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Strategic analysis of large local construction firms in China

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The many transitory changes in China have raised the intensity level of competition among construction firms. Despite having a high growth economy, some construction firms continue to suffer from low profitability. Meanwhile, practical cases and empirical findings related to Chinese construction firms remain lacking. This research develops a conceptual model for improving the competitiveness of large construction firms in China. The model integrates two main streams of strategic management theories—the industrial organisation theories, and the resource-based and competence-based views. Critical variables that form the model are initially identified from an environmental analysis and the case studies of 12 large Chinese construction companies. The relationships between competitive strategies, important resources and competencies, and competitive advantage are then verified using survey results. The statistical findings suggest that two strategies—differentiation and market/product diversification, and three important resources and competencies—technological innovative capabilities, financial capabilities and *guanxi* (relationship), directly affect firm performance as measured by revenue and profit growth.

Keywords: China, competence, competitiveness, construction companies, strategic analysis

Introduction

Since the establishment of the open door policy in 1978, China has gradually transited from a centrally planned economy to a socialist market economy. In 1992, the Chinese Communist Party (CCP) launched a new campaign for faster and bolder economic reforms. Since then, China's economy has sustained a high growth rate while maintaining relatively stable prices. In 2004, the country's GDP reached RMB 13,651.5 billion, and the growth rate of GDP amounted to 9.5% (National Bureau of Statistics of China, 2004).

As an important pillar supporting the country's economy, the construction industry has also grown rapidly. This fast pace of growth has increased the pressure on the already strained transportation infrastructure and energy supply, as well as creating a high demand over commercial office space and residential buildings in many urban areas. Each year, a large amount of investment is plunged into infrastructure and building projects. According to the National Bureau of Statistics of China (2004), the contribution of the construction industry to the GDP of China increased from 3.8% in 1978 to 7.0% in 2003. The number of construction enterprises grew from 6,604 in 1980 to 48,688 in 2003. In 1992, the average level of demand in construction was only RMB 301 billion; in 2003, it had reached RMB 2,291 billion, indicating a growth of nearly eight times. Over the same period, the average output value of the Chinese construction industry has grown from RMB 217.4 billion to RMB 2,308.4 billion, recording an expansion of more than tenfold.

As part of China's transition to a socialist market economy, the construction industry has been going through continual changes in a process of transition to make it more effective and efficient. First, the governance and administrative systems of the industry have been gradually improved (Luo and Gale, 2000). Under the old planning system, the Chinese government often maintained a tight control over the industry. They planned and financed all projects, with close supervision and monitoring of the construction process (Wang, 2004). Now, particularly since China's accession to the World Trade Organization, the government has gradually withdrawn its 'invisible hands' over the

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industry, although the administrative systems at various hierarchical levels are yet to become fully developed and matured. The second set of changes comes from several new mechanisms that are set up to manage the construction process, which include: new bidding procedures, construction supervision systems and contract management systems (Yao *et al.*, 2001). Third, more and more large Chinese construction companies have built up their competencies to venture into the international market. Finally, the country is committed to gradually remove trading limitations and industry barriers in accordance with the WTO's guidelines. With a greater number of international enterprises making direct investments and setting up factories in China, there should be plenty of growth opportunities. On the flip side, however, domestic firms will now have to confront the rivalry of foreign construction firms, which largely possess stronger financial and technological capabilities.

Overall, it is natural to think that most local construction firms should be able to capitalise on the strong demand and rapid growth of the industry. The reality is that many firms are facing serious difficulties in adapting to the ongoing economic transitions and are plagued by low profitability. Figure 1, constructed using data from the China Statistical Yearbook, illustrates the average profitability level of Chinese construction companies from 1997 to 2002. On average, the pre-tax profit margin is about 4.6%, and the after-tax profit margin (net profit margin) is only about 1.5%. There are many plausible explanations for such observations. One reason is that subcontractors, which are included in Figure 1, often face difficulty in getting payments from clients or main contractors. Another possible reason is the lack of long-term strategies for survival and growth.

In some Western countries, strong development of the field of strategic management since the 1960s has helped industrial corporations strive under different business environments (Rumelt *et al.*, 1994). However,

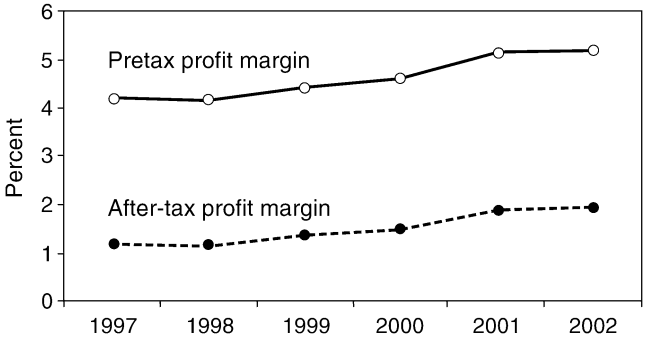

Figure 1 Profitability level of Chinese construction firms, 1997–2002

application of strategic management to construction remains less widespread (Chinowsky, 2000). Some of the largest construction firms in China are previously (or currently) state-owned—with almost 'guaranteed' job orders, many did not feel the importance of strategic planning. Consequently, there have been very few models or typologies constructed for the unique context of the Chinese construction industry (Cheah and Chew, 2005). It follows that studies building on either practical cases or empirical findings related to the Chinese construction industry are seriously lacking. Indirectly, these factors play a part in hindering the development of sound strategies and management practices within the larger Chinese construction firms.

