highlighted the problems of foreign contractors in China. The legal framework is a popular subject. Lam and Chen (2004) review the legal system governing construction in China. They note that, despite China’s accession to the World Trade Organisation (WTO) (in December 2001), this system and related practices “are still very different from the international norm” (p. 347). They advise foreign firms “to understand the Chinese way of life. Particularly, they must prepare to adapt to an environment where new rules are created as circumstances and situations change” (p. 355). They note (p. 355):

Although the Construction Law 1997, with the existing construction regulations and rules, provides a governing legal framework for construction activities in China, this framework is still not completely satisfactory... the lack of proper infrastructure in terms of laws and rules and regulations will hinder foreign investment and weaken the construction industry’s development and growth. It is vital and urgent for the Chinese construction laws and practice to develop further, be more sophisticated and more in line with international practice.

Shen et al. (2006b) identify the strengths, weaknesses, opportunities and threats of “foreign-invested construction enterprises” in developing businesses in China (p. 966). These are shown in Fig. 1

Joint ventures between Chinese firms and foreign ones for operations in China are also studied. Low et al. (2004) suggest that “the internalization and specialty advantages of British firms and some of the ownership advantages of top Chinese firms may provide them with opportunities to work together in many areas” (p. 717). Paton and Fellows (2005) suggest that two most important factors when doing business in China through an alliance are culture and network. They suggest that the following culture-related factors should be considered when forming collaborations in China: (i) developing interpersonal relationships between the client, designers and site management; (ii) familiarity with the Chinese negotiation process; (iii) understanding of Chinese thinking (process) from a foreign perspective; and (iv) acquaintance with Chinese criteria for employee for employee evaluation and work assessment. They note that in China, firms need partners which help them develop the capacity to learn and then utilise transfer the acquired knowledge, as well as enhance their own reputation and image. Thus, they search for partners with strong intangible assets; hence, partner reputation plays a major role in collaborator selection (p. 26).

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<i>Threats</i>	<i>Strengths</i>
1. Reduction of the investment in fixed assets 2. Certain restrictions on foreign investment 3. Increasingly intense competition 4. Risk of breaching contracts	1. Good project management skill 2. Better information management facilities 3. Advanced machinery and equipment 4. High labour productivity 5. Good finance-raising ability 6. Proper debt/asset ratio 7. Good control skill 8. Attraction to good human resources
<i>Weaknesses</i>	<i>Opportunities</i>
1. Limited number of professionals 2. Higher production costs 3. Limited channels for market information 4. Lack of knowledge of regulations 5. Lower business qualification grades 6. Limited business relationships	1. Reformed policy environment for foreign businesses 2. Governmental promotion of construction 3. Establishment of credit system 4. Market access protected by WTO agreement 5. Development of Chinese construction industry toward international practice

Source: Compiled from Shen et al. (2006b)

Fig. 1 Strengths, weaknesses, opportunities and threats of foreign-invested construction enterprises in China

4 Discussion

4.1 Potential for Development

From the literature, the construction industry in China, like those in all other countries, faces some problems. Low and Jiang (2003) highlight the following characteristics of the industry in China: large domestic market and huge construction workforce; labour intensive and less open industry, with a high but falling proportion of state-owned enterprises which face problems including poor management, use of old technology and overmanning; division of industry into specialised sectors and enterprises administered by different government departments; delineation between design and construction, with supervisory-based companies; low emphasis on research and development in the construction firms. It is necessary to consider, also, the strengths of China's construction industry.

In the light of a limited amount of research on China's construction firms when they operate abroad, the profile of the firms is mixed. For example, the 2005 *ENR* survey (Reina et al., 2006) devoted several columns to coverage of Chinese contractors. It noted that the firms were growing in size, experience and sophistication; some have now passed the US\$10 billion mark. However, many of the executives interviewed remarked on Chinese firms as winning projects on lowest-cost basis and producing low quality work. They also note that owners are becoming wary of the low-bid mentality and taking precautions. A Spanish executive said: "The negative aspects [in the global market] are the increase in competition from the Asian countries, particularly China and India, and emerging countries with very aggressive prices as a result of low labour costs". A Turkish manager said: "Chinese companies are running all around the world with low quality and consequently impossibly low prices".

The picture also persists of a China construction market with an uncertain and unclear legal framework and restrictive policies. For example, two of the world's largest firms, Vinci and Hochtief, are doing very little work in China. The Chairman of one of them said: "It's difficult and I'm not sure they need us." For many firms, legal framework has been discouraging. One executive said: "Construction remains very challenging due to the regulations that apply to the construction companies and increasing competition". A manager of a Japanese firm which had followed several Japanese manufacturers into Indonesia, Malaysia, Thailand and Vietnam, and gone on to undertake many projects in those countries noted: "The law and regulations are not clear for us [and] China's first class contractor's license is a barrier for us."

