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INTERNATIONAL STRATEGIC MANAGEMENT OF CHINESE CONSTRUCTION FIRMS

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ABSTRACT

With the rapid increase in China's construction demand and the liberalization of the construction market after its entry into WTO, foreign contractors are presented with tremendous opportunities to participate in construction activities in China. Concurrently, Chinese construction firms (CCFs) are also actively involved in international construction projects. Such developments pose both opportunities and threats for CCFs. How can CCFs effectively compete with their international competitors? Strengthening their international strategic management (ISM) hence becomes a top priority and challenge. The aim of this research is to provide new insights on the ISM of CCFs.

This research aims to build a conceptual model to examine the major sources of CCFs' international competitiveness. Fundamental strategy theories and related Chinese research were systematically reviewed. The conceptual model was formulated based mainly on the industrial organisation economics view and the resource-based view. It incorporated variables of firm-specific resources/capabilities, generic competitive strategies, market entry strategies, and the international performance of CCFs. These variables and their relationships were identified through extensive literature review and ascertained through environmental analysis.

Based on the conceptual model, 22 hypotheses were developed. These hypotheses were tested through a questionnaire survey with 92 senior managers of large CCFs. The conceptual model was revised based on the hypothesis results. The revised model revealed a difference in the significance of the identified firm specific resources/capabilities and strategies. Key findings indicated that three strategies – cost leadership, differentiation and sophisticated contracting, strongly influence the international performance of CCFs. Three firm-specific resources/capabilities – financial capability, project management capability and reputation, were found to be strongly contributing to firm strategy and performance.

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LIST OF ABBREVIATIONS

LEGEND	DESCRIPTION
AIC	Advanced Industrialised Country
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
BOT	Build-Operate-Transfer
CCF	Chinese Construction Firm
CCI	Chinese Construction Industry
CHINCA	China International Contractors Association
CITIC	China International Trust and Investment Corp
CJV	Cooperative Joint Venture
CM	Construction Management
CRCC	China Railway Construction Corporation
CSCEC	China State Construction Engineering Corporation
D&B	Design and Build
EJV	Equity Joint Venture
ENR	Engineering News Record
EPC	Engineering -Procurement-Construction
FDI	Foreign Direct Investment
GDP	Gross Domestic Production
HR	Human Resource
HQ	Headquarter
HSE	Health, Safety and Environment
IADB	Inter-American Development Bank
IEC	International Economic Cooperation Magazine
INV	International New Venture
IO	Industrial Organisation
IPCLS	International Project Contracting and Labour Services Magazine
ISM	International Strategic Management
IT	Information Technology

List of Abbreviations

JV	Joint Venture
LDC	Least Developed Country
M&A	Merger and Acquisition
MNE	Multinational Enterprise
MOC	Ministry of Construction
NIC	Newly Industrialised Country
Oa	Asset-Based Advantage
Ot	Transaction-Cost Advantage
OHSAS	Occupational Health and Safety Assessment Series
OLI	Ownership Advantage, Locational Advantage and Internalisation
PM	Project Management
PPP	Private-Public-Partnership
R&D	Research and Development
RBV	Resource-Based View
SME	Small and Medium sized Enterprise
SOE	State-Owned Enterprise
SPSS	Statistical Package for the Social Sciences
SWOT	Strength, Weakness, Opportunity and Threat
WTO	World Trade Organisation

Chapter 1 Introduction

1.1 Prologue

Facing an era of unprecedented business environmental change and uncertainty under the trend of global economic integration, the issues of strategic management and internationalisation have become imperative for top management in organisational survival and success. At the same time, these issues have been the foci of inquiry for numerous researchers and practitioners in the past few decades. Many multinational enterprises (MNEs) from advanced industrialised countries (AICs) have demonstrated their ability for internationalisation in various industries. As a result, their international competitiveness has been built upon and enhanced.

Construction has been one of the most important economic activities during the process of humankind's remaking of natural environments. Construction is driven and affected by the global economy, and it has a worldwide impact. According to the study by Global Insight Inc., 55 countries with the largest construction markets, spent US\$3.9 trillion on construction in 2004 (Tulacz 2005). Such a huge 'cake' has been luring numerous construction firms all over the world. It is hence no wonder that cross-border transactions of construction business have been steadily increasing, regardless of the turbulence in the global political and economic scene. The last century saw British and US construction firms pioneering the entry into the international markets, followed by international contractors from other Western countries, Japan, South Korea and some newly industrialised countries (NICs).

China, as the largest NIC, had built up an extensive basic infrastructure during the past three decades. It is expected that the high demand for construction in China will last for a long time in future due to its fast economic growth. With the rapid development of the Chinese construction industry, increasing support from the Chinese government, and China's WTO accession, Chinese construction firms (CCFs) have been given numerous

opportunities in venturing abroad and acquiring wide-ranging experience, enhancing their knowledge and skills. Some CCFs have made significant achievements in international construction. The number of CCFs that have emerged in the Engineering News Record (ENR) Top 225 International Contractors list has increased from a mere 4 in 1992 to 49 in 2005. The rapid emergence of CCFs in international markets has generated much interest in their competitors around the globe as well as in researchers. ENR has also, for the first time, produced a ranking of contractors for a single country outside of the US – Top 60 Chinese Contractors. On the other hand, although CCFs have had great achievements in recent years, their international market share is still relatively small compared to the more established contractors from AICs. International competitiveness must still be improved significantly if they want to make a bigger foray into international markets. However, based on extensive literature review, it was found that there are few empirical studies on how to improve CCFs' international performance, especially from the corporate and business-level perspectives.

1.2 Research Objectives and Research Questions

The primary aim of this research is to build a conceptual model to help improve the international strategic management (ISM) of CCFs. The model should include the selected strategies, the internal and external parameters, as well as the influence of these variables on the international performance of CCFs. Thus, the research objectives are outlined as follows:

- To investigate the strengths, weaknesses, opportunities and threats (SWOTs) of CCFs by analysing their external and internal environments;
- To review ISM studies and examine the current research on the ISM of CCFs;
- To identify the research variables and postulate the research model to establish the inter-relationships among these variables; and

- To examine the inter-relationships among the research variables included in the conceptual model in order to determine the significance of these variables to the international performance of CCFs.

In order to realise the above objectives, it is essential that the research scope is narrowed down and that a path-analysis conceptual model is constructed. This gives rise to the following five research questions, which need to be answered in this research:

- (1) What are the literature gaps for the ISM of CCFs?
- (2) What competitive strategies can CCFs adopt to contend with their international rivals?
- (3) What entry and operation modes can help CCFs achieve better international performance?
- (4) What are the internal critical factors that influence the strategies and international performance of CCFs?
- (5) How does the external environment influence the selection of strategies and the cultivation of internal strengths of CCFs?

1.3 Research Scope

At the outset of this study, the researcher would like to briefly explain the research title and scope. The meaning of the term “ISM” includes how CCFs compete with their international rivals in both international and domestic markets. This research only focuses on international markets. However, international competition in the domestic market should not be overlooked, as the Chinese construction market is now internationalised, leading to a rapid increase in foreign direct investment (FDI) in China.

CCFs are classified into several types according to the grade system and ownership structure. In this research, only large state-owned CCFs are studied because they are the “main force” to compete with top international contractors in any markets.

The traditional classification of strategies includes four levels in accordance to a firm's management hierarchies: corporate, business, functional and operating (Thompson and Strickland 2003). This research focuses mainly on corporate and business-level strategies. Although the ISM field covers a wide range of strategic issues according to Bruton et al. (2004), this research focuses only on the major issues which can adequately answer the research questions raised in the preceding section.

1.4 Outline of the Thesis

Chapter 2 presents the literature review on general strategy theories, international business studies, strategic management in construction, and the ISM of CCFs. This chapter is organised in a zooming-in sequence from general strategy theories to the focus of this research. A conceptual model is postulated based on literature review. In essence, this chapter provides a theoretical foundation for the whole research, and the conceptual model provides guidance for the research works described in the chapters that follow.

Chapter 3 presents the analysis on CCFs' external environments and internal status, as well as their international performance. The international construction market is first studied by region, encompassing the market characteristics, trends of international construction, the international competitors of CCFs and the strategies adopted by them. As the Chinese construction market is the supporting environment for the internationalisation of CCFs, a general analysis of the Chinese construction industry is also carried out in this study. Subsequently, the international performance of CCFs is studied. Finally, the SWOT analysis on CCFs is conducted.

Chapter 4 covers the development of hypotheses in accordance with the conceptual model. Major research variables in the conceptual model are discussed. Twenty-two research hypotheses are made with regards to the inter-relationships among the research variables in the conceptual model, which comprises firm-specific resources and

capabilities, generic competitive strategies, market entry strategies, and the international performance of CCFs.

Chapter 5 presents the research methodology adopted in this study. Questionnaire survey is the principal method for data collection. Measures for major research variables are identified through literature review and ascertained by personal interviews. Questionnaire design, pilot survey and data collection are explained.

In Chapter 6, the twenty-two hypotheses are tested mainly through the findings from the regression analysis of the questionnaire survey. Research findings are discussed and a summary of the research findings is provided.

Chapter 7 concludes this research and highlights the research contributions. The conceptual model is revised based on the research findings. The limitations of the research are explained. From the discussions on the limitations, recommendations for future research are provided.

1.5 Overview of Research Design

This research is divided into five major parts: research questions; literature review and critical analysis; conceptual model and hypothesis development; data collection and research findings; and conclusions, as highlighted in different patterns in Figure 1.1. The logic of the research is outlined below.

The development of the conceptual model and hypotheses is a logical and incremental process. First, research questions are raised to make the whole research purposeful. Then, literature review is conducted, which encompasses the resource-based view (RBV), industrial organisation (IO) economics view, international business studies, strategic management in construction, and the Chinese research on the ISM of CCFs. Second, a conceptual model is postulated, based on extensive literature review. Third, based on the

conceptual model and the research questions, the analysis of CCFs and their external environments are carried out. The analysis of the external environment also consolidates the conceptual model, as it implies the strategies and firm-specific resources and capabilities are able to cope with the environmental conditions. Fourth, based on the conceptual model and literature review, hypotheses on the inter-relationships among research variables are developed. Fifth, literature review and personal interviews are jointly adopted to identify measures for the major research variables. A questionnaire is designed in line with the hypotheses, and a pilot survey is performed to validate the questionnaire before the formal survey. Sixth, the research findings are analysed and the hypotheses are tested, which verify the conceptual model. Finally, the whole research is concluded.

Figure 1.1 Research Process Flowchart

1.6 Chapter Summary

This chapter first introduced the research background, which indicated the importance of this research. Second, research objectives were identified and research questions were raised. Third, the research scope was defined, focusing on large state-owned CCFs and their corporate and business-level strategies. Fourth, the whole thesis was outlined chapter by chapter. Finally, the overall research design was explained by outlining the logic of major parts of the research.

Chapter 2 Literature Review and Conceptual Model

In this chapter, relevant literature are reviewed in a zooming-in sequence, which include general strategy theories, international business studies, strategic management in construction, and Chinese research on the ISM of CCFs. Based on these literature, a conceptual model is postulated. The organisation of this chapter is shown in Figure 2.1.

Figure 2.1 Organisation of Chapter 2

2.1 General Strategy Theories

The term “strategy” literally evolved from the selection of position in the context of military battle. The current Chinese saying that the “market place is a battlefield” illustrates this (Tung 1994). As such, some writers of business strategy picked up the

spirit of military maxims. Theories of strategy in the contemporary sense were born and rapidly developed from the mid of 20th century.

The intellectual foundations of strategy are drawn from various disciplines, which are constantly evolving at their own pace (Rumelt et al. 1994). Hence, there are conflicting theories from different schools of thoughts as a result of this heterogeneous composition of disciplines (Cheah 2002). From the multifarious writings on strategy, Mintzberg et al. (1998) and Whittington (2001) are two influential masterpieces which mapped the various schools of thoughts revolving strategy theories. Mintzberg et al. (1998) identified ten schools of thoughts which fall into three groupings, namely perspective, descriptive and integrative groups. Whittington (2001) classified strategy into four basic conceptions: classical, evolutionary, processual and systemic approaches. He mapped these four schools of thoughts along two dimensions – the outcomes of strategy and the processes by which it is made. Regardless of how the schools of thoughts on strategy are classified, the following two types of strategy approaches are currently very popular (Mintzberg et al. 1998): one is the ‘outside-in’ approach, represented by the industrial organisation (IO) economics view, especially for Porter’s five forces model and generic competitive strategies; the other one is the ‘inside-out’ approaches, represented by the resource-based view (RBV), especially for core competency theory. These two theories are discussed next.

2.1.1 ‘Outside-In’ Approach – Industrial Organisation (IO) Economics View

IO theories examine the impact of environment on firm’s competitive behavior and performance at the industry level. The Mason/Bain Model and Porter’s theories of five forces model and generic competitive strategies, as the major elements of IO theories, are discussed below. Other renowned writers, such as Ansoff (1965) and Ackoff (1969), also made a significant contribution to the IO theories.

2.1.1.1 Mason/Bain Model and Its Development

The dominant model for IO theories is the industry structure-conduct-performance framework, which was initially developed by (Mason 1938) and later articulated by Bain (1968). It is hence also known as Mason/Bain Model. The nature of this model is that the performance of a firm in the industry depends on the characteristics of the environment in which it competes. The term industry structure in this framework refers to the characteristics of an industry. The term firm conduct refers to specific firm actions, including firm strategies. The term performance refers to the individual firm's performance. In this model, the firm's performance is proposed to be determined by firm conduct and industry structure. At the same time, IO theories also bypass the conduct of firms in its sequential analysis by arguing that because industry structure determines firms' conduct, one could ignore firms' conduct and focus on the characteristics of the industry in trying to explain performance (Porter 1980). Since the underlying logic of this framework is to first understand the environment and next position the firm, it is also referred to as the "outside-in" approach (Bosch 1997). This model has provided a useful way for analysing industrial environment and firm positioning strategies. Though this model focuses on the industry level to investigate firm's performance, it is also valid in examining individual firm's behavior and performance. Porter (1980) adapted this paradigm to strategic management by developing a five forces model and the generic competitive strategies to measure 'industry structure' and represent 'firm conduct' in the Mason/Bain Model (Figure 2.2).

Figure 2.2 IO Economics and Porter's Contribution

Source: Adapted from Bain, 1968

Porter identified factors that prevail in any industry, such as product differentiation, economies of scale, economies of scope, organisational learning, etc. These factors present threats and opportunities for gaining and creating competitive advantage and in turn superior performance. Porter's (1980; 1985; 1991) ideas on competitive advantage have been one of the dominant perspectives in the business strategy literature in the last two decades. It is considered to be an important development in organisational studies but most importantly it presents a useful framework for studying the concept of strategy and its performance implications (Kale 1999). Porter's five forces model and generic competitive strategies are introduced next.

2.1.1.2 Five Forces Model

According to Porter's model as depicted in Figure 2.3, in any industry, whether it is domestic or international or producing a product or a service, the profitability of an industry is determined by five competitive forces (Porter 1985):

- The bargaining power of buyers relative to firms in the industry
- The bargaining power of suppliers relative to firms in the industry
- The ease of entry of new firms into the industry
- The availability of substitute products
- The intensity of rivalry among existing firms in the industry

Figure 2.3 The Five Forces Model of Industry Attractiveness

Source: Porter, 1985

Even as it needs to be modified before applying to construction industry, the five forces model is a powerful tool for systematically diagnosing the principal competitive pressures in a market and assessing how strong and important each one is. This model had been widely applied to analyse the construction industry or market segments in different countries (Betts and Ofori 1992; Lan and Jackson 2002). In this model, the threat of substitute can be assumed not existent in the construction industry, because of the non-substitutional nature of the products or services provided by the industry. It could be replaced with the effect of government. Examples include the analysis on Australian construction industry by Wang and Yang (2000).

2.1.1.3 Generic Competitive Strategies

The five forces model leads to the identification of three generic competitive strategies to achieve a defendable competitive position. Porter (1980) highlighted three types of generic competitive strategies: cost leadership, differentiation and focus. Cost leadership means having lower cost arising from the firm's ability to perform activities differently than rivals (Porter 2002). Differentiation means that a firm differentiates itself from its competitors if it can be unique at its competency that is valuable to buyers (Differentiation = uniqueness + value to the buyer). To position itself, the firm must decide whether it intends to perform activities differently or to perform different activities as compared to its rivals. Focus could also be known as scope of competition, which refers to a firm's decision on the breadth of developing competitive advantage (Kale and Ardit 2002). It means that the firms could compete in either a narrow or a broad market segment, which can vary in business (products/services), geographical scope, and function (Cheah 2002). Porter argued that these generic strategies would provide firms with the ability to achieve a competitive advantage and outperform the other firms in their industry.

Based from these three types of competitive advantage, Hoskisson et al (2003) identified five strategies that a firm can use to get ahead in the market, namely, cost leadership, differentiation, focused cost leadership, focused differentiation and the integration of cost

leadership and differentiation, as shown in Figure 2.4. Firms can choose from among these five strategies to establish and defend their desired strategic position against rivals. The effectiveness of each strategy is contingent on both the opportunities and threats in a firm's external environment and on the possibilities provided by the firm's unique resources, capabilities and core competencies (Hitt et al. 2003). None of the five strategies is inherently or universally superior to the others (Dess et al. 1999). Porter disagreed with the integration of cost leadership and differentiation as a generic strategy, suggesting that the firms that attempt to follow a hybrid approach will be at the risk of 'stuck in the middle' and cannot achieve above industry average performance.

Figure 2.4 Generic Competitive Strategies

Source: Hoskisson et al, 2003 (adapted from Porter, 1985)

2.1.2 'Inside-Out' Approach - Resource-Based View

The RBV and core competency theory are the major symbols of the 'inside-out' approach. Core competency theory is usually deemed as a branch of the RBV (Barney 1991; Hitt et al. 2003). Some researchers also consider them as close cousins, such as Hsu (2003) and Kang (2006). These two theories are discussed next.

2.1.2.1 Resource-Based View

The RBV of a firm emphasizes on the firm's internal resources and capabilities, rather than market structures (Barney 1991). The RBV approach assumes that firms are fundamentally heterogeneous in terms of their resources, capabilities and competencies (Amit and Schoemaker 1993; Wernerfelt 1984). The critical factors for success lie within the firm itself in terms of its resources and capabilities, and the firm's choices are not dictated by environmental constraints, but by evaluating how the firm can best exploit its resources relative to opportunities and threats in the environment (Barney 1991).

Definition of resources, capabilities and core competencies

The definitions of resources, capabilities and core competencies should first be clarified. Resources are inputs into a firm's production process, which cover a spectrum of individual, social and organisational phenomena. Resources are classified into tangible and intangible resources. Tangible resources include financial resources, physical resources, human resources and organisational resources. Intangible resources include technological resources, resources for innovation and reputation (Barney 1991; Hall 1992; Grant 1991). Capability refers to an integration of resources. Identifying and assessing the value of a firm's resources and capabilities require judgment. There is no obviously correct model and rule available to help the judgment. At the same time, most data available for these evaluations are largely anecdotal, sometimes unreliable, or difficult to interpret (Hitt et al. 2003). Core competencies (competences) are defined as the bases upon which an organisation achieves strategic advantage in terms of activities, skills or know-how which distinguish it from competitors and provide value to customers or clients (Prahalad and Hamel 1990). Core competency is differentiated from capability. Some capabilities lead to the development of a firm's core competencies (Figure 2.5). Core competencies are strategic capabilities which satisfy the criteria of sustainable competitive advantage: valuable, rare, costly-to-imitate and non-substitutable (Hitt et al. 2003).

Figure 2.5 Components of Internal Analysis

Source: Adapted from Hitt et al., 2003

RBV and firm’s strategy

The RBV provides the theoretical rationale for predicting firm strategy and its subsequent performance based on corporate characteristics (Amit and Schoemaker 1993; Moahoney and Pandian 1992; Wernerfelt 1989). Firm resources are commonly controlled by the firm that enable the firm to conceive and implement strategy and improve its efficiency (Daft 1983; Penrose 1959). Firms can adapt their strategies only to the extent that their corporate characteristics support the strategies undertaken (Peteraf 1993). Empirical support for this view is drawn from many studies that examine linkages between firm characteristics, strategy and firm’s performance (Harrison et al. 1993; Mosakowski 1993). Sustainable competitive advantage comes from the utilisation of both tangible and intangible resources that are heterogeneous, difficult to substitute and imitate, and less mobile (Barney 1991; Peteraf 1993).

RBV and Performance

The RBV of the firm proposes that a firm’s internal resources and capabilities can serve as the basis for competitive advantage in a firm’s strategy to achieve superior performance (Barney 1991; Day 1994). Differences in performance among firms may be best explained through differences in corporate assets and resources and their application rather than through differences in industry structure identified by industry analysis (Grant 1991; Peteraf 1993). A firm may be perceived as an integration of resources and capabilities, which are translated by management into the strengths and weaknesses of the firm. Researchers adhering to the RBV argue that the firm’s tangible and intangible resources are central in explaining its performance (Wernerfelt 1984).

The RBV is a conceptual framework for understanding firm-level growth using resources as building blocks. The rate and direction of a firm's growth is influenced by how management conceptualises the firm's resource base. These internal choices and resources interact with the competitive environment to determine the firm's economic performance.

2.1.2.2 Core Competency Theory

As discussed above, core competencies differ from capabilities in four characteristics: valuable, rare, costly-to-imitate and non-substitutable. Valuable capabilities are those that help a firm exploit opportunities and neutralise threats in its external environment, which allow the firm to either reduce costs or further differentiate relative to competitors by improving quality or enhancing attractive features (Grant 1991). Rare capabilities are those possessed by few, if any, current or potential competitors. Competitive advantage results only when firms develop and exploit capabilities that differ from those they share with competitors (Hamel and Prahalad 1993, 1994). Costly-to-imitate capabilities are those that other firms cannot develop easily. A firm may possess valuable and rare resources and capabilities, but such an advantage can only be sustained if competing firms cannot similarly obtain these resources (Peteraf 1993). Capabilities that are costly to imitate can occur due to one of three reasons: unique historical conditions; casually ambiguous link between the firm's competencies and its competitive advantage; and social complexity (Hitt et al. 2003). Non-substitutable capabilities are those that do not have strategic equivalents. It may be possible for a firm to substitute with a similar resource that enables it to devise and execute the same strategies as other firms. At the same time, a combination of different firm resources can be used as a strategic substitute (Barney 1991). In brief, the sustainable competitive advantage can be achieved only when resources and capabilities that are valuable, rare, costly to imitate, and nonsubstitutable, and their related activity systems have complementarities.

Core competency theory ties competitive advantage to the possession of unique firm-specific resources, capabilities and competencies, defined as identifiable assets, complex

combinations of resources, and tacit managerial routines for applying these resources and capabilities. The RBV predicts that competition in the future will be based on core competencies, which can also be thought as higher second-level aggregations of capabilities (Del Canto and Gonzalez 1999).

This research will identify those resources and capabilities of CCFs that would match the opportunities and threats of the environment and contribute to establishing their competitive advantage over their international competitors.

2.1.3 Necessity of the Synthesis of 'Outside-In' and 'Inside-Out' Approaches

The 'outside-in' approach suggests that the environmental factors are the determinants of strategies that firms should adopt to achieve competitive advantage. IO theories have their obvious merits. Its rational analysis and planning provides an explicit and consistent system for decision-making, which can help to effectively monitor the actual performance and update the system itself. However, IO theories also received some criticisms over the years. The major criticisms include (Mintzberg et al. 1998): (1) they favour a set of analytic techniques to develop strategy, which can hardly be achieved in reality; (2) there is a bias in IO theories towards the external conditions, especially of industry and competition, at the expense of internal resources and capabilities; (3) strategy itself tends to have a narrow focus in positioning, which is seen as generic position not unique perspective. Rumelt's (1991) empirical study revealed that the industry structure can only account for 8-15% of the variance in profit rates across firms, and the majority of the remaining variance could be explained by the individual firm differences.

The 'inside-out' approach focuses on the heterogeneity of firm's abilities. The RBV stresses that the efficient use of firm-specific resources and capabilities can create sustained performance differentials within industries. It has made a major contribution in bringing a reality to the study of strategy formation as a learning process. Learning in construction firms is not uncommon (Fu et al. 2003). Many contractors show positive

attitudes to learn so as to adapt to the competitive business environment (Jashapara 1995). However, the RBV over-devalues rational planning and the objectivity of corporate control. Rational planning can sometimes serve as means for putting everyone on the same wavelength. The RBV approach was also criticized as “no strategy”, “lost strategy” and even “wrong strategy” (Mintzberg et al. 1998). The comparison of the IO theories and the RBV is summarized in Table 2.1 based on the above discussion.

Table 2.1 Differences in Two Views of Competitive Advantage

Theory	Focus	Assumptions	Drivers	Sources
IO Theories	Industry characteristics	Firms are homogeneous	Firm’s strategy	Product/service and market factors
RBV	Firm’s characteristics	Firms are heterogeneous	Firm-specific resources and capabilities	Resources that are qualified as valuable, rare, costly to imitate, and nonsubstitutable

Source: Kale, 1999

As indicated in Table 2.1, a fundamental tension between these two apparently opposite theories was identified. A theory tension can be viewed as a puzzle, a dilemma, a trade-off, or a paradox. The paradox is a situation in which two seemingly contradictory, or even mutually exclusive, factors appear to be true at the same time, leading to no real solution (Quinn and Cameron 1988; Lewis 2000). Most people are used to solving puzzles, resolving dilemmas and making trade-offs. However, from De Wit and Meyer (2005), viewing strategy tensions as strategy paradoxes is the ultimate intellectual challenge and will encourage the use of creativity to find ways of benefiting from both sides of a tension at the same time. For the tension of IO theories and the RBV, two opposed views are not always true, but they do expose their respective merits. In order to overcome their respective weaknesses, it should be a better solution to synthesise these two views following De Wit and Meyer’s way of solving strategy paradoxes.

2.2 International Business Studies

The trend towards globalisation has added a new dimension into the field of strategy, (De Wit and Meyer 2005). Due to the complexity of the issues of international management, research in this area are more multidisciplinary and fractionizing. In this section, literature about internationalisation theories, ISM research and market entry strategies are reviewed.

2.2.1 Internationalisation Theories

A number of theories for internationalisation are reviewed, which covers Porter's National Diamond, internalisation theory and transaction cost theory, and Dunning's eclectic paradigm.

2.2.1.1 Porter's National Diamond

Porter (1990) produced a critique on comparative advantage and proposed alternative concepts of competitive advantage - the "National Diamond". The Diamond is Porter's another contribution to the IO theories. It has gained wide application in international management research since the early 1990s. According to Porter (1990), the Diamond framework includes the following six elements (Figure 2.6):

Figure 2.6 Porter's National Diamond for Analysis of International Competitiveness

Source: Porter, 1990

- Factor conditions (i.e. the nation's position in factors of production, such as skilled labour and infrastructure)
- Demand conditions (i.e. sophisticated customers in home market)
- Related and supporting industries (includes suppliers and related industries, usually occurring at a regional level as opposed to a national level)
- Firm strategy, structure and rivalry (i.e. conditions for organisation of firms, and the nature of domestic rivalry)
- The role of chance (random events can either benefit or harm a firm's competitive position, like major technological breakthroughs or inventions, acts of war and destruction, or dramatic shifts in exchange rates)
- The role of government (Government's proper role is as a catalyst and challenger; it is to encourage, or even push, firms to raise their aspirations and move to higher levels of competitive performance)

The Diamond framework highlights not only the naturally inherited or comparative but also the advanced or competitive factors of production. Competitive advantage emphasizes the cost and availability of all inputs in a particular location. In contrast,

comparative advantage focuses only on the availability and cost of those inputs referred to as factors of production (Tayeb 2000). However, the Diamond framework was viewed as being more relevant to the public policy domain than specific firm strategies because it focuses primarily on the role of government in upgrading indigenous firms' competitive advantages (Bruton et al. 2004). There was little direct advice to individual firms on how to gain these advantages. In recent years, researchers employed it along with other theoretical foundations to examine specific firm strategies (Lu 2003).

2.2.1.2 Internalisation Theory and Transaction Cost Theory

Hymer (1976) proposed that firms exist because they possess "unique assets" in terms of products, processes and skills. These resources, when employed in a host country, serve to reduce rivalry as they are imperfectly imitable (Kindleberger 1969). In a traditional H-O theorem of free trade, perfect goods and factor markets, zero transaction costs, constant returns to scale are assumed. However, the market for firm-specific tangible and intangible assets is imperfect, resulting in high transaction costs. Firms had better to internalise their international operations (Williamson 1975). This analysis has been called internalisation theory (Rugman 1980).

The internalisation theory has its roots in the transaction cost theory, developed by Coase (1937) who was the first to explain that internal organisation of a firm can be an efficient method of production. According to Williamson (1975), the size and scope of the firm will depend on the decrease or increase in the costs of the internal management of a transaction instead of obtaining those services, parts, components and other resources from another firm in the marketplace. For example, vertical integration, horizontal integration, diversification and outsourcing are options that can be explained using the logic of transaction costs (Williamson 1991).

Both the internalisation theory and transaction cost theory see the firm as a response to market failure (Teece 1986). Profit seeking firms internalise operations when by doing so the costs of organisation and transacting business will hence be lowered. As a result, they

are one and the same from this perspective. However, the two approaches diverge when it comes to specifics. The transaction cost approach is micro-analytic, focusing on the transaction as the basic unit of analysis. It regards firms, markets, and hybrid markets as alternative governance structures; the selection of one or the other depends on their relative efficiency properties. In contrast, the internalisation approach is macro-analytic, focusing on the firm as the unit of analysis (Hsu 2003).

The internalisation theory has rarely been empirically tested. Buckley (1988) mentioned the limits and problems in testing the internalisation theory, such as transaction costs are very difficult to quantify and longitudinal data is needed (Morck and Yeung 1991). Agarwal and Ramaswami (1992) used managerial perceptions to measure the internalisation component of Dunning's paradigm in their study of the US equipment leasing industry's foreign entry mode decisions. For construction industry, internalisation theory is also applicable but may not be as important as in other industries due to the specificities of construction.

2.2.1.3 Dunning's Eclectic Paradigm

Dunning (1988) explained the prerequisites of the existence of MNE by providing an eclectic theory, i.e. ownership-specific advantage, location-specific advantage and internalisation-specific advantage (OLI) based on the previous MNE theories. These prerequisites help define the strategic options for competing in worldwide businesses (Bartlett, et al. 2004). This paradigm became a strong theoretical foundation for internationalisation. In order to improve its application, it was re-examined by Singh and Kundu (2002) in the context of electronic markets and supplemented with network advantages. It was also reexamined by Low and Jiang (2003, 2004) in the context of construction markets and supplemented with specialty advantage. Dunning has also suggested to broaden the eclectic paradigm to incorporate the relational assets of firms, and inter-firm networks (Dunning 2004).

According to Dunning's eclectic paradigm, the more MNEs possess ownership advantages, the greater the incentive they have to internalise those ownership advantages. MNEs perceive their innovative capabilities to give them important competitive advantages over their foreign competitors. Two types of ownership advantages are classified: asset-based advantages (Oa) and transaction-cost advantages (Ot). Ot means the abilities of MNEs to coordinate multiple and geographically dispersed value-added activities and to capture the gains of risk diversification (Dunning 1988). Oa means the proprietary ownership of specific resources by MNEs vis-à-vis those possessed by other enterprises. It is the main motives for MNEs to expand internationally and these specific resources refer to specific knowledge and specialised assets (Barney 1991; Wernerfelt 1984).

As for the locational advantages and its components, Dunning (1993) noted that a firm's propensity to invest in a particular country is often strongly influenced by the factor endowments, created capabilities and markets available in that country relative to others, as well as the extent to which it is perceived that the economic system and policies of a country enable it to exploit its ownership advantages profitably. The most important locational factors viewed from a dynamic perspective include the macro-organisational policies and development strategies pursued by host-countries (Dunning 1993), together with the factors included in Porter's Diamond framework (Cuervo and Low 2003b).

The internalisation advantages that form part of the eclectic paradigm have their bases on internalisation theory. Rugman (1980) suggested that market imperfections force transaction costs onto the firms conducting international business to avoid open market inefficient transactions. MNEs should opt for internalising their international operations within the organisation to reduce transaction costs.

As discussed above, Dunning's eclectic theory seems to encompass all the core contents of Porter's Diamond framework, internalisation theory and transaction cost theory. It considers both firm-specific resources/capabilities and their interaction with the external environment.

2.2.2 ISM Research

The domain of ISM research has made significant strides since the early 1990s, which employs a rich set of theories and frameworks that have largely been drawn from other disciplines such as sociology and economics (Bruton et al. 2004). In this section, four main ISM theories are first outlined; the application of the RBV in ISM research is discussed next; and the ISM field will be summarized finally.