The primary objective of this research study is to identify critical variables and relevant strategies that function as important sources of competitive advantage in the China market. The study targets firms that are relatively large in size, particularly those that belong to the 'First Class' qualification as classified by the Ministry of Construction (MOC) of China. This classification is based on factors such as professional qualifications of employees, invested capital and annual turnover. According to the MOC guidelines, the equity of a 'First Class' firm must exceed RMB 100 million, with a minimum working capital of RMB 30 million and an annual turnover of RMB 300 million.

Research methods

The overall research methods of the whole study are shown in Figure 2. The methods include four major components: literature review, environmental analysis, case studies, questionnaire survey.

The literature review stage studies the diverse theoretical schools of thought in strategy and also analyses the limitations in applying these Western concepts directly to the industrial context of China construction. By evaluating their strengths, limitations and relevance to the Chinese market, selected concepts and theories (or certain components of these) can be applied or included in the preliminary model.

The environmental analysis identifies external factors and industrial conditions that may affect the general outlook of a firm. Effectively, the following components are analysed: governmental influence; regulatory factors; market structure (e.g. concentration ratio, entry and exit barriers); operating conditions (e.g. level of quality, use of labour versus technology); conditions of horizontal and vertical markets related to construction; project procurement systems in China; and the impact of China's accession to the World Trade Organization. The analyses of these components help to suggest

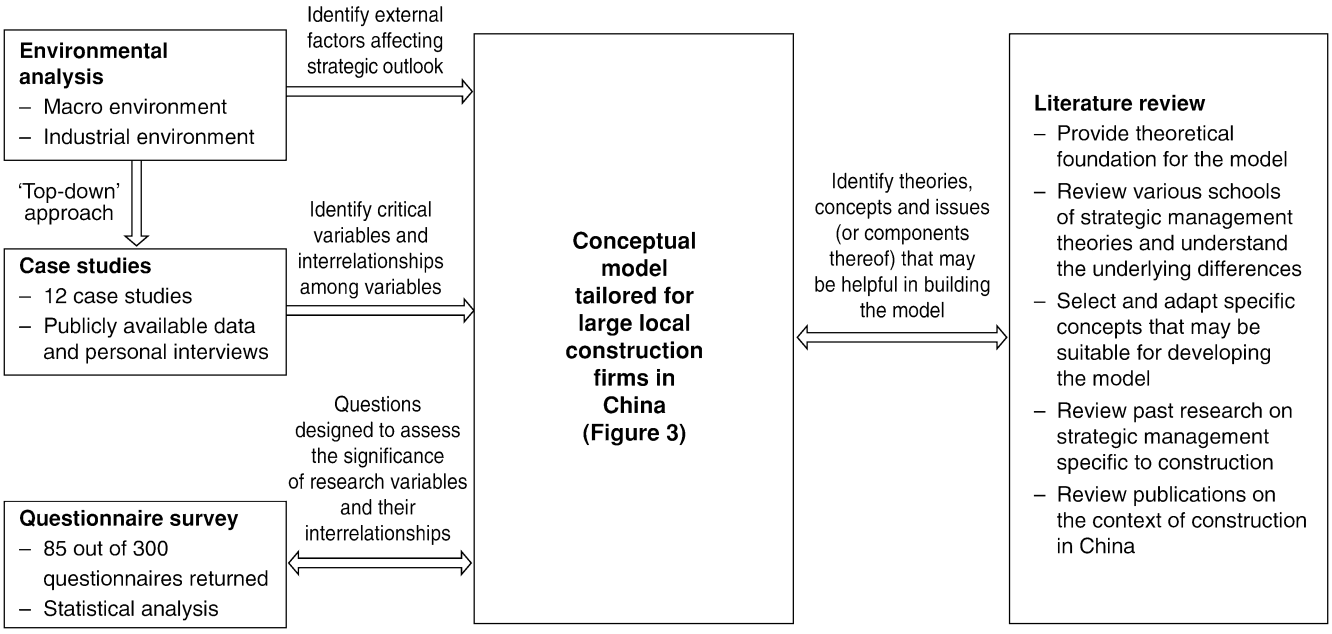

Figure 2 Overall research methods

certain competitive strategies (e.g. differentiation, diversification, integration) and resources and competencies that are required to overcome specific unfavourable industrial conditions in China.

For the case studies, 12 construction firms were selected: China HuanQiu Contracting and Engineering Corporation (HQCEC); China Non-ferrous Metal Mining and Construction (NFC); China Railway Erju (CREC); SINOPEC Engineering (SEI); Sinohydro Corporation; China State Construction International (CSCIC); China Petroleum Engineering and Construction Corporation (CPECC); Tianjin Construction Engineering and Main Contracting (TCEMC); China Harbour Engineering Company-Tianjin Port Construction Corporation (CHEC-TPCC); Beijing Urban Construction Engineering (BUCEC); Shanghai Construction Group (SCG); and CITIC International Contracting (CICI). These companies were chosen for their strong performance and reputation (among the 12 companies, 10 are listed in *Engineering News Record*'s 'Top 225 Global Contractors' and/or 'Top 60 Chinese Contractors' listings; all 12 companies have pre-tax and/or net profit margins that are well above the average numbers in Figure 1). Personal interviews were conducted with middle- or senior-level managers. Relevant information and documents were collated either directly through these companies or via other public sources. Detailed qualitative studies were then conducted to draw practical evidence from these case companies in order to identify the presence and significance of any competitive strategies, resources and competencies.