A development that offers immense potential for Chinese international construction firms is a positive national approach to trade. For example, China has developed a “new type of strategic partnership” with Africa to suit “new circumstances, new conditions” (Chua, 2006, p. 8) based on “political equality and mutual trust, economic win-win cooperation and cultural exchanges”. It would open up more of its market to African goods and continue to offer soft loans to African governments (with no political strings attached), and grant preferential loans and buyer credits to Chinese companies setting up operations in Africa. Whereas such developments have led to concerns in the western countries that China was altering the strategic playing field in Africa, they have the potential to open up wider and more significant opportunities for Chinese international contractors.

4.2 Developing Export Capability

The governments of several developing countries have implemented initiatives to develop the ability of their construction industries to undertake international projects, and, in particular, to export their services. An example is Malaysia. The Construction Industry Development Board (CIDB) (<http://www.cidb.gov.my>) expects that, by 2015, the Malaysian Construction Industry shall be among the best in the world. The CIDB hopes to assist the country’s construction sector to attain the level of a captive global player, excelling in its project delivery. It has developed the “Going Global” initiative to promote and encourage the export of construction services and products. The CIDB’s Policy Initiative on Markets has two segments:

- a. Domestic Construction Market – technology transfer; improvement and enhancement of competition; and expansion of demand for domestic construction services and products. (the Malaysian Domestic Market should remain open and in line with the WTO’s regulations without compromising national interest)
- b. International Market (to enhance and maintain Malaysia’s competitive advantage as a construction product and services exporting country) – industrialization; research and development; marketing; application of ICT; monitoring the international market; and promoting Malaysian firms overseas.

Another example is Singapore. The Enterprise Promotion Department of the Building and Construction Authority (BCA) assists Singapore’s construction and construction-related firms to operate abroad. It helps them to obtain relevant information, gain new skills and thrive. It actively participates in projects by facilitating the preparation of feasibility studies, formation of value-chain consortia, sourcing of funds, and liaising with host country agencies.

A strategy for developing China’s capabilities in international construction should be formulated. Some models developed from the discussion above are presented in the next section. A research agenda is then discussed.

5 Proposed Models

Some tentative analytical models are now presented. In Table 3, China’s strengths as a market for construction are considered from the perspectives of local and foreign contractors. The potential of using each of the strengths to further develop the capability of the local companies to compete effectively with their foreign counterparts at home and overseas is also highlighted. Table 4 presents a consideration of the current strengths of the economy, culture and national endowments of China which can be utilised to enhance the competitiveness of Chinese international construction enterprises when they operate overseas.

Table 5 is a tentative framework for analysing the Chinese construction industry to determine its potential to stimulate and facilitate the development of competitive international enterprises. It draws on Porter’s (1990) diamond concept and the work of Ofori (2003).

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Table 3 China’s strengths as construction services market

China’s strength from perspective of	Opportunities for further development
<i>Local and Foreign Firms</i>	
Fast growing economy and improving incomes, creating a large customer base for construction	Sustained demand for construction can: (i) provide opportunities for local firms to undertake international construction projects at home, and build up track records for overseas; (ii) offer opportunities for Sino-foreign strategic alliances with long-term strategies for operations in China and third countries Competition among local and foreign firms will help both sets of firms to upgrade
Massive volume of work required for national economic development and improved quality of life	
Opportunities for foreign firms to choose their base for Asia	Cities in China may be desirable bases for foreign construction firms wishing to undertake projects in Asia
<i>Local Firms Only</i>	
Government’s support and industry development policies	Properly designed and targeted, industry development policies and initiatives can enhance Chinese firms’ capabilities to undertake international projects
Attempts at preferential treatment and assistance for local firms such as limits on foreign ownership	Any protection should be targeted at particular sections of the industry, and have a particular duration to avoid creating complacent and inefficient local firms
<i>Foreign Firms Only</i>	
Opening up of market owing to China’s WTO entry	This may offer sustained business opportunities for foreign firms in China
Attraction as investment venue leading to presence of many multi-national firms which were clients of firms in their own homes	Demand from clients from the foreign construction firms’ home bases can provide entry and continuing opportunities for them
Continuing liberalisation of economy and investment regulations	Liberalisation provide opportunities for foreign firms. This should lead to considerations of long-term Sino-foreign strategic initiatives
Improvement of administrative and legal infrastructure for construction	This continuous development will reduce the transaction costs of foreign firms

Table 4 China’s strengths as construction services exporter

China’s strength	Remarks on possible development and application
Availability of human resources	Further development through education and training; need for foreign language proficiency
Availability of materials	Further attention to the quality of materials, presentation and marketing, including performance
Technical solutions in medium-scale technologies	Further attention to reliability and attention to detail in designing and packaging
Cultural issues	Culture based on goodwill and conciliation useful for continuing business relationships
Political relationships	Lack of legacy of colonialism; good relations with most countries
Alliances for synergy among home firms	Large number of firms with overseas experience can team up to form critical mass for projects growing in size, complexity
Partnership opportunities	Chinese firms will be desirable partners as firms wish to explore opportunities in China. Technology acquisition opportunities
Government support	Awareness of importance and potential of construction
Total China package	Seen by many businesses as “country of the future”. Reputation for providing solutions which work should be systematically enhanced