2.2.2.1 Four Main ISM Theories

Bruton et al. (2004) investigated the evolution of ISM research over the past 15 years, based on Lu (2003) and Lohrke and Bruton (1997). According to their studies, the ISM theories developed based on the eclectic paradigm, agency, transaction cost, and diversification theories in the 1990s. In particular, four theories/frameworks became well known since mid-1990s, namely institutional theory, social network theory, organisational learning theory, and the RBV of the firm. In addition, two new topical areas also emerged, i.e., international new ventures (INVs) and e-commerce.

Institutional theory developed within the field of sociology, where it had been applied to explain social, economic, and political phenomena. ISM studies employed this theory to examine both environmental constraints on MNE decision-making and how mimetic behaviour can help MNEs overcome environmental uncertainty. While most researchers focused on the broader institutional environment, a few have applied institutional theory to examine inter- and intra-organisational mimetic behavior in the decision to expand internationally (Guillen 2002).

Social network theory is also rooted in sociological theory. But it focuses on actions that result from membership in social networks. The application of network theory in the ISM is a more recent event. Most network-labeled studies in the ISM field employed network term in a metaphorical manner and equated it with connections to networks. A few studies have implemented social network theory and techniques to examine both

relational and structural characteristics of networks (Andersson and Forsgren 2000; Chew 2001; Salk and Brannen 2000).

Organisational learning theory emphasizes the importance of organisation learning and the process through which such learning occurs, primarily focusing on how firms balance exploiting current and exploring new capabilities (March 1991). The major studies include employing internalisation theory to examine FDI, international strategic alliances for organisation learning, and combining real option and learning theories to examine MNE location and entry mode decisions (Kogut and Kulatilaka 2001; Rivoli and Salorio 1996).

The RBV of the firm argues that an organisation can develop a sustainable competitive advantage from its unique resource endowments. Strategy studies have examined numerous issues employing the RBV in recent years. Based on Lohrke and Bruton (1997) and Lu (2003), the ISM studies which employed or referenced the RBV increased significantly from 1986 to 2000. Even though studies have increasingly employed the RBV in ISM studies, direct investigation into what constitutes resources in international context has remained somewhat limited (Bruton et al. 2004; Peng 2001).

2.2.2.2 Application of the RBV in ISM research

As mentioned above, the RBV of the firm has become an influential theoretical perspective in recent international business research (Peng 2001). ISM studies employed the RBV to examine not only well-established (e.g., leadership, strategic alliances, or location advantage) but also newer (e.g., a subsidiary's rather than parent firm's role in firm-specific capability cultivation) topics related to developing a strategic competitive advantage (Birkinshaw et al. 1998). Peng (2001) found that among all the studies of the RBV in international business research appearing in leading international journals, only half measured firm resources, and many of these employed broad resource measures (e.g., advertising intensity or degree of firm internationalisation). Others examined the RBV

conceptually, and employed it as a related literature to frame conceptual arguments; or employed it to examine the impact of resources on firm's performance.

Collis (1991) and Tallman (1991) have tested the influence of firm resources on internationalisation strategies and its subsequent effect on performance, and found support for the notion that resources influence the outcome of a firm's strategic choices. Current research is at a nascent stage to predict the directionality of the linkages between type of firm resources and their influence on the extent and form of internationalisation (Delios and Beamish 1999). It is commonly agreed that the presence of resources could provide a firm the discretion or motivation (strategic choices) to pursue a strategy of internationalisation thereby increasing its size and profitability (Hsu 2003). This research will examine the influence of firm-specific resources and capabilities on selected strategies and international performance of CCFs.

2.2.2.3 ISM Field

Besides the theoretical evolution of ISM studies, Bruton et al. (2004) identified the ISM field in detail from four broad aspects: environment, leadership and organisation, strategy, and performance. A framework for the ISM field developed by Bruton et al. (2004) is shown in Table 2.2. This framework will provide a guideline for the review of Chinese research on the ISM of CCFs, which will be presented in Section 2.4.

Table 2.2 ISM Field

Environment
Environmental/Industry analysis
Culture (National)
Scenario development/Political risk analysis
Leadership and organisation
Internal coordination
Knowledge flow/learning
Top management characteristics
Board of directors
Decision-making
Structure
Culture (Corporate)
Strategy
Strategy typologies
Enterprise level strategy
Corporate level strategy
International diversification
Strategic alliances
Business level strategy
Decline/turnaround
E-commerce strategy
New venture strategy
Performance
Relative performance

Source: Adapted from Bruton et al., 2004

2.2.3 Market Entry Strategies

Market entry strategies are one of the most important international business strategies. The selection of an appropriate entry mode is crucial and affects the overall success of an investment (Porter 1987; Woodcock et al. 1994). According to Pan and Tse (2000), entry modes can be viewed as two major categories: equity-based modes (wholly-owned subsidiaries and equity joint ventures (EJVs)) and non-equity-based modes (contractual agreements and export), as shown in Figure 2.7. Wholly-owned subsidiary modes include Greenfield subsidiary and wholly-owned subsidiary by merger and acquisition (M&A). Contractual agreements include licensing, R&D contracts and alliances/contractual joint ventures (CJVs).

Figure 2.7 A Hierarchical Model of Choice of Market Entry Modes

Source: Pan and Tse, 2000

The mode of entry decision reflects the level of commitment to and investment by the firm in international markets (Bradley 2004). For different market entry modes, the resource commitment should be different, and the firms will possess different control power, but they have to face different level of risks. Generally, the greater the resource commitment, the higher the risk, but also the more control the firm has over its international operation. The relationship among resource commitment, operational risk and control for major market entry modes is shown in Figure 2.8.

Not all entry modes are suitable to any firms. Firms have to select suitable modes to enter foreign markets based on the environmental conditions and firms' internal factors. Literature on theories of foreign market entry mode choice is dominated by the transaction cost theory, eclectic paradigm and the RBV (Ekeledo 2000). In transaction cost theory, traditional studies treat each particular entry as a 'transaction' (Anderson & Gtignon 1986), and the key concern is whether to rely on external market measures or to internalise operations (Buckley and Casson 1976). The RBV raises the level of analysis from transaction to the firm, suggesting that "a particular entry decision cannot be viewed in isolation, and it must be considered in relation to the overall strategic posture of the firm" (Hill et al. 1990). Transaction cost theory generally focuses on one-time entries based on a set of relatively static conditions. In contrast, the RBV highlights a dynamic,

longitudinal process in which multiple entries take place, each building capabilities and learning from the previous entry experience (Chang 1995). In addition, while the dependent variable of transaction cost theory is typically the entry modes, RBV studies aim to link entry modes with post-entry performance (Peng 2001). Therefore, the RBV has its own advantages in studying market entry strategies, but it should also absorb the spirits of transaction cost theory in considering environmental factors.

Figure 2.8 Risk-Control Relationship for Market Entry Modes

Source: Adapted from Axinn and Matthyssens, 2001

2.3 Strategic Management in Construction

This section is organised into three subsections. The specificity of construction industry and international construction is first presented. Then, the literature on strategic management in construction and international construction are discussed separately.

2.3.1 Specificity of Construction Industry and International Construction

As Ofori (1994) concluded, construction economics cannot be described as a bona fide subject and recognised as a distinct part of general economics, because it lacks a clear indication of its main concerns and contents, and a coherent theory. Little has changed during the subsequent period of this conclusion (Myers 2003). As such, there are many research gaps that need to be tackled by future researchers. In essence, the construction industry is filled with much specificity, and the construction delivery process remains a complicated and complex delivery system involving multiple participants in a dynamic process (Wyk and Chege 2004). Such specificity is reflected in eight aspects according to Cheah (2002):

- High degree of fragmentation;
- Fierce rivalry within the industry;
- Low entry barrier, but high exit costs due to existing contractual obligations;
- Limited economies of scale and a weakened learning effect due to onsite production nature;
- Heavy reliance on labour;
- Mostly process-oriented;
- Rules of competition being critically governed by contract modes, at least at the project level;
- Sensitivity to environmental factors

Cheah's list of factors provides a very good summary of the specificity of construction business in general, compared to other businesses. However, not all of these factors are applicable to international construction. For example, one does not need a lot of capital to start a construction business since equipment can be hired, labor cost is generally low, and part of work can be subcontracted out. Therefore the entry barrier of construction, compared to manufacturing, is generally low (Cheah 2002; Macomber 1989). In contrast, when contractors go global, they have to face "an extremely hard wall" of targeted foreign construction markets, which make "the local building market more difficult to enter than walls surrounding most consumer and industrial goods markets." Thus, the

entry barrier for foreign construction markets should be higher (Huovinen and Kiiras 1994).

As for studies on international construction, Ofori (2003) asserted that there is no perfect framework for analysing the factors that influence success in international construction, nor is any one sufficient for all sectors. In order to develop a suitable analytical framework for international construction, the difference should be recognised between international construction and other international business by encompassing the peculiar features of construction in general and international construction projects in particular. The peculiar features of construction in general have been discussed. The peculiar features of international construction include the following five aspects that combined the opinions of Choi (2003) and Ofori (2003):

- Location specificity of construction projects, which makes it necessary for firms to enhance logistics and communications, shorten learning curve, limit the costs of acquiring local knowledge, and improve risk management ability;
- Shorter time for realising returns due to project-based nature, which gives firms flexibility in capacity and capability;
- High risks in legal and technical aspects, instead of nationalisation and expropriation due to the lack of direct investment;
- More public concerns and government regulations involved; and
- Mixed corporate objectives and mixed cultures due to the participants from different countries

2.3.2 Strategic Management in Construction

Research on strategic management in construction can be traced back to three decades ago. UK researchers pioneered in this academic area and have been leading the trend. The research conducted by Ashridge Management Research Unit (Lea et al. 1974; Lansley et al. 1979; Sadler et al. 1974) in the UK was a big effort in strategic management study in the 1970s. Hillebrandt and Cannon (1989) edited the studies on the issues of business strategy, diversification and product differentiation mainly from the perspectives of UK-

based contractors. Male and Stocks (1991) systematically studied the competitive advantage, economics, organisational behaviour, culture and sociology in construction by combining the articles contributed by a number of researchers. The debate on the disagreement between Betts and Ofori (1992, 1993) and Fellows (1993) on the relevance of Porter's models to both supply- and demand-side analysis let subsequent researchers and practitioners have a clearer understanding of such principles in construction. Langford and Male (2001) thoroughly explained a wide range of issues on strategic management in construction by combining various strategic management theories with the unique characteristics of the construction industry. They argued that the business environment shapes not only the kind of projects a firm chooses to pursue but also the procurement and contractual choices it offers its clients, implying that business environment is a critical factor in formulating business strategy. In addition, Price (2003) critically reviewed various theories of strategic management and applied them to investigate the current approaches to the process of managing strategy within the construction industry based on case studies of large construction firms.

In the US, Friedman (1984) studied the issues on marketing strategies and strategic planning from construction organisation's perspective. Chinowsky (2000) represented perhaps only the first book ever written by a construction professional in the US that focused entirely on strategic corporate management (Cheah, 2002). Besides, a number of PhD theses from universities in the US and numerous related journal papers witnessed the contribution from US researchers. For example, Kale (1999) applied IO theory and the RBV approach to examine the generic competitive strategies of US construction firms. He proposed a useful model for explaining the relationship among resources, strategy and competitive advantage (Figure 2.9). He revealed that US construction firms that adopt neutral scope of competition and place strong emphasis on all modes of competition (cost leadership and differentiation) outperform their rivals. Choi (2003) studied the M&A transactions in the US public construction industry, which revealed that related business diversification is slightly more important than unrelated diversification.

Figure 2.9 Competitive Advantage Model

Source: Adapted from Kale, 1999

In Singapore, George Ofori and S.P. Low published a number of books and numerous papers on the practical application of strategic management theories in the construction industry and enterprises, such as Ofori (1993, 1994), Low (1995, 1996), Ofori and Han (2001). Besides, Singaporean scholar Charles Cheah has also produced a number of publications on corporate strategies of engineering and construction organisations. Cheah and Gurvin (2004) provided an open framework for corporate strategy in construction. Cheah and Chew (2005) revealed that within the internal aspects of CCFs, business imperatives, core competencies and resources are cultivated by a proper alignment between strategic fields and organisational mechanisms; the interactions among various internal and external components therefore create a perpetual feedback loop. Kang (2006) applied the RBV and IO theories to study the performance of large CCFs in domestic market, and examined the impact of so-called ‘important resources and competencies’ on generic competitive strategies and the performance.

As a whole, research on strategic management in the construction industry is not as substantial compared to other industries. The researcher examined most electronically accessible literature and found that related research usually focus on functional and operational level management rather than on corporate and business level management. This contradicts Lu’s (2003) findings on ISM research covering all industries, which revealed that corporate strategy was among the most vital areas of research.

2.3.3 Strategic Management in International Construction

Research on strategic management in international construction was apparently not accorded as much attention as in other international businesses. Howes and Tah (2003)

tried to explain the strategic issues of international construction by applying strategic management theories. Their arguments include various levels of strategic issues from corporate strategies to operational strategies in the context of international construction. This book is perhaps the most comprehensive regarding strategic management in international construction. Related studies from AICs to NICs are discussed hereinafter.

Hasegawa (1988) examined the international strategies of leading Japanese contractors and identified factors leading to the success of these firms in the 1980s, without reference to any existing theoretical frameworks. Sugimoto (1990) applied Porter's model of value chain and global strategy (configuration and coordination) concept, trade theory and MNE theory, to analyse the globalisation of US international engineering and construction firms. Besides, Aziz (1991) examined the strategies adopted by international contractors from AICs during the 1980s. He insisted that the global strategies that focus on manufacturing industries cannot be adopted by contractors without modification, and the manifestation of global strategies in contractors is both the result of deliberate and spontaneous actions. In addition, Al-Dughaiter (1996) focused on international construction financing strategies, examining the points of view of leading international contractors for reasons that may contribute to their decision to use or not attempt to use financing techniques. Han and Diekmann (2001) developed a risk-based decision-making model for international construction market entry, based on the study of top international contractors from AICs. Furthermore, Gunhan and Arditi (2005) developed an international expansion decision model and identified the SWOT contents, benefits and costs relative to international construction, based on the survey among US international contractors. They also examined the importance of three market entry modes to US construction firms: wholly-owned subsidiary, JV and turnkey project modes.

Besides the above studies carried out in AICs and based on their contractors, a number of research works were also carried out in NICs from the strategic perspective of the international contractors of these countries. Major studies include the following. Chang (1987) analysed the performance of the Korean contractors in the Middle East, and explained the prevailing success of Korean contractors in international markets by using

H-O theorem, scale economy theory, internalisation theory and technology-based theory. Oz (2001) examined the international operations of Turkish contractors using Porter's Diamond framework. Suggestions were hence given to the Turkish government and contractors on improving their international competitiveness. Besides, Low (1996) explained many strategic issues on international construction marketing based on the Singaporean construction industry and firms. His recent research included the application of Dunning's eclectic paradigm in international construction, such as Cuervo and Low (2003a, 2003b and 2005), Low and Jiang (2003 and 2004) and Low et al. (2004). In addition, Ofori (2003) conducted a systematic review on related literature, and provided useful suggestions for future research on the application of Porter's Diamond framework, i.e., using culture and institutional arrangements to replace chance event.

2.4 Chinese Research on the ISM of CCFs

Research regarding the ISM of CCFs can be found in several Chinese journals such as the *International Economic Cooperation Magazine (IEC)* and *International Project Contracting and Labour Services Magazine (IPCLS)*. A number of related journal papers can also be found in two other journals entitled *Architecture and Construction* and *Construction Economy*. IEC is an authoritative journal in China which publishes Chinese researchers' and practitioners' writings on international businesses of Chinese enterprises from all industries. A large portion of articles were written on construction-related aspects. IPCLS exclusively focuses on international construction and related issues. International market information and firms' business introduction as well as the working reports of China International Contractors Association (CHINCA) are included in IPCLS. All relevant articles (published in Chinese) regarding the ISM of CCFs in IEC (from 2002 to 2004) and IPCLS (from 2003 to 2005) were examined. In addition, other relevant literature (like PhD theses) were also reviewed. Guided by Bruton's framework for the ISM field (see Table 2.2), Appendix 1 summarizes the articles from IEC and IPCLS and the ISM field to which these articles are related. In the following sections, discussions on

these literature and those from other sources are first presented, followed by overall comments on literature gaps for the ISM of CCFs.

2.4.1 Discussion on Major ISM Issues of CCFs

As mentioned earlier, many ISM issues were studied by Chinese authors in IEC and IPCLS. The ISM field of CCFs were identified (Figure 2.10) based on Bruton's framework, the classification of strategies by Thompson and Strickland (2003), and the summary of Chinese research shown in Appendix 1. These ISM issues were aggregated into three groupings, namely strategic analysis, firm strategy and government supports/policies. These issues are discussed next.

2.4.1.1 Strategic Analysis

As a fundamental element of strategic management, strategic analysis on CCFs and their environments is inevitable. In relation to international construction, key external factors that are to be analysed include international construction markets, international competitors, and domestic supporting environments. Key internal factors that are to be analysed include the organisational factors of CCFs and their international performance. Major studies are presented as follows:

Environment analysis and international performance review

A large number of articles, especially from IPCLS, presented the environmental analysis on international construction markets. Some of these are serial market reports conducted by relevant government agencies, such as those on the India's construction market by Bao (2003, 2004). Others come from practitioners of CCFs. The former mainly focused on overall market scanning, while the latter was concerned with markets of specific types of works where the CCFs had some experiences. While analysing international markets, these authors also reviewed CCFs' performance in the respective markets. In general, the market analysis, especially those conducted by government agencies, is comprehensive and useful for CCFs to obtain market information and prevent potential risks. However,

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most studies on the international performance of CCFs are too general, without sufficient empirical evidence.

ISM Field	Strategic Analysis	Firm Strategy	Government Support and Policies ***
Environment			Environment
Environmental/Industry analysis	International construction markets, international competitors, domestic supporting environment		↑ Create favourable environment to support CCFs to go abroad
Leadership and organization			
Internal coordination			
Leadership	Strengths and weakness at organizational aspects		
Structure			Structure
Culture (Corporate)			↑ Help CCFs in restructuring and M&As
Strategy		Business diversification	
		M&As	
		Financing strategies ***	
		Localization	
		Social responsibility *	
		Building core competencies/capabilities	
		Strategic alliances/JVs	
		Sophisticated contracting ***	
		Generic competitive strategies	
		New venture strategies	
		E-commerce strategies *	
		Decline/turnaround strategies *	
Performance			
Relative performance	International performance		

Note: (1) The highlighted issues were discussed extensively in IEC and IPCLS.

(2) * denotes the strategies which are included in Bruton et al. (2004) or Thompson and Strickland (2003), but were not discussed or far insufficiently discussed or discussed as lower level strategies in IEC and IPCLS.

(3) *** denotes the strategies which are not included in Bruton et al. (2004) or Thompson and Strickland (2003) at corporate and business level, but were discussed in IEC and IPCLS.

Figure 2.10 Major ISM Field for CCFs

Source: Adapted from Bruton et al. (2004), Thompson and Strickland (2003), and Appendix 1

Internal coordination and organisational structure

Headquarter(HQ)-subsidiary relationship was moderately covered. It was generally agreed that CCFs tended to adopt centralisation for the internal coordination between HQs and their foreign subsidiaries. Opinions on the role of HQ's control and coordination over their foreign subsidiary were mixed. Some authors insisted that HQ should strengthen its centralisation and supervision to reduce risks arising from inappropriate decision-making (Hu 2004). In contrast, others insisted that HQ should give more autonomy power to their subsidiaries to stimulate localisation. They suggested that flexible operations of subsidiaries could be more favourable for business expansion (Sun 2005). However, restructuring was extensively discussed. It was basically agreed that the organisational structure of state-owned CCFs is unsuitable for improving their international competitiveness, and even for competing against domestic private contractors. CCFs are intensifying their efforts to restructure their organisation. Major suggestions for restructuring include the establishment of the so-called 'Modern Enterprise System'. This topic generated much interest among Chinese researchers, government policy-makers and management staff of CCFs for past few years (Xie and Zhang 2004; Xing 2005).

Organisational culture

Organisational culture was not widely studied. To facilitate internationalisation, Yan (2005) emphasized the importance of cross-cultural management, adaptation of culture (localisation of culture) and team-working. Ren (2005a) reported that organisational culture should be deemed as a core competency, and valuable organisational culture could have positive impact on CCF's branding and international performance. He also stressed the importance of relationship between homogeneity of organisational culture and heterogeneity of subcultures of foreign subsidiaries. Hu (2002) emphasized the role of people-orientation and organisational learning in improving organisational culture.

2.4.1.2 Firm Strategy

Only major corporate and business level strategies were reviewed in this research. The related literature in these two journals (IEC and IPCLS) is discussed below, based on the sequence in Figure 2.10.

Business Diversification

There are limited studies on business diversification of CCFs. Articles that involve this topic only treat business diversification as one of the strategic choices. Li (2002) suggested that several key factors have to be taken into account, such as market demand, financial capability, HR management capability, and operational management capability. Zhu et al. (2002) suggested that business diversification should consider the market potential, firm's competitive advantage, financial capability, and the relatedness of diversified business to the core business. Vertical integration was suggested by a few authors, which includes alliances with investors, participation in property/resources development and downward integration (Tan 2005; Xing 2004a).

M&As

M&As among Chinese enterprises in building their international competitiveness is one of the popular topics in China in recent years. A few large CCFs have already executed M&As among themselves or with other construction-related firms. A handful of authors expressed concern and gave pertinent recommendations on this strategy, although in-depth study was not conducted (Qian 2005). This strategy tends to continue to be adopted by large CCFs under the guidance of the Chinese government, to achieve bigger market share, better financial and technological capabilities (Xing 2004). However, the topic on cross-border M&As has not generated any interest for Chinese researchers and practitioners.

Financing strategies

Financing strategies, which include both corporate financing and project financing, were accorded much attention by Chinese researchers and practitioners, as CCFs realised the

importance of financing in international construction. Most of the authors emphasized the cooperation with banks and financial institutions (Liu 2004; Xu 2003). Public-listing and bond-issuing were also suggested as financing channels (Yu 2002). Besides, cooperation with firms from AICs and acquiring shares of financial institutions were also suggested (Ding 2001; Hao 2004). However, detailed discussion on financing strategies was not found in these articles.

Localisation

Localisation as an international strategy has been extensively studied by Chinese authors, especially on the issue of human resource (HR) localisation (Jin 2003; Shan 2005). The overwhelming discussion on this issue could be due to the over-centralisation of Chinese enterprises on their foreign subsidiaries. Other identified localisation strategies include: localisation of marketing, organisational culture, administration mode, product/material manufacturing, capital operation (including public-listing overseas), and branding (Shan 2005; Sun 2003).

Core competency/capability

The concept of core competencies has been widely accepted in China, and it has been applied to the strategic management in construction. Vagueness or misunderstanding about the definition of core competencies can be found in a few articles, such as Ma (2004). Creating effective organisational structure, improving technological innovation and financing capabilities were discussed by a large number of authors. Major strategies proposed therein for building core competencies and capabilities can be selectively used in this research.

Strategic alliances/JVs

Strategic alliances/JVs with domestic and international contractors have also been widely discussed. Yao (2004) provided an in-depth study on strategic alliances/JVs which covered alliances formation principles, various modes of alliances and their characteristics. Xue (2003) emphasized the importance of strategic alliances for market entry, commenting that strategic alliances could complement competitive advantages and

cultivate core competencies through learning and technology transfer. Sun (2005) suggested that cooperation could be achieved from three channels: cooperation with renowned international contractors, cooperation with other CCFs, and internal cooperation among subsidiaries.

Sophisticated contracting

Many researchers presented the analysis of contracting modes, especially on EPC and BOT contracts (Meng and Zhao 2004; Wang 2005). At the same time, a number of recent articles also stressed the strategic choice of sophisticated contracting modes (Lu 2005; Tan 2005; Xu 2005). They agreed that sophisticated contracting is highly influenced by the developmental trends of international construction. They suggested that CCFs should improve their financing capability, project management capability, technology and innovation, and strategic HR management to meet the requirements of sophisticated contracting. Besides, strategic alliances should be considered when sophisticated contracting modes are adopted. Notably, the Chinese government plays an important role in financial support and facilitation to encourage CCFs in the participation of sophisticated contracting.

Generic competitive strategies

Strategic issues pertaining to cost leadership, differentiation and scope of competition were discussed in a few articles. Fu (2005) revealed that CCFs have been successful in competing international markets due mainly to cost leadership strategy. Zi (2005) suggested that CCFs should compete internationally using differentiation strategy. Possible channels include unique market positioning, core competency cultivation, adopting sophisticated contracting modes, outsourcing, and specialisation. Sun (2003) and Gang (2005) explained the generic strategies of China State Construction Engineering Corporation (CSCEC) for international competition. CSCEC adopted both cost leadership and differentiation strategies in international markets. At the same time, they also applied a hierarchical development mode to expand its geographical scope, focusing on a number of large markets and expanding regionally and globally. Other articles, such as Tan (2005), suggested that CCFs should widen their geographical

coverage. In particular they should pay more attention to markets in AICs, besides their traditional markets in NICs and LDCs. However, such a shift of markets should take a gradual mode (Liu 2004).

International New Ventures (INVs)

Since 1980's, many Chinese enterprises have been established to exclusively carry out international construction and trading. These enterprises are "Chinese-style" INVs. They had succeeded in exporting construction services and were experienced in international business. They often act as main contractors and subcontract projects to other large CCFs that have strong construction capabilities but less international experience. However, with the increasing internationalisation of large CCFs, these INVs are faced with challenges for survival. Re-customising their development strategies thus becomes imperative. Several authors provided a number of strategic choices for these INVs (Du 2002; Guo 2003), which include M&As with other CCFs, shifting to become management-oriented firms, and improving construction capability by cultivating their construction workforce.

2.4.1.3 Government Support and Policies

Besides firm strategies, the Chinese government is obligated to customise appropriate policies and strategies to support the ISM of CCFs, as it is their biggest shareholder. A large number of articles are related to government policies. Some suggestions were provided on creating a supporting environment and guiding CCFs to build competitiveness through restructuring and M&As among themselves (Wang and Yue 2003; Xing 2004). Although few of these suggestions were explained in detail, they are important for the Chinese government to enhance its relevant policies.

2.4.2 Major Chinese Research from Other Sources

Zhang (2000) studied on ways to improve the international competitiveness of Chinese construction industry. He provided suggestions to improve international competitiveness of CCFs from both firm's and government's perspectives. The suggestions include

strengthening HR management, increasing investment in technology and innovation, improving financial capability, and enhancing international project management.

Zhang (2002) made a strategic analysis on the internationalisation of Chinese construction industry using the MNE theory, making a number of suggestions on the ISM of CCFs. He suggested CCFs to enter foreign markets through JVs, wholly-owned subsidiary or M&A modes. He also suggested CCFs to participate in more BOT projects through strategic alliances.

Zhu (2002) studied the internationalisation strategies of Chinese enterprises, including CCFs. He identified seven factors that influence the international competitiveness of Chinese enterprises, which include management capability, marketing capability, product, technology, human resource, financial strength, and intangible assets. He proposed the integration of gradualism approach and fast entry approach for internationalisation, and analysed the pre-conditions of M&As. He further suggested the Chinese government to provide financial support for CCFs in five aspects: relaxing foreign exchange control, financing, taxation, foreign investment funds, and foreign investment insurance.

Lu (2003) analysed the competitiveness of large CCFs. He postulated a framework to assess internal and external firm-specific capabilities of CCFs. Based on the framework, he proposed several strategies to improve CCFs' competitiveness, which include international competitiveness. These strategies are: HR strategy, M&As, strategic alliances with domestic and international enterprises and banks/financial institutions, vertical integration, business diversification, regionalisation and localisation.

CMRE (2004) examined the ISM issues from the perspectives of CCFs and Chinese construction industry. Six broad areas were covered: market information of major foreign countries, government support/policies of some countries, trends of international construction, top Chinese design firms and CCFs, problems in Chinese construction industry that hinder internationalisation of CCFs, and suggestions for CCFs and the Chinese government to improve international performance of CCFs.

2.4.3 Research Gaps for the ISM of CCFs

Based on the extensive effort made by the researcher in literature review, major research gaps for the ISM of CCFs were identified as follows:

- Lack of related studies in international refereed publications

There are few studies regarding internationalisation of CCFs in international refereed publications. Low and Jiang (2003) could be the only international journal paper directly related to this topic. However, it just analysed the degree of internationalisation of those CCFs in the ENR Top 225 International Contractors list. In contrast, a number of articles are available in international journals on exporting construction services to China and the analysis on the Chinese construction industry (Xu et al. 2005). It indicated that the recent opening up of the Chinese construction market to foreign participants had generated significant interests for foreigners, with CCFs' venturing abroad being largely neglected.

- Lack of in-depth studies

The related articles in IEC and IPCLS were written mainly by practitioners. These articles provide more 'practical value' than pure academic papers. However, they are loosely organised and fragmented, even as they cover a wide spectrum of subject matters. For example, on the topic of building up CCFs' core competencies/capabilities, suggestions provided in most articles were limited to a few points within the psychological limit, covering from all levels of strategy, with issues being scarcely discussed. Besides, most related studies are descriptive in nature, devoid of empirical evidences and references. Nevertheless, reviewing these articles is helpful for understanding major concerns and opinions of Chinese researchers and practitioners.

- Lack of studies on corporate and business level strategies

The reviewed articles presented more discussions on strategic analysis on environmental and organisational factors, and functional strategies, rather than corporate and business level strategies. For example, HR management, project risk management, contract management, contracting mode analysis and operational control were extensively

discussed at functional and operating level. In contrast, literature about generic competitive strategies, market entry strategies, social responsibility, and decline/turnaround strategies are insufficient.

- Lack of path-analysis studies

Although the literature covers most of the ISM field in Bruton's framework, studies centred on examining the relationships among strategy, performance, environment, and resources/capabilities in the context of CCFs' internationalisation were not found.

This research is expected to fill part of the literature gaps mentioned above, by constructing a path-analysis conceptual model to examine the relationships among the research variables in the model, which will be discussed in next section.

2.5 Conceptual Model for the ISM of CCFs

Literature review has been conducted in the preceding sections from general strategy theories to the focus of this research – the ISM of CCFs. The research question “What are the literature gaps for the ISM of CCFs?” has been answered in Section 2.4. In this section, a conceptual model will be postulated based on the remaining research questions, the RBV, IO theories, internationalisation theories, as well as other frameworks that were developed using these theories. This section starts from recalling the research questions.

- (1) What are the literature gaps for the ISM of CCFs? -- (answered)
- (2) What competitive strategies can CCFs adopt to contend with their international rivals? -- (to be answered)
- (3) What entry and operation modes can help CCFs achieve better international performance? -- (to be answered)
- (4) What are the internal critical factors that influence the strategies and international performance of CCFs? -- (to be answered)

(5) How does the external environment influence the selection of strategies and the cultivation of internal strengths of CCFs? -- (to be answered)

In order to answer Question (2), generic competitive strategies and their impact on the international performance of CCFs will be studied. To answer Question (3), market entry strategies and their impact on the international performance of CCFs will be studied. To answer Question (4), firm-specific resources and capabilities and their impact on the above selected strategies and the international performance of CCFs will be studied. To answer Question (5), the external environment and its impact on the selection of strategies and the cultivation of firm-specific resources and capabilities will be studied. These research variables and the relationships among them are conceptualised in the preliminary model shown in Figure 2.11. Arrows ① and ② are concerning Question (2) and (3) respectively. Arrows ③, ④ and ⑤ are pertaining to Question (4). Arrows ⑥, ⑦ and ⑧ are regarding Question (5).

Figure 2.11 Preliminary Conceptual Model

2.5.1 Theoretical Implications and Related Path-Analysis Studies

The IO theories suggest an industry structure (environment) – firm conduct (strategy) – performance framework, as discussed in Section 2.1.1. The relationship paths represented by Arrows ⑥-① and ⑦-② in Figure 2.11 are supported by the IO theories. The RBV emphasizes that a firm’s performance depends on firm-specific resources and capabilities, as discussed in Section 2.1.2. Firm-specific resources and capabilities could contribute to performance directly or indirectly through various strategies (see Figure 2.9). Thus, three relationship paths represented by Arrows ④-①, ③, and ⑤-② are supported by the RBV. In particular, market entry strategies are also favoured by transaction cost (or internalisation) theory, which deems market imperfection as major motives of market entry strategies (Peng 2001). Besides, the environment has obvious influence on firm’s resources (Arrow ⑧). A rich and growing environment generates excess resources, which can buffer the firm in times of relative scarcity. Hence, the firm may maintain minimum resources and maximise the outsourcing for their business (Robbins 2005). On the contrary, if a country is lacking in workers and it is difficult to recruit labour from abroad, the firm has to accumulate and train certain number of skilled workers in preparation for sudden business increase. Table 2.3 summarizes a number of previous related path-analysis studies that could give additional support to the preliminary conceptual model.