Progress made in the first three components (i.e. literature review, environmental analysis and case studies) effectively contributes to the incremental development of a conceptual model that is tailored for large local construction firms in China. This model is depicted in Figure 3. The final component in the research process—questionnaire survey—was designed to examine the significance of the research variables and their interrelationships. A questionnaire was sent out to 300 companies, including the 12 firms that had been interviewed. The sample mainly covered larger-sized construction companies in China (as described earlier in the paper) and targeted middle- or senior-level managers who would have access to the information requested in the questionnaire. Since random sampling usually secures a very low response rate in China (many managers in the Chinese companies are not willing to reveal certain information unless they know the enquirer personally), these questionnaires were sent out through the authors' correspondents in China who have past dealings with these 300 companies. In total, 85 questionnaires were returned, which constitutes an effective response rate of 28% (85/300). The feedback gathered was used to conduct statistical analyses to determine whether the hypothesised relationships among certain variables indeed exist.

Scope of this paper

The details of environmental analysis, case studies and questionnaire survey are reported in Kang (2006).

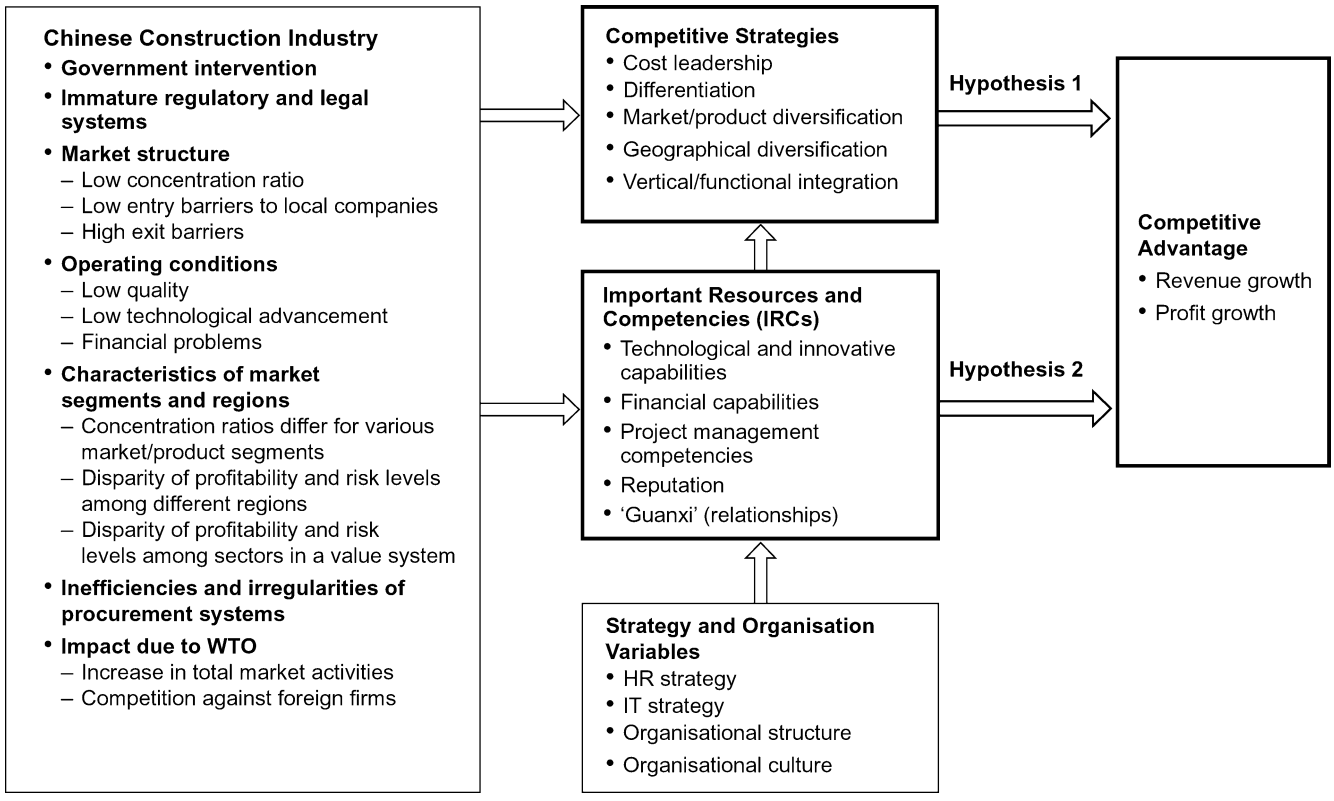

Figure 3 Conceptual model and research components

Referring to Figure 3, the discussion of this paper is limited to the three boxes that are framed with lines in **bold**. Specifically, the analyses of interrelationships between *competitive advantage*, *competitive strategies* and *important resources and competencies* (hereafter simply denoted as 'IRCs') are examined using the results of the questionnaire survey. Selected findings deduced during the case study stage will also be used to illustrate the contents of some of the research variables.

Competitive advantage, or strategic performance, usually refers to the achievement of an enterprise with respect to certain criteria (Lenz, 1980). In this research, this is represented by the growth rates of revenue and net profit, which are widely used in past studies of Chinese businesses and the construction industry (e.g. Park and Luo, 2001; Kale, 1999). Instead of using a subjective measurement approach as in Kale (1999) and Wagner and Digman (1997), this study adopts Park and Luo's (2001) approach: two questions were designed to ask, in the most recent three years, what the growth rates of revenue and net profit of the company are. This measurement approach is more objective and reliable than a subjective approach, which simply seeks an arbitrary answer of how well the company has performed. Likewise, to examine each of the competitive strategies and IRCs, questions are designed individually based on the findings from literature review, environmental analysis and case studies. Some of the survey questions that are related to these variables have been extracted from the questionnaire and illustrated in the Appendix.