6 Research Agenda

Researchers in China have a responsibility to explain the Chinese construction market, industry and firms to the rest of the world. Accurate and comprehensive descriptions of the national construction industry would be a good base for business decisions by both Chinese firms operating at home as well as foreign companies in China; for the formulation of government policies; and for further research activity. The following topics could also be addressed:

- what are the strengths of Chinese contractors at home? What are the underlying factors of these strengths, and how can the firms be developed further? How can the domestic accomplishments of the Chinese firms be most effectively marketed overseas?
- what particular strengths are offered by the current features of China’s construction industry? For example, what do the design institutes and site management entities offer? How can they be developed into special pillars in their own rights? How can they be better integrated together with the contractors to create strong business units? Which of their aspects should be replaced?
- is it necessary for a new concept of Project Management in China to be developed?
- how does China’s culture influence the corporate strategies and operating strategies of Chinese international construction firms, especially when they operate overseas? Which aspects should be renovated for application today, and in future?

How will China’s construction industry progress from now on? Research is required to map out a path and how it is to be attained. This should be a comprehensive review of the industry, which would be similar to Singapore’s Construction 21 blueprint. It would provide the policy elements for a systematic development of Chinese construction industry with strong ability to undertake international projects at home and abroad.

It is necessary to determine the desirable features of construction industry in China as the country’s economy matures, and it acquires the features of a developed country. The following topics are relevant:

- what are the competitive strengths of Chinese construction firms on international projects at home and abroad? Does it only stem from low labour costs?
- how can Chinese construction firms develop the capabilities and the reputation to undertake work in China for multi-national enterprises relocating their business activities there?
- how can the Chinese construction industry benefit from the government’s policies as they change, such as trade-oriented foreign policy
- how can Chinese firms form joint ventures with foreign partners in China to undertake projects in third countries?

It is necessary to help Chinese firms operating on the international market to address the current apparently widespread characterisation among their international peers that they (the Chinese firms) are offering low bids, paying little attention to the welfare of their workers as well as environmental, health and safety issues, and delivering poor quality construction. How can the firms develop a better corporate image and international reputation?

Dynamism should be introduced into the research on entry mode selection for operations in China by foreign construction enterprises. In particular, these should be related to the development of the economy and of the construction industry in China.

Researchers should help Chinese construction firms to develop and effectively adopt and apply new corporate policies such as Social Corporate Responsibility, and corporate Codes of Ethics. They should be able to develop strengths which will enable them to project a progressive image.

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Table 5 Tentative analytical framework for assessing competitiveness of domestic firms

Key factor	Explanatory note	Possible influence	Potential contribution to development
Firm Structure and rivalry	Competition within domestic industry	Intensity of competition among local firms; foreign contractors as a spur to local firms' performance improvement; peculiar structure of Chinese construction industry potentially offers strength	Level and nature of competition builds up domestic firms' competitiveness at home, and also for operations abroad
Demand conditions	Client demands and pressure for continuous improvement	Balance of bargaining power between clients and contractors; opportunity for domestic firms to undertake projects of more demanding foreign clients	Market force for stimulating improved performance by firms
Supporting industries	Materials manufacturers; suppliers; financial institutions; insurance services; legal services	Capacity of manufacturing base; quality of supply system; constraints from legal sector; lack of need to procure globally may deprive firms of building up capabilities for overseas projects	Provides inputs of goods and services to support for firms at home and abroad
Factor conditions	Natural and man-made “endowments” required as inputs for construction	Abundance of human resources; presence of material endowments; ease of conversion to desired product; relative prices	Provides opportunities to gain self sufficiency in material and other resource requirements, easing logistics
Government action	Statutory and policy framework; enablements, constraints from policy; political actions	General policies, such as incentives, and those dedicated to contractors	Need for government to understand the industry, appreciate its needs to formulate and implement appropriate instruments and initiatives; need for long-term industry plan
Firm's internal factors	Internal corporate capacity and capabilities	Firm's resources, expertise; track record; strategic alliances; supply chain	How much of these can be directly deployed overseas? Strength in a particular regard determines domestic strategy at home, overseas
Influencing and determinant environment	Culture, national history; international factors such as regional “structures”; chance events	Background systems, networks and factors from which firms can gain strengths but also face weaknesses	Firms should be able to draw upon, and build on, the good influencing factors, or counter adverse ones

7 Conclusion

China is a major construction market which is attracting some of the top international contractors. Chinese contractors are also increasingly major players on the global scene. Researchers should contribute to the effort to improve the competitiveness of Chinese international construction firms at home and abroad. It is necessary to address the current paucity of knowledge on such entities when they operate overseas. The tentative models for analysis, and the research agenda proposed in this paper will be useful in this endeavour.

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