Table 2.3 Chronological Summary of Related Path-Analysis Studies

Researcher(s)	Theories Used	Study Focused on	Studied Paths in Figure 2.11
Agarwal and Ramaswami (1992)	Eclectic paradigm	• Relationship among firm-specific resources/capabilities (ownership advantage), environment and market entry strategies for US equipment leasing industry	⑤, ⑦
Chandler and Hanks (1994)	RBV, IO	• Relationship among firm’s performance, market attractiveness, resourced-based capabilities, and generic competitive strategies of manufacturing firms	①, ③, ④, ⑥, ⑧
Woodcock et	Eclectic paradigm and	• Relationship among firm-specific resources/capabilities, market entry strategies and	②, ⑤

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al. (1994)	contingency theory	performance of Japanese firms entering North America	
Nitsch et al. (1996)	Eclectic paradigm, RBV	<ul style="list-style-type: none"> Relationship between market entry strategies and performance of Japanese FDI in Western Europe 	②, ⑦
Mutinelli and Piscitello (1998)	RBV, transaction cost theory	<ul style="list-style-type: none"> Impact of firm-specific resources/capabilities and environment on market entry strategies of Italian firms in mining and manufacturing industries 	⑤, ⑦
Kale (1999)	RBV, IO	<ul style="list-style-type: none"> Relationships among resources, generic competitive strategies and performance of US construction firms 	①, ③, ④, ⑥
Pan and Chi (1999)	Eclectic paradigm	<ul style="list-style-type: none"> Impact of entry timing, mode of entry, market focus and locational advantages on financial performance of foreign enterprises in China 	②
Ekeledo (2000)	RBV, transaction cost theory, and eclectic paradigm	<ul style="list-style-type: none"> Impact of firm-specific resources/capabilities and home and host country environments on market entry strategies in the manufacturing sector 	⑤, ⑦
Brouthers (2002)	Transaction cost theory	<ul style="list-style-type: none"> Relationship of environment-market entry strategies-performance of EU firms 	②, ⑦
Fahy (2002)	RBV, IO, transaction cost theory and eclectic paradigm	<ul style="list-style-type: none"> Relationship among environment (home and host countries), resources (firm-specific and country-specific) and performance in global automotive components industry 	③, ⑧
Chen and Hu (2002)	Transaction cost theory	<ul style="list-style-type: none"> Relationship among firm-specific resources/capabilities, environments, market entry strategies, and performance using a database of foreign investment in China 	②, ⑤, ⑦
Mayrhofer (2004)	IO	<ul style="list-style-type: none"> Impact of home country environment on market entry strategies 	⑦
Jaafar (2004)	RBV	<ul style="list-style-type: none"> Relationship between firm's management capabilities and performance of construction SMEs in Malaysia 	③
Clavor and Quer (2005)	RBV, eclectic paradigm	<ul style="list-style-type: none"> Relationship between firm-specific resources/capabilities and market entry mode selection for foreign investment in China 	⑤
Kang (2006)	RBV, IO	<ul style="list-style-type: none"> Relationships among resources, generic competitive strategies, industrial environment and performance of CCFs at home 	①, ③, ④, ⑥, ⑧

Source: Developed by the Researcher

2.5.2 Identification of Research Variables

The research variables for each of the four constructs and the external environment (Figure 2.11) are identified in the following five subsections. The details will be discussed in Chapter 4 in which the research hypotheses are developed.

2.5.2.1 Firm-Specific Resources and Capabilities

The first construct is concerned with firm-specific resources and capabilities which favour international construction. As suggested by Bruton et al. (2004), the ISM studies employing the RBV have to overcome critical conceptual and measurement issues by examining what constitute resources in international contexts. Major resources and capabilities are identified below.

The identification of firm-specific resources and capabilities are mainly based on the related Chinese research. As summarized in Appendix 1, major core competencies/capabilities that may influence CCF's international competitiveness, as suggested by the Chinese researchers, include: (1) technology and innovation capability; (2) financial capability; (3) marketing capability; (4) project management capability; (5) HR management capability; (6) reputation/brand; (7) organisational structure; and (8) organisational culture. These eight factors are identified as major variables of firm-specific resources and capabilities. Other literature were also selectively reviewed to examine if these variables have been previously adopted in related studies, and if any other variables need to be considered.

Six related studies were selected to support and supplement the firm-specific resources and capabilities identified from the Chinese research. They are Cheah (2002), Kang (2006), Cuervo and Low (2003a), Seymour (1987), Claver and Quer (2005) and Ekeledo (2000), as shown in Table 2.4. Cheah (2002) identified seven strategic fields and two internal mechanisms of organisation for large global engineering and construction firms. These issues exist at the corporate level and are embedded in the very lifeblood of the

organisation, and hence reflect the corresponding firm-specific resources and capabilities. Kang (2006) identified five critical resource/capability variables and four structural and organisational variables, adapted from Cheah (2002), to study the competitive advantage of large CCFs in the domestic market. Cuervo and Low (2003a) identified nine firm-level intangible asset advantages and eight transactional and organisational advantages for Singapore international contractors. Seymour (1987) showed that UK-based international contractors derived their most important ownership advantages from four factors: superior technology, greater experience, management expertise, and good reputation. Besides, Claver and Quer (2005) and Ekeledo (2000) are two recent studies that used the RBV to study international market entry strategies and identified firm-specific resources and capabilities (ownership advantages) in other industries. In general, the above-mentioned six studies complementarily covered all variables identified from the Chinese research. At the same time, two additional variables, firm's age (international experience) and size were also found to be frequently used to examine their relationships with performance and strategies. However, these two variables were often used as control variables (Li 1998), and were studied at a less important level, as they were deemed as firm's basic or demographic characteristics (Cuervo and Low 2003a; Kale 1999). Therefore, the first eight variables in Table 2.4 are finally adopted as the variables of firm-specific resources and capabilities of CCFs. Firm's age and size will be studied as background information.

Table 2.4 Major Firm-Specific Resources and Capabilities

Other related studies that match the results in the Chinese research	From the Chinese Research (see Appendix 1)								From Other Literature	
	1. Technology & innovation capability	2. Financial capability	3. Marketing capability	4. Project management capability	5. HR management capability	6. Reputation /Brand	7. Organisational structure	8. Organisational culture	9. Age - International experience	10. Firm size
Cheah's (2002) strategic fields and organisational mechanism	■	■	■	■	■		■	■		
Kang's (2006) iRCs and S&O variables	■	■		■	■	■	■	■		
Cuervo and Low's (2003a) ownership advantage factors	■	■	■		■	■	■		■	■
Seymour's (1987) ownership advantages	■			■		■			■	
Claver and Quer's (2005) firm-specific factors			Intangible assets and past performance						■	■
Ekeledo's (2000) firm-specific resources	Firm-specific capabilities and specialised assets					■		■		■

Source: Abstracted by the Researcher.

2.5.2.2 Generic Competitive Strategies

The second construct is regarding generic competitive strategies. Kale (1999) directly used cost leadership, differentiation and focus strategies to study their relationship with resources and performance. Kang (2006) adopted cost leadership, differentiation, product/service diversification, geographical scope diversification and vertical integration to represent the generic competitive strategies of CCFs. Carpano et al. (1994) studied generic competitive strategies in the international context from two major dimensions: segment differentiation and geographical scope. They also highlighted the importance of cost leadership and differentiation strategies. Kang's (2006) classification on generic competitive strategies, which was adapted from Cheah (2002), overcame the weakness of Kale's (1999) by providing a concrete and measurable content of the focus strategy. At the same time, it also overcame the weakness of Carpano et al. (1994) which was just focused on the heterogeneity of markets but ignored competitive strategies. However, vertical integration and product/service diversification in Kang's (2006) classification can be aggregated into one variable, as they belong to business scope diversification, with the former involving parallel business diversification (both related and unrelated) and the latter involving vertical business diversification (both upstream and downstream). Therefore, this research identified four generic competitive strategies:

- Cost leadership
- Differentiation
- Geographical scope diversification
- Business scope diversification

2.5.2.3 Market Entry Strategies

The third construct is regarding market entry strategies. For the purpose of studying the path-analysis relationships, only those market entry modes which are appropriate for construction firms and have been commonly adopted by CCFs are to be selected.

Wholly-owned subsidiary, JV (EJV and CJV) and M&A are the most commonly used market entry modes by researchers, such as Chen and Hu (2002) and Mansumitrachai et al. (1999), to study their impact on firm's performance or to compare their importance. For construction, there is limited literature on foreign market entry modes. Cuervo and Low (2005) studied the preferred entry modes by Singapore contractors. They revealed that wholly-owned subsidiary, JV and subcontracting are three commonly-used initial modes of entry. Besides, wholly-owned subsidiary and JV are the most preferred entry modes. Gunhan (2003) identified three key market entry modes for large U.S. construction firms: JV, wholly-owned subsidiary and turnkey project. The above-mentioned subcontracting and turnkey projects belong to project contracting modes.

In this research, market entry strategies involve both entry modes and contracting modes. "Entry mode" refers to the way a firm registers a business (or invests) and operates in a foreign market. It includes both the modes of initial entry to international markets and the modes of subsequent operation. Historically, wholly-owned subsidiary has been widely adopted by CCFs. In recent years, Sino-foreign JVs have been gradually forged between CCFs and foreign contractors to undertake both domestic and international construction projects (Cheah and Chew 2005; Luo 2001; Shen et al. 2001). At the same time, JVs between CCFs, typically between civil engineering firms and mechanical and electrical supply/installation firms, were also very common (Low et al. 2004). M&A was seldom adopted by CCFs in the international context (CHINCA 2004).

In contrast, "contracting mode" refers to the type of contracts the firm implements the target projects. There are many contracting modes generated through past examples, which can be categorised into the following five types:

- (1) BOT, PPP, and other similar modes, such as BOO, BOOT, etc. (financing and operation-related)
- (2) Design and Build (D&B), and Engineering, Procurement and Construction (EPC) (engineering-related)
- (3) Construction Management (CM) and Project Management (PM) (management-focused)

- (4) Construction main-contracting (construction-focused)
- (5) Subcontracting (construction-focused)

These five contracting modes are to be studied as one variable, represented by “sophisticated contracting”. This variable aims to examine the relationship of the level of sophistication of contracting modes to firm’s performance and resources/capabilities.

Based on the above discussion, major market entry strategies that are adopted for this research include:

- Wholly-owned subsidiary
- JV
- Sophisticated contracting

2.5.2.4 International Performance

The fourth construct is regarding the international performance of CCFs. Researchers have argued that multiple performance measures should be used whenever possible (Prescott 1986). In this study, growth in international sales and growth in net profits of CCFs’ international business are used to measure the international performance of CCFs. The sales and profit performance indicators have been widely adopted by researchers (Kale 1999; Kang 2006; Li 1998).

2.5.2.5 Environment

As discussed earlier, previous studies proved that the environment influences firm strategies and firm-specific resources and capabilities. Cuervo and Low (2003b) studied the host and home country locational factors that favour international construction based on cases of Singapore contractors. Fahy (2002) emphasized the impact of the host and home country environmental factors on firm-specific and country-specific resources. Ekeledo (2000) also considered the home and host country environmental factors for their impact on firm-specific resources and market entry strategies. Therefore, both the home

and host country markets should be analysed to identify opportunities and threats from the host country and the sources of competitive advantages from the home country. As this research is not focused on one particular foreign market, the international construction market, instead of any host country environment, will be analysed. As for the home country environment, Chinese construction industry will be studied.

2.5.3 Conceptual Model

Based on the above analysis, by incorporating the research variables identified in the preceding section into Figure 2.11, the conceptual model for this research is postulated as shown in Figure 2.12. Based on this model, environmental analysis will be conducted in Chapter 3, and hypothesis development and testing will be carried out in Chapter 4 and Chapter 6 respectively.

2.6 Chapter Summary

In this chapter, literature about general strategy theories was first reviewed, covering the IO theories and the RBV. Second, literature about international business studies was reviewed in terms of its fundamental theories, ISM research and market entry strategies. Third, literature on strategic management in construction, especially in international construction, was reviewed. Fourth, Chinese research on the ISM of CCFs was reviewed to examine the current research status and identify the literature gaps in this research area. Finally, a conceptual model for the ISM of CCFs was postulated. The conceptual model includes four constructs and the external environment in which CCFs operate. The constructs are: firm-specific resources and capabilities, generic competitive strategies, market entry strategies, and international performance. Major research variables for each of the constructs were identified based on literature review. This conceptual model sets the direction for the research in the following chapters.

Figure 2.12 Conceptual Model for the ISM of CCFs
Source: Developed by the Researcher

Chapter 3 Analysis of CCFs and the External Environment

In this chapter, the external environment of CCFs, which consists of the international construction market and the Chinese construction industry, is first analysed. The relevant strategies and firm-specific resources/capabilities which will be helpful in coping with such environmental conditions are suggested. Next, the international performance of CCFs is reviewed. Based on these review and analyses, SWOT analysis on CCFs is carried out. The organisation of this chapter is shown in Figure 3.1.

Figure 3.1 Organisation of Chapter 3

3.1 International Construction Market

It is very important for international contractors to constantly monitor the construction environment. This section will present an overview of the international construction market, trends of international construction, and the analysis on international competitors of CCFs.

3.1.1 Overview of the International Construction Market

Construction is a major industry throughout the world accounting for a sizeable proportion of most countries' GDP, especially in developing countries (Crosthwaite 2000a). The construction industry is also undergoing major changes. Some of the drivers for these changes are political shifts and pressures, new financial systems, information technology, and new concerns for the environment (Bjornsson 2001). In recent years, the global construction industry has been deeply affected by financial crises, terror attacks, wars and severe natural disasters. Besides, the hikes in the price of oil and interest rates have also influenced the recovery of the global economy and that indirectly affect the global construction industry. Notwithstanding this, global construction spending reached nearly US\$ 4.2 trillion in 2004, a 4.6 percent increase over 2003, with future growth rates expected to exceed five percent annually over the next four years (DLSI 2005). However, there is an obvious unbalanced distribution of the construction spending globally. The 55 countries with the largest construction markets spent US\$3.9 trillion on construction in 2004, according to a study by Global Insight Inc. (Tulacz 2005).

The economic development levels of different regions directly determine their weights on the world construction market, which can be witnessed by the contribution to GDP and global construction by continent as shown in Table 3.1 (Bon and Crosthwaite 2000). Asia, Europe and North America are indicated as the top three biggest construction markets. The percentage of Asian construction spending of the world construction market (35 percent) far exceeded its contribution to world GDP (26 percent). In contrast, there was a reverse situation for the North American market (22 percent vs. 30 percent). For the other regions, their construction market share weights are basically commensurate with their GDP contributions.

Table 3.1 Contribution to GDP and Global Construction by Continent

	% of world GDP	% of world construction market
Asia	26	35
Africa	2	2
Europe	33	31
Latin America	7	8
North America	30	22
Middle East	2	2

Source: Bon and Crosthwaite, 2000

In another study, Datamonitor (2005) conducted a survey for the global construction and engineering market from a different angle. It calculated the revenues of firms whose primary activity is the construction of non-residential buildings and non-building construction (civil engineering), excluding firms involving in residential buildings. The global market investigated comprises Asia-Pacific (six major countries), Europe (14 major countries), the US, Canada, Mexico, Brazil, and South Africa. The major data is summarized in Table 3.2. As indicated, the total global construction and engineering works within the identified scope was nearly US\$1.7 trillion in 2004, which was forecast to increase to US\$2.06 trillion in 2009. From this table, it can also be deduced that the residential building sector constitutes a large portion of the remaining US\$2.5 trillion of the global construction spending in 2004. Such statistics indicate that housing sector is a major and growing market for construction around the world.

Table 3.2 Global Construction and Engineering Industry Profile

Geographical Market	Trade Sector		Total Value in 2004 (US\$bil.)	Total Value in 2009 (US\$bil.) (estimated)
	Civil Engineering	Non-Residential Building		
Global Total	885.4 (52.2%)	810.7 (47.8%)	1696.1 (100%)	2057.5
Asia Pacific	387.7 (65.5%)	203.8 (34.5%)	591.5 (34.9%)	700.8
Europe	229.9 (40.7%)	334.4 (59.3%)	564.3 (33.3%)	684.5
US	210.7 (47.5 %)	232.6 (52.5 %)	443.3 (26.1%)	554.3
Others	57.1 (58.9%)	39.9 (41.1%)	97 (5.7%)	117.9

Source: Datamonitor, May, 2005

Chapter 3 Analysis of CCFs and the External Environment

It is commonly observed that regional construction markets exhibit different characteristics due to their particular emphasis on certain construction domains. Table 3.3 summarizes the growth markets for international construction by regions based on an extensive literature search. The US, Japan and China are the three largest construction markets in terms of construction spending in 2004. India, China and Brazil are the three fastest growing construction markets in terms of their growth in construction demand (DLSI 2005). The markets by regions are discussed next.

Table 3.3 Growth Markets for International Construction

Region	Construction Growth Markets
Asia	<ul style="list-style-type: none"> - Power plants and transmission, telecommunications - Residential and institutional buildings - Airports, roads & bridges, tunnels, rails and MRT, ports and sea defenses - Environmental and water works - Oil and gas - Mining
Europe	Eastern Europe: <ul style="list-style-type: none"> - Oil and gas, residential buildings, rails, roads, airports, power plants, water works Central Europe: <ul style="list-style-type: none"> - Residential building, roads, power plants, telecommunication, environmental works Western Europe: <ul style="list-style-type: none"> - Environmental works, roads, bridges and tunnels, rails, repair and maintenance
North America	<ul style="list-style-type: none"> - Institutional, commercial and manufacturing buildings - Environmental and water works - Roads and bridges - Power plants and transmission
Latin America	<ul style="list-style-type: none"> - Power plants and transmission, telecommunication - Environmental and water works - Residential and commercial buildings - Roads and bridges, ports
Middle East	<ul style="list-style-type: none"> - Oil and gas - Residential, institutional and commercial buildings - Roads, rails and MRT, airports - Steel sector works - Power supply and telecommunication - Mining
Africa	<ul style="list-style-type: none"> - Power plants and power supply, telecommunication - Environmental and water works - Airports, roads, bridges, ports and sea defenses - Residential and institutional buildings - Oil and gas - Mining
Australia	<ul style="list-style-type: none"> - Commercial & industrial building - Roads and bridges, rails, ports - Power plants and transmission, telecommunication - Environmental and water works - Mining

Source: AsiaConstruct, 2004; Atkinson and Coffin, 2003; Bjornsson, 2001; Buckley, 2005; CFC, 2005; Chiang et al., 2004; CSIR, 2004; DLSI, 2005; Euroconstruct, 2005; Ford, 2003; Janssen, 2000; Jiang, 2005; Lawson et al., 2005; Rahman, 2005; Young, 2005

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Asia Pacific

The Asian market has rebounded with fast growth after several years of financial crisis. Total construction investment in Asia for 2003 was valued at about US\$1.9 trillion, accounting for 16.9% of GDP (excluding Japan), which was much higher than Europe or the US. India and China have the fastest growth in the region. The construction investment in Japan continued to decline from mid-1990s to 2004, and the overall downward trend is likely to continue (RICE 2005). Although the Japanese market is huge, intense rivalry among domestic firms with strong technological and financial capability effectively prevents any foreign entry (Chiang et al. 2004). In China, construction spending is stimulated by the economy, which is witnessed by large-scale infrastructure investments (AsiaConstruct 2004). Concession models have been implemented in infrastructure such as power, transportation and water supply (Kwak 2002). However, China is still considered to be a high-risk market (Reina and Tulacz 2005). India had the highest rate of global construction spending growth in 2004, at around 10 percent, with the same or even greater growth expected to continue through to 2008 (DLSI 2005). It is estimated that India's construction industry could grow from US\$50 billion in 2005 to US\$180 billion by 2020 (Ramos 2005). The Indonesian tsunami and earthquakes had caused extensive damage to its infrastructure and a number of neighbouring countries including Sri Lanka, Thailand, India and Maldives. The reconstruction under the international aid and the countries' own efforts will provide vast opportunities for international contractors. The recovery of construction investment in Hong Kong, South Korea, and Singapore after the Asian financial crisis has been slow, although these three markets have the highest levels of per capita construction investment next to Japan (AsiaConstruct 2004). The Australia's infrastructure is booming. However, the market has been monopolised by a small number of large international contractors, causing other international contractors difficulties in entering the market (Reina and Tulacz 2005).

Europe

The European construction market began to recover with a slight growth rate of 1.9 percent in 2004 (DLSI 2005). The growth in 2004 in the EUROCONSTRUCT area (including 19 member countries) was steady at 2.1 percent, which was forecast to

increase by 2.2 percent in 2005, 1.5 percent in 2006 and 1.7 percent in 2007 (Euroconstruct 2005). Residential construction was the main driver, accounting for 46.9 percent of this area's total construction. Eastern Europe emerged as the 2004's "star" with a growth rate of 6.6 percent, compared with a subdued 1.9 percent from its Western European neighbours. This disparity is predicted to widen further with the total construction output forecast to grow rapidly by 22 percent to 2007, compared with an expected growth rate of only five percent in Western Europe (Euroconstruct 2005). Germany, the UK, Italy, France and Spain were the five largest construction markets in Europe, accounting for nearly 73 percent of the total output of the EUROCONSTRUCT zone in 2004. Czech Republic and Norway realised fastest growth in Europe in 2004 at the same growth rate of 9.7 percent. Poland, Hungary and Czech Republic are expected to see fast growth up to 2007 (Euroconstruct 2005). The Central and Eastern European markets offer substantial growth prospects at the expense of Western Europe because Japanese manufacturers are shifting their production bases from Western Europe to this region (Reina and Tulacz 2005). These countries are attracting foreign investment following their recent accession to the European Union. In addition, falling trade barriers, relatively low costs and privatization are stimulating industrial development. The development of oil and gas reserves is driving investment in Azerbaijan, Kazakhstan and Turkmenistan (DLSI 2005). Although many European contractors were ranked up front in the ENR Top 225 International contractors, the overwhelming majority of firms is not involved in transcontinental or transnational competition. The European Commission seems determined to make an attempt to create a universally open market through enforcing effective procurement regulations (Janssen 2000).

North America

The North American market is represented by the US market, which is diverse and huge, with residential, non-residential building and non-building construction accounting for 54, 28 and 17 percent respectively (O'Neal and Berning 2002; Young 2005). Total construction rose nine percent in 2004, fueled by the sustained strength of the single-family home market. The growth is expected at five percent and set to grow at a similar rate through to 2008 (DLSI 2005). Although the housing market is predicted to cool

down in 2005, other sectors are expected to be strong and boost total construction by two percent nationwide (Buckley 2005). The industry is complex due to its prolific and varied number of players. Most US construction firms are small, facing increasing competition from the global market due to factors such as labour shortage, poor image, costs pressures, environmental impact and other regulations (Young 2005). Although the US market is large and open, there is little opportunity for contractors from developing countries as it is dominated by domestic contractors and a number of large European contractors, both of which are equipped with advanced technology and management skills. The Canadian construction industry also experienced a good performance in 2004, with a growth of 3.5 percent, and is expected to continue for the next two years before it is forecast to decline by 2007. The growth is largely driven by the residential construction sector (CCA 2005).

Latin America

Since 1985, countries in Latin America have begun a process of reform that includes the opening of the economy to international competition and promotion for privatization (Morley et al. 1999). The region realised its best economic performance in 2004 since 1997, although risks remain relatively high. Brazil accounts for about half of the Latin American construction market, with a forecast growth rate of eight percent for the next few years (DLSI 2005; FEICON 2005). The country witnessed increasing investment in civil engineering and infrastructure works. Its construction sector is dominated by large enterprises, which account for 4.7 percent of the enterprises and secure 43.7 percent of the total construction value in 2000 (IBGE 2004). Next, Venezuelan construction market realised a 31.8 percent growth in 2004, a result of its strong economic growth spurred by oil price increase (Jin 2005). The Inter-American Development Bank (IADB) has provided several billion US dollars in loans for civil engineering projects in the Continent (Bjornsson 2001). The success in privatization of natural resources has stimulated the construction of infrastructure facilities (Tulacz 1998). Despite increasing optimism, the Latin American recovery will remain vulnerable to higher global interest rates (DLSI 2005). Major obstacles for CCFs to enter into Latin American market were discussed by Zhang and Liu (2002), which include: cultural differences and distrust on CCFs' capability; ineligibility of CCFs to participate in projects funded by IADB; stricter

technological and financial requirements for this market than in other developing regions; and tight timeframe for foreign firms to take part in open tenders. Due to the above difficulties, CCFs could only achieve a small market share in this region.

Africa

African construction has great potential but it is a rough-and-tumble market. Infrastructure development in Africa lags behind the rest of the world in terms of quantity, quality, cost, and equality of access (World Bank 2000). In past years, loans from World Bank had helped Africa in its infrastructure development. At the same time, infrastructure privatization has been the main mode of development for the Continent. African countries are also beginning to consider privatizing their natural resources, following the Latin American model. Oil and gas projects, particularly on the West Coast, are the big lure for construction firms (Tulacz 1998). The growth rate for construction sector ranges from six to ten percent and looks set to be sustained over the next decade (Ford 2003). In particular, countries on the Mediterranean coast in North Africa, such as Libya and Algeria, are experiencing rapid growth in construction spending. In South Africa, the biggest construction market in Africa, its medium-term expenditure framework places increased emphasis on infrastructure provision to meet the targeted GDP growth of 6.4 percent in 2004/5 (CSIR 2004). The hosting the 2010 football World Cup by South Africa will also stimulate its construction demand in the medium term. However, capital flight, AIDS epidemic and political instability are major obstacles to growth in the Continent (DLSI 2005). In this market, CCFs had posed severe threats to other international contractors (Reina and Tulacz 2005). Ford (2003) further suggested two challenges confronting the African construction industry: encouraging organic growth of domestic firms through competency building and improving quality and safety standards.

The Middle East

In the Middle East, revenues from high oil prices are fuelling the construction activities, which are largely led by government projects growing at a rate of US\$4 billion a week. The United Arab Emirates (UAE), the largest market in the Middle East, accounts for 31.57 percent of the projects by value. The per capita spending in projects in the UAE is

one of the highest in the world (Rahman 2005). The UAE market (particularly Dubai and Bahrain) continues to buck the trend with strong growth predicted up to 2008 (DLSI 2005). The market is lucrative yet highly competitive (Reina and Tulacz 2005). Saudi Arabia ranks second, accounting for 20.8 percent, followed by Qatar, Iran and Kuwait (MEED 2005; Rahman 2005). In addition, the reconstruction of Iraq after the war will offer extensive construction opportunities. The European, the US, Japanese and Korean contractors have been highly active in the Middle East, working closely with their respective domestic energy firms, financial institutions and special equipment suppliers to offer comprehensive packages to their clients. A number of large CCFs have consolidated their business in this region (Jiang 2005). However, the lack of peace and fears of terrorism have undermined foreign investment and hence construction spending there. As Arkinson and Coffin (2003) suggested, although the Middle East has enjoyed an unprecedented construction boom, it does carry special challenges and risks. It is not a place to enter lightly, and for any foreign contractor to prosper in the region, it must be prepared for a uniquely challenging environment.

In summary, the overview of the international construction market shows an unbalanced distribution of the construction spending around the globe, and vast opportunities for various construction projects in different geographical markets. Such an environmental condition favours CCFs to expand their geographical scope to increase their market coverage and sales volume. It also suggests CCFs to pursue business scope diversification strategy to seize more opportunities presented in different growth markets beyond their core businesses.

3.1.2 Trends of International Construction

International construction has been profoundly influenced by the globalisation of the world economy and the emergence of new players from NICs. A number of distinct trends have been observed and are discussed next, based on CHINCA (2004), CMRE (2004) and other literature.

Share of international construction is becoming bigger

With the globalisation of the world economy, construction markets in most countries are gradually opening to foreign contractors. The boundary between the domestic market and the international market is becoming blurred. Besides, the global FDI volume has been increasing dramatically. Such an economic development trend results in a greater weight of international construction on the global construction market (CMRE 2004).

Contracting modes are becoming more complex

Vertical integration in the packaging of construction projects and larger private sector participation in infrastructure projects have become the new trends in international construction (Raftery et al. 1998). The growing global interest in EPC, BOT, PPP and other sophisticated contracting modes presents new challenges to international contractors (Diao 2005). Competitive prices are no longer the only determinant for winning contracts; they have to be combined with financing innovations, higher levels of expertise and management. In particular, the financial strength of international contractors has become a key determinant for success in international construction (Wang 2003).

Technology and innovation is becoming more important

Information technology (IT) is increasingly applied in international construction, which helped international contractors reduce construction costs, increase their contract volume, and enable them to participate in virtual construction (CMRE 2004). At the same time, the R&D investment in construction and related industry has been increasing. New technology and intellectual property helped international contractors from AICs gain competitive advantages over those from NICs. It is predicted that technology and innovation capability is becoming more important for international competition (CMRE 2004).

Health, safety and environmental issues are given increasing attention

More and more project clients include Health, Safety and Environment (HSE) requirements in their tender documents. The wide application of the ISO14000

environment management systems and standards and the OHSAS18000 occupational health and safety assessment series shows the increasing importance of HSE management in construction (CMRE 2004).

Contractors from NICs become more active in international market

According to ENR annual surveys, the number of international contractors from the NICs increased from 41 firms in 1995 to 92 firms in 2004. Their share of international billings as a total of the Top 225 International Contractors, rose from 5.3 percent in 1995 to 12.2 percent in 2004. This indicated that while domestic construction markets grew rapidly and became increasingly attractive in the NICs, their construction MNEs have also become increasingly involved in the international market, with China being the typical case (Low and Jiang 2004). Hence, future international construction market will become more competitive (Hassan et al. 1998).

Large construction firms are becoming more domineering

In recent years, large construction firms are becoming stronger. They are supported by financial consortiums, and dominate the international construction market (Reina and Tulacz 2005). This trend underpins a growing market, yet at the same time it hinders the growth of newer and smaller international firms. Such a phenomenon is due to the increasing complexity of contracting modes, larger project scales and greater rivalry among international competitors. Many cross-border and home-based M&As effected by large international contractors since 2003 reinforce this trend. Hence M&As have become one of the topical strategies of top management to pursue growth and increase wealth for shareholders of targeted firms (Delaney and Wamuziri 2004).

International contractors are repositioning themselves

Contractors from NICs, especially those from China, are playing an increasingly prominent role in international construction. Contractors from AICs have realised that they should re-consider their market positioning strategies, as it is not wise to compete with these rivals in NICs markets due to the latter's locational and cost advantages (Diao 2005). Some Western contractors have started to relocate their resources globally. For

example, Skanska has given up most of its markets in NICs and started to consolidate its business in the US (CHINCA 2004). Hochtief is also focusing on mature markets like other large international firms (Reina and Tulacz 2005). Conversely, some international contractors from NICs began to compete in AICs markets after they had developed sufficient market shares in NICs.

In summary, international construction is undergoing rapid changes. Its trends are mainly driven by international contractors from AICs. As project contracting modes are becoming more complex, international contractors should adopt sophisticated contracting modes to gain bigger market shares. Such complicated projects normally involve various expertise and services, which may not be fully undertaken by one contractor. JV strategy is hence suggested to cope with such a trend. At the same time, the increasing requirements in contracting methods, technology and HSE management also impel contractors to adopt differentiation strategy in terms of financing, technology and management. In addition, contractors from NICs are becoming more active in international markets, and such contractors possess similar cost advantage as CCFs. CCFs may have to compete with them using differentiation strategy. The above-mentioned trends in international construction also require CCFs to enhance their technology and innovation capability, financial capability, project management capability and HR management capability.

3.1.3 Competitor Analysis

There is a famous Chinese saying, “know yourself and your rivals, and you will always win”. If CCFs want to succeed in the international market, they have to know their competitors in the market that they intend to enter and the strategies that their competitors adopt. In the following sections, the ENR Top 225 international contractors, as the formidable rivals of CCFs, are first discussed, followed by strategies adopted by these contractors.

3.1.3.1 The ENR Top 225 International Contractors

ENR provides the ranking of the Top 225 International Contractors (hereinafter called “Top 225”) annually according to their international construction turnovers. The data quoted in this section are drawn from various issues of the ENR magazine. In general, the international construction market grew rapidly over the past years. The Top 225 generated combined revenue of US\$167.5 billion from projects outside their home countries in 2004, up 19.8 percent over US\$139.8 billion in 2003 and up 43.8 percent over US\$116.5 billion in 2002. Questions such as where the Top 225 are from, where and what they are working, and what market shares they hold, as the main concerns of CCFs, are discussed as follows:

Where the Top 225 are from

Appendix 2 indicates where the Top 225 came from and what market share they held in different regions in 2004. Despite being the majority, the number of firms from Western countries continues to decrease, with 55 from the US, four from Canada and 56 from Europe. The number of firms from China and Turkey continues to increase, with 49 CCFs and 14 Turkish contractors being included. The number of Japanese and Korean contractors also increased from two years ago, with 18 Japanese firms and eight Korean firms being ranked.