Literature review and theoretical foundations

Historical factors have created the nature of complexity in China, giving it very different characteristics from those typical of Western industrial countries (Boisot and Child, 1999). When assessing the universality of the macro and micro theories of organisation that have been largely developed in North America, Shenkar and von Glinow (1994) found that the theories vary in their degree of applicability to the Chinese context. It is therefore legitimate to assume that Chinese construction firms behave and react to their environment differently from firms in other economies. Although there are numerous publications reporting issues confronted by the Chinese firms, most of them are expressed in the form of opinions and are generally lacking in theoretical rigour and content.

The general landscape of strategic management theories developed by Western researchers is by itself complex. A good overview of the various typologies of strategic theories is given by Elfring and Volberda

(2001). Among these typologies, Whittington (2001)'s framework is found to be very helpful in streamlining the diversity of theories by narrowing down to four different schools of thoughts—classical, evolutionary, processual and systemic (see Figure 4). Whittington suggests that these distinct schools of thoughts can essentially be mapped along two axes: outcomes of strategy; and the processes by which it is made. The vertical axis examines the degree of variation of strategic intent and outcomes produced. This may represent profit maximisation *per se* at one extreme, or accommodation for other complex priorities such as social responsibilities at the other end of the spectrum. The horizontal axis considers the fact of whether such outcomes are derived from deliberate planning, calculation and formulation, or simply as an emerging product of accidents, chance, and social and organisational inertia.

The radically different implications on strategy are read off from the relative positions along the two axes in the diagram. Thus, based on this framework, some prominent works classified under the classical stream would include Chandler (1962) and Porter (1980, 1985); the evolutionary stream would include Hannan and Freeman's (1988) notion of 'organisational ecology' and Williamson's (1975, 1991) insights on market and inter-organisational transaction costs; the now widely known resource-based view (Wernerfelt, 1984; Barney, 1991) and theory of core competence (Hamel and Prahalad, 1994) would belong to the processual school; while institutional theories related to local social systems (Granovetter, 1985) are deemed to subscribe to the systemic view. Not surprisingly, contentions exist over the relative merits of each school of theory. The debate between Mintzberg (1990, 1991) and Ansoff

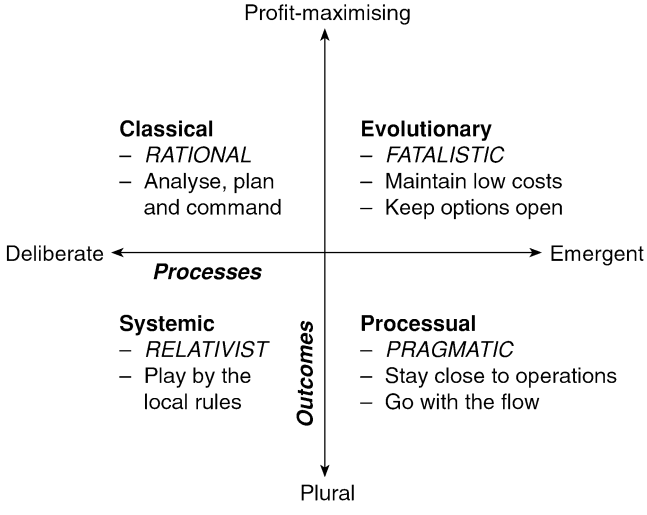

Figure 4 Whittington's (2001) four generic approaches to strategy

(1991) on 'learning versus planning', which radically stems from the differences between processual and classical views, is a good example. Even the individual streams have attracted controversial views concerning their applicability to a particular industrial context. In construction management, we have witnessed differing opinions between Betts and Ofori (1992, 1993) and Fellows (1993) concerning the application of Porter's (1980, 1985) analysis to construction.

In reviewing the fields of theories that may be suitable for management studies of the Chinese construction industry, Cheah and Wong (2004) concluded that the different theoretical fields should be viewed as complementary rather than mutually exclusive. For example, Oliver (1997) successfully combined both institutional and resource-based views to derive a series of interesting propositions concerning sustainable competitive advantage. One should not hasten to discard specific Western theories, practices or approaches that may seem to be the most inapplicable at first sight. Furthermore, the phenomenon of environmental demand shift reminds us about the dynamism of the real world and other transitory effects. Characteristics that are plausibly explained using theories from a specific field may become invalid after some environmental changes have taken place. An open mindset would thus go a long way in matching theories with circumstantial evolvements in China, especially for the context of the Chinese construction industry.

Armed with the above philosophical construct, our review of past literature focused on a combination of views and approaches in building the theoretical foundation for competitive advantage, competitive strategies and IRCs. To this end, the industrial organisation (IO) theories, resource-based view (RBV) and competence-based view (CBV) are regarded as potentially applicable.

The IO theories, from the classical stream, are founded on the belief that strong corporate performance (i.e. competitive advantage) emerges from market positioning of a firm within the industry. Many of these theories are developed by economists (e.g. Oster, 1999), who conventionally start with industrial and market analyses during the process of strategic planning. Porter's (1980) notion of 'generic competitive strategies'—cost leadership, differentiation and focus—is a widely adopted concept that fits many industrial contexts. Cost leadership requires management to focus its attention on competing on cost. Differentiation is concerned with creating something that is perceived by the buyers as unique. A focused strategy implies that a company would compete in only limited functions or market segments. This is central to the distinction between diversification and integration.

Another theoretical source of competitive advantage comes from the resource-based view (RBV) and competence-based view (CBV) from the processual school. These theories claim that firms are fundamentally heterogeneous in terms of their resources and competencies (Wernerfelt, 1984; Peteraf, 1993). These resources include financial resources, tangible resources (such as plant, equipment and buildings), and intangible resources (such as patents, know-how, brands and experience). Some researchers view competencies as functionally based (Hitt and Ireland, 1985; Snow and Hrebiniak, 1980). For example, Hitt and Ireland described that 'competencies occur through development of specific activities associated with each function'. RBV and CBV theories indicate that firms' resources and competencies, not market positioning, are the major sources of competitive advantage if they could meet four criteria: value, rareness, non-substitutability and imperfect imitability (Barney, 1991).

The conceptual model proposes that in the context of the Chinese construction industry, competitive strategies and IRCs of a firm represent two major sources of competitive advantage (denoted as Hypotheses 1 and 2 in Figure 3). The research variables for competitive strategies are supported by the IO theories, while the IRCs are related to RBV and CBV theories.

Characteristics and contents of the research variables

Competitive strategies

As mentioned previously, Porter's (1980) competitive strategies include cost leadership, differentiation and focus. The cost leadership and differentiation strategies can be considered as the *mode of competition*, which refers to a firm's decision on the methods of developing competitive advantage. To draw an example from the case studies, Table 1 summarises the supporting components for each mode of competition that are commonly found in the 12 companies.

The focus strategy is related to the *scope of competition*, which refers to a firm's decision on the breadth of developing competitive advantage (Kale and Arditi, 2002). This scope of competition can vary in three dimensions: *market/product*, *geography* and *function* (Cheah, 2002). In the context of construction, the dimension of market/product would refer to the different types of projects and market segments, such as the construction of residential and commercial buildings, civil works, environmental engineering, industrial and infrastructure projects. The dimension of geography implies the act of diversification into different domestic, regional and international markets.

Table 1 Some common components of the mode of competition

Mode of competition	Supporting components of each mode
Cost leadership	(1) Procurement costs of materials and equipment (2) Manpower costs (3) Actual cost control during construction (4) Administrative costs (5) Subcontracting costs
Differentiation	(1) Reputation (2) High quality projects (3) Advanced technology (4) *Guanxi* resources (relationships and connections) (5) Project financing

The dimension of function relates to vertical integration of different functions within a value system. For a contractor, this could mean backward integration into the functions of engineering design or construction materials/equipment manufacturing, or forward integration into real estate development and project financing. Evidence drawn from the case study companies confirms that many have indeed diversified into various market segments and functions, although there are a few that have stayed focused within selected geographical regions. Table 2 compiles some information gathered on the scope of competition from the case studies.

Important resources and competencies (IRCs)

The five main IRC variables listed in Figure 3 include: *guanxi* resources (relationships), technological and innovative capabilities, financial capabilities, project management competencies, and reputation.

Guanxi *resources*

Some researchers (Zhu and Hu, 2001; Chen, 1998) reported that the industrial environment of the construction industry in China has a high degree of institutional uncertainty. Some examples include a lack of fully developed legal and regulatory systems, excessively bureaucratic administrative procedures, inconsistent regulations that vary with hierarchies and regions, and a lack of legal enforcement and supervision. To reduce some of these uncertainties, Park and Luo (2001) suggested that firms in China may turn to *guanxi* with related parties in the so-called 'task environment' (for an interesting discussion on the *guanxi* phenomenon in China, readers may refer to Tsang (1998)). Indeed, all the case study companies

Table 2 Scope of competition as illustrated by the 12 case companies

Company	Market/product	Geography	Function
HQCEC	Petrochemical; chemical; power plant; environment engineering; infrastructure; building	30 provinces and autonomous regions; Southeast Asia, Europe, US, Middle East	Material supply; engineering design and consultancy; own and develop
NFC	Non-ferrous metal exploration; buildings	Beijing; Middle East; Mongolia	Developer and supplier for non-ferrous metal; real estate development
SEI	Petrochemical; infrastructure; buildings; environment	Beijing and most eastern coastal and central regions of China	Design; supervision; EPC contracting; geotechnical investigation
Sinohydro	Hydropower projects; roads; airports; harbours; buildings environmental engineering	15 provinces covering the eastern coastal, central and western regions of China	Engineering design and consultancy; investment and real estate
CSCIC	Buildings; road and bridges; rail works; dams and irrigation works; power plants; environment	Covers almost all regions of China; Singapore, US, Japan, Korea, Russia, Germany, Ireland	Project financing; design; construction; real estate development
CPECC	Petroleum and petrochemical projects; buildings; roads and bridges	Beijing, Qingdao, Zhuhai plus more than 40 foreign countries	Design and consultancy; import and export of technologies, equipment and materials
CHEC-TPCC	Shipyards; harbours; airports; highways	Tianjin, Dalian, Qingdao, Qinhuangdao	Engineering; construction
BUCEC	Civil works; industrial facilities; subways; highways; airports; buildings	Beijing	Real estate; financing; construction
SCG	Civil works; commercial buildings; steel structural works	Shanghai; overseas	Manufacturing of construction materials and equipment; engineering; construction; real estate development
TCEMC	Civil works; commercial buildings; M&E services	Tianjin	Steel component fabrication; construction; real estate development
CREC	Railways; toll roads; water conservation projects; power projects	Nineteen different regions in China, mostly in eastern coastal and central regions	Engineering; construction; equipment manufacturing; real estate development
CICI	Energy supply; railways; subways; roads and bridges; dams; buildings	Mainly eastern coastal and central regions; Hong Kong	Engineering; construction; technological services

have established *guanxi* with government or regulatory bodies, clients, financial institutions, research institutes, subcontractors and suppliers.