Market share of Top 225 and where they are working

Based on their revenues instead of number of firms, firms from AICs monopolise with 90 percent of the total international market share, with remaining 10 percent being shared by firms from developing countries led by CCFs. European contractors are the frontrunners. They secured about 60 percent of the total international construction contracts. In term of international contracts, their shares were 90 percent of the US, 77 percent of Europe, 59 percent for Latin America, 50 percent of Africa, and 38 percent of Asia, with the rest being all ranked at second. To further scrutinize the firms from individual European countries, French, German and British contractors are the best performers, each focusing on different regions. French contractors are active mainly in Africa, Europe and the US.

German contractors focus mainly on the US and Asian market, while British contractors are keen on the US market. American contractors should be the leader if Europe is not considered as one entity. Their monopoly effects are reflected in the Middle East and Canadian markets. They are also ranked second in European and Latin American markets. Japanese contractors did well but not as excellent as before. They target markets in Asia, the Middle East and the US. CCFs have performed reasonably well in Asia and Africa, but they fail to penetrate the rest of the international markets. Although Korean and Turkish contractors are active internationally, their overseas market shares are relatively small. Appendix 3 shows a list of contractors among the 2004's ENR Top 225 which had worked or were working in any of 140 countries or regions in 2003. It does not include the home country of the contractor (ENR 2004). The top 10 countries which attracted the most international contractors (number in brackets) are: Singapore (58), China (53), Malaysia (52), Canada (50), Saudi Arabia (50), UK (49), Hong Kong (47), Indonesia (47), the Philippines (47) and the US (45).

What the Top 225 are working on

Figure 3.2 indicates the major types of works the Top 225 were engaged in outside their home markets in 2004. As indicated, transportation infrastructure accounts for the biggest share, at 26.3 percent of Top 225's total international revenue. Building sector ranks second, at 24.8 percent, followed by petroleum projects which accounts for 18.3 percent. Other sectors including power and industrial construction constitute around 30 percent.

Figure 3.2 Major Types of Works the Top 225 Are Engaged in

Source: ENR, 2005

3.1.3.2 Strategies Adopted by International Contractors

Expectedly, international contractors from different countries tend to adopt different strategies to compete internationally. This section will outline strategies adopted by Japanese, US and European, Korean, and Turkish contractors. Some of these strategies might be useful to CCFs.

Japanese contractors

The most critical success factors of Japanese contractors are their technological superiority and financing capacity (Hasegawa 1988; Raftery et al. 1998). The existence of research institutes is a major reason for the success of Japanese contractors (Fraser and Zarkada-Fraser 2001). Nearly every major Japanese contractor has such a laboratory, which is a vital tool in its marketing strategy. This new technology spurs accomplishment in construction projects at all levels (Hampton 1991). Japanese contractors are linked strongly with Japanese banks for overseas project financing (Wang 2003). The major Japanese contractors belong to industrial groupings. The affiliated banks provide preferential funding and, thus, enhance the contractors' financing capability. Hasegawa (1988) further identified four strategies adopted by Japanese contractors: a transnational approach; new business development; integrated engineering construction; and total project development. Raftery et al. (1998) added two more factors: skill in forming strategic alliances and ability to foster long-term relationships with local political powers. Japanese contractors value organisational culture in learning, customer orientation and pursuing innovation. They prefer to seek long-term interest even at the expense of immediate profit (Aziz 1994). Finally, the Japanese government takes an active role in helping Japanese contractors to grow locally and internationally. The government agencies supply low-interest credit for pre-bid feasibility studies, provide financial guarantees for overseas projects, train international project managers, grant tax reductions for exporting activities, coordinate Japanese banking sector to promote exports, and collect and disseminate overseas marketing information (Aziz 1994).

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The US and Western European contractors

Compared to Japanese contractors, European and US contractors focus more on project management and consultancy services (CHINCA 2004). They are also superior at technology and financing capability, although the US contractors stressed less on R&D than Japanese contractors (Hampton 1991). Top international contractors from Western countries also invest heavily on R&D. In contrast to Japan, the US government policies have been a liability rather than an asset (Arditi and Gutierrez 1991). The US government provides little support to its contractors to compete internationally. For Western European contractors, majority of their international projects is sited in developed countries, with the exception of a small number of British contractors which were active in Asia (Janssen 2000; Crosthwaite 2000b). Large contractors from AICs, especially those from Europe, pioneered the M&A strategy to gain a fast entry into new markets and improve their international competitiveness. Outstanding examples include the acquisition of Grupo Dragados SA by Grupo ACS in Spain, the acquisition of HBG by Royal BAM Groep in the Netherlands, and the acquisition of Babbie Group by Jacobs (Reina and Tulacz 2004). Although contractors from different AICs have differing competitive strategies, they basically share the common strategic principle of focusing on major markets and competing on technology, management and financing.

Korean contractors

Korean contractors were highly successful in the Middle East during 1970s and 1980s. Their good performance was attributed to many factors including cheap and skilled manpower, government support, rapid mobilisation of resources, speed of delivery, quality and reliability, and commitment with a high degree of motivation (Chang 1987). Cost leadership was the major generic competitive strategy adopted by Korean contractors. The international market entry modes adopted by Korean contractors had evolved from the export of construction workers, to subcontracting, prime contracting, and JV/consortium. They focused more on generalisation than specialisation under environmentally challenging conditions. They are well diversified in businesses, related and unrelated to construction. Vertical integration was an important strategy used by Korean contractors to exploit backward linkage effect in the construction value chain.

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Inter-organisational cooperation strategy was another success factor. Korean contractors often acted together with their supporting firms as a group to compete in the Middle East. Government's support had been far more pervasive than in Japan. However, the excessive government support has resulted in over expansion and bankruptcy of some contractors. As a result, the Korean government was forced to change its supporting measures to become selective and indirect in nature (Chang 1987). With their comparative advantage eroding, Korean contractors have been adjusting their strategies in order to achieve appropriate profit from international projects. They started to focus on improving bidding strategy, contract and procurement management, as well as developing construction technologies (KSCE 2003).

Turkish contractors

More Turkish contractors emerged in the list of the Top 225 than Korean contractors in 2004. However, their international revenue is far less than that of Korean contractors. The major generic strategy adopted by Turkish contractors is cost leadership in international markets in the study of Oz (2001), although more building contractors adopted differentiation strategy at home (Dikmen and Birgonul 2003). Their success in international markets is attributed to labour cost advantages and geographic and cultural proximity to several promising markets. Beyond these 'factor conditions' and 'chance' events, other advantages include the existence of dynamic home market, favourable entrepreneurial variables, and pressures to upgrade stemming from intense domestic rivalry (Oz 2001). Turkish contractors were forced to go abroad due to the serious economic and political difficulties and the depressed market at home. The construction boom in the Middle East and North Africa allowed them to gain initial international experience and grow gradually. Turkish contractors also benefited from a cluster of competitive industries such as construction materials. However, the Turkish government failed to provide an advantage for Turkish contractors in international markets, and even created troubles in the industry (Oz 2001). In fact, the advantages of Turkish contractors and problems they face are similar to that of CCFs, but their domestic supporting environment is not as good as that of CCFs and Korean contractors. CCFs should at least learn from the entrepreneurship ability of Turkish contractors.

In summary, different strategies were adopted by international contractors from different countries/regions to compete in international markets. In general, contractors from AICs tend to differentiate themselves from their competitors from NICs in terms of technology, financial capability and management expertise. At the same time, they also have the capability to adopt fast entry modes (M&As) and sophisticated contracting modes. In contrast, contractors from NICs tend to exert their cost advantage and use less sophisticated contracting modes. Such a phenomenon suggests CCFs to pursue cost leadership or JV strategy to compete with contractors from AICs, but use differentiation strategy to outperform their competitors from NICs. To catch up with their competitors from AICs, CCFs have to cultivate their technology and innovation capability, financial capability, project management capability and strong organisational culture.

3.2 Chinese Construction Industry

The Chinese construction industry (CCI) has played an important role in the Chinese economic growth and national employment market. The development status of CCI is set to have a great impact on the international performance of CCFs. By adopting Porter's Diamond framework, sources of competitive advantages of CCFs from CCI are discussed next.

3.2.1 Factor Conditions

For international construction, CCFs prefer to employ Chinese workers due to their relatively low wages and adept skills. By using Chinese workers, CCFs could avoid possible communication problems arising from language and cultural incompatibility. The Chinese labour force hence becomes a major asset for CCFs to operate abroad. Besides, Chinese engineers have good educational background and job skills. However, wages of Chinese workers are also increasing due to the rapid growth of China's economy, and immigration rules of many countries tend to restrict the use of Chinese workers. Thus CCFs may have to consider employing foreign workers in their overseas

operations. CCFs are also short of mid-level professionals and country managers with sound knowledge and experience in international contracting practices (Chen and Mohamed 2002). Challenges arising out of such human resource problems of CCFs have been widely reported (Hu 2004; Yan 2005).

CCFs have not significantly benefited from using low-cost Chinese construction materials in international construction. However, a number of CCFs benefit from their internationally competitive machinery and equipment. This will be discussed further in Section 3.2.3 when analysing the related and supporting industries. As discussed earlier, financing is becoming increasingly unavoidable for international construction. However, most CCFs traditionally operated without access to credit facilities as they are not required to provide finance for their projects in China (Chen 1998). A number of large CCFs have started to seek long-term cooperation with banks and financial institutions.

In summary, an overall evaluation of the factor conditions reveals a relatively favourable position for the industry. It indicates that CCFs could pursue cost leadership strategy for international construction to utilise the low-cost labour force, materials, machinery and equipment. However, they should enhance their HR management capability by training and recruiting mid-level managers and country managers for international operations. Simultaneously, they should also strengthen their financing capability which is not well developed for the industry.

3.2.2 Home Market Demand and Major Characteristics

The rapid economic growth of China has boosted its construction industry. The average construction growth since 1978 was faster than China's GDP growth (Lu and Fox 2001). Survey results conducted by the University of Reading show that the Chinese construction market has become the most attractive market in the world (Bon and Crosthwaite 2000), as indicated in Table 3.4.

Table 3.4 Ranking of Attractiveness of Construction Markets by Country

Rank	Country	Fastest Growing	Most Profitable	Most Open	Combined Score
1	China	416	88	47	551
2	USA	6	29	95	130
3	Japan	1	60	3	64
4	UK	0	5	58	63
5	Germany	16	27	15	58

Source: Bon and Crosthwaite, 2000

Total construction output in China reached US\$ 280 billion, accounting for seven percent of the GDP in 2003 (CBIY 2004). Construction demand will remain strong in individual locations, such as the Beijing's 2008 Olympics and Shanghai's World Expo 2010. Table 3.5 summarizes the output for different construction sectors in 2003. Building construction was the biggest sector, accounting for the majority of the total revenue and profit. CCFs' international construction reflects the pattern of demand in China's domestic market, which is dominated by building and various infrastructure projects. The details will be discussed in Section 3.3. The major foreign markets of CCFs are NICs and LDCs in Asia and Africa, where the clients are usually in need of general buildings and infrastructure, with a similar demand pattern to that of China. The following highlight the key aspects of CCI.

Fast development sectors

Building construction, road construction and interior decoration were the three fastest growing sectors over the past three years. Building sector contributed 70% to the construction output in 2003. This sector comprises a strong housing component precipitated by the housing reform program in China since 1998. The total completed building floor area in 2003 was 1.5 times as that in 2000 (NBSC 2001 and 2004). The total length of built highways was 34,288 km in 2004, doubling that in 2000 (Department of Overall Planning 2005). The average annual growth of decoration sector was 45 percent in the last decade (CBIY 2004).

Technology advancement

Technology advancement for CCI has been significantly improved over the past few years; advanced technology and sophisticated techniques have been used for a large

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number of mega-projects, either completed or on-going (Shen and Ye 2002). Equipment and technologies used and construction methods adopted had increased in sophistication, enhancing the capability and productivity (NBSC 2004). However, compared to its counterparts in AICs, CCI still lagged behind in modern technology applications (Chen 1998; Xu et al. 2005). For example, in 1999, 70% of the use of construction equipment in China only managed to achieve the same level of output as the developed countries did in the 1960's (Qi and Deng 1999).

Table 3.5 Some Macro-Factors of CCI by Trade Sector in 2003

Currency: US\$

	Building	Civil Engineering						Others	Total
		Railway, road and bridge	Water and harbour	Mining	Pipeline and wiring	Other CE works	Sub total		
Total construction output (bil.)	174.6	45.8	9.5	4.8	6.2	4.7	71.0	35.9	281.5
Value-added (bil.)	35.8	7.7	2.1	1.0	1.5	0.9	13.2	7.8	56.8
Total int'l revenues (mil.)	1826.8	481.7	101.2	53.7	67.1	50.0	752.4	386.6	3035.4
Number of enterprises with grade	24278	3317	1206	337	1316	1535	7711	16699	48688
Number of employees ('000)	19073.3	2821.1	758.1	363.5	447.5	356.2	4746.5	2815.6	26635.4
Net profit (mil.)	3239.0	958.5	203.7	58.5	347.6	98.8	1668.3	1212.2	6119.5
Productivity (by total output)	9153.9	16232.1	12544.5	13069.9	13932.7	13217.0	14957.8	37207.3	10569.0
Gross profit/output	5.2	5.3	5.5	4.5	9.7	5.4	5.7	20.6	5.5
Net profit/output	1.9	2.1	2	1	6.2	2.3	2.4	10.4	2.3
Enterprises with financial loss (%)	13.8	15.1	16	27	14.9	21.2	16.9	60.7	16.9

Source: Data from CBIY, 2004

Safety and Quality

The construction quality and safety management have improved significantly, especially for large CCFs. However, these two aspects are still the weakness of CCI. Construction is

the most hazardous industry in China, with fatal accidents accounting for up to 62 percent of all fatal events from 1993 to 1997 (Lam 2000). The rate of death per year in construction industry is extremely high, causing an appalling loss of manpower (Lam and Chen 2004). The Chinese government and CCFs have jointly undertaken efforts to improve construction safety management and construction accidents have since declined. However, statistical data on construction safety are less than reliable, as data reporting, collecting and processing processes are not well audited (Fang et al. 2002). In addition, construction quality is recognised as a critical problem in China (Chen 1998). The construction scale and volume had increased so fast that the quality of some construction projects could not be fully guaranteed (Chiang et al. 2004). Although the percentage of acceptable quality projects has increased, there is virtually no increase in the percentage of good quality projects over the last decade. The reasons for low quality include poor designs and materials, ineffective management, unrealistic completion targets and lack of worker skills, as well as irregular practices (Chen 1998; Lam and Chen 2004).

Buyer's Knowledge and Sophistication

As Porter (1990) emphasized, when buyers are knowledgeable and sophisticated, they would put more pressure on local providers to improve themselves. This effectively makes the local providers better equipped when they compete overseas. In China, non-state-owned clients have been increasing due to the growing economy; likewise foreign clients are also increasing rapidly due to the large influx of foreign investment. These clients usually set high standards of construction requirements. Some of them also engage project management firms to enhance their construction management, such as Genway Housing Development Group in the Suzhou Industrial Park. Besides, with the internationalization of the CCI, Chinese clients are more familiar with the advanced management and practices of foreign clients. Some of the state-owned clients have already started to set international standard for construction requirements. For example, Ertan Hydropower Development Co. had engaged a large number of foreign experts for the power station construction. These clients also invited top international contractors to compete with large specialized CCFs for their projects, such as the Jin Ping Dewatering Tunnel Project.

In summary, the booming domestic market is strongly favourable for CCFs. The nature of the domestic market provides CCFs with an advantage while working in other developing countries, where they can make use of the experience they accumulated at home to undertake various types of construction projects overseas. At the same time, CCFs have to improve their project management capability (safety and quality) and technology and innovation capability, in order to narrow the gaps with their competitors from AICs.

3.2.3 Related and Supporting Industries

CCI is linked to a number of related and supplementary industries, among which engineering design and supervisory consultancy services and materials and equipment supply are the major ones. They are discussed as follows:

Engineering design and supervisory consultancy services

The international revenues of traditional Chinese design firms have increased rapidly, with annual growth rates of 279 percent and 160 percent in 2003 and 2004 respectively (MOC 2005). 13 Chinese design firms were included in the ENR Top 200 International Design Firms in 2004. However, these firms still lack international competitiveness due to numerous weaknesses highlighted by Xu et al. (2004). Although such firms had done some consulting work in the past, they were not called consultants (Chen 1998). Supervisory consultancy is a new and fast-growing field in China, which began when foreign contractors entered China, and are gradually taking over the role of engineering consultancy from the traditional firms (CAEC 2005). The separation of design and supervisory consultancy weakened the international competitiveness of Chinese design firms.

Material and equipment suppliers

There is a huge gross output for material suppliers. Some materials are found to form a large proportion of supply to the world market. At the same time, there are a large number of suppliers with low concentration of production (CBMP 2000). Such a status

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increased CCFs' bargaining power in selecting material suppliers. Besides, many large CCFs are both manufacturers and final users of building materials. The backward integration strengthened CCFs' comprehensive competitiveness. However, the productivity, profitability and technology application of Chinese construction material industry are far lower than that of the AICs (Chen 1998; Lan and Jackson 2002). As a result, the advantage of CCFs in using the ordinary Chinese building materials in international construction is still not verified. On the other hand, some machinery and equipment suppliers, especially those specialising in complete plants and mechanical and electrical equipment, have achieved considerable international revenues. They also created vast construction opportunities for themselves and other CCFs through export.

Although CCFs and Chinese design firms are active in international markets, they seldom join hands to compete internationally. The improvement in service standards and the increase in international experience of Chinese design firms may enable such cooperation in future. Some CCFs enjoy the benefits of exporting construction machinery and equipment. Besides, CCFs have the potential to benefit from using Chinese low-cost materials in overseas markets if the quality and productivity of Chinese materials are significantly improved in future. The prevalent situation of the related and supporting industries indicates that CCFs could form JVs with domestic design firms to compete internationally. At the same time, they could also diversify their business scope by backward integration with domestic material and equipment suppliers. Through these two channels, CCFs could gain cost advantage in international markets.

3.2.4 Firm Rivalry

The competition among CCFs is intense, both in the domestic and international markets. The percentage of large CCFs is much higher than that in some AICs such as Japan and Germany (Jin 1999). The value of concentration ratio [CR_4 , 100(output value of largest four firms) / total output value of the industry] for the CCI was 5.85, 4.97 and 5.2 in 1999, 2000 and 2001 respectively (JSRI 2002). This indicates that the CCI has a very low degree of concentration. The market is extremely competitive, and no single group of

firms could dictate a trend or impact on the general market. Besides, compared to the US and Japan, the differences in percentages of small, medium, and large CCFs are smaller. This would also suggest the existence of a more intense level of competition in the CCI (Kang 2006). The Chinese government is aware of this problem and appropriate reforms have been in progress, including revising the grading system to minimize competition. In addition, the competition among CCFs in their traditional foreign markets (certain Asian and African countries) is also intense (CMRE 2004).

In order to cope with the intense competition, large CCFs should provide something unique as perceived by the clients to avoid competition that is not placed on a level-playing field. This would require them to pursue a differentiation strategy to distinguish themselves from their competitors. In the Chinese construction context, the uniqueness provided by CCFs may include quality improvement, strong innovation, reputation and relationship with various parties (Kang 2006). As Cheah and Chew (2005) suggested, relationships play a key role for the success of CCFs in the home market. Thus, the marketing capability of CCFs can be cultivated in the home market. Traditionally, CCFs know how to deal with bureaucracy. They can establish good ties with external parties. Such a capability, coupled with their previous satisfactory performance, could help them secure more contracts abroad.

3.2.5 Chance Events – China's WTO Entry

The most important 'chance' event for the CCI is China's WTO entry in 2001. The benefits to the CCI and CCFs arising from China's WTO entry are summarized as follows (Huang et al. 2002; Liu and Chew 2003; Shen and Ye 2002):

- Stimulating construction investment. After entering WTO, China will further open up its economy and foreign investors will have greater confidence in China's macro-environment. More foreign capital will be attracted to its infrastructure projects.

- Improving management and technology. To compete effectively with foreign entrants in China, CCFs will have to do their utmost to improve their core competency in management and technology.
- Streamlining industry organisational structure. The gradual market liberalisation after China's WTO entry will hasten the restructuring of CCFs to make them more competitive. Large CCFs are set to become more capital and technology intensive, while small and medium contractors will become specialist contractors.
- Streamlining legal framework for construction. The construction-related laws and regulations will be strengthened. The internationalisation of CCI requires that its laws and regulations to be in line with international norms.
- Favourable environment for CCF's international construction. Market entry barriers will be lowered in member countries after China's accession to the WTO, which will strengthen CCFs' chances of securing construction projects in these countries.

However, China's WTO entry will also allow domestic and foreign construction firms to compete under the same market conditions. This development will lead to a more vigorous participation from foreign contractors in the Chinese construction market (Shen et al. 2004). Besides, China's WTO entry seems to be more advantageous for AICs contractors to enter China than for CCFs to enter AICs. Market entry barriers of some AICs still persist despite being lowered and the barriers still deter CCFs from entering these markets. This adverse situation cannot be improved immediately thus impeding CCFs' international prospects (Liu and Chew 2003). CCFs could only focus on markets in Asia and Africa for the time being. The markets covered by their international business only make up 20 percent of the global construction spending (Bon and Crosthwaite 2000; DLSI 2005).

This big 'chance' event favour CCFs for geographical scope diversification, as foreign market entry barriers are lowered and the domestic market shares are threatened. In order to compete with competitors from AICs at home, CCFs need to cultivate their technology and innovation capability, financial capability and project management capability.

3.2.6 Role of Government

Government's influence of the construction market in China is set to continue within the framework of a socialist market economy, although such an influence changes from the traditionally administrative control to overall supervision (Walker et al. 1998). Under such a setting, the economic system has gradually changed from being highly central-planned to one which is market-driven. Most enterprises are still state-owned although their ownership has been increasingly diversified. The number of government agencies is excessive, and the Chinese government has multiple identities - as clients, shareholder of contractors, and legislator, which are discussed as follows:

Government agencies/industry associations

The Ministry of Construction (MOC) plays a leading role in guiding and administering the industry (Lu and Fox 2001). There are two types of industry associations: contractor associations that deal mainly with the government to improve CCI and to protect their vested interests; and professional associations that promote academic and technical exchanges (Ahmad and Yan 2000). Major government agencies and industry associations which are related to the international business of CCFs include MOC, Ministry of Commerce, State Administration of Foreign Exchange, CHINCA, and the Chinese embassies in foreign countries. The Chinese government has been improving its policies through these agencies and associations to support the internationalisation of CCFs.

Government as clients

The state-owned sector still plays an important role in China's economy, accounting for about half of the construction market by clients from state-owned units (Lan and Jackson 2002). However, the dominance of such clientele has been decreasing while clients from the non-state sector have increased steadily. Due to their undercapitalisation, more clients are asking CCFs to undertake projects with their own capital. Some Chinese clients tend to adopt improper or even illegal practices to manage their projects. On the other hand, the investment in fixed assets by foreign clients has increased sharply from US\$455 million in the 1981 to US\$41 billion in 2004 (NBSC 2005), due to the large FDI in recent

years. The increase of foreign clients will allow CCFs to have more opportunities to undertake foreign-funded projects and establish their international network.

Government as the biggest shareholder of contractors

As indicated in Table 3.6, the percentage of SOEs and shareholding enterprises (recently restructured from SOEs, in which the government is still the biggest shareholder) among all CCFs is still high, although it has significantly decreased (NSBC 2004). These CCFs are often plagued with deficiencies such as over-centralisation (Kang 2006), informalisation (CMRE 2004), overstaffing and heavy social responsibility burden. Overstaffing is reflected in three aspects: large number of redundant workers; multi-layered divisions related to Party administration; and too many subsidiaries and hierarchies. Such an unwieldy mechanism causes cost overrun and even conflicts with the organisation. State-owned CCFs bear heavy social responsibility burden as they are obliged to provide social security for retirees (Liu and Chew 2003). Besides, many of these CCFs are diversified entities which are accustomed to handle all kinds of construction works. This resulted in a lack of specialised contractors and the ineffectiveness in utilising resources and maximising their core competencies (Lan and Jackson 2002). Nonetheless, SOEs and shareholding enterprises are larger in size, having more equipment and professional staff. They are major players in the international arena.

Government as regulator and legislator

Unlike in many Western countries, where judiciary functions, legislation and administration are independent, in China they are largely controlled by the same level of government. The central government and various departments promulgate various construction and related laws and regulations to regulate or change the operating environment of CCFs, such as Guarantee Law, Insurance Law, Construction Law, Tender Law, Contract Law, and numerous administrative rules and regulations (Lu and Fox 2001; Meng 2002; Wang 2001). These laws and regulations effectively standardized the construction market, and provided a more conducive environment for the development of CCI. However, the legal framework and mechanism are still incomplete and deviate from the international norm (Lam and Chen 2004; Xu et al. 2005). Besides, the legal

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system is lacking in implementation, supervision and actual enforcement, which should be strengthened to stamp out corruption (Kang 2006; Li and Flanagan 1996). In addition, there are still no effective laws and regulations which support and regulate the international construction of CCFs (CMRE 2004). Furthermore, by directly involving in the operation of state-own banks, the government can intervene and influence the market through its credit lending policies.

Table 3.6 CCFs by Ownership and Foreign-Related Firms in China in 2003

	SOE	Collective Enterprise	Private Enterprise	Shareholding Enterprise	Foreign-Invested Enterprise	Hong Kong, Macau and Taiwan Invested Enterprise	Average
Nos of enterprises	6,638	10,425	13,372	17,230	287/269*	535/489*	48,688/48,624*
% of enterprises	13.7%	21.4%	27.5%	35.4%	0.6%	1.0%	
Nos of employees	6,035,531	5,218,993	4,218,490	10,846,063	96,427	91,724	26,635,390
Employees per firm	909	501	315	629	336	171	547
Productivity (by totall output, yuan)	100,409	62,670	76,131	93,926	134,181	134,876	86,666
Productivity (by value-added, yuan)	18,779	13,808	16,754	18,729	21,523	22,394	17,476

Note: 48624* denotes all CCFs including Sino-foreign JVs; 269* denotes Sino-foreign JVs; 489* denotes JVs between CCFs and the enterprises from Hong Kong, Macau and Taiwan.

Source: CBIY (2004)

In general, the Chinese government plays an active role in supporting CCFs to enter into new markets. The support and policies include: financial and taxation support, in terms of soft loans and tax exemption; government-to-government agreements to protect CCFs' foreign operation against double taxation; and market information and training and coordination services offered by government ministries. However, such support is still insufficient, as argued by many researchers and practitioners (Xing 2004a). Besides, the complicated approval procedures for international investment, strict foreign exchange control, and lack of insurance for overseas investment also hinder the progress of CCFs' internationalisation (CMRE 2004).

In summary, the Chinese government has fundamental influence on CCFs, but it is unable to provide an obvious advantage for CCFs in international markets. Compared to the governments of countries like Korea and Japan (as discussed in Section 3.1.3), the Chinese government support seems far insufficient. However, compared to the governments of other countries like Turkey (Oz 2001), CCFs seem to possess an advantage in terms of government support. CCFs should on one hand restructure themselves to minimize the government intervention, and on the other hand build good relationship with the government to gain more support.

3.3 CCF’s International Performance Review

CCFs have achieved significant milestones in the international market since early 1980. They are actively involved in construction projects in more than 180 countries or regions (CHINCA 2004). Figure 3.3 shows the international performance record of CCFs over the past 15 years. However, the international performance of CCFs has not been well studied (Low et al. 2004). This section provides an overview of CCFs’ international performance, paving the way for the SWOT analysis in the next section.

Figure 3.3 International Performance Record of CCFs since 1991

Source: Department of Foreign Economic Cooperation (2006), ENR (1992-2005)

3.3.1 Historical Perspectives

Before 1980s, only a few CCFs were involved in international projects under the Chinese government's foreign aid to the third world countries (Low and Jiang 2003). However, after China adopted the open-door economic policy in 1979, CCFs' international business has witnessed a progressive development. In retrospect, such a development can be classified in three distinct stages, briefly as follows: (CHINCA 2002; Low and Jiang 2003; Zhao 2001)

Preliminary stage (1979-1982)

Four large CCFs were the first to be approved by the Chinese government to undertake international construction in 1979. They started their work in the Middle East. By the end of 1982, the government had approved 29 firms for international construction. By then, 755 contracts had been secured, with a total value of US\$1.25 billion. Projects completed were worth US\$560 million, covering markets in 45 countries and regions. Major markets were West Asia and North Africa, with major projects in building and road construction. Most of the projects were sub-contracts and small in scale.

Stable development stage (1983-1989)

This stage coincided with the recession of the world economy, during which construction demands in the Middle East and North Africa suddenly declined. CCFs had to expand into other regional markets. By 1989, 88 CCFs had obtained international business licenses. During this period, the total transacted value of international construction and labour services was US\$7.22 billion. Business has been expanded to more than 130 countries, with Asia as the biggest market, accounting for 60 percent of the business. Besides buildings, road and bridge projects, a number of power stations and industrial plants were built.

Fast development stage (1990- present)

In 1990, CCFs had to give up the Middle East market after the Gulf War. With government support, CCFs were involved in many construction projects in Russia,

Eastern Europe, Asia, Africa and Latin America. During this period, SOEs have been progressively restructured and become more adaptable to the international market. From 1997, many large SOEs were severed from respective government ministries, and put under the supervision of a new committee. As a result, CCFs grew at an annual rate of 20 percent internationally. More than 2000 contractors had been licensed for international business. CCFs have since played an increasingly significant role in international construction. Currently they are re-entering the Middle East market and expanding their business in AICs as well.

3.3.2 Market Share Distribution

Figure 3.4 shows the CCFs’ international market share by regions in 2003. It can be seen that the main bulk of CCFs’ business was centred in Asia, which includes the Middle East (CHINCA 2004). Figure 3.5 summarizes the market share distribution of the 49 CCFs included in the 2005 ENR Top 225 International Contractors, based on their international revenues in 2004.

Figure 3.4 CCFs’ International Market Share by Regions in 2003

Source: CHINCA, 2004

Figure 3.5 International Market Share by Regions of the 49 CCFs in ENR Top 225 in 2004

Source: ENR, 2005

In Asia, CCFs are most active in Hong Kong due to historical and locational factors. Many CCFs are also successful in Singapore because of its similar cultural environment, open construction market and flexible immigration rules (Chew and Liu 2004). However, these two markets have matured due to their size constraint and limited economic growth. For other countries, CCFs' market shares were not stable, depending largely on whether any big projects could be secured. Table 3.7 lists the ten most active markets for CCFs, for which Asian countries accounts for the majority. In particular, China State Construction Engineering Corp (CSCEC) was ranked No.3 for Top 10 International Contractors in Asia in 2004 (ENR 2005).

In Africa, CCFs mainly participated in large infrastructure projects, especially in Algeria, Sudan, Nigeria and Angola (CHINCA 2004). CCFs have a small market share in Latin America, having secured a number of projects in Mexico, Venezuela and other Caribbean countries with the help of the Chinese government. In AICs, CCFs were hardly able to compete with local contractors in Europe and North America, where they failed to gain sufficient ground in their foray there.

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Table 3.7 Top 10 Countries for CCFs' International Construction and Labour Service in 2003

Country/ Region	Transacted Construction Revenue (\$mil.)	Country/ Region	Transacted Revenue for Construction, Design & Labor Services (\$mil.)	Country/ Region	New Contracts for Construction, Design & Labor Services (\$mil.)
Hong Kong	2637.32	Hong Kong	2837.51	Hong Kong	2506.45
Pakistan	614.73	Singapore	927.96	Sudan	1154.18
Singapore	499.33	Japan	704.61	Singapore	1021.81
Sudan	476.91	Pakistan	617.58	Japan	822.90
Algeria	471.76	Algeria	500.26	Algeria	694.74
Myanmar	370.74	Sudan	488.54	The Philippines	598.75
Bangladesh	348.82	Myanmar	378.78	Nigeria	533.38
Iran	328.44	Bangladesh	353.49	Myanmar	463.31
Nigeria	264.28	Iran	337.17	Pakistan	408.12
Mexico	247.56	South Korea	318.79	Kazakhstan	384.62
Total for the Globe	13837.36		17233.93		20930.31

Source: Data from Ministry of Commerce, 2004; and NSBC, 2004

3.3.3 Types of Works Undertaken by CCFs

The types of international construction projects undertaken by CCFs can be categorised as follows: general building, transportation, power, petrochemical, manufacturing, sewage treatment, water supply, telecommunication projects, etc. (CHINCA 2004). In 2003, the top three types of works involving CCFs are general building (28.6%), transportation (18.6%) and petrochemical projects (14.5%) (Figure 3.6). As indicated, there is a trend from 2001 to 2003 towards more diversification in CCFs' construction business. General building works remain the biggest share. More projects involving high technology and financial requirements have been undertaken, including large industrial manufacturing, power, water supply and telecommunication works. As for the rankings of CCFs in the Top International Contractors for different sectors in 2004, CSCEC was ranked No.7 for building works and China Harbour Engineering Co. No.3 for manufacturing works, while China National Machinery & Equipment Corp was ranked No.8, No.3 and No.9 for water, hazardous waste and sewer/waste sectors respectively.