Technological and innovative capabilities

Technological innovation can contribute to the growth in market share through the provisions of new or improved products and services and the reduction in construction costs (Slaughter, 1998). Most of the case study companies have the following features in common:

(1) Process innovation and product innovation constitute two primary types of innovation;
(2) Internal exploration as well as external collaboration with domestic and international research institutes are the modes of innovation;
(3) Technology and innovation centres are set up to absorb, introduce, spread and evaluate new technologies;
(4) Sufficient funds are allocated for innovative studies—in most of these firms, the R&D expenditure amounts to 0.5%–1% of the total revenue;
(5) All employees are encouraged to take part in the innovation process by providing training and various incentive mechanisms;
(6) Technical database and IT systems are set up to facilitate collection of data from different sources;
(7) Innovation in technologies is promoted as a core value of corporate culture.

Financial capabilities

In the Chinese construction industry, there is a serious lack of financial resources and channels to many construction companies (Chen, 1998). Therefore, the ability to acquire financing from banks or other financial institutions is one major capability that needs to be developed. In China, this ability can be fostered by building up *guanxi* with financial institutions or by raising capital as publicly listed firms.

Another type of financial capability that has been identified is a company's foresight in making strategic investments and project investments. Companies often pursue long-term strategic investments in related market segments and industries. For example, China Non-ferrous Metal Mining and Construction (NFC) adopts a '4–3–2–1' strategy, with 40% of the company's capital invested in its main businesses (non-ferrous metal exploration, mining and construction), 30% invested in real estate, 20% invested in financial institutions (e.g. as shareholders of China Minsheng Bank and Minsheng Insurance Company) and the remaining 10% invested in other diversified areas. Other than strategic investments, some companies also invest their equity directly in some projects in order to seek a return that is higher than what the conventional scope of engineering and construction works could offer. A good example of this is the investments made in build–operate–transfer (BOT)-type of projects.

The third type of financial capability is financial management. Relevant activities would include setting up a total budgeting system, enhancing financial information reporting systems, internal auditing, tracking working capital requirements and rate of circulation. The proper implementation and management of these activities will also lead to cost leadership. With a strong financial management system, a firm can track all its cost components more effectively and create greater accountability.

Project management competencies

As a matter of fact, this IRC variable requires less elaboration in view of its fundamentality to the construction business. Put simply, strong project management competencies would ensure that a project is completed on time, within budget and with a desirable level of quality. In most construction companies, project management remains a key function, and the main activities include schedule management, cost management, quality management, contract management and procurement management. Project management competencies are usually supported and cultivated jointly by IT strategy, human resource strategy, organisational structure and culture—four of the nine strategic fields and mechanisms in Cheah and Garvin's (2004) framework for corporate strategy in construction.

Reputation

Corporate reputation is an invaluable intangible asset. It may even produce long-term competitive advantage and shareholder value (Fombrun, 1996; Gray and Balmer, 1998). Corporate reputation can impede rivalry, enhance the legitimacy to operate and serve as a protective shield against downturns and crises. It could also result in price premiums for products and projects and create additional leverage in negotiations with suppliers and creditors. For example, the reputation of HQCEC, NFC, Sinohydro, CREC and SCG is mainly derived from high quality projects and advanced technologies. Quality management is obviously related to project management competencies, whereas advanced technologies are built up by having strong technological and innovative capabilities. This also illustrates that the IRC variables are not totally independent, but can be mutually supportive.

Essentially, based on the findings of literature review, case studies and environmental analysis, Hypotheses 1 and 2 depicted in Figure 3 can be formally stated as follows:

> *Hypothesis 1*: Companies could achieve better performance by pursuing several types of competitive strategies. These potential strategies include cost leadership, differentiation, market/product diversification, geographical diversification and functional/vertical integration.
>
> *Hypothesis 2*: Companies could achieve better performance by building up their strength in several important resources and competencies (IRCs). These IRC variables may include *guanxi* resources, technological and innovative capabilities, financial capabilities, project management competencies and reputation.

The validity of these hypotheses and the significance of each research variable within the hypotheses are now tested using the survey results gathered from the 85 companies.

Analytical results and discussion of Hypothesis 1

Hypothesis 1 proposes that the five competitive strategies are primary sources of competitive advantage. To test this hypothesis, a linear regression is conducted using three related models: Models 1a, 1b, and 1c. The independent variables in Models 1a, 1b and 1c are the same—*cost leadership*, *differentiation*, *geographical diversification*, *market/product diversification* and *functional/vertical integration*. However, the dependent variable for each model is different: *revenue growth* (Model 1a), *profit growth* (Model 1b) and *overall performance* (Model 1c). *Overall performance* is computed as a simple average of *revenue growth* and *profit growth*. The analytical results are shown in the Table 3. Only two independent variables—*differentiation* and *market/product diversification*, are statistically significant at the 5% level.

The results suggest that among the five types of competitive strategies, only the differentiation strategy and market/product diversification could contribute directly towards the competitive advantage of a firm in terms of revenue growth and profit growth. As Porter (1980) commented, a firm should not pursue cost leadership and differentiation at the same time, for it would face the risk of being 'stuck in the middle'. The research results confirm this view for the firm sample (since the two independent variables *differentiation* and *cost leadership* are not concurrently significant). The fact that differentiation, instead of cost leadership, has a stronger relationship with performance could be due to the excessive competition that exists in the Chinese construction industry. Because of high exit barriers, many underperforming firms continue to stay afloat in the industry (Shanghai Jinxin Security Research Institute, 2002). These companies, many of which are small- and medium-sized enterprises, often lower their bid price to secure new projects. In some projects, the bid price may even be lower than the cost in order to prolong their survival in the industry. On the contrary, large and influential companies have more resources and competencies to differentiate themselves from their competitors. Therefore, they can secure revenue growth and profit growth by adopting a differentiation strategy instead of a cost leadership strategy.

Table 3 Results of regression analysis of competitive strategies and firm performance

Competitive strategies	Revenue growth (Model 1a)	Profit growth (Model 1b)	Overall performance (Model 1c)
Cost leadership	0.149	0.013	0.062
Differentiation	0.346***	0.384***	0.358***
Geographical diversification	0.129	0.159	0.130
Market/product diversification	0.227**	0.217**	0.229**
Functional/vertical integration	0.019	0.044	0.004
Adjusted R^2	0.205	0.227	0.212
F-Value	5.331***	5.703***	5.166***

Notes: n=85. *P≤0.1; **P≤0.05; ***P≤0.01.

Other than differentiation, the findings in Table 3 also suggest that market/product diversification can contribute towards competitive advantage. As mentioned previously, market/product diversification implies that a firm is competing in different types of projects, from roads, railways and dams to residential and commercial buildings. One possible explanation for this finding is that market/product diversification helps to reduce business risks, which are typically faced by a focus strategy that targets only a single market segment. Furthermore, market/product diversification fully utilises the experience, resources and competencies gained in one project and synergises these with applications related to other types of projects.

The results do not support the notion that geographical diversification could influence performance. One possible factor is the protectionist policy of the local and regional government in China. In order to protect benefits to the locals, secure short-term profits and lighten the pressure of unemployment and fiscal problems, some local government authorities choose to lower the entry barriers to their local construction

firms (Shanghai Jinxin Security Research Institute, 2002). This aggravates the intensity of competition within the local industry, as the number of firms increases and companies undercut one another in pricing. At the same time, the local government would elevate entry barriers to companies originating in other regions (e.g. by setting up regulatory hurdles), thus making it difficult for them to secure new projects in the region.

The results also do not support the notion that vertical/functional integration could influence performance. This suggests that vertical or functional integration may not be a viable strategy for the larger construction companies in China. Although vertical integration could reduce operational risk and transaction costs (such as backward integration into manufacturing of critical resources and forward integration into real estate development), the transfer of resources and competencies developed in one segment to other upstream/downstream segments is not fully compatible. For example, some IRC variables—*guanxi* resources with original clients, project management competencies and technological and innovative capabilities—have limited 'expansion value' in the upstream and downstream businesses.

In summary, the findings of Models 1a–1c suggest that firms should adopt the differentiation and market/product diversification strategies concurrently to improve their performance.

Analytical results and discussion of Hypothesis 2

Hypothesis 2 postulates that the five IRC variables are also primary sources of competitive advantage. Similar to Hypothesis 1, a linear regression is conducted using three related models: Models 2a, 2b, and 2c. The independent variables in Models 2a, 2b and 2c include: *guanxi*, *project management competencies*, *financial capabilities*, *technological and innovative capabilities* and *reputation*. The dependent variables are respectively: *revenue growth* (Model 2a), *profit growth* (Model 2b) and *overall performance* (Model 2c). The analytical results are summarised in Table 4. At a 5% level of significance, it is found that *guanxi*, technological and innovative capabilities and financial capabilities directly contribute towards competitive advantage. It should be noted that *guanxi* and technological and innovative capabilities only contribute to revenue growth but not profit growth.

The existence of a direct relation between *guanxi* and revenue growth is not surprising. *Guanxi* with government may help to increase new orders in public projects. According to Lu (2003), 'tendering shows' exist in the Chinese construction procurement system. This encourages companies to build up *guanxi* with the government in order to increase their chances of securing public projects. In addition, *guanxi* with clients may spur customer loyalty, minimise transaction costs and business uncertainty. However, cultivating and sustaining *guanxi* can be costly in terms of the reciprocal and utilitarian demands (Park and Luo, 2001). Consequently, this to some extent offsets the benefits derived from *guanxi*, which also helps to explain why *guanxi* is only related to revenue growth but not profit growth.

Strong technological and innovative capabilities can contribute to revenue growth due to their role in expanding the business scope of a firm by increasing its chances of getting engaged in high technology projects. Consider the case of Shanghai Construction Group (SCG). It was able to construct the China National Grand Theatre mainly because of its strong technological capability in handling complex steel structure works. This high-tech market segment is difficult for lower level firms to penetrate. Another factor can be traced to the theory of economies of scale. Technology with generic applications or functions can be used

Table 4 Results of regression analysis of IRCs and firm performance

IRC (important resources and competencies) variables	Revenue growth (Model 2a)	Profit growth (Model 2b)	Overall performance (Model 2c)
Technological and innovative capabilities	0.256^{***}	0.090	0.203^{**}
Financial capabilities	0.264^{**}	0.374^{***}	0.347^{***}
Project management competencies	0.038	0.081	0.044
Reputation	0.011	0.062	0.013
Guanxi	0.291^{***}	0.113	0.231^{**}
Adjusted R^2	0.413	0.314	0.402
F-Value	12.811^{***}	8.679^{***}	11.657^{***}

Notes: n=85. $^{*}P\leq0.1$; $^{**}P\leq0.05$; $^{***}P\leq0.01$.

multiple times in similar types of projects, therefore expanding the turnover of a firm. Therefore, technological and innovative capabilities could contribute directly to revenue growth, especially if it helps to build up a track record and good reputation in complex and high-tech projects. On the other hand, innovation could be costly, since every year the firm has to invest a fair amount of money into R&D (the case studies show that most case study companies spend about 0.5%–1% of total revenue on R&D). This would then offset the benefits derived from a higher level of sales, thus dampening the impact on profit growth.