Figure 3.6 Share of Various Types of Work CCFs involved in international Markets

Source: CHINCA, 2004

3.3.4 Horizontal Comparison of CCFs

Among CCFs, there appears to be an imbalance in their international development. To begin with, CCFs have to secure international business licenses from the government before they can venture abroad. A number of CCFs ventured abroad in early days and have become multinational contractors. Amongst these, some INVs (as discussed in Chapter 2) had managed to obtain licenses without a strong competitive position at home; they were able to gain sufficient ground in the international market. These INVs originated from the international departments of government ministries or SOEs (Low et al. 2004). They usually act as main contractors and would subcontract their projects to other CCFs. On the contrary, other CCFs with strong home competitive position were disadvantaged in international construction due to their late foray overseas. Even as such firms were successful at home, their international performance is still unsatisfactory.

Low and Jiang (2003) examined the internationalisation level and international strength of 35 CCFs by adapting Dunning's eclectic paradigm, taking into account the ownership, locational, internalisation and specialty advantages. They extended Dunning's eclectic theory by stressing the importance of specialty advantage, which seemingly is synonymous with the ownership advantage, and making a scientific horizontal

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comparison among top CCFs. They hence identified the “top 10 truly global CCFs”. Their research provided a useful and illustrative approach to turn the abstract theory into concrete analysis on firms’ internationalisation level and competitiveness. The overall internationalisation index they defined can be used effectively to explain the internationalisation level of firms. However, the firms’ international strength or competitiveness is a more complicated matter, which may not be fully explained through multiplying the overall internationalisation index by their respective international revenues. For example, although the shares of international revenues of Shanghai General Construction Corp, China Railway Construction Corp (CRCC) and China Railway Engineering Corp were small, they have completed many world-class, sophisticated projects at home, which show their international competitiveness; they have also employed more advanced equipment and technology, and human resources than a few of these “top 10 truly global CCFs”.

In this research, without referencing any theories and complicated analytical tools, the top 10 CCFs in international performance are identified by simply considering their combined international revenues from 2002 to 2004 (Table 3.8) and their total construction contracting revenues in 2004 (Table 3.9).

Table 3.8 Top 12 CCFs by Combined International Revenue from 2002 to 2004

Combined Ranking	Company Name	International Revenue (\$ mil.)				Ranking in 2005
		2002	2003	2004	Total	
1	China State Construction Engineering Corp	1480.3	1954.6	2124.3	5559.2	17
2	China Harbour Engineering Co.	657.7	846.7	925.2	2429.6	39
3	China National Machinery & Equipment Corp	622.4	736.0	708.0	2066.4	47
4	China Railway Engineering Corp	306.7	556.0	678.6	1541.3	48
5	Shanghai Construction General Co.	479.8	518.9	381.2	1379.9	68
6	China Petroleum Engineering & Construction Corp	256.9	502.2	500.2	1259.3	58
7	China Civil Engineering Construction Corp	338.7	353.0	379.7	1071.4	69
8	China Road & Bridge Corp	312.3	297.7	290.6	900.6	84
9	Sinohydro Corp	171.7	250.1	303.2	725.0	81
10	Dongfang Electric Corp	244.8	284.3	NA	529.1*	NA
11	China National Complete Plant Imp. & Exp. Corp	386.0	41.6	55.7	483.3	158
12	China Metallurgical Construction (Group) Corp	143.7	137.1	197.0	477.8	101

* Data does not include the international revenue for 2004

Source: ENR, 2003, 2004, and 2005

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Table 3.9 Top 12 CCFs by Total Construction Contracting Revenue in 2004

Ranking in 2005	Company Name	Total Revenue in 2004 (mil.)	Int'l Revenue for Past 3 Years (mil.)
1	China Railway Engineering Corp	11,612.6	1541.3
2	China Railway Construction Corp	10,493.2	247.2
3	China State Construction Engineering Corp	10,271.7	5559.2
4	China Metallurgical Construction (Group) Corp	6,003.0	477.8
5	China Harbour Engineering Co.	4,429.7	2429.6
6	Shanghai Construction General Co.	3,810.8	1379.9
7	China Road & Bridge Corp	2,990.7	900.6
8	Sinohydro Corp	2,989.9	725.0
9	Beijing Construction Engineering Group Co.	2,224.5	66.2
10	Zhejiang Construction Investment Group Co.	1,909.1	328.2
11	Beijing Urban Construction Group Co.	1,685.9	27.7*
12	China National Machinery & Equipment Corp	1,138.0	2066.4

* Data does not include the international revenue for 2002

Source: ENR, 2005

Accordingly, the top 10 CCFs in international competitiveness are identified in Table 3.10. The first nine firms are included in both Table 3.8 and Table 3.9. These nine firms have also appeared in the Top 100 Chinese Enterprises list within all industries in recent years. The tenth firm, China Petroleum Engineering & Construction Corp, had achieved significantly better international performance than the remaining five CCFs in Table 3.8 and Table 3.9. It was also ranked 169th in the 2005 ENR Top 225 Global Contractors. The above analysis indicates the strong international competitive positions of these CCFs.

Table 3.10 Top 10 CCFs in International Competitiveness

Rank	Firm Name
1	China State Construction Engineering Corp
2	China Harbour Engineering Co.
3	China National Machinery & Equipment Corp
4	China Railway Engineering Corp
5	Shanghai Construction General Co.
6	China Railway Construction Corp (considering its acquisition on China Civil Engineering Construction Corp in 2003)
7	Sinohydro Corp;
8	China Road & Bridge Corp
9	China Metallurgical Construction (Group) Corp
10	China Petroleum Engineering & Construction Corp

Source: Developed by the Researcher

3.4 SWOT Analysis on CCFs

To understand the external factors that influence CCFs' development and internationalisation, the broad opportunities and potential threats for CCFs will be analysed. Concurrently, CCFs' internal strengths and weaknesses will be examined, in relation to their international competitors, in the following SWOT analysis.

3.4.1 Opportunities

The opportunities for CCFs can be attributed to two broad aspects – the favourable domestic environment and the opportunities arising from the global environment.

3.4.1.1 Favourable Domestic Environment

The favourable domestic environment is underpinned by four developments. First, the stable political situation and economic environment at home provide a solid basis for CCFs' business growth (Liu and Chew 2003). Currently China has a stable political climate under a strong central government leadership. The booming economy has been underpinned by huge investments in fixed assets/infrastructure. In 2003, total investment in fixed assets amounted to US\$672 billion, growing at a rate of 27.7 percent, out of which US\$504 billion were expended in infrastructure, upgrading and real estate (NSBC 2004). The construction industry and CCFs are set to benefit from such an environment.

Second, there is positive impact on the construction industry and CCFs arising from China's WTO entry in 2001, as discussed in Section 3.2.5. Market entry barriers will be lowered in member countries after China's accession to the WTO, which will strengthen CCFs' chances of securing construction projects in these countries.

Third, more technically complex mega projects are emerging in China. Construction contracting modes are becoming more sophisticated, following increasing globalisation and privatization of the domestic market (CNAEC 2005; Wang 2005). Participation in

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such world-class projects will improve CCF's construction capability. BOT, PPP, EPC and other complicated contracting modes are set to be widely used in China, which will enhance CCF's financing and project management capability. As a result, CCFs' overall competitiveness will be strengthened.

Fourth, the increase in foreign investment projects and the resultant rivalry between CCFs and foreign contractors in China will enhance CCF's international competitiveness. The total FDI attracted to China was US\$72.4 billion in 2005 (FIA 2006). Foreign contractors entering China often need to cooperate with CCFs to increase their chances of securing projects. Such cooperation allows CCFs to enhance their management and technological competencies. Such collaborative experiences also enable both parties to venture into any third countries.

3.4.1.2 Opportunities from the Global Environment

The global environment has given rise to three opportunities for CCFs. First, the global economy has recovered from its downturn and the current stable growth has boosted the demand of construction in many countries. The resultant increase in infrastructure spending provides more opportunities for international contractors including CCFs. In addition, some "chance" events, such as wars and natural disasters, which are prevalent nowadays, also provide rebuilding opportunities in the affected markets.

Second, as more CCFs become top international contractors, their image and reputation have undergone drastic improvement in international arena. They have been focusing on building their brand name and embracing higher quality and technology construction. This will enable them to compete with their international rivals from AICs. Clients would have no reason to reject CCFs if they could implement projects at low costs yet deliver similar or better quality than others.

Third, overseas investment of Chinese enterprises has increased dramatically, providing abundant opportunities for CCFs to construct the overseas facilities of these Chinese

investors. In 2005, the non-financial overseas investment reached US\$6.92 billion, growing at a rate of 25.8 percent (FIA 2006). Besides, the increase in government-led global investment in energy sourcing will also provide more opportunities for CCFs in the construction of such projects.

3.4.2 Threats

The potential threats to CCFs can be attributed to four aspects. First, China's WTO entry will lead to a more intense competition between CCFs and their rivals from AICs in the Chinese construction market, as discussed in Section 3.2.5. A number of top international contractors and design firms from AICs are now involved in the design and construction of sophisticated mega projects in China. CCFs would have no alternatives but to become their partners or subcontractors (Liu and Chew 2003). Furthermore, Sino-foreign JVs between foreign contractors and privately-owned CCFs will pose greater threats to state-owned CCFs, as these JVs combine foreign partners' financing and technology advantage with flexible management of non-state-owned Chinese partners (Xie and Mao 2004).

Second, market entry barriers of some AICs still persist despite being lowered after China's WTO entry, as discussed earlier. Such entry barriers deter CCFs from the geographical expansion into these markets.

Third, even in NICs and LDCs, the trend of international construction is towards greater emphasis on financing, technology and sophisticated project management (Raftery et al. 1998; CHINCA 2004; Wang 2003). International contractors from AICs are naturally favoured over CCFs as the former possess such advantages.

Fourth, while painstakingly competing with their international rivals, CCFs are also competing among themselves in foreign markets with increasing internationalisation (Diao 2005). CCFs have yet to establish a cluster approach to compete internationally. The coordination from Chinese government agencies is found to be lacking (Wang 2003). The outcome is that CCFs' international rivals will benefit from their internal competition.

3.4.3 Internal Strengths

Compared to their international competitors, CCFs' strengths mainly lie in four aspects: cost advantage, strong home market support, specialisation in certain types of construction works, and good relationship building (Low et al. 2004; Chew and Liu 2004).

First, CCFs have obvious cost advantage in most international markets. Abundant natural and manpower resources have led to lower costs of labour, construction materials and equipment. CCFs have also increased the employment of indigenous workforce in many LDCs markets. Coupled with the deployment of Chinese engineers overseas, CCFs' costs are far lower than most international competitors (Chew and Liu 2004).

Second, the strong home market can provide CCFs with sufficient projects which are usually more profitable than their international projects. The international construction is carried out to expand CCFs' overseas market share, and alleviate a labour-surplus situation at home (Low et al. 2004). Hence, compared to other international contractors which are forced to go abroad due to poor home market conditions, such as Turkish and Singaporean contractors (Cuervo and Low 2005; Oz 2001), CCFs can afford to be more aggressive internationally as the home market provides a buffer to any overseas risks.

Third, a few large CCFs have become top international contractors for certain types of work and in some particular markets (see Section 3.3.2 and 3.3.3). A number of CCFs have developed their own technologies, machinery and equipment, and special materials or products, which are accepted by the clients in most NICs and LDCs (Xu 2000).

Fourth, Chinese cultural values of trust and relationship enable CCFs to create a favourable environment for conducting business that can lower cost, shorten duration, and improve performance (Jin and Ling 2005a). CCFs are adept in generating goodwill among all project stakeholders which put them in a competitive position when compared to the legalistic and transactional approach adopted by most contractors from AICs.

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3.4.4 Internal Weaknesses

In general, large CCFs are lacking in core competencies and competitiveness (Wang et al. 2002). The overall comparison in sales between top CCFs and the ENR Top 225 International/Global Contractors is summarized in Table 3.11. In particular, key performance indicators of the top 10 international contractors and CSCEC are shown in Table 3.12. Major weaknesses of CCFs are briefly discussed next.

Table 3.11 Comparison between Top CCFs and Top 225 International Contractors

	Total revenue (US\$bil.)	Total revenue per firm (US\$bil.)	Int'l revenue (US\$bil.)	Int'l revenue per firm (US\$bil.)	% of int'l revenue
Top 225 Int'l Contractors	502.3	2.2324	167.5	0.7444	33.3%
49 CCFs in the Top 225 Int'l Contractors	68.87	1.4055	8.83	0.1802	12.8%
Top 225 Global Contractors	555.6	2.4692	161.9	0.7194	29.1%
22 CCFs in the Top 225 Global Contractors	66.49	3.0221	7.36	0.3347	11.1%

Source: Data from ENR, 2005

Table 3.12 Key Information of the Top 10 International Contractors and CSCEC in 2004

Firm Name	Country	Total employees	Revenue			Productivity (\$,\$000)	Gross Profit (\$mil.)	Profitability (%)
			Total (\$mil.)	Int'l (\$mil.)	Int'l (%)			
Hochtief	Germany	36,409	14,975.3	12,632.0	84.4	411.3	232.7	1.55
Skanska	Sweden	57,000	14,138.3	11,436.3	80.9	248.0	524.4	3.71
KBR	USA	47000	10,899.4	9,830.8	90.2	231.9	-342.0	-3.14
VINCI	France	128,433	24,268.0	9,202.0	37.9	189.0	517.0	2.13
Bechtel	USA	40,000	14,424.0	8,105.0	56.2	360.6	NA	NA
Bouygues	France	113,300	20,148.0	7,464.0	37.0	177.8	1,066.2	5.29
Technip	France	19,000	6,484.0	6,377.0	98.3	341.3	129.5	2.00
FIMAG	Austria	33,287	8,131.3	5,993.4	73.7	244.3	108.0	1.33
Royal BAM	Netherlands	26,801	9,108.0	5,027.0	55.2	339.8	137.9	1.51
Bilfinger	Germany	50,460	7,602.0	4,915.0	64.7	150.7	151.1	1.99
CSCEC	China	121,500	10,271.7	2,124.3	20.7	84.5	55.6	0.54

Source: Data from the Annual Reports and the websites of the above firms, and ENR, 2005

Lack of international exposure

On average, international construction revenues of CCFs only account for a small proportion of their total revenues, compared with their counterparts from AICs (Table 3.11). Besides, China is lacking of large-sized contractors with high globalisation extent. For example, the international revenue of Hochtief in 2004 accounted for 84.4 percent of its total, which was 1.43 times of the combined international revenue of all CCFs (ENR 2005). In contrast, CSCEC's international revenue only accounted for 20.7 percent of its total (Table 3.12). In addition, CCFs are still focusing on general contracting construction projects. Their international projects are usually small in size and less sophisticated compared to large AICs contractors, although they have undertaken a number of large projects in Asia and Africa (Shen and Ye 2002).

Weaknesses in financial capability

The lack of financing capability and shortage of capital are the major obstacles for CCFs to secure large international projects (Chen and Mohamed 2002). With the increasing trend of project finance for both domestic and international clients, CCFs will need to expand their financing channels. However, their financing capability still lags far behind their international competitors. Unlike CCFs, these competitors have built up close relationship with financial institutions and banks and many have also enhanced their financial strength through public offerings.

Weaknesses in technology and innovation

In terms of technical expertise, CCFs have few advantages when compared with their competitors from AICs, especially in R&D (Chen 1998; Low et al. 2004). Most large international contractors from AICs emphasize R&D, and try to apply the most advanced technical know-how. For example, the investment of Kajima in R&D was US\$10 million (0.08% of total revenue) in 2004 (Kajima 2005). Over the last few years, the investment of Hochtief in R&D has amounted to about US\$9 million annually (0.06% of total revenue in 2004) (Hochtief 2005). Bechtel spent more than US\$10 million in R&D for project management software annually (0.07% of total revenue in 2004) (Bechtel 2005). CCFs have recognised this weakness and have started to invest in R&D. An example is

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CSCEC's setting up of a technical centre in July 2005 - the biggest construction R&D centre in China. Besides lacking in R&D, CCFs are also slow to adopt state-of-the-art technology in construction. Their construction equipments are relatively unsophisticated (Chen 1998; Xu et al. 2005).

Lack of experienced managerial staff

Low productivity and profitability reflect the weakness of CCFs in their management (Table 3.12). This weakness could be attributed to the lack of experienced mid-level professionals and expatriate managers (as discussed in Section 3.2.1) and the inexperience of top managers. Top managers of state-owned CCFs are usually appointed by the government (Li 2003). As political appointees, most of them have no international experience and lack management competence. They consider globalisation as a political task under the "Going Abroad" strategy. Their decisions on international business were often made without sufficient feasibility study and due diligence, resulting in frequent financial losses (Liu and Shi 2003).

Inappropriate organisational structure

Most of the large CCFs are apparently less competitive due to their over-centralised and informalised structure, overstaffing and heavy social responsibility burden (as discussed in Section 3.2.6). Many CCFs are unable to handle the complexity arising from autonomy and centralisation. Loss of control in the midst of autonomy and failures caused by centralisation are common problems that continue to plague CCFs' corporate leaders (Hu 2004; Liu et al. 2002). In contrast, international contractors from AICs have effective, streamlined organisational structure with a lean and competitive workforce (Xu et al. 2005).

3.5 Chapter Summary

The international construction market was first examined by regions, with major country markets being highlighted. Major trends of international construction were explained.

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The ENR Top 225 International Contractors were analysed, and the strategies adopted by international contractors from different economies were discussed. Second, CCI as the supporting environment of CCFs' internationalisation was analysed using Porter's Diamond framework. While analysing the international and domestic environments, relevant strategies and firm-specific resources and capabilities which could favour CCFs to cope with the environmental conditions were suggested, and they are summarized in Table 3.13. Third, the international performance of CCFs was analysed through historical perspectives, market share distribution, types of works undertaken, and their horizontal comparison. Finally, SWOT analysis on CCFs was conducted and the results are summarized in Table 3.14.

Table 3.13 Suggested Strategies and Resources/Capabilities to Cope with the Environment

Environment	Suggested Strategies and Resources/ Capabilities
International Construction Market	
Overview of the international construction markets	Geographical scope diversification; business scope diversification
Trends of international construction	Differentiation; JV; sophisticated contracting Technology and innovation capability; financial capability; project management capability; HR management capability
International competitors	Cost leadership; Differentiation; JV Technology and innovation capability; financial capability; project management capability, organisational culture
Chinese Construction Industry	
Factor conditions	Cost leadership HR management capability; financing capability
Home market demand	Project management capability; technology and innovation capability
Related and supporting industries	Cost leadership; business scope diversification; JV
Firm rivalry	Differentiation Project management capability; technology and innovation capability; reputation; marketing capability
Chance event – China's WTO entry	Geographical scope diversification Technology and innovation capability; financial capability; project management capability
Role of government	Marketing capability (relationship); organisational structure (restructuring)

Table 3.14 Summary of SWOT Analysis of CCFs

Opportunities	<p>Major opportunities from the domestic environment</p> <ul style="list-style-type: none">• Favourable political and economic environment• Positive impact of China's WTO entry• Increasing sophisticated mega projects in China• Increasing foreign funded projects in China <p>Major opportunities from the global environment</p> <ul style="list-style-type: none">• Recovery of global economy• Improvement of CCF's image in the international market• Increasing opportunities arising from China's foreign investment
Threats	<ul style="list-style-type: none">• Increasing competition with foreign contractors in China• Market entry barriers to AICs• Increasing requirements for financing and technology in international construction• Potential increase in internal competition among CCFs in international markets
Strengths	<ul style="list-style-type: none">• Cost advantage• Strong home market support• Specialisation in certain types of construction works• Ability in good relationship building
Weaknesses	<ul style="list-style-type: none">• Lack of international exposure• Weakness in financial capability• Weakness in technology and innovation• Lack of experienced managerial staff• Inappropriate organisational structure

Based on literature review and the conceptual model in Chapter 2, as well as the analysis of CCFs and their external environment in this chapter, the research hypotheses will be developed in the next chapter.

Chapter 4 Hypothesis Development

In the preceding chapters, the conceptual model was postulated, and the research variables in the model were identified through literature review and ascertained by environmental analysis based on IO economics view. In this chapter, research hypotheses will be proposed based on the conceptual model and research variables. The hypotheses to be developed are shown in Figure 4.1. The hypotheses pertaining to the relationship between generic competitive strategies and performance will first be posited, followed by those between market entry strategies and performance. Next, the hypotheses for the relationship between firm-specific resources/capabilities and performance/strategies will be proposed.

Figure 4.1 Research Hypotheses

4.1 Generic Competitive Strategies and International Performance

Proper application of strategies should lead to improved performance (Hsu 2003). Generic competitive strategies have acted as catalysts in the empirical investigation of the link between organisational performance and strategic orientation of firms. Miles and Snow (1978) and Porter (1980; 1985) suggest that within an industry setting which has its own degree of profitability, a firm pursuing any of these generic competitive strategies (focus, cost leadership or differentiation) can gain competitive success. Their propositions have been challenged. A number of researchers revealed that all competitive strategies are not equally viable in different industry settings, as the characteristics of an industry can limit the range of maximally feasible strategies (Arditi et al. 1997; Kim and Lim 1988).

In construction management literature, it appears that researchers argue that a contractor usually has several feasible options for adopting a competitive strategy; the viability of each strategic orientation is based on the choices of the firms' leaders (Betts and Ofori 1992; Warszawski 1996). Although many researchers disagreed with the equal importance of all generic strategies in terms of different environmental factors, it is generally agreed that the positive impact of all generic competitive strategies on firm's performance could exist, which need to be empirically studied under different circumstances (Kale 1999; Kang 2006).

In the international context, although Douglas and Rhee (1989) and Carpano et al. (1994) confirmed the applicability of generic competitive strategies, the related empirical studies are limited. As the major differences between international and domestic construction are merely the places where the business is transacted and the origin of competitors, the positive impact of generic competitive strategies on performance is supposed to exist. As indicated in the conceptual model, generic competitive strategies include four variables: cost leadership, differentiation, geographical scope diversification and business scope diversification. The relationships between these four variables and performance, as shown in Figure 4.2, will be discussed and hypothesized next.

Figure 4.2 Hypotheses on the Relationships between Generic Competitive Strategies and Performance

Cost leadership-performance relationship

A cost leadership strategy requires management to focus its attention on competing on cost (Male and Stock, 1991). Cost advantage leads to superior performance if the firm provides an acceptable level of value to the client so that its cost advantage is not nullified by the need to charge a lower price than competitors (Porter, 1985). The firm sells its products either at average industry prices to earn a profit higher than that of rivals, or below the average industry prices to gain market share. According to Porter (1980; 1985), preferential access to raw materials, proprietary technology, and economies of scale or scope represent potentially significant competitive advantages. These represent sources of cost advantage and make the firm to be the low-cost leader in its industry. When a significant price differential exists between suppliers inside versus outside a country, competitive advantages accrue to cross-border operation. Thus, a MNE that has adopted a strategy of cost leadership in the industry may find it advantageous to internationalise. As discussed in Chapter 3, CCFs have obvious advantage on labour costs, material and equipment costs and overhead, as compared to their competitors from AICs. As Fu (2005) commented, CCFs and Turkish contractors have been successfully competing in international markets based mainly on cost leadership strategy. Therefore,

although cost leadership may not be effective for CCFs in the home market (Kang 2006), it may be effective in international markets when competing with contractors from AICs.

Differentiation-performance relationship

The differentiation strategy implies that a firm offers something unique and unmatched by its competitors and valued by the industry that enables the firm to command higher prices than industry average (Male and Stocks 1991). Differentiation strategy calls for creating and developing something truly unique or that is perceived as unique in order to achieve and sustain competitive advantage. In construction industry, contractors using this competition strategy aim to outperform their rivals through providing their clients with more values. Kale (1999) revealed that those US contractors pursuing differentiation strategy in quality, product/service and process innovation, and time, achieved better performance. Kang (2006) also revealed that differentiation strategy contributed directly to CCFs' performance in the home market. As discussed in Chapter 2, many Chinese researchers suggested CCFs to adopt differentiation strategy in international markets (Zi 2005). In particular, CSCEC has achieved good international performance by pursuing differentiation strategy, coupled with cost leadership (Gang 2005). Thus, differentiation strategy could play an important role in improving CCF's international performance.

Geographical scope diversification – performance relationship

Focusing on a market segment enables a firm to gain exclusive experience of the conditions and trends within that market segment which in turn increases its responsiveness. Therefore, adopting a narrow market approach to compete in the context of international construction presents some potential for creating superior performance. On the other hand, by adopting a broad market approach, contractors can exploit economies of scale and scope by sharing the resources in different locations, spreading the risks across different markets and significantly reduce their vulnerability against market fluctuations. Economies of scale and scope can lead to better sales performance. As Gunhan (2003) indicated, expanding business into new geographical areas will help to establish new networks and improve the firm's track record. Hence, adopting a broad market approach for competition also presents some potential for creating superior

performance. Many Chinese researchers suggested that CCFs should widen their geographical coverage gradually. They argued that the narrow market approach is usually more suitable during the early venturing stage and for small and medium sized enterprises (SMEs) with limited resources whereas the broad market approach is more appropriate for the developed stage and large CCFs (Liu 2004; Tan 2005). As this study focuses on large CCFs, the broad market approach is supposed to influence the international performance of CCFs.

Business scope diversification – performance relationship

Business scope diversification involves both horizontal diversification (into different products and services) and vertical integration (along a value system/vertical market). One possible reason for construction firms pursuing a horizontal diversification strategy is that there is a need to spread risks and reduce fluctuations in revenues, which may be seasonal or cyclical, as suggested by the portfolio theory (Hillebrandt and Cannon, 1989). Another possible reason for pursuing horizontal diversification is to fully create synergies among operating and management activities. Two major reasons for pursuing the vertical integration strategy are reducing operational uncertainty and increasing profitability (Kang 2006). Adopting a broad product/service approach enables CCFs to share their resources in different foreign projects. The synergy among these resources can lead to cost reductions and enhance revenue and hence improve their international performance. Kang (2006) revealed that adopting a broad product/service approach directly contributes to CCF's overall performance in the home market. A number of Chinese researchers argued that large CCFs should expand their business scope in international markets, as they have the capability for diversification and the fact that foreign markets are usually more dynamic than the Chinese construction market (Tan 2005; Xing 2004b). They also suggested that a gradualism approach should be adopted for business scope diversification, and the diversification should consider both the firm's capabilities in developing new businesses and the market situation. Therefore, this study supposes that business scope diversification is helpful for the international performance of CCFs.

Based on the above discussions, four hypotheses are made as follows (Figure 4.2):

H_{1.1}: Cost leadership strategy is positively related to the international performance of CCFs.

H_{1.2}: Differentiation strategy is positively related to the international performance of CCFs.

H_{1.3}: Geographical scope diversification strategy is positively related to the international performance of CCFs.

H_{1.4}: Business scope diversification strategy is positively related to the international performance of CCFs.

4.2 Market Entry Strategies and International Performance

It is an ambitious task to link market entry strategies with their influence on subsequent performance. However, this issue has to be pursued to advance the literature. There are few studies that examine the impact of entry mode choices on performance (Chen and Hu 2002; Nitsch et al. 1996). Further studies were strongly suggested to assess such impact (Rindfleisch and Heide 1997; Sarkar and Cavusgil 1996). Several studies analysed whether some entry modes provide better performance than other modes (Gunhan 2003; Li 1995; Nitsch et al. 1996; Pan and Chi 1999). Other studies attempted to examine the issues of mode choice and performance (Anand and Delios 1997; Chen and Hu 2002; Pan 1996). Anand and Delios (1997) showed that market entry strategies can have important implications for firm's performance. Specifically, it was found that the comparative performance of the three entry modes – wholly-owned subsidiary, JV and M&A was contingent on the industry of entry and the associated demands for local content. Although such research derived different conclusions for the impact of entry modes on performance due to varied research objectives and conditions, it is generally agreed that market entry strategies are strongly related to firm's performance. Three market entry strategies are adopted in this research: wholly-owned subsidiary, JV and sophisticated

contracting; their relationships with the international performance of CCFs, as indicated in Figure 4.3, are discussed and hypothesized below.

Figure 4.3 Hypotheses on the Relationships between Market Entry Strategies and Performance

Wholly-owned subsidiary – performance relationship

Wholly-owned subsidiary is a high risk, high resource commitment endeavor. Investors enjoy full control of the operation and keep the problems of bounded rationality and opportunism under control. Chen and Hu (2002) revealed that wholly-owned subsidiaries are more likely to be chosen than EJVs when MNEs expand into markets with high regional and industrial growth; and they are also more likely to be chosen than CJVs when the investments involve proprietary products or where the cultural distance is large between the home and host country markets. Pan and Chi (1996) revealed that MNEs using wholly-owned subsidiary and EJVs to enter into China achieved better financial performance than those employing CJVs. Studies of Li (1995) and Nitsch et al. (1996) revealed that wholly-owned subsidiary tends to have the highest proportion of gains relative to losses, compared to JVs and acquisitions. Thus, wholly-owned subsidiary is supposed to influence firm’s performance. In the construction management literature, Gunhan (2003) and Cuervo and Low (2005) revealed that wholly-owned subsidiary is one of the most suitable market entry modes for US and Singapore construction firms. However, there is no related literature that examines the relationship between market entry strategies and performance of construction firms. Notwithstanding this, based on

the above-mentioned literature in other industries and the fact that wholly-owned subsidiary mode has been extensively engaged by CCFs, it is supposed that this strategy could result in improved international performance.

JV-performance relationship

JV means that all rights and obligations, risks and returns are shared according to equity contributions or the JV contract (Chen and Hu 2002). MNEs adopting JVs benefit from savings in production costs, risk sharing with local partners, acquiring knowledge of host markets, and securing future growth opportunities (Chen et al. 1991). Several studies indicated that JV is as important as wholly-owned subsidiary (Nitsch et al. 1996). For international construction, Gunhan (2003) revealed that JV is the most preferred entry mode; contractors without a track record should establish JVs to minimize risks and to improve their records for future work. Luo (2001) found that Sino-foreign construction JVs perform well in Chinese construction industry. A large number of studies are concerned with the management (especially for risk management) of construction JVs for improving firm's performance (Li and Tiong 1999; Li et al. 1999). Many Chinese researchers also suggested CCFs to adopt JV strategy for international construction (Hu 2004; Xing 2004b). A few Chinese practitioners also explained the importance of JVs in international construction using their JV experience (Huo 2004). Besides, a number of CCFs that used JV strategy to win mega international projects witnessed the positive impact of JV strategy on their international sales performance. Hence, JV strategy is supposed to lead to better international performance of CCFs.

Sophisticated contracting – performance relationship

As discussed in Chapter 3, sophisticated contracting has become one of the significant trends of international construction. The stimulus and benefits of using sophisticated contracting modes has been studied by numerous researchers (Eaton et al. 2006; Leiringer 2006; Wang 2005; Ye 2005). The sophistication level of contracting modes directly influences the rivalry intensity among international construction participants. Sophisticated contracting modes set higher entry barriers for participants in track records, financing capability, technological capability and management capability. Fewer

qualified participants would reduce the competition in costs and hence increase the profitability. Besides, projects implemented through sophisticated contracting are usually large in scale, which could increase the contract values of the participants substantially. For example, China North Industries Corporation secured the EPC contract of Tehran Subway Line 4 Project in 2004, with a total contract sum of US\$836 million (NORINCO 2004). Therefore, sophisticated contracting can be deemed as another effective market entry strategy to improve CCFs' international performance.

Based on the above analysis, each entry mode has ample scope for application. The impacts of wholly-owned subsidiary, JV and sophisticated contracting strategies on firm's performance are hypothesized as follows:

H_{2.1}: Wholly-owned subsidiary strategy is positively related to the international performance of CCFs.

H_{2.2}: JV strategy is positively related to the international performance of CCFs.

H_{2.3}: Sophisticated contracting strategy is positively related to the international performance of CCFs.

4.3 Firm-Specific Resources/Capabilities and their Relationship with International Performance and Strategies

In this section, the hypotheses on relationships between the eight identified firm-specific resources/capabilities and performance/strategies are posited, as indicated in Figure 4.4. The hypothesis development begins with the discussion on firm-specific resources and capabilities. In the discussion, hypotheses on the resource/capability – performance relationships (H_{3.1} - H_{3.8}) will be directly made. Hypotheses on resource/capability-strategy relationships will be developed in two steps. In the first step, the strategies that could be influenced by each resource/capability are identified ('one resource/capability – many strategies' relationship, hereinafter called 'prelude for hypotheses'). In the second

step, after the discussion on all resource/capability variables, hypotheses on ‘many related resources/capabilities – one strategy’ relationships ($H_{4.1} - H_{4.4}$; $H_{5.1} - H_{5.3}$) are made based on the ‘preludes’ presented in the first step.

Figure 4.4 Hypotheses on the Relationships between Firm-Specific Resources/Capabilities and Performance/Strategies

4.3.1 Technology and Innovation Capability

It is commonly acknowledged that innovation is a core competency (Synder and Duarte 2003). The literature on innovation contains a wide array of definitions. Cameron and

Whetten (1998) defined innovation as discontinuous changes and breakthroughs. Drucker (1985) defined innovation as the set of tools to create a new business. These tools can be learnt and practised. Hamel (1998) redefined innovation as strategic innovation – the capacity to re-conceive the existing business model in ways that create new value for customers and stakeholders and advantages over the competition. Innovation can be segmented into new products and new processes (Franko 1989). Product innovation can help create and capture new markets while yielding competitive advantages. Process innovations are more incremental and often times are not related to the end product themselves. Technology and innovation capability can be considered as a subset of dynamic organisational capabilities. They are defined as ‘the comprehensive set of characteristics of an organisation that facilitate and support innovation strategies’ (Burgelman et al., 1996).

In the construction industry, process innovation is an improvement in construction methods designed to accomplish usual construction operations or to improve the efficiency of a standard operation (Tatum, 1987). It can reduce cost and increase efficiency (Rosenberg, 1982). On the other hand, product innovation is an important advantage for creating a higher quality product (Slaughter, 1998). It can also produce qualitatively superior output (Rosenberg, 1982). As a result, process innovation is deemed to be able to help contractors achieve better financial performance, while product innovation can help contractors to increase market share. As process innovation can reduce cost and increase efficiency, it should be a source of cost leadership strategy. Besides, as product innovation can produce superior output and help create and capture new markets, it should be a source of differentiation strategy, geographical scope diversification and business scope diversification.

Risk-reducing considerations may push firms that have proprietary products or technology to choose higher control modes (Eaton and Gersovitz 1983). As Agarwal and Ramaswami (1992) indicated, firms with higher ability to develop differentiated products show a preference for wholly-owned subsidiary mode of entry in markets that are perceived to have higher contractual risks. One reason for forming JVs is that one firm

must have complementary resources and capabilities over another, such as distribution channels, technology and finance. Moon (1998) revealed that the higher the technological capacity of a firm, the more likely the firm will choose a JV strategy, because a high technological capacity makes the opinion of a JV more attractive by reducing the risk of unfavourable learning asymmetry, and also by increasing the bargaining power over the partner. Besides, some sophisticated contracting modes, such as BOT and EPC, require advanced and specialised technology. Contractors adopting these contracting modes should have strong technology and innovation capability.

Based on the above analysis, the hypothesis for the relationship between technology and innovation capability and performance ($H_{3.1}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

H_{3.1}: Technology and innovation capability is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- Technology and innovation capability is positively related to all generic competitive strategies: cost leadership, differentiation, geographical scope diversification, and business scope diversification.
- Technology and innovation capability is positively related to all market entry strategies: wholly-owned subsidiary, JV, and sophisticated contracting.

4.3.2 Financial Capability

Financial capability is the ability of firms to use financial resources as medium of exchange for other productive resources (Chatterjee and Wernerfelt 1991). Examples of financial resources include cost/price margins or liquid cash on hand, and external resources (such as bank loans). Financial resources offer the most flexibility to managers in their deployment.

In construction industry, several innovative financing techniques used to finance international engineering and construction projects have emerged in the international marketplace. Among these techniques, project finance and countertrade are the most dominant (Al-Dughaiter 1996; Tiong and Yeo 1993; Verzariu 1993). Project finance has been defined as a “financial method whereby the project being financed is treated as an entity separate and distinct from the firm sponsoring the project” (Mao 1982). NICs and LDCs consider project finance their best alternative and a new way to offset risk to their countries. Among the potential financing sources for international projects are commercial banks and various financial institutions, and customers of the project sponsor (Woody and Pourian 1992). In some cases potential sources may include the participants of the project themselves, such as contractors, equipment venders, and suppliers. Countertrade financing technique is widely used in NICs and LDCs. Countertrade is an acceptable financing alternative for international construction projects where the traditional project financing is not available. The practice of countertrade in construction is based on the exchange of commodities by governments for engineering and design fees and/or construction services by construction firms. Many leading international contractors are reluctant to get involved in countertrade practices due to their lack of experience to market the amount of countertrade (Woody and Pourian 1992).

As discussed in Chapter 3, there is an increasing trend for financing-related international construction projects. It is evident that strong financing capability could help contractors achieve bigger market share by participating in such projects. At the same time, good financial/accounting management and effective strategic investment could increase financial benefits (Kang 2006). Thus, the financial capability of contractors can influence their international performance.

Effective financial management can also reduce operational costs. Contractors with strong financial capability can differentiate themselves from their competitors by providing various financing packages to benefit clients. The fact that CCFs have been unable to compete successfully in AICs due partially to their weakness in financial capability (CHINCA 2004) implies that financial capability can influence market

expansion. Besides, business scope expansion also requires the financial strength of firms, as new resources have to be deployed or heavy investment may be required.

Contractors with strong financial capability, such as large contractors from AICs, may prefer to adopt wholly-owned subsidiary mode and even M&As to expand internationally (CHINCA 2004; Reina and Tulacz 2005). Strong financial capability can become one of the complementary resources and capabilities that favour a firm to adopt JV strategy. For example, CRCC formed a JV with China International Trust and Investment Corp (CITIC) and was able to secure a US\$6.25 billion contract for an Algeria highway project due partially to CITIC's financial strength (Dong 2006). Besides, contractors which have strong financial capability can participate in financing-related projects, such as BOT and PPP.

Based on the above analysis, the hypothesis for the relationship between financial capability and performance ($H_{3.2}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

H_{3.2}: Financial capability is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- Financial capability is positively related to all generic competitive strategies: cost leadership, differentiation, geographical scope diversification, and business scope diversification.
- Financial capability is positively related to all market entry strategies: wholly-owned subsidiary, JV, and sophisticated contracting.

4.3.3. Marketing Capability

Marketing in the construction industry is defined as finding information about the economy, the client and competition. It was also found to mean having the goods at the right time, the right place and the right price (Wheeler & Boon, 1987). In the international construction industry, the site of production changes place with every

consumer, which renders the process of standardization of the product price and quality difficult. Marketing of construction services therefore requires a number of strategies according to the attributes of the type and nature of the service provided at any one point in time (El-Higzi 2001). El-Gamal (1993) argues that better marketing for the construction industry requires better contractor's customer philosophy, market segmentation, market organisation, adequate marketing information and a pricing strategy.

A considerable body of research has indicated that marketing capability leads to superior organisational performance (Barney 1991; Peteraf 1993; Prahalad and Hamel 1990; Teece et al. 1997). Marketing capability can help contractors build good relationship with various external parties, which enable them to achieve better overall performance, as verified by Kale (1999) and Kang (2006).

In some NICs and LDCs, a large number of construction contracts were traditionally secured through personal contacts and repeated business. Large amount of resources and information flow through personal relationships due to institutional and environmental uncertainties. Such relationships could reduce transaction costs and improve efficiency of resource allocation. Therefore, it seems that marketing capability is more likely to favour cost leadership strategy. At the same time, the capacity to create superior customer value stems from the marketing capability a firm possesses (Guenzi and Troilo 2006; Hult and Ketchen 2001; Slater and Narver 2000). Besides, as Kang (2006) indicated, relationship is positively related to differentiation and business scope diversification strategies of CCFs in the home market. Effective marketing could help firms find more business opportunities in international markets, both in their core business and related businesses, and even unrelated businesses. Thus, marketing capability could also favour geographical and business scope diversification strategies.

Ekeledo (2000) revealed that the firm that owns the specialised asset, including the relationship asset which is largely determined by marketing capability, will favour a full control mode of entry. Besides, as Zhu (2002) suggested, strong marketing capability

could help CCFs to select good JV partners in international markets and also increases their bargaining power over the partners. Moreover, personal contacts could increase the winning chances of international projects in some countries, which include those secured through sophisticated contracting modes.

Based on the above analysis, the hypothesis for the relationship between marketing capability and performance ($H_{3.3}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

$H_{3.3}$: Marketing capability is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- Marketing capability is positively related to all generic competitive strategies: cost leadership, differentiation, geographical scope diversification, and business scope diversification.
- Marketing capability is positively related to all market entry strategies: wholly-owned subsidiary, JV, and sophisticated contracting.

4.3.4 Project Management Capability

Project management capability reflects if construction firms can sustain their competitive advantages over their competitors through the effective management of their core business - construction. Projects are “the basic building blocks in the strategic management of products and services” and help firms survive in the global marketplace (Cleland, 1991). The growth of project management is attributed to its ability to help organisations do work more efficiently, effectively, and productively (Kerzner, 1987).

Major elements of project management include the management in cost, quality, progress, contract, procurement, safety and environmental aspects (Kang 2006; Teo and Ling 2005). Apparently, effective progress control, cost control, contract and procurement management can reduce project costs and increase working efficiency and hence increase firm's financial benefits. This indicates the positive relationship between project

management capability and firm's performance and cost leadership strategy. On the other hand, effective progress control, quality control, and safety and environmental management can increase clients' value and hence favour differentiation strategy. Besides, all projects require strong project management capability for execution. Naturally, most generic types of project management capabilities enable a firm to diversify into various markets/products segments (Kang 2006). Also, with strong project management capability, a firm can undertake complex projects in regions where local firms have weaker capabilities to execute the job. Thus, the project management capability can also support a firm to diversify into different regions.

Strong project management capability enables contractors to solely undertake those international projects without financing and special engineering requirements. Thus, wholly-owned subsidiary mode is favoured. At the same time, strong project management capability can be favourable to contractors for forging JVs with other contractors that possess complementary strengths in other areas, such as proprietary technology and financial strengths (Zhang 2000). Obviously, strong project management capability is one of the prerequisites for those large projects secured through sophisticated contracting modes.

Based on the above analysis, the hypothesis for the relationship between project management capability and performance ($H_{3.4}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

$H_{3.4}$: Project management capability is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- Project management capability is positively related to all generic competitive strategies: cost leadership, differentiation, geographical scope diversification, and business scope diversification.
- Project management capability is positively related to all market entry strategies: wholly-owned subsidiary, JV, and sophisticated contracting.

4.3.5 HR Management Capability

Human resource is one of the most important firm assets that can help to form sustainable competitive advantage (Delaney and Huselid, 1996). Barney and Wright (1998) outlined the way that human resources provide competitive advantage using what they called a VRIO (value, rareness, imitability, and organisation) framework. Human resources need to be managed very carefully to ensure that only the best people are selected, and are given high quality and appropriate training and development. They should be suitably rewarded to reflect their value, and their commitment to the organisation is recognised (Druker and White, 1996).

High quality human resources and effective HR management could help firms improve their working efficiency, and hence increase their financial returns (Yan 2005). HR management capability is thus deemed to have positive impact on firm's performance and favour cost leadership strategy. At the same time, CCFs have abundant human resources, which lead to low labour costs and overhead (as discussed in Chapter 3), favouring cost leadership strategy. Besides, possession of specialised human resources may favour differentiation strategy. For example, the success of Shanghai Tunnel Engineering Company in Singapore is due partially to their abundant specialised engineers and tunneling machine operators. Besides, possession of capable marketing professionals and international operations managers can help firms increase their geographical coverage. Thus, cultivating and recruiting versatile managers for multiple business management would enable firms to expand their business scope.

Similar to the discussion on marketing capability, Ekeledo (2000) revealed that the firm that owns specialised assets including human resources will favour a full control mode of entry. Simultaneously, skilled human resources and effective HR management could enable CCFs to form JVs with other contractors which possess complementary resources and capabilities. Besides, sophisticated contracting requires both specialised and versatile staff who are highly competent to fulfill the complicated technical and managerial tasks (Wang 2005).

Based on the above analysis, the hypothesis for the relationship between HR management capability and performance ($H_{3.5}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

$H_{3.5}$: HR management capability is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- HR management capability is positively related to all generic competitive strategies: cost leadership, differentiation, geographical scope diversification, and business scope diversification.
- HR management capability is positively related to all market entry strategies: wholly-owned subsidiary, JV, and sophisticated contracting.

4.3.6 Reputation/Brand

According to Ren (2005a), reputation/brand reflects the core competencies and comprehensive strength of a firm. Reputation/brand creates shareholder's value and produces significant long-term competitive advantage (Fombrun 1996; Gray and Balmer 1998). It impedes rivalry, enhances the license to operate and is a protective shield against downturns and crisis. Reputation/brand influences stakeholders to provide or withhold support. It could result in premium prices for their products and leverage in negotiations with suppliers, creditors and distributors (Fombrun, 1996).

Reputation/brand could positively contribute to differentiation strategy. Mudambi et al. (1997) revealed that reputation/brand may play a powerful role, especially in industrial markets where it is increasingly difficult to maintain meaningful differentiation on the basis of product quality or price. Besides, reputation/brand could be related to business scope diversification and geographical scope diversification. Many large CCFs that have pursued horizontal diversification strategy and vertical integration strategy have strong reputations in their fields and regions (Kang 2006). The reputation of completing high quality projects may be known within network of clients in different markets, regions and

industries. One example is CSCEC. Its brand name is highly recognizable among clients from various sectors in both domestic and overseas markets. By harnessing its brand name and reputation, CSCEC entered into different market segments and various overseas markets with relative ease. For instance, in Algeria, CSCEC secured a number of influential projects, which include the Alger Boumediene International Airport Project, due largely to its reputation and brand name (CSCI 2004).

Ekeledo (2000) found that a manufacturing firm's reputation for superior product, process, or management technology increases the odds of using wholly-owned subsidiary mode to enter a foreign market. A firm may be guided by the desire to protect and maintain its positive reputation, which is its key success factor. Luo (2002) revealed that organisational reputation is positively associated with JV performance, as perceived by Chinese firms. Reputation could facilitate CCFs to form JVs with other firms as it is one of the sources of trust-based relationship. Ngowi (2006) revealed that firms consider reputation and other factors before they make a selection on a JV partner as the level of trustworthiness can influence the governance structures of JVs. In addition, clients of most large, sophisticated projects would normally invite experienced and reputable contractors to bid for such projects. Hence, reputation is favourable for sophisticated contracting.

Based on the above analysis, the hypothesis for the relationship between reputation/brand and performance ($H_{3.6}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

$H_{3.6}$: Reputation/brand is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- Reputation/brand is positively related to differentiation, geographical scope diversification, and business scope diversification strategies.
- Reputation/brand is positively related to all market entry strategies: wholly-owned subsidiary, JV, and sophisticated contracting.

4.3.7 Organisational Structure

An organisational structure refers to the formal configuration between individuals and groups with respect to the allocation of tasks, responsibilities, and authority within organisations (Greenberg 2005). Organisational structures differ due to different strategy, organisational size, technology, and environment (Robbins 2005).

Lin and Germain (2003) highlighted two main dimensions of organisational structure: formalisation and centralisation. Formalisation may be defined as the degree to which rules and procedures within a system are specified and/or adhered to (Ford and Slocum 1976). Rules and procedures can be implicit as well as explicit, and can be used either to prescribe what should be done or what is forbidden (Sozen 1985). Centralisation refers to the diffusion of decision making power, or the locus of decision making in an organisation (Mintzberg 1979). Theoretically, a maximum degree of centralisation would exist if all decisions were made by a single individual; a minimum degree would exist if authority to make these decisions were exercised equally by all members, regardless of their level or rank (Marsh 1992). Four types of organisational structures are identified by considering formalisation and centralisation, as shown in Figure 4.5.

Type I (Fief) is informalised and centralised; this represents the principal organisational form in pre-reform China (Boisot and Child, 1996). Type II (Bureaucracy) is formalised and centralised, which provides an institutional order for many firms, but may lead to congested hierarchies and inadaptability. Type III (Ideal) organisations are formalised and decentralised, which are typical of those in the Western economies wherein a large number of autonomous units transact through impersonal relationships. The effectiveness of decentralisation rests upon formalisation and management competence. Type IV (Anarchy) is informalised and decentralised. In this type, firms are not necessarily dysfunctional if informal coordination through negotiation and value sharing compensates for the lack of impersonal bureaucratic control (Boisot and Child, 1996). However, without the necessary mechanisms required for informal coordination, such decentralisation would only settle into anarchy.

Figure 4.5 Formalisation and Centralisation of Organisational Structure

Source: Adapted from Lin and Germain (2003) and Boisot and Child (1996)

It is generally believed that organisational effectiveness is primarily due to its structure. The selection of structure also determines whether a chosen strategy can be successfully implemented and achieves the desired performance in an organisation (Tse 1991). The positive impact of appropriate organisational structure on firm's performance has been empirically proved in other industries (Nahm et al. 2003; Tse 1991). However, there is limited research which examined such impact for construction firms (Kale 1999).

Structure follows strategy, but structure also influences strategy. It is only logical that strategy and structure should be closely linked. Strategy always goes in parallel with the internal mechanisms of an organisation – both from the heart and soul of a corporation (Cheah 2002). In general, effective organisational structure (formalised and decentralised) could minimize bureaucracy, and hence increasing operational efficiency and reducing operational costs. At the same time, there could be positive impact of effective organisational structure on differentiation strategy as revealed by Kang (2006). Most contractors have formulated rules and procedures to handle project management. These rules and procedures covered most of the activities, including quality management, cost management, contract management, and technology management. The pattern of

formalisation could vary with firms, which could differentiate one firm from another. Besides, as effective organisational structure could be favourable for project management (Kang 2006) and corporate operations, it should favour wholly-owned subsidiary mode. Furthermore, firms adopting similar organisational structure tend to hold consistent attitude toward joint management. The more formalised and decentralised the organisational structure of CCFs, the more possible they are to cooperate with firms from AICs due to the similarity of structure. A decentralised structure would also increase the autonomy and power of foreign subsidiaries, which may be favourable for the decision-making of pursuing CJVs.

Based on the above analysis, the hypothesis for the relationship between organisational structure and performance ($H_{3.7}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

$H_{3.7}$: Effective organisational structure is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- Effective organisational structure is positively related to cost leadership and differentiation strategies.
- Effective organisational structure is positively related to wholly-owned subsidiary and JV strategies

4.3.8 Organisational Culture

The importance of organisational culture has been increasingly recognised. Schein (1992) defined organisational culture as a system of shared meaning held by members that distinguishes the organisation from other organisations. The primary characteristics of organisational culture include: innovation and risk-taking, attention to details, outcome orientation, people orientation, team orientation, aggressiveness, and stability (Ashkanasy et al. 2000). Organisational culture has common properties. At the same time, there can

also be subcultures within any given culture. Most large organisations have a dominant culture and numerous sets of subcultures (Hofstede 1998b).

As noted by Grant (1991), organisational culture sustains a firm's competitive advantage through its maintenance of firm-specific capabilities and socialisation of new workers. Differences in organisational culture among competing firms are identified as important sources of sustainable competitive advantage (Coyne 1986; Hall 1992). For superior performance, there should be a high degree of fit between organisational culture and strategy (Arogyaswamy and Byles 1987). Flamholtz (2001) and Kotter and Heskett (1992) demonstrated that there is statistically significant evidence of the impact of organisational culture on the financial performance of the firm. Flamholtz and Kannan-Narasimhan (2005) found that different cultural dimensions have differential impact on the financial performance of US industrial enterprises.

On the relationship between culture and strategy, culture influences the style of thinking favoured in an organisation as well as its use of analysis, and thereby influences strategy formation (Mintzberg et al. 1998). The role of culture in influencing employee behaviour appears to be increasingly important in today's workplace (Case 1996). For example, a culture in quality management may help the firm achieve its quality goals by encouraging all employees, especially those at the project level, to change their attitudes, mindsets and skills to meet the quality requirements. Valuable organisational culture can increase working efficiency and reduce costs to favour cost leadership strategy. Similar to corporate reputation/brand, organisational culture is a corporate identity to differentiate one firm from another. Wang and Guo (2003) suggested CCFs to cultivate a culture of innovation, which includes innovation spirits, involvement of all employees to innovate, and team-work spirit. This would encourage employees to participate in innovation and therefore develop their own unique strengths to differentiate them from other firms.

The degree to which a firm's culture is tacit will strengthen the firm's proclivity toward a full-control mode of entry to avoid leaking out valuable firm-specific routines (Wernerfelt 1989). On the other hand, Zeng's (2003) empirical analysis showed that

similarity in JV partners' organisational cultures or management styles led to a higher degree of cooperation among partners. Good organisational culture values trustworthiness. Trustworthiness of partners eliminates the need of contractual clauses in the operation of alliances and is an influential factor in all stages of the alliance/JV development (Ngowi 2006).

Based on the above analysis, the hypothesis for the relationship between organisational culture and performance ($H_{3.8}$) is developed, with the prelude for the hypotheses between resources/capabilities and strategies summarized thereafter, as follows:

H_{3.8}: Valuable organisational culture is positively related to the international performance of CCFs.

Prelude for hypotheses between firm-specific resources/capabilities and strategies:

- Valuable organisational culture is positively related to cost leadership and differentiation strategies.
- Valuable organisational culture is positively related to wholly-owned subsidiary and JV strategies.

Based on the discussions in Section 4.3.1 to Section 4.3.8, the relationships between firm-specific resources/capabilities and strategies are summarized in Figure 4.6. The related hypotheses are posited, considering all 'preludes' presented in these Sections, as follows:

H_{4.1}: Cost leadership strategy is supported by seven firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, organisational structure, and organisational culture.

H_{4.2}: Differentiation strategy is supported by all (eight) firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organisational structure, and organisational culture.

H_{4.3}: Geographical scope diversification is supported by six firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, and reputation/brand.

H_{4.4}: Business scope diversification is supported by six firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, and reputation/brand.

H_{5.1}: Wholly-owned subsidiary strategy is supported by all (eight) firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organisational structure, and organisational culture.

H_{5.2}: JV strategy is supported by all (eight) firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organisational structure, and organisational culture.

H_{5.3}: Sophisticated contracting strategy is supported by six firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, and reputation/brand.

Figure 4.6 Relationship between Firm-Specific Resources/Capabilities and Strategies

4.4 Chapter Summary

In this chapter, twenty-two research hypotheses were developed based on the conceptual model. First, four generic competitive strategies were discussed. Hypotheses on the relationships between these strategies and the international performance of CCFs were proposed. Second, three market entry strategies were discussed. Hypotheses on the relationships between these strategies and the international performance of CCFs were posited. Third, eight firm-specific resources and capabilities were discussed. From the discussion, eight hypotheses on the relationships between resources/capabilities and the international performance of CCFs were proposed. Finally, four hypotheses on the relationships between resources/capabilities and generic competitive strategies and three hypotheses on the relationships between resources/capabilities and market entry strategies were developed. A summary of these hypotheses is presented in Table 4.1.

Table 4.1 Summary of research hypotheses

Generic competitive strategies and the international performance of CCFs
H _{1.1} : Cost leadership strategy is positively related to the international performance of CCFs.
H _{1.2} : Differentiation strategy is positively related to the international performance of CCFs.
H _{1.3} : Geographical scope diversification strategy is positively related to the international performance of CCFs.
H _{1.4} : Business scope diversification strategy is positively related to the international performance of CCFs.
Market entry strategies and the international performance of CCFs
H _{2.1} : Wholly-owned subsidiary strategy is positively related to the international performance of CCFs.
H _{2.2} : JV strategy is positively related to the international performance of CCFs.
H _{2.3} : Sophisticated contracting strategy is positively related to the international performance of CCFs.
Firm-specific resources/capabilities and the international performance of CCFs
H _{3.1} : Technology and innovation capability is positively related to the international performance of CCFs.
H _{3.2} : Financial capability is positively related to the international performance of CCFs.
H _{3.3} : Marketing capability is positively related to the international performance of CCFs.
H _{3.4} : Project management capability is positively related to the international performance of CCFs.
H _{3.5} : HR management capability is positively related to the international performance of CCFs.

Chapter 4 Hypothesis Development

H_{3.6}: Corporate reputation/brand is positively related to the international performance of CCFs.

H_{3.7}: Effective organisational structure is positively related to the international performance of CCFs.

H_{3.8}: Valuable organisational culture is positively related to the international performance of CCFs.

Firm-specific resources/capabilities and generic competitive strategies

H_{4.1}: Cost leadership strategy is supported by seven firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, organisational structure, and organisational culture.

H_{4.2}: Differentiation strategy is supported by all firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organisational structure, and organisational culture.

H_{4.3}: Geographical scope diversification is supported by six firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, and reputation/brand.

H_{4.4}: Business scope diversification is supported by six firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, and reputation/brand.

Firm-specific resources/capabilities and market entry strategies

H_{5.1}: Wholly-owned subsidiary strategy is supported by all firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organisational structure, and organisational culture.

H_{5.2}: JV strategy is supported by all firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organisational structure, and organisational culture.

H_{5.3}: Sophisticated contracting strategy is supported by six firm-specific resources and capabilities: technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, and reputation/brand.

Chapter 5 Research Methodology

This chapter describes the methodology used for this research. The major research methods for this study are first presented. Questionnaire survey is the principal method for data collection. To ensure the quality of questionnaire, measures for major research variables are first identified through literature review and next ascertained by personal interview. The questionnaire design is then presented, followed by pilot survey and data collection methods. The organisation of this chapter is shown in Figure 5.1.

Figure 5.1 Organisation of Chapter 5

5.1 Introduction

The overall research design for this study has been explained in Chapter 1. This chapter focuses on the concrete research methods, covering the identification of measures for major research variables, design of questionnaire and data collection. Research methods should be selected according to research objectives. The major research methods for this study are outlined as follows:

- Literature review and critical analysis

Literature review is one of the core components in the entire research methodology. It is vital to conduct ongoing literature review throughout the entire research within the context of strategy theories and the related literature about the ISM of CCFs, as such literature are dynamic and constantly evolving. Critical analysis is also an ongoing exercise for this research as the environment (both domestic and international) is fast changing. Such review and analysis has mostly been covered in the preceding chapters. In this chapter, the focus of literature review is to identify measures for the major research variables in the conceptual model.

- Personal interview

Interview is a method, which involves collecting data by asking questions to selected participants face-to-face to find out what they do, think and feel (Thomas 2004). Personal interview was conducted in this research prior to the questionnaire design. It aimed to identify and ascertain the measures for major research variables, based on the interviewees' knowledge and practices of their firms.

- Questionnaire survey

Questionnaire survey was used as the principal method to verify the validity of the conceptual model and test the relevant hypotheses. The questionnaire was designed based on the research variables and their measures identified from literature and ascertained by the interview. Experience of other researchers was also referred to in the questionnaire design. The questionnaire was then pre-tested through a pilot survey to ensure its quality.

Appropriateness is an important principle in the selection of data analysis techniques. The data regarding the opinions of people is not as precise as those generated from laboratory experiments. Thus it becomes unnecessary to focus too much on complicated analytical techniques. As the purpose of data interpretation in this research is to verify the hypotheses and to refine the postulated relationships among the research variables in the conceptual model, descriptive analysis and multivariate analysis (multiple linear regression) are sufficient. Statistical package for social sciences software (SPSS) is selected as the analytical tool for data analysis.

5.2 Measures for Research Variables

Measures for research variables directly affect the reliability of research findings. In this section, measures for major research variables were identified through literature review and ascertained by personal interview, providing the input for the questionnaire design in the next section. Detail of the interviewees is first presented, followed by the identification of measures.

5.2.1 Detail of Interviewees

As suggested by Travers (2001), there is no fixed rule on how many interviews one needs to conduct. However, data has to be sufficient enough to explore and document a range of themes. The researcher interviewed ten persons who were senior executives from large CCFs listed in the ENR Top 225 International Contractors. Anonymity was accorded for confidentiality purposes, and a summary of the profile of interviewees is shown in Table 5.1. The interviewees are all senior managers, with an average 14.6 years of international experience (between 9 to 24 years). Interview questions were asked to determine the critical measures (determinants) for research variables (resources and capabilities and strategies). Although the questions were asked in an open-ended way, the researcher tactically channeled the attention of the interviewees to focus on those measures identified through literature review. From the interviewees' answering sequence and

degree of emphasis, the researcher could clearly grasp their standpoints. Such an interview approach requires the researcher to be well prepared in advance.

Table 5.1 Summary of Profile of Interviewees

Interviewee	Designation	Years of International Experience	Firm's Business Nature	ENR Top 225 (Yes or No)
A	Vice President	11	General building	Yes
B	Deputy GM of Overseas Dept.	16	Civil engineering	Yes
C	Deputy GM of Enterprise Management Dept.	9	Civil engineering	Yes
D	Director of Singapore Subsidiary	20	General building	Yes
E	Vice President, Overseas Group	13	Civil engineering	Yes
F	GM of African Market Dept.	10	Civil engineering	Yes
G	Deputy GM of Overseas Group	24	Civil engineering	Yes
H	GM of Overseas Dept	16	General building	Yes
I	Senior Manager of Overseas Dept.	12	Civil engineering	Yes
J	GM, Overseas Dept.	15	General building	Yes

5.2.2 Identification of Measures for Research Variables

The measures for all firm-specific resource/capability variables and two strategy variables – cost leadership and differentiation were derived from literature review and ascertained by personal interview. Only measures that were supported by more than 50% of the interviewees are deemed valid. The measures for performance variables and other strategy variables are quite straightforward, which were determined when the questionnaire was designed. The relevant measures are identified as follows:

- Technology and innovation capability

Lu (2003) identified three measures for technology and innovation capability at a broad level: IT application, design and construction technology, and innovation capability

(patent products). Yao et al. (2001) identified four measures for technology and innovation capability at a more concrete level: new materials and products, new technology and techniques, new machinery and equipment, and IT application. Li and Jin (2002) and Wang and Guo (2003) also identified new materials, new technology and techniques, and new machinery and equipment as the main elements of technology and innovation capability. Kang (2006) used R&D investment, relationship with research institutes, and technological awards/patents to measure technology and innovation capability.

Based on the above literature, it was found that these researchers used different methods to measure technology and innovation capability. An interview question was asked to draw out the interviewees' opinions on this issue. Five measures were supported by more than 50% of the interviewees (Table 5.2). Some interviewees commented that other measures in the above literature are also relevant, but could be less important or have similar meanings with these five measures. Most interviewees explained that the efforts of their firms in improving technology and innovation capability have been increasing but is still insufficient, especially for the application of new technology in their international construction projects.

Table 5.2 Measures for Technology and Innovation Capability

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. New materials and products	√	√		√	√		√	√	√	√
2. New machinery and equipment			√	√		√	√	√	√	
3. New technology and techniques	√	√	√	√	√	√	√	√	√	√
4. Design capability	√	√		√		√	√		√	√
5. IT application	√		√	√	√	√	√	√		√

- Financial capability

As Kang (2006) suggested, financial capability can be measured and developed in three areas: acquisition of financial resources (financing), strategic investment, and financial management. According to the Chinese research highlighted in Appendix 1, measures for improving financing capability include the following: building good relationship with banks and financial institutions, public-listing, buying shares of banks/financial institutions to become their minority shareholders, and cooperation with firms from AICs (Ding 2001; Hao 2004; Ren 2005b; Yu 2002). Countertrade, which is sponsored by the Chinese government, is also a possible financing channel (CMRE 2004).

Interview results indicate that five measures (Table 5.3) could determine and effectively improve the financial capability of CCFs. Although countertrade and buying shares of banks/financial institutions were also considered as important measures, these two measures were seldom considered by CCFs as commented by the interviewees. Although public-listing was only realised by a small number of large CCFs, most interviewees thought that it would become an important financing channel in the future when the profitability of CCFs is improved. Four interviewees were from listed CCFs, with another two indicating their firms' desire for public-listing. Most interviewees were however not satisfied with the financial capability of their firms.

Table 5.3 Measures for Financial Capability

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Building good relationship with banks and financial institutions	√	√	√	√	√	√	√	√	√	√
2. Public-listing	√	√			√		√	√		√
3. Cooperation with firms from AICs	√	√	√	√	√	√		√		√
4. Strategic investment				√	√	√		√	√	√
5. Financial/accounting management	√	√	√	√		√	√	√	√	

- Marketing capability

Marketing skills cultivated at home might be useful for CCFs when they venture into similar international environment. However, international construction marketing is much more complex compared with marketing at home. It requires more marketing knowledge, wider marketing channels, and greater support from the top management to secure sufficient business information to meet the needs of foreign clients of various cultural backgrounds. In order to enhance marketing capability and minimize the risks in market entry decision-making, the following measures are considered to be important based on the respective literature reviewed.

- (1) Using experienced international marketing professionals, especially for CCFs with limited international construction experience (Li 2002)
- (2) Top management's overall guidance on international marketing in accordance with the firm's vision and strategy (Sun 2003)
- (3) Employing sufficient information channels (Shao 2002; Zheng 2004)
- (4) Building good relationship with various external parties (Kale 1999)
- (5) Promotion through various marketing channels, such as media advertising, word-of-mouth, public relations, and corporate identity (Langford and Male 2001)
- (6) Adopting internal marketing through creating an environment of employee support and commitment to increase customer satisfaction (Langford and Male 2001)

The results of interviews support all the above measures for CCF's marketing capability (Table 5.4), although the supporting levels for top management's overall guidance and internal marketing are somewhat lower. The interviewees cited the lack of both experienced marketing professionals and information channel as the apparent weaknesses of their firms in marketing.

Table 5.4 Measures for Marketing Capability

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Using experienced international marketing professionals	√	√		√	√	√	√	√	√	√
2. Top management's overall guidance	√			√	√		√		√	√
3. Sufficient information channels		√	√	√	√	√	√	√	√	√
4. Promotion through various marketing channels		√	√	√	√		√	√		
5. Good relationship with various external parties	√	√	√		√	√	√	√	√	√
6. Internal marketing	√			√		√	√		√	√

- Project management capability

Project management capability is structured to ensure that a project is completed on time, within budget and with a desirable level of quality (Cheah and Chew 2005). Schedule, cost and quality controls are the three basic elements of project management recognised by most researchers (Chinowsky 2000). Kang (2006) used firm's performance in contract management and procurement management to measure project management capability. Safety and environmental protection issues are also important indicators to measure the project management capability of contractors, which have widely been discussed (Abudayyeh et al. 2006; Lam and Chen 2004; Tam et al. 2005; Teo and Ling 2005).

In the interview, all these six measures were found to be valid (Table 5.5). Most of the interviewees were confident in the project management capability of their firms, especially for progress and cost control. Progress, cost and quality control were deemed to be the most effective measures by all interviewees. A few interviewees reckoned that contract management and procurement management for their international projects need to be improved significantly.

Table 5.5 Measures for Project Management Capability

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Schedule/progress control	√	√	√	√	√	√	√	√	√	√
2. Cost control	√	√	√	√	√	√	√	√	√	√
3. Quality management	√	√	√	√	√	√	√	√	√	√
4. Contract management		√	√		√	√	√		√	√
5. Procurement management	√		√				√	√	√	√
6. Safety and environmental management	√		√	√	√	√		√	√	√

- HR management capability

International construction business imposes stricter requirements for HR management. Loosemore and Dainty (2002) identified three main elements for HR management in construction: employee resourcing, HR development, and reward management. Employee resourcing aims to ensure an organisation a ready supply of skilled people. Its HR management encompasses the planning function, deployment decisions, recruitment and selection process, and succession planning. HR development covers training and development programmes, and career management. Reward management concerns decisions on rates of pay, pay structures and performance appraisal. Chinese researchers and practitioners showed greatest concerns on HR management for international construction. Major measures they proposed include: cultivating talents for international business (Yan 2005); improving reward management to prevent talent poaching (Zheng 2004); enhancing management of key expatriate managers (Li and Zhang 2004); providing sufficient training for international business (Zheng 2004; Fu 2004); and expanding channels of recruitment (Shao 2002; An 2003). Notably, Zhu (2002) used four indicators to assess the HR management capability of international contractors. They are: proportion of foreign staff at senior management level of foreign subsidiaries, international experience of expatriate managers, quality (job skills and international experience) of technical and managerial staff, and quantity of technical and managerial staff with higher education.

Based on the above literature, the interviewees' opinions on this issue were examined. Six measures were identified to measure HR management capability (Table 5.6). Reward management and the international experience and ability of expatriate managers were emphasized by these interviewees. They argued that talent poaching is a common problem of their firms, especially for expatriate staff, due to poor reward management. They also commented that financial losses often occur due to the inappropriate decision-making of their expatriate managers.

Table 5.6 Measures for HR Management Capability

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Training for international business	√			√	√	√	√	√		
2. Reward management	√	√	√	√	√	√	√	√	√	√
3. Level of international recruitment	√		√	√	√			√	√	
4. International experience and ability of expatriate managers	√	√	√	√	√	√	√	√	√	√
5. Quality (job skills and international experience) of management and technical staff		√	√	√		√		√	√	√
6. Quantity of technical and managerial staff (proportion of staff with higher education)			√	√	√	√		√		√

• Reputation/brand

There is limited literature that focus solely on reputation/brand of construction firms. It is usually discussed together with other strategic issues. Based on limited literature, it is summarized that reputation/brand of international construction firms can be built up by satisfying clients and the community of host countries, and gaining international recognition by scale. Satisfying clients can be measured by: fulfillment of contract obligations (such as time and quality of project delivery, number of litigation cases) (Lu 2003), awards of good quality projects (Kang 2006), reputation for superior management, and reputation for technological innovation (Ekeledo 2000). Satisfying community of

host countries can be measured by the level of social responsibility (Ge and Li 2003). Besides, firm's international recognition by scale, such as rankings provided by ENR or other organisations, can also be used as an indicator for measuring CCF's reputation/brand (Zhu 2002).

All these measures were supported by the results from the interview (Table 5.7). Fulfillment of contract obligations and international recognition by scale are two measures stressed by all interviewees. Reputation for technological innovativeness and social responsibility received the least support. Several interviewees commented that technological innovation for construction is usually less important compared to other businesses, and social responsibility is not emphasized by their firms.

Table 5.7 Measures for Reputation/Brand

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Fulfillment of contract obligations	√	√	√	√	√	√	√	√	√	√
2. Awards of good quality projects	√	√		√	√	√	√		√	√
3. Reputation for superior management	√		√	√	√	√	√	√	√	√
4. Reputation for technological innovation		√	√	√			√	√	√	
5. Social responsibility			√	√	√			√	√	√
6. International recognition by scale	√	√	√	√	√	√	√	√	√	√

- Organisational structure

As discussed in Chapter 4, formalisation and centralisation are two main dimensions of organisational structure. It is a complex task to measure the formalisation and centralisation of an organisational structure. Kang (2006) identified nine measures for formalisation and centralisation, while Kale (1999) used thirteen measures for these two dimensions. Their measures used are totally different. It indicated that there are no fixed

measures for these two structure dimensions. An effective way to identify the measures was through examining the practices of the respective firms of these interviewees.

For the formalisation dimension, six measures were confirmed by the interviewees to be appropriate for measuring this variable. They are quality management system, HR management system, contract management system, financial management system, cost control system, and marketing system (Table 5.8). The interviewees commented that their firms usually adopt formalised rules and procedures for various management systems in the home market. For international operations, these large CCFs also tend to adopt a formalised structure but usually adapt it to suit local operational rules.

Table 5.8 Measures for Formalisation of Organisational Structure

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Quality management system		√	√		√		√	√	√	√
2. HR management system	√			√			√	√	√	√
3. Contract management system	√	√		√	√			√	√	√
4. Financial management system	√			√		√	√		√	√
5. Cost control system	√	√	√			√	√	√	√	
6. Marketing system		√	√	√	√	√		√		√

For the centralisation dimension, seven measures were identified based on the interview (Table 5.9). It was found that the decisions in these seven aspects of the interviewees' firms were made at different management level, which reflects the different centralisation levels of these firms. The seniority of the decision maker for such measures reflects the level of centralisation.

Table 5.9 Measures for Centralisation of Organisational Structure

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Entering into new markets	√	√		√	√			√		√
2. Appointment of key managers of foreign subsidiaries					√	√	√	√	√	√
3. Selection of functional department managers of foreign subsidiaries	√		√	√			√	√	√	
4. Global transfer of human resources	√	√		√	√	√		√	√	√
5. Capital control of foreign subsidiary	√		√			√	√	√	√	
6. Procurement management	√		√	√	√		√	√		√
7. Setting up of project team	√	√		√		√	√		√	√

- Organisational culture

Measuring organisational culture is difficult due to its intangible and firm-specific nature. Flamholtz and Kannan-Narasimhan (2005) identified six measures (or components of culture), which were found to be most useful to this study among all relevant literature. The six measures are the respective scales in terms of customer, HR practices, identification with the firm, performance and behavior standards, community contribution, and communication. Customer scale consists of items that indicate how the customers are viewed and treated by the organisation (customer-orientation). HR practices scale contains items that indicate how the organisation views and treats its employees by employing appropriate HR policies and procedures (people-orientation). The identification with the firm scale measures the extent to which the employees identify themselves with the firm or the extent to which they feel a part of the larger corporation. Performance and behavior standards scale measures the expectations of the firm with respect to how the employees are supposed to perform and behave as members of the firm. Community contribution scale measures the way the organisation is viewed by the community in which it operates (social responsibility). Communication scale measures the practices regarding communication within the organisation.

Among these six measures, four were favoured by interviewees. They are: customer-orientation, people-orientation, identification with the firm and internal communication. Besides these measures, organisational learning, pursuing innovation, and quality-orientation were also deemed as important factors from the interviewees' perspectives. A few interviewees commented that 'quality-orientation' would be covered under 'customer-orientation' as quality is one of the measures that can satisfy clients. Thus six measures are identified for the organisational culture (Table 5.10).

Table 5.10 Measures for Organisational Culture

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Customer-orientation	√	√	√	√	√	√	√	√	√	√
2. People-orientation	√	√	√		√	√	√	√	√	√
3. Identification with the firm		√	√	√		√	√	√		√
4. Internal communication		√	√		√		√	√	√	
5. Organisational learning	√		√	√		√	√	√		√
6. Pursuit of innovation			√	√	√	√			√	√

- Cost leadership strategy

Kale (1999) studied the cost leadership strategy by directly asking if the firm competes on the basis of cost, instead of using cost factors. On the other hand, Kang (2006) used costs on manpower, materials and equipment, administration (overhead), subcontracting and construction process control to measure the cost leadership strategy. In the interview, six measures were supported by interviewees to represent cost factors (Table 5.11). Several interviewees commented that although there is comparative cost advantage for CCFs, their ability to access low cost resources should be more important. This is because they are restricted in using their own resources in foreign countries. Notwithstanding this, a number of large CCFs have achieved economies of scale or scope in international markets, such as CSCEC's operation in Hong Kong and Singapore, which enabled them to pursue cost leadership strategy.

Table 5.11 Measures for Cost Leadership Strategy

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Labour cost	√	√	√	√	√	√	√	√	√	√
2. Material and equipment cost	√			√	√	√	√			√
3. Overhead cost	√	√		√	√			√	√	√
4. Project and operational cost control	√	√			√	√	√	√		√
5. Ability to access low-cost resources	√		√	√	√	√	√	√	√	
6. Economies of scale or scope		√	√	√	√		√	√	√	√

• Differentiation strategy

Differentiation is hard to be measured as a firm can differentiate itself from other firms in many ways. Kale (1999) used quality, schedule and innovation to represent differentiation strategy. Kang (2006) used five firm-specific resources/capabilities to measure differentiation strategy. In this research, five measures were identified based on these literature and the interview. They are: quality, delivery time, attractive financing packages, good relationship with external parties, and technology and innovation (Table 5.12). The interviewees explained that their firms have been striving for differentiation in international markets using largely these measures. Other than these five measures, reputation and track record were also stressed by a few interviewees (less than 50%).

Table 5.12 Measures for Differentiation Strategy

Measures	Interviewees who support the measures									
	A	B	C	D	E	F	G	H	I	J
1. Quality	√	√	√	√	√	√	√	√	√	√
2. Delivery time	√	√	√	√	√	√	√	√	√	√
3. Attractive financing packages	√	√			√	√	√	√	√	
4. Good relationship with external parties	√		√	√	√	√	√			√
5. Technology and innovation		√	√		√	√	√	√	√	√

5.3 Questionnaire Design

Questionnaire survey is the principal means for data collection in this study. The advantage of questionnaire survey is that it can efficiently generate large amount of data that can be subjected to statistical analysis (Snow and Thomas 1994). Based on the research questions developed from the hypotheses (Chapter 4) and the measures for major research variables identified (Section 5.2), the questionnaire is designed and presented in this section. The measures for increasing the rate of return are first discussed, followed by the organisation of questionnaire.

5.3.1 Measures for Increasing the Rate of Return

Following Dillman's (1978) instruction for survey design, the questionnaire for this research was designed in consideration of the following factors to increase the rate of return.

Minimizing the cost of responding. The measures taken to minimize the cost of responding include the following: the Chinese version of questionnaire was used to avoid misunderstanding and loss of time arising from language difficulties; questions were grouped by content and type, and were worded correctly and structured in a manner that would not bias the results; questionnaire was pre-tested before sending to respondents to ensure that it is unambiguous and clearly understandable; an easy format was created to enable respondents to simply tick the answers instead of typing or writing.

Maximising incentives and establishing trusts. In the cover letter, the following aspects were emphasized to maximise incentives and establish trusts: respondents were told that they were carefully selected as experts in this research area; issues to be dealt with were explained to show great relevance to the strategic management of the respondent's firm; research findings would be shared with respondents; the cover letter was printed on letterhead including the name and logo of the university, with the name of the researcher and the department affiliated being clearly indicated; the information provided by

respondents was to be kept strictly confidential and only used for academic purposes; and the copies of the questionnaire were not coded to ensure anonymity of respondents.

5.3.2 Organisation of the Questionnaire

The designed questionnaire consists of five parts (Appendix 4). The first part concerns general questions on respondent firms. The second part includes questions that measure the dependant variable of the research: international performance of CCFs. The third, fourth and fifth parts include questions on CCFs' generic competitive strategies, market entry strategies and firm-specific resources and capabilities.

The first part of the questionnaire presents the general information, which includes the designation of respondent, firm type (general building or civil engineering; HQ or subsidiary), firm size, and years of international operation. As only large CCFs were studied in this research, the firm size was measured by the total number of employees in the firm on a five-point scale (i.e., <500; 501-1000; 1001-10000; 10001-50000; >50000). Based on the overseas venturing history of CCFs (Chapter 3), years of international operation were measured on a five-point scale (i.e., <5; 6-10; 11-15; 16-20; >20).

The second part of the questionnaire solicits information on the international performance of CCFs. The performance is measured by the growth rates on sales and net profit, which were widely used in past studies on construction firms and Chinese businesses (Kale 1999; Kang 2006; Li 1998; Park and Luo 1998). In Question 2.1 and 2.2, respondents were asked to indicate the average growth rates of sales and net profit of their firms in the past three years on a five-point scale (i.e., <10%, 10%-20%, 20%-30%, 30%-40%, >40%). The determination of the scale was based on the overall sales performance of CCFs: the average international sales growth rate of all CCFs was around 25% from 2003 to 2005 (CHINCA 2006), and the average growth rate of those CCFs in ENR Top 225 International Contractors exceeded 30% (Figure 3.2). However, financial performance data (profits) are generally unavailable for CCFs. It was presumed that the growth rates in sales and net profits are in the same range.

The third part of the questionnaire gathers information on CCFs' generic competitive strategies, which include cost leadership, differentiation and scope of competition (geographical scope diversification and business scope diversification). The firm's applications of cost leadership and differentiation (Question 3.1 and 3.2) were measured by six and five measures respectively (Table 5.11 and Table 5.12). Respondents were asked to indicate to what extent their firm emphasizes these measures on a five-point scale ranging from [1=not at all] to [5=extremely]. Question 3.3 tests the extent of geographical scope diversification, which implies diversification into different international markets. Respondents were asked to indicate the number of international markets that their firm operates in on a five-point scale (i.e., ≤ 3 ; 4-6; 7-10; 11-15; >15). Question 3.4 evaluates the extent of business scope diversification, which mainly refers to the diversification into different types of projects and products/services segments. Respondents were asked to indicate the number of trade sectors that their firms are involved in the international market on a five-point scale (i.e., 1; 2-3; 4-5; 6-7; >7). The determination of scales for geographical/business scope diversification was based on the overall geographical/business coverage of large CCFs.

The fourth part of the questionnaire solicits information on CCFs' market entry strategies, which include wholly-owned subsidiary, JV and sophisticated contracting. The firm's application of wholly-owned subsidiary strategy (Question 4.1) was measured by asking respondents to indicate the percentage of their firm's international business which was carried out by sole operation on a five-point scale (i.e., $<20\%$; 20-40%; 40-60%; 60-80%; 80-100%). The application of JV strategy (Question 4.2) was measured by asking the respondents to indicate to what extent their firm's international contracts through JVs changed over the past three years on a five-point scale: 1 – significant decrease; 2 – slight decrease; 3 – no obvious change; 4 – slight increase; 5 – significant increase. Question 4.3 evaluates the sophistication level of CCFs' international project contracting. For this research purpose, construction contracting modes are classified into three categories according to the sophistication level: sophisticated contracting (as defined in Chapter 2), main contracting, and subcontracting. Respondents were asked to indicate the application of various contracting modes by their firms on a five-point scale: 1 – subcontracting only

(least sophisticated); 2 – main contracting and subcontracting are concurrently used, with subcontracting being dominant; 3 – main contracting and subcontracting are concurrently used, with main contracting being dominant; 4 – main contracting and sophisticated contracting are concurrently used, with main contracting being dominant; 5 – sophisticated contracting is the dominant contracting mode.

The fifth part of the questionnaire gathers information on CCFs' firm-specific resources and capabilities, which include technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organisational structure, and organisational culture. In the eight questions (Question 5.1 to Question 5.8), respondents were asked to rate each of the measures identified (Table 5.2 to Table 5.10) on a five-point scale. Meanings of the scale may vary in different questions as indicated in the Questionnaire (Appendix 4).

After the final question, a statement was provided which expressed the researcher's appreciation to the respondents for their valuable participation and contribution. It was also promised that a summary of the findings of the survey would be sent to those interested respondents who have provided their corresponding particulars in the questionnaire.

5.4 Pilot Survey

A pilot survey was undertaken to identify the salient issues and improve the clarity and relevancy of the questionnaire. The pilot survey involved six participants: two professors and four industry professionals who were very familiar with this research area. These participants were encouraged to comment on the survey format, content and the validity of research variables. They also provided valuable advice on several questions about instructional clarity, item clarity, relevancy, and time needed to complete the survey, with the objective of effectively communicating the meaning of the questions. Based on the pilot survey, the wording of some questions was modified. As the research variables were

identified through extensive literature review and personal interview, these participants agreed with the content of questions and the validity of research variables. The revised questionnaire was further reviewed by the same participants as well as other two researchers in the related area. All agreed that the wording was clear, requiring no further changes. Thereafter, the questionnaire was finalised and the formal survey was conducted.

5.5 Data Collection

Respondents of the survey include senior managers from large CCFs having international operations, especially those included in the ENR Top 225 International Contractors. The list includes general managers, related division heads or subsidiary general managers, and senior staff with extensive international experience. Given the fact that this research focuses on Chinese international contractors, and is targeted at senior executives having international experience and strategic management perspective, the sample size becomes relatively limited. The following four channels for data collection were used:

- Through the researcher's contacts in the industry and academia and the help of his supervisor, a total of 140 sets of questionnaire were disseminated via emails and by postal mails. With the assistance of these people, high response rate and quality of the survey were expected.
- During the personal interview with the ten senior managers (Section 5.2.1), trust-based relationship was built. Expectedly, they were also included as the respondents for the survey. Eight interviewees also helped to disseminate 30 sets of questionnaire to their related firms and subsidiaries and other CCFs.
- Through the Training Institute of the Ministry of Construction of China, 60 sets of questionnaire were sent out. Although the response rate was not high, the respondents were senior managers and had carefully answered the questions.

- For other CCFs listed in the 2004 ENR Top 225 International Contractors which were not covered in the above-mentioned channels, e-survey was carried out. Respondents were identified as heads of enterprise management department, general managers of overseas department/group, and vice presidents (overseas business). A total of 30 sets of questionnaire were sent out. Although telephone follow-ups were made by the researcher, few replies were received through this channel. This is the common problem encountered in electronic questionnaire survey in China.

5.6 Chapter Summary

The research methods adopted in this study were first outlined. Questionnaire survey was used as the principal data collection method. Descriptive analysis and multiple linear regression were identified as the major data analysis techniques to be used in this study. Measures for major research variables were derived from literature review and personal interview. Subsequently, the questionnaire was design based on the hypotheses, research variables and the identified measures for these variables. The questionnaire was finalised after a pilot survey. Finally, the data collection methods were discussed.

Based on these research methods, research findings will be generated through data analysis in the next chapter, and the validity of research hypotheses will be examined.

Chapter 6 Research Findings

In this chapter, hypotheses proposed in Chapter 4 will be verified by the analysis of the results of questionnaire survey. The general information of the survey will first be explained. Next, data interpretation for research variables and hypothesis testing will be carried out according to the sequence of hypothesis development. Figure 6.1 shows the organisation of this chapter.

Figure 6.1 Organisation of Chapter 6

6.1 General Information of the Survey

The questionnaire survey targeted large CCFs which were undertaking international construction projects. The sample was selected based on the ranking of the firms in the ENR Top 225 International Contractors list and their reputation in China. The questionnaire was completed by middle or senior managers of these firms. Altogether 260 sets of questionnaire were sent out through the channels discussed in Chapter 5. A total of 96 sets of answered questionnaire were received. The rate of return is 36.9% (96/260). From the return, 92 respondents had duly answered the questions and were selected for this analysis. The general information of the respondents is summarized in Table 6.1. Among these respondents, 37 were from top management, and 55 were department managers and project managers. There were 48 respondents from civil engineering firms and 44 from general building firms. Most of the respondents were from HQs, whereas 28 were from their subsidiaries which were involved in international construction. All respondents were experienced and well familiar with the research area. After sending out the questionnaire, further contacts through email and telephone were also made to confirm and probe further several respondents' views if such respondents had provided contact information in the returned questionnaire.

Table 6.1 General Information of the Respondents

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

Table 6.2 summarizes the size and years of international operation of the respondent firms. As indicated, 39.1 percent of the respondents were from CCFs with staff ranging

from 1,001 to 10,000, followed by 33.7 percent with staff ranging from 10,001 to 50,000. Only 4.3 percent of respondent firms engaged less than 500 staff. This indicated that the respondent CCFs were large in size. Most of the respondents were from CCFs with 11 to 20 years of international operation. Only less than 10 percent of the firms had operated overseas for more than 20 years.

Table 6.2 Respondent Firm Size and Years of International Operation

	Size by Staff	Nos. and % of Respondent CCFs	Scale of Variables	Years of International Operation	Nos. and % of Respondent CCFs	Scale of Variables
	<500	4 (4.3%)	1	<5	6 (6.5%)	1
	501-1000	16 (17.4%)	2	6-10	18 (19.6%)	2
	1001-10000	36 (39.1%)	3	11-15	34 (37.0%)	3
	10001-50000	31 (33.7%)	4	16-20	25 (27.2%)	4
	>50000	5 (5.4%)	5	>20	9 (9.8%)	5
Mean			3.18			3.14
Standard Deviation			0.94			1.05
Median			3			3

6.2 Data Interpretation for Research Variables

In this section, the reliability analysis on the survey data is first carried out to examine the quality of data (internal consistency of scales). Subsequently, survey data of research variables are generally interpreted.

6.2.1 Reliability Analysis

The reliability of data is the basis of the quality of research findings. The internal consistency of scales is usually assessed by the Cronbach Alpha method. The Cronbach Alpha coefficient has a value that ranges from 0 to 1, where higher values indicate higher internal consistency of scales. It has been suggested that reliabilities of between 0.50 and 0.60 will suffice (Churchill 1979; Nunnally 1978). Van de Ven and Ferry’s (1979)

minimum criteria for measuring reliability of organisational attributes is that the Cronbach Alpha value is 0.35.

As discussed in Chapter 2, the conceptual model for this research incorporates four constructs: firm-specific resources and capabilities, generic competitive strategies, market entry strategies, and international performance. Table 6.3 shows the Cronbach Alpha values for the research variables of these constructs, which indicated that all survey data are basically reliable, with the Cronbach Alpha values ranging between 0.52 and 0.82.

Table 6.3 Reliability of Survey Data

Constructs			Number of items	Reliability (Cronbach Alpha)
International performance			2	0.6461
Generic competitive strategies	Cost leadership		6	0.5892
	Differentiation		5	0.6094
Market entry strategies			3	0.6165
Firm-specific resources and capabilities	Technology and Innovation capability		5	0.6136
	Financial capability		5	0.5471
	Marketing capability		6	0.5235
	Project management capability		6	0.8157
	HR management capability		6	0.5420
	Reputation/brand		6	0.6515
	Organisational structure	Formalisation	6	0.6168
		Centralisation	7	0.5628
	Organisational culture		6	0.6222

6.2.2 Research Variables

There are a number of measures representing each research variable and there are also 92 responses received for each measure. The 92 mean values of the corresponding measures for each research variable were first computed. Each research variable was represented

by these mean values, and based on these values, the means, standard deviations and medians of the research variables were derived as summarized in Table 6.4. Results of these variables are briefly discussed next.

Table 6.4 Means, Standard Deviations and Medians of Research Variables

Construct	Variable	Mean	Standard Deviation	Median	
Performance	Sales	3.53	0.919	4	
	Profits	2.83	0.779	3	
	Overall performance	3.18	0.732	3.5	
Generic Competitive Strategies	Cost leadership	3.57	0.562	3.7	
	Differentiation	2.91	0.472	3	
	Geographical scope diversification	3.04	0.948	3	
	Business scope diversification	3.08	0.905	3	
Market Entry Strategies	Wholly-owned subsidiary	3.61	0.889	4	
	JV	3.35	0.954	3	
	Sophisticated contracting	2.91	1.002	3	
Firm-Specific Resources and Capabilities	Technology and innovation capability	2.49	0.644	2.5	
	Financial capability	2.65	0.631	2.7	
	Marketing capability	3.18	0.595	3.2	
	Project management capability	2.93	0.494	3	
	HR management capability	3.19	0.476	3.2	
	Reputation/Brand	3.08	0.614	3.1	
	Organisational structure	Formalisation	3.09	0.527	3.1
		Decentralisation	2.55	0.483	2.6
		Overall	2.82	0.428	2.9
	Organisational culture	3.03	0.422	3	

• International Performance Variables

The international performance of CCFs was measured by the growth rate of international sales (hereinafter called ‘sales growth’), the growth rate of net profits of international business (hereinafter called ‘profit growth’), and the overall international performance (hereinafter called ‘overall performance’). The overall performance can be measured by a multidimensional method (Kale 1999) or by averaging the sales growth and profit growth

(Kang 2006). This research adopted the latter, which means that the sales growth and profit growth were treated as equally important for the international performance of CCFs. As indicated by the median values in Table 6.4, the average sales growth for the respondent firms fell within the range of 30% to 40%. The average profit growth fell within the range of 20% to 30%. Although the profit growth rate of CCFs is not as high as their sales growth, such profit growth is considered extremely good.

- Generic Competitive Strategy Variables

The mean value of cost leadership is much higher than differentiation strategy (3.57 vs. 2.91) (Table 6.4). It implies that cost leadership was adopted more widely by CCFs than differentiation strategy in international markets. The median value of geographical scope diversification indicates that the average number of international markets of the respondent firms fell within the range of 7 to 10 countries or regions. The median value of business scope diversification indicates that on average, the respondent firms tended to engage four to five types of projects or businesses.

- Market Entry Strategy Variables

As indicated, the median values of wholly-owned subsidiary, JV and sophisticated contracting variables implies that: (1) the average percentage of international business of the respondent firms conducted through sole operation fell within the range of 60% to 80%; (2) on average, there was no obvious increase or decrease in CCF's international contracts through JVs from 2002 to 2004; and (3) on average, the respondent firms mainly adopted main contracting and subcontracting modes in international markets, with main contracting being dominant.

- Firm-Specific Resource/Capability Variables

In general, the firm-specific resources and capabilities of CCFs were not highly valued, with the maximum mean score of 3.19 being recorded for HR management capability (Table 6.4). In particular, technology and innovation capability, financial capability and organisational structure are three variables with mean values lower than the mid-point of the scale. It implies that technology and innovation capability and financial capability of

CCFs were weak, and their organisational structure was ineffective (over-centralised). These results are basically consistent with the SWOT analysis in Chapter 3.

6.3 Hypothesis Testing

Hypothesis testing was conducted by linear regression statistical method using SPSS, following the sequence of hypothesis development. Hypotheses on the relationship between four generic competitive strategies and performance ($H_{1.1} - H_{1.4}$) were first tested. Second, hypotheses on the relationship between market entry strategies and performance ($H_{2.1} - H_{2.3}$) were examined. Third, hypotheses on the relationship between firm-specific resources and capabilities and performance ($H_{3.1} - H_{3.8}$) were verified. Fourth, hypotheses on the relationship between firm-specific resources/capabilities and generic competitive strategies ($H_{4.1} - H_{4.4}$) were tested. Finally, hypotheses on the relationship between firm-specific resources/capabilities and market entry strategies ($H_{5.1} - H_{5.3}$) were examined. The testing results for these research hypotheses are discussed accordingly.

6.3.1 Testing of Hypotheses on Relationship between Generic Competitive Strategies and Performance

In order to test $H_{1.1}$ to $H_{1.4}$, a multiple regression analysis was conducted based on three related models: Model 1a, Model 1b and Model 1c. The independent variables in these three models are cost leadership, differentiation, geographical scope diversification, and business scope diversification. The dependent variables are sales growth, profit growth and overall performance. The regression equations take the following forms, and the analytical results are shown in Table 6.5.

$$\text{Model 1a: Sales growth} = \alpha_0 + \beta_1 CL + \beta_2 DF + \beta_3 GD + \beta_4 BD$$

$$\text{Model 1b: Profit growth} = \alpha_0 + \beta_1 CL + \beta_2 DF + \beta_3 GD + \beta_4 BD$$

$$\text{Model 1c: Overall performance} = \alpha_0 + \beta_1 CL + \beta_2 DF + \beta_3 GD + \beta_4 BD$$

Where, CL = Cost Leadership
DF = Differentiation
GD = Geographical Scope Diversification
BD = Business Scope Diversification

Table 6.5 Regression Coefficients for Generic Competitive Strategies and Performance

Generic Competitive Strategies	Sales Growth (Model 1a)	Profit Growth (Model 1b)	Overall Performance (Model 1c)
Cost Leadership	0.300***	0.341***	0.370***
Differentiation	0.210*	0.313***	0.298***
Geographical Scope Diversification	0.144	0.055	0.120
Business Scope Diversification	0.216**	0.036	0.155*
Adjusted R ²	0.455	0.382	0.573
F-Value	19.97***	15.05***	31.48***

*P≤0.1; **P≤0.05; ***P≤0.01

As indicated, these three related models are all statistically significant at 0.01 level. The values of adjusted R² for Model 1a, 1b and 1c are 0.455, 0.382 and 0.573 respectively. It means that these four generic competitive strategy variables can explain 46%, 38% and 57% of the variance in the sales growth, profit growth and overall performance of CCFs. These values are deemed to be acceptable for evaluating these three models, compared to previous studies. For example, Kale (1999) and Kang (2006) accepted the values of adjusted R² exceeding 0.2. The results concerning each of the hypotheses (H_{1.1} to H_{1.4}) are presented next.

H_{1.1} proposed that cost leadership is positively related to the international performance of CCFs. In these three models, the results showed that the regression coefficients of cost leadership had a significantly positive relationship with all the three dependent variables statistically: sales growth ($\beta=0.300$; $p<0.01$), profit growth ($\beta=0.341$; $p<0.01$) and overall performance ($\beta=0.370$; $p<0.01$). Thus, H_{1.1} was strongly supported.

H_{1.2} proposed that differentiation strategy is positively related to the international performance of CCFs. Similar to H_{1.1}, the results showed that the regression coefficients of differentiation strategy had a significantly positive relationship with: sales growth ($\beta=0.210$; $p<0.10$), profit growth ($\beta=0.313$; $p<0.01$) and overall performance ($\beta=0.298$; $p<0.01$). Thus, H_{1.2} was strongly supported.

H_{1.3} stated that geographical scope diversification is positively related to the international performance of CCFs. As indicated, the regression coefficients of this independent variable had no significantly positive relationship with any of the three performance variables at 0.1 level of significance. As a result, H_{1.3} was not supported.

H_{1.4} stated that business scope diversification is positively related to the international performance of CCFs. As shown in Table 6.5, the regression coefficients of this independent variable were statistically significant to sale growth ($\beta=0.216$, $p<0.05$) and overall performance ($\beta=0.155$, $p<0.10$). Thus H_{1.4} was supported.

Discussion

As indicated in the analytical results, cost leadership and differentiation strategies directly contributed to the international performance of CCFs in term of sales growth and profit growth. Since these two strategy variables are concurrently significant, it thereby implies that cost leadership and differentiation strategies could be simultaneously pursued. This result favoured the integration of cost leadership and differentiation strategy as defined by Hoskisson et al (2003) (see Figure 2.3), and disagreed with Porter's (1985) viewpoint that a firm pursuing cost leadership and differentiation strategies concurrently would face the risk of being 'stuck in the middle'.

Kang (2006) revealed that differentiation strategies, instead of cost leadership, had a stronger relationship with the performance of large CCFs in their home market. However, in international markets, this study revealed that both cost leadership and differentiation strategies had strong relationships with CCFs' international performance, with cost

leadership proven more important than other strategies by comparing mean values (Table 6.4) and β values (Table 6.5). Possible reasons are given below.

In the domestic market, CCFs are mainly competing among themselves, and therefore, intense competition exists in the industry. The comparative cost advantage among CCFs is not significant, due to similar labour cost, management efficiency and overhead cost. As a result, each CCF has to distinguish itself from its competitors by adopting differentiation strategy. However, when CCFs compete at the international level, their major competitors are foreign contractors, particularly those from AICs. Cost leadership and differentiation strategies could be adopted concurrently due largely to the following determinants:

- Internally, CCFs had comparative cost advantage as compared to their competitors from AICs. However, they tended to lag behind their competitors in technological, financial and management aspects (see Chapter 3). Hence, they will require the cost advantage to offset these disadvantages. At the same time, a number of large CCFs had already accumulated much experience in executing large, complex projects both at home and in international markets, which enabled them to adopt differentiation strategy. Besides, they could also differentiate themselves from the AIC competitors in other aspects. For example, CRCC-CITIC JV won a big contract of Algeria Highway Project due partially to their promise for training the local workforce, besides other success factors discussed in Chapter 4.
- Externally, international competition has become increasingly intense, with contracting modes becoming more complicated. This necessitates all participants to position themselves differently to increase their winning chances and remain competitive, as pure reliance on cost advantage is no longer relevant in this market environment.

In addition to cost leadership and differentiation strategies, the analytical results also revealed that business scope diversification contributed to the international performance of CCFs in terms of sales growth. Traditionally, a number of large CCFs, especially civil engineering firms, have been competing in different types of construction projects in international markets. The business scope of these CCFs in China is broad, covering a wide range of construction and related businesses. These CCFs initially entered foreign markets based on their core business, and later expanded their business to reduce possible risks inherent in a focus strategy that targets only a narrow range of projects. The risks include the shrinking market demand and the increase in market entrants. Business scope diversification in international markets can enable them to effectively employ their human resources and specialised construction equipment at home. However, as business scope diversification usually requires firms to increase or re-allocate resources, firm's performance in profitability could be affected, especially at the early stage. Due to the short history of CCFs' international operation, the financial benefits accruing from this strategy had yet to be realised.

The positive relationship between geographical scope diversification and international performance was not supported by the results. The following plausible reasons may explain the research results. (1) Due to insufficient international exposure, CCFs had to focus on a small number of markets for which they were familiar and had locational advantages, in order to minimize risks of initial entry. (2) Entry barriers were still prevalent in many countries, although they had been reduced since China's WTO entry (see Chapter 3). The entry barriers include protective policies of the host countries and increasing complexity of contracting modes. These factors increased CCFs' costs of initial entry to such countries, thereby hindering their geographical expansion. (3) The disadvantageous financial and technological capabilities of CCFs still posed as bottlenecks in their geographical expansion.

6.3.2 Testing of Hypotheses on Relationship between Market Entry Strategies and Performance

To test H_{2.1} to H_{2.3}, a multiple regression analysis was conducted based on three related models: Model 2a, 2b, and 2c. The independent variables are wholly-owned subsidiary, JV, and sophisticated contracting. The dependent variables are sales growth, profit growth, and overall performance. The regression equations take the following forms, and the results are shown in Table 6.6.

Model 2a: Sales growth = $\alpha_0 + \beta_1 WS + \beta_2 JV + \beta_3 SC$

Model 2b: Profit growth = $\alpha_0 + \beta_1 WO + \beta_2 JV + \beta_3 SC$

Model 2c: Overall performance = $\alpha_0 + \beta_1 WO + \beta_2 JV + \beta_3 SC$

Where, WS = Wholly-Owned Subsidiary

JV = Joint Venture

SC = Sophisticated Contracting Mode

Table 6.6 Regression Coefficients for Market Entry Strategies and Performance

Market Entry Strategies	Sales Growth (Model 2a)	Profit Growth (Model 2b)	Overall Performance (Model 2c)
Wholly-Owned Subsidiary	0.140	0.412***	0.307***
JV	0.387***	0.131	0.313***
Sophisticated Contracting	0.339***	0.211**	0.325***
Adjusted R ²	0.356	0.269	0.391
F-Value	17.78***	12.14***	20.51***

*P≤0.1; **P≤0.05; ***P≤0.01

As indicated, these three related models are all statistically significant at 0.01 level. The values of adjusted R² for Model 2a, 2b and 2c are 0.356, 0.269 and 0.391 respectively, which are deemed acceptable for evaluating these three models. It implies that these three market entry strategy variables can explain 36%, 27% and 39% of the variance in the sales growth, profit growth and overall performance of CCFs. The testing results for each of the hypotheses (H_{2.1} to H_{2.3}) are presented below.

H_{2.1} stated that wholly-owned subsidiary strategy is positively related to the international performance of CCFs. As indicated, the results showed that the regression coefficients of

this independent variable had a significantly positive relationship with both profit growth ($\beta=0.412$; $p<0.01$) and overall performance ($\beta=0.307$; $p<0.01$). Hence, $H_{2.1}$ was supported.

$H_{2.2}$ proposed that JV strategy is positively related to the international performance of CCFs. The results showed that the regression coefficients of JV strategy variable had a significantly positive relationship with both sales growth ($\beta=0.387$; $p<0.01$) and overall performance ($\beta=0.313$; $p<0.01$). Thus, $H_{2.2}$ was also supported.

$H_{2.3}$ stated that sophisticated contracting mode is positively related to the international performance of CCFs. As indicated, the results showed that the regression coefficients of this independent variable had a significantly positive relationship with all the three performance variables: sales growth ($\beta=0.339$; $p<0.01$), profit growth ($\beta=0.211$; $p<0.05$), and overall performance ($\beta=0.325$; $p<0.01$). Therefore, $H_{2.3}$ was strongly supported.

Discussion

The results revealed that: (1) the higher the percentage of international business CCFs engaged by sole operation, the higher their profit growth; (2) the greater the increase in their international contracts secured through JVs, the higher their sales growth; and (3) the higher the sophistication level of contracting modes adopted, the better their performance in sales and profits.

Apparently, CCFs were confident in sole operation in their traditional markets. This is because: (1) requirements for the tendering and execution of projects in these markets might not be as high as in AICs; (2) compared to international contractors from AICs, CCFs possessed cost advantages; (3) compared to local contractors, CCFs had apparent comprehensive competitive advantages. Thus, they could solely compete with any competitors in these markets. By sole operation, CCFs could fully utilise their cost advantage and hence achieved better financial performance. However, due to their lack of international exposure, sole operation would further limit their international networking compared to the pursuit of JV strategy, thus undermining their international

competitiveness. This could be the reason why sole operation failed to help increase their sales volume.

JV strategy helped CCFs achieve good sales growth, but was unable to help them increase their profits (Table 6.6). This result indicated that even though CCFs were confident in sole operation in traditional markets, they still needed to cooperate with foreign firms. Cooperating with local contractors might enable CCFs to make full use of the locational advantages. Likewise, cooperating with international contractors from AICs might enhance their financing, technological and management capabilities for mega projects. However, such cooperation is usually one-off, project-based (CJVs), and there may not be sufficient mega projects in these markets to support any long-term cooperation. For such a project-based cooperation, adapting to the partner's management style could affect their working efficiency, leading to a drastic decline in profit growth.

As indicated, sophisticated contracting strategy contributed to CCFs' sales growth and profit growth. Low entry barriers and the locational and cultural proximity enabled large CCFs to implement large, complicated projects in their traditional markets (see Chapter 3). Many CCFs had executed EPC projects overseas, with a number of them also undertaking BOT projects, such as Sinohydro Corporation. Such projects are usually large in scale, which increased contract values of respondent CCFs significantly. On the other hand, sophisticated contracting led to good financial performance due probably to two reasons: (1) sophisticated contracting reduced the intensity of rivalry thus increasing profits; (2) sophisticated contracting enabled CCFs to offer unique service packages to increase client's value, which also benefited themselves.

6.3.3 Testing of Hypotheses on Relationship between Firm-Specific Resources/Capabilities and Performance

To test $H_{3.1}$ to $H_{3.8}$, a multiple regression analysis was conducted based on three related models: Model 3a, 3b, and 3c. The independent variables for these three models are the eight firm-specific resources and capabilities, and the dependent variables are sales

growth, profit growth and overall performance. The linear regression between performance and firm-specific resources/capabilities is expressed by the following three equations. The analytical results are shown in Table 6.7.

Model 3a: Sales growth = $\alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB + \beta_7 OS + \beta_8 OC$

Model 3b: Profit growth = $\alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB + \beta_7 OS + \beta_8 OC$

Model 3c: Overall performance = $\alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB + \beta_7 OS + \beta_8 OC$

Where, TI = Technology and Innovation Capability

FC = Financial Capability

MC = Marketing Capability

PM = Project Management Capability

HR = HR Management Capability

RB = Reputation/Brand

OS = Organisational Structure

OC = Organisational Culture

Table 6.7 Regression Coefficients for Firm-Specific Resources/Capabilities and Performance

Firm-Specific Resources and Capabilities	Sales Growth (Model 3a)	Profit Growth (Model 3b)	Overall Performance (Model 3c)
Technology and innovation capability	0.232**	0.140	0.220**
Financial capability	0.281***	0.137	0.249***
Marketing capability	0.228**	0.123	0.209**
Project management capability	0.067	0.214**	0.156**
HR management capability	0.104	0.274***	0.210***
Reputation/brand	0.147*	0.071	0.130*
Organisational structure	-0.074	-0.113	-0.107
Organisational culture	-0.068	-0.012	-0.049
Adjusted R ²	0.498	0.423	0.637
F-Value	12.28***	9.32***	20.93***

*P≤0.1; **P≤0.05; ***P≤0.01

As indicated, these three related models are all statistically significant at 0.01 level. The values of the adjusted R^2 for Model 3a, 3b and 3c are 0.498, 0.423 and 0.637 respectively, which are deemed acceptable. It indicated that these eight resource/capability variables can explain 50%, 42% and 64% of the variance in the sales growth, profit growth and overall performance of CCFs. The testing results for each of the hypotheses ($H_{3.1}$ to $H_{3.8}$) are presented below.

$H_{3.1}$ stated that technology and innovation capability is positively related to the international performance of CCFs. The results in Table 6.7 showed that the regression coefficients of this independent variable had a significantly positive relationship with both sales growth ($\beta=0.232$; $p<0.05$) and overall performance ($\beta=0.220$; $p<0.05$). Thus, this hypothesis was supported.

$H_{3.2}$ proposed that financial capability is positively related to the international performance of CCFs. The results showed that the regression coefficients of financial capability variable had a significantly positive relationship with both sales growth ($\beta=0.281$; $p<0.01$) and overall performance ($\beta=0.249$; $p<0.01$). Hence, $H_{3.2}$ was also supported.

$H_{3.3}$ proposed that marketing capability is positively related to the international performance of CCFs. As indicated in Table 6.7, the results showed that the regression coefficients of marketing capability variable had a significantly positive relationship with both sales growth ($\beta=0.228$; $p<0.05$) and overall performance ($\beta=0.209$; $p<0.05$). Hence, $H_{3.3}$ was supported.

$H_{3.4}$ predicted that project management capability is positively related to the international performance of CCFs. The results showed that the regression coefficients of project management capability variable had a significantly positive relationship with both profit growth ($\beta=0.214$; $p<0.05$) and overall performance ($\beta=0.156$; $p<0.05$). As a result, $H_{3.4}$ was also supported.

H_{3.5} stated that HR management capability is positively related to the international performance of CCFs. The results showed that the regression coefficients of this independent variable had a significantly positive relationship with both profit growth ($\beta=0.274$; $p<0.01$) and overall performance ($\beta=0.210$; $p<0.01$). Therefore, H_{3.5} was supported.

H_{3.6} proposed that corporate reputation/brand is positively related to the international performance of CCFs. The results showed that the regression coefficients of reputation/brand variable had a significantly positive relationship with both sales growth ($\beta=0.147$; $p<0.10$) and overall performance ($\beta=0.130$; $p<0.10$). Therefore, H_{3.6} was also supported.

H_{3.7} and H_{3.8} stated that the organisational structure and culture are positively related to the international performance of CCFs respectively. As indicated in Table 6.7, the regression coefficients of these two independent variables had no significantly positive relationship with any of the three performance variables at 0.1 level of significance. As a result, these two hypotheses were not supported.

Discussion

The results revealed that four firm-specific resources and capabilities directly influenced sales growth. They are technology and innovation capability, financial capability, marketing capability, and reputation/brand. On the other hand, project management capability and HR management capability contributed to profit growth. However, organisational structure and culture were not proved to be significantly related to the two performance variables. The possible reasons are discussed next.

Technology and innovation capability contributed to sales growth due probably to its role in helping CCFs increase their chances in winning projects with high technological requirements. For example, CRCC was awarded a mega high-speed railway project in Turkey in 2005 due mainly to its strong technological capability and extensive experience

in railway construction. Those contractors without strong specialised technology were unable to enter such a market segment. However, developing proprietary technology requires large amount of capital injection, which offsets the benefits derived from a higher level of sales, thus reducing the impact on profit growth. Examples include Kajima, Hochtief and Bechtel which spent around US\$10 million annually in R&D each (Chapter 3). They had to generate huge extra profits to offset this expenditure.

Financial capability was also confirmed to have direct impact on sales growth. The possible reasons are discussed as follows: (1) Most of the international projects require tender bond, performance bond, advance payment bond, retention money and other financial commitments to ensure contractors' fulfillment of contract obligations. (2) The working capital required for international projects is usually higher than projects in the home market. This is because firms' resources in the home market could not be fully utilised for international construction. (3) The increasing financing requirements for international construction allowed only firms with strong financial capability to undertake such projects. Kang (2006) revealed that financial capability also helped large CCFs improve their profitability at home. However, this study did not derive the same conclusion for CCFs' international construction. Many large CCFs had executed strategic investments in the home market, such as CSCEC's investment in real estate and China Metallurgical Construction Corp's investment in mining development. Such strategic investments had helped these CCFs generate more profits. However, strategic investments of CCFs in international markets were still limited. Thus its impact on profitability had not been achieved.

As indicated, marketing capability contributed to sales growth instead of profitability. This result is consistent with Kang's (2006) but opposite to Kale's (1999). The latter found that relationships with various external parties were positively related to the profitability, instead of the sales growth, of US construction firms. The positive relationship of marketing capability to sales growth is understandable. The international network of CCFs was still limited due to lack of international exposure. Those CCFs with strong marketing capability could establish good relationship with international clients,

contractors, financing institutions, and other parties. Such a network would enable them to secure more projects and hence increase their sales volume. However, cultivating and sustaining relationship could be costly in terms of the reciprocal and utilitarian demands (Park and Luo, 2001). At the same time, other measures for improving marketing capability, such as engaging experienced marketing professionals and efforts in promotion, also increased CCFs' operational costs. As such, it offset the benefits derived from marketing capability.

The results also indicated that reputation/brand directly led to higher sales volume (Table 6.7). It is consistent with Fombrun's (1996) viewpoint that reputation could help to improve firm's sales performance. For international construction, reputation is usually very important for contractors to be pre-qualified, besides technology capability and financial capability. For international projects that are not administrated through open tender, reputation becomes even more important to contractors for securing clients. Thus it is logical that reputation plays an important role in increasing the sales volume of CCFs. However, building reputation and branding take much time, effort and cost. The financial benefits from reputation might not be obvious in the short-term.

Project management capability was proved to be positively related to profit growth. This result is consistent with Kerzner's (1987) viewpoint that project management capability could help contractors increase their productivity and profitability. Although most of the CCFs were latecomers to international markets, they nonetheless had accumulated extensive project management experience at home, especially in progress and cost control. Such a capability increased their working efficiency and hence led to better financial performance. The positive impact of this capability on sales growth was not confirmed. However, the indirect influence of project management capability on sales growth might exist. For example, project management capability might be positively related to reputation, thus indirectly contributing to sales growth.

As indicated, HR management capability also contributed to profit growth. It indicated that cost advantage could be amplified by those CCFs with strong HR management

capability. Although many foreign contractors had also engaged a large number of Chinese workers in certain markets like Singapore, it was commonly commented by these foreign contractors that it was difficult to manage Chinese workers. Chinese workers usually perform efficiently under supervision of Chinese managers. As a result, CCFs with strong HR management capability possessed apparent advantages over these international competitors. However, the lack of experienced managerial staff for international operations is a weakness of CCFs (see Chapter 3). It implies that those CCFs with more experienced staff would reduce risks in international operations, thereby increasing their profitability. On the other hand, HR management capability did not contribute to sales growth. However, it might indirectly contribute to sales growth through its influence on marketing capability, i.e., engaging experienced marketing professionals.

Organisational structure and culture were not proved to be significantly related to sales growth and profit growth. This result would disappoint those Chinese researchers (see Appendix 1) who suggested that CCFs should improve their international competitiveness through restructuring their organisations (see Chapter 2). The result is consistent with Kale's (1999) findings that indicated the least relevance of organisational structure to the performance of US construction firms. As revealed by Kang (2006), the formalisation of structure had a positive impact on project management capability. It might be possible that the organisational structure could influence performance in an indirect way. On the other hand, valuable organisational culture is usually seen as an intangible asset and needs to be cultivated in the long-run. This might be the reason why the positive impact of organisational culture on firm's performance had yet to be realised.

6.3.4 Testing of Hypotheses on Relationship between Firm-Specific Resources/Capabilities and Generic Competitive Strategies

In order to verify $H_{4.1}$ to $H_{4.4}$, a multiple regression analysis was conducted based on four models: Model 4, 5, 6 and 7. The independent variables for these four models are the related firm-specific resources and capabilities which have been stipulated in $H_{4.1}$ to $H_{4.4}$.

Each generic competitive strategy would serve as the dependent variable separately in Model 4 to Model 7. The linear regression between generic competitive strategies and firm-specific resources/capabilities is expressed by the following four equations. The analytical results are summarized in Table 6.8.

Model 4: $CL = \alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 OS + \beta_7 OC$

Model 5: $DF = \alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB + \beta_7 OS + \beta_8 OC$

Model 6: $GD = \alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB$

Model 7: $BD = \alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB$

Where, the meanings of the abbreviations for all variables are consistent with those used in Table 6.5 and Table 6.7.

Table 6.8 Regression Coefficients for Firm-Specific Resources/Capabilities and Generic Competitive Strategies

Firm-Specific Resources and Capabilities	Cost Leadership	Differentiation	Geographical Scope Diversification	Business Scope Diversification
	(Model 4)	(Model 5)	(Model 6)	(Model 7)
Technology and innovation capability	0.054	0.224*	0.027	0.295**
Financial capability	0.011	0.300**	0.045	0.281**
Marketing capability	0.019	0.006	0.349**	0.014
Project management capability	0.299**	0.226*	0.088	0.023
HR management capability	0.230*	0.013	0.05	0.272*
Reputation/brand		0.235*	0.236*	-0.099
Organisational structure	0.240*	-0.016		
Organisational culture	0.010	-0.124		
Adjusted R ²	0.572	0.604	0.410	0.462
F-Value	18.39***	18.34***	11.56***	14.04***

*P≤0.1; **P≤0.05; ***P≤0.01

As indicated, these four models are all statistically significant at 0.01 level. The values of the adjusted R² for Model 4, 5, 6 and 7 are 0.572, 0.604, 0.410 and 0.462 respectively, which are deemed acceptable. It implies that these related firm-specific resource/capability variables can explain 57%, 60%, 41% and 46% of the variance in the

implementation of the four generic competitive strategies: cost leadership, differentiation, geographical scope diversification and business scope diversification. The testing results for each of the hypotheses ($H_{4.1}$ to $H_{4.4}$) are presented below.

$H_{4.1}$ stated that cost leadership strategy is supported by seven firm-specific resources and capabilities, except for reputation/brand. As indicated in Table 6.8, the regression coefficients of the following three independent variables had significantly positive relationships with the dependent variable (cost leadership): project management capability ($\beta=0.299$; $p<0.05$); HR management capability ($\beta=0.230$; $p<0.10$); and organisational structure ($\beta=0.240$; $p<0.10$). Thus, this hypothesis was partially supported.

$H_{4.2}$ proposed that differentiation strategy is supported by all the eight firm-specific resources and capabilities. The regression coefficients of the following four independent variables had significantly positive relationships with the differentiation strategy variable: technology and innovation capability ($\beta=0.224$; $p<0.10$); financial capability ($\beta=0.300$; $p<0.05$); project management capability ($\beta=0.226$; $p<0.10$); and reputation/brand ($\beta=0.235$; $p<0.10$). As a result, this hypothesis was partially supported.

$H_{4.3}$ stated that geographical scope diversification strategy is supported by six firm-specific resources and capabilities, except for organisational structure and culture. As indicated in Table 6.8, only the regression coefficients of marketing capability ($\beta=0.349$; $p<0.05$) and reputation/brand ($\beta=0.236$; $p<0.10$) had significantly positive relationships with the dependent variable. Thus, this hypothesis was partially supported.

$H_{4.4}$ predicted that business scope diversification strategy is also supported by the same six firm-specific resources and capabilities as in $H_{4.3}$. As indicated, the regression coefficients of the following three independent variables had significantly positive relationships with the dependent variable: technology and innovation capability ($\beta=0.295$; $p<0.05$); financial capability ($\beta=0.281$; $p<0.05$); and HR management capability ($\beta=0.272$; $p<0.10$). Thus, this hypothesis was partially supported.

Discussion

Discussions related to cost leadership, differentiation, geographical scope diversification and business scope diversification strategies are presented next.

- **Cost leadership strategy**

As indicated, cost leadership strategy was supported by project management capability, HR management capability and organisational structure. This result confirmed the following: (1) The effective project management and control in labour, materials and equipment costs, construction progress, and outsourcing costs, had helped CCFs to pursue a cost leadership strategy. (2) The effective cultivation and management of their human resources had enabled CCFs to reduce their operational cost, hence favouring a cost leadership strategy. For example, CSCEC had sustained their success in Singapore throughout the Asian financial crisis period due mainly to their HR management capability and cost leadership strategy. (3) CCFs which adopted formalised rules and regulations and had decentralised structure for their international operations achieved higher operational efficiency, thus favouring a cost leadership strategy.

Four other identified firm-specific resources and capabilities in H_{4.1} were not proved to be significantly related to cost leadership strategy. (1) Technology and innovation capability of CCFs had not resulted in cost reduction for international construction due probably to three reasons: the new products and process developed by CCFs could not be applied widely overseas as it was in China, as CCFs were faced with their AIC competitors which were more superior in this capability. Besides, technology innovation might not lead to cost reduction without scale economies due to high investment in R&D as in the case of CCFs. Another possible reason is the content of technologies and innovations that CCFs possess. There are many types of technologies and innovations, and not all of them would contribute towards cost reduction in project management or construction processes. Some of them contribute to project quality and functionality. (2) For financial capability, although effective financial management could help firms utilise their assets more efficiently, its impact on cost leadership strategy might not be significant as CCFs'

international business volume was small. Few CCFs were involved in strategic investments overseas, and they had not achieved scale economies. Besides, only a small number of large CCFs participated in financing-related projects overseas, and they had limited financing channels, which restricted them in the selection of various financing packages for cost reduction. (3) During the early stage of CCFs' internationalisation, cultivating a strong international marketing capability might be too costly, such as engaging marketing professionals, frequent overseas traveling, promotion through various channels, and building up relationships with external parties, which run counter to cost reduction objective. (4) Compared to their foreign competitors, CCFs were lacking in modern enterprise management. To develop an organisational culture steep in customer orientation, organisational learning and pursuit of innovation, would entail heavy investment, which countervailed the positive impact on cost reduction.

- Differentiation strategy

It was proved that technology and innovation capability, financial capability, project management capability and reputation/brand supported CCFs to pursue differentiation strategy. These findings confirmed the following:

(1) Those CCFs possessing special technology and innovative products tended to pursue differentiation strategy, as these technology and products are usually difficult to be imitated by their competitors. For example, three large specialised CCFs jointly secured a US\$8 billion mega power plant project in Indonesian in 2006 due largely to their construction technology in power plant projects and capability in the related equipment manufacturing and installation.

(2) Those CCFs with better financial status and more sources of financing could differentiate themselves from their competitors, as they could provide greater value to clients through offering special financing packages. For example, China Metallurgical Construction Corp secured a number of large international mining projects, such as the Ramu Nickel and Cobalt Mine Project in Papua New Guinea, based on its attractive financing packages and construction capability in mining projects.

(3) Strong project management capability could enhance the service to clients by ensuring quality, timely delivery, safety and environmental management of projects. A number of large CCFs had been improving their capability in project management in international markets and achieved unique advantages, such as CSCEC in Algeria Pine National Apartments Project. Thus, this capability contributed to differentiation strategy.

(4) Those CCFs having good reputation were distinguished by their foreign clients from other competitors. CCFs had raised their international influence as evidenced by their improved rankings in ENR. They had also cultivated their reputation through other channels, such as strict fulfillment of contract obligations, superior quality and social responsibility. For example, China Harbour Engineering Corp's specialised equipment had become world renowned due to their quality and sophistication, enabling the firm secure more international harbour construction EPC projects.

Four other firm-specific resources and capabilities in H_{4.2} were not proved to be significantly related to this strategy. The possible reasons could be as follows:

(1) Marketing capability was found to be not supporting CCF's differentiation strategy. Due to historical reasons, Chinese firms were generally weak in marketing, especially in the international context. Their marketing effort was mainly focused on cultivating good relationships with clients as "Guanxi" (relationship) was highly valued in China. However, such relationship was not highly valued by international clients who looked more to contractors' reputation and the ability to discharge contractual commitments as paramount. Hence, compared to their international rivals, CCFs were not able to pursue differentiation strategy through marketing.

(2) Although the possession of specialised human resources and effective HR management could create a unique advantage, human resources are different from proprietary technology and financial capability. Compared to the latter, human resources could easily be acquired through offers of attractive remuneration and rewards. However, due to their traditional cost orientation, CCFs are unwilling to acquire experienced

managers at higher costs, unlike their counterparts from advanced countries. As a result, most CCFs were lacking of experienced managerial staff for international operations. Their traditional HR management practices in China, such as inequitable reward system and inefficient training programme, etc. were not suitable in international markets, as compared to their international rivals. Thus, HR management capability did not contribute to differentiation strategy.

(3) Inappropriate organisational structure was one of the major weaknesses of CCFs (see Chapter 3). Over-centralisation severely reduced the operational efficiency of their foreign subsidiaries. In contrast, contractors from AICs had mostly employed decentralised and formalised organisational structure which was more superior to CCFs'. Even CCFs with more streamlined structure were disadvantaged against their AIC competitors. Therefore, organisational structure failed to favour differentiation strategy.

(4) Due to historical reasons, most Chinese firms had a weak organisational culture which was detrimental to their international competitiveness. They tended to ignore the importance of innovation and organisational learning and accorded little attention to internal communication between HQs and foreign subsidiaries. Besides, a progressive culture needs to be cultivated in the long-run, which put CCFs in a disadvantage as they were latecomers to international markets. Thus, organisational culture did not contribute to this strategy.

- Geographical scope diversification

As indicated, only marketing capability and reputation/brand contributed to geographical scope diversification strategy. The results are indeed logical and explained as follows: (1) CCFs with strong marketing capability were able to establish a wider international network and obtain more project information on foreign markets. This increased the possibility of geographical expansion. (2) The positive relationship of reputation/brand to this strategy could be attributed to CCFs' international influence which had been increasing. More CCFs were becoming ENR Top 225 International Contractors. Three large CCFs were also included in the Fortune Global 500 in 2005. Some large CCFs

started to pay more attention to social responsibility, such as CSCEC's generous donation in Algeria for the earthquake victims in 2001. Many CCFs had also been striving to build up their reputation through superior quality delivery and fulfillment of contract obligations. Such reputation helped CCFs to reach out to clients from different geographical markets, hence favouring this strategy.

Four other identified resources and capabilities in H_{4.3} were unable to support the geographical scope diversification strategy. Obviously, the relative weaknesses of CCFs in technology innovation, financial capability and project management, as compared to their AIC competitors, limited the geographical markets for CCFs to penetrate. CCFs had to focus their business in the Asian and African markets, instead of the AICs, to avoid direct competition with more AIC contractors. Thus, contributions of these three capabilities to geographical expansion had yet to be achieved. HR management capability did not contribute to geographical expansion either. The main reason could be the lack of HR management system in CCFs which was essential for the recruitment and development of senior staff for international operations, especially for international marketing. CCFs tended to appoint their own indigenous staff, but were reluctant to engage foreign professionals, especially for senior positions. Consequently, the lack of competency of these senior managerial and technical staff hindered their process of market expansion.

- **Business scope diversification**

Technology and innovation capability, financial capability and HR management capability contributed to business scope diversification. The results confirmed the following: (1) Those CCFs possessing the technology in multiple trade sectors (such as different types of projects), or having the capability to develop new products or process, were able to diversify their business scope. (2) Diversification into new business segments required more financial support. In particular, backward integration into construction equipment/materials manufacturing and forward integration into real estate and resource development required that the firm had sufficient financial resources. (3) Cultivating and recruiting sufficient technical and managerial staff in various trade

sectors was vital for business scope diversification. Those CCFs which had recruited and trained up versatile managers for the management of diversified businesses, especially for distinctive and complex projects, would be able to pursue this strategy.

Marketing capability, project management capability and reputation/brand did not support business scope diversification. The plausible reasons for these results include the following: (1) CCFs tended to focus on their core business when they ventured abroad. However, they would be forced to engage in other business sectors when the market demand for their core business declined or the competition became more intense. Marketing was seldom the reason behind such diversification strategy. (2) Project management capability for one type of projects might not be strongly applicable or transferable to other projects or businesses. For example, specialised tunneling contractors might not be able to apply their project management capability to building projects, as clients' requirements for these two types of projects were totally different. Thus, project management capability did not favour this strategy. (3) Similar to the above, corporate reputation/brand built up for one type of business might not be easily transferred to and recognised by another new business segment. For example, specialised contractors reputable in mining construction might not be known to clients in the oil and gas industry.

6.3.5 Testing of Hypotheses on Relationship between Firm-Specific Resources/Capabilities and Market Entry Strategies

In order to test $H_{5.1}$ to $H_{5.3}$, a multiple regression analysis was conducted based on three models: Model 8, 9, and 10. The independent variables for these three models are the related firm-specific resources and capabilities which have been stipulated in $H_{5.1}$ to $H_{5.3}$. Each market entry strategy would serve as the dependent variable separately in Model 8 to Model 10. The linear regression between market entry strategies and firm-specific resources/capabilities is expressed by the following three equations. The analytical results are shown in Table 6.9.

Model 8: $WS = \alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB + \beta_7 OS + \beta_8 OC$

Model 9: $JV = \alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB + \beta_7 OS + \beta_8 OC$

Model 10: $SC = \alpha_0 + \beta_1 TI + \beta_2 FC + \beta_3 MC + \beta_4 PM + \beta_5 HR + \beta_6 RB$

Where, the meanings of the abbreviations for all variables are consistent with those used in Table 6.6 and Table 6.7.

Table 6.9 Regression Coefficients for Firm-Specific Resources/Capabilities and Market Entry Strategies

Firm-Specific Resources/Capabilities	Wholly-Owned Subsidiary (Model 8)	Joint Venture (Model 9)	Sophisticated Contracting Modes (Model 10)
Technology and innovation capability	0.018	0.012	0.203*
Financial capability	0.206*	0.063	0.255**
Marketing capability	0.271*	0.020	0.015
Project management capability	0.038	0.269*	0.199*
HR management capability	0.221**	0.041	0.010
Reputation/brand	-0.130	0.244**	0.196*
Organisational structure	0.212*	-0.083	
Organisational culture	0.010	0.230*	
Adjusted R ²	0.495	0.459	0.520
F-Value	12.13***	10.66***	17.42***

*P≤0.1; **P≤0.05; ***P≤0.01

As indicated, these three models are all statistically significant at 0.01 level. The values of the adjusted R² for Model 8, 9 and 10 are 0.495, 0.459 and 0.520 respectively, which are deemed acceptable for evaluating these three models. It implies that the related firm-specific resource/capability variables can explain 50%, 46% and 52% of the variance in the execution of the three market entry strategies: wholly-owned subsidiary, JV strategy, and sophisticated contracting. The testing results for each of the hypotheses (H_{5.1} to H_{5.3}) are presented below.

H_{5.1} stated that wholly-owned subsidiary strategy is supported by all the eight identified firm-specific resources and capabilities. As indicated in Table 6.9, the regression coefficients of the following four independent variables had significantly positive

relationships with the dependent variable: financial capability ($\beta=0.206$; $p<0.10$); marketing capability ($\beta=