The research findings also confirm that financial capabilities are important and directly related to both revenue growth and profit growth. The following comprise some of the possible explanations:

(1) According to Chen (1998), the financing conditions in the Chinese construction industry are problematic, such as a lack of access to bank loans by many construction firms and delayed payments by the clients. Thus, the ability to secure financial resources would help a firm to undertake more projects as compared to those who have less financial resources. This in turn increases the turnover of the firm.
(2) Sound investment strategies would lead a firm towards rapidly growing and more profitable industries. This factor also partly explains the contribution of financial capabilities to positive revenue and profit growth.
(3) Strong financial management capabilities would require a firm to utilise its assets more efficiently, track working capital and cash flows and reduce financial risks. All these initiatives help to enhance the stability of revenue and profit growth.

Interestingly, the findings in Table 4 suggest that project management competencies may not directly contribute to the performance of a firm—in terms of neither revenue growth nor profit growth. This may be due to the unfavourable environmental conditions in China that exist at the project level. For example, excessive administrative regulations and procedures would introduce unnecessary uncertainties to the operating environment of a project. These factors create additional hindrances to effective project management.

Finally, as far as the survey results can tell, strong reputation does not necessarily lead to better performance. This is contrary to the findings of many researchers including Fombrun (1996), who suggested that reputation can produce significant long-term competitive advantage. In China, reputation is always seen as an intangible asset that needs to be cultivated in the long run. It takes much time, effort and cost to build up a good track record, brand name and reputation. The benefits from reputation may not be obvious in the short term as examined in the survey (which only evaluates the performance of a firm in the three most recent years).

Conclusions

A virtual knowledge gap exists between Western theories of strategy and the Chinese construction industrial context. This research aims to build a conceptual framework for developing the competitive advantage of larger-sized Chinese construction firms. The process involves reviewing Western theories to select those that may be applicable to the Chinese context, analysing the external environment of the Chinese construction industry to identify major influential factors, studying 12 companies to determine prominent characteristics and competencies, and finally conducting a survey and analysing the feedback to assess the significance and interrelationships of the research variables.

As part of the broader scope, this paper presents the empirical findings on competitive strategies, important resources and competencies, and competitive advantage. Although it has been hypothesised in the model that five competitive strategies and five IRCs are potentially relevant to developing competitive advantage, statistical analyses of the survey feedback confirm that only two competitive strategies (differentiation and market/product diversification) and three IRCs (financial capabilities, technological and innovative capabilities and *guanxi*) are significant.

On the other hand, it is important to realise that the conditions of the Chinese construction industry are still in flux. The research findings presented here are limited by not just the surveyed sample of firms, but also the ongoing changes occurring at the industry level and the larger political and economic environment of the country. As the outlook changes, other competitive strategies and IRCs that are not currently supported by these statistical findings may become more significant. A good example is the competitive strategy of geographical diversification. As the country progresses and the local government authorities slowly diminish their intervention and heavy-handedness in the local construction industries, this strategy would become more important. It is therefore obvious that the model developed in Figure 3 requires constant updating and refinement based on future research work. Nevertheless, it would serve as a good referencing framework to track the linkages between these different strategic variables.

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Appendix

Extract of questionnaire (translated)

1. Firm performance

(1) Kindly indicate, in the most recent 3 years, the average sales growth rate of your company:
1. <5% 2. 5%–10% 3. 10%–15% 4. 15%–20% 5. >20%
(2) Kindly indicate, in the most recent 3 years, the average profits growth rate of your company:
1. <5% 2. 5%–10% 3. 10%–15% 4. 15%–20% 5. >20%

2. Competitive strategies

(3) Differentiation strategy
Select one or more areas listed below in which your company has advantages over your competitors:

Reputation/brand name	Access to financing
Project quality	*Guanxi* resources
Construction technology and innovation	Others, if any (please indicate)

(4) Market/product diversification
Select one or more categories listed below which belong to your company's existing project portfolio:

Roads, tunnels, bridges	Residential/commercial buildings
Subways, railways, airports	Special facilities (sport centres, museums)
Harbours, docks	Petrochemical and industrial plants
Hydraulic/dam projects	Metallurgical projects
Environmental engineering projects	Others, if any (please indicate)

(5) Vertical integration
Select one or more categories listed below which belong to your company's existing functional scope:

Engineering design	Real estate development
Construction	Manufacturing of materials/ equipment
Financing	Others, if any (please indicate)

3. Important resources and competencies (IRC variables)

(6) Kindly evaluate your company's *guanxi* with the following bodies:

	Insignificant	→	Average	→	Excellent
	1	2	3	4	5
Government, regulatory bodies					
Financial institutions					
Clients					
Research institutes					
Subcontractors, suppliers					

(7) Technological and innovative capabilities
Select one of more of the following technological and innovation aspects possessed by your company:

Setting up a special department to conduct technological innovation	Winning technology and innovation awards or securing patents
Setting aside funds for technological innovation every year	Building long-term relationships with research institutes
	Others, if any (please indicate)

(8) Financial capabilities
Kindly evaluate your company's financial capabilities in the following areas:

	Insignificant	→	Average	→	Excellent
	1	2	3	4	5
Ability to secure financial resources from banks or other financial institutions					
Foresight in making strategic and project investments					
Accounting and financial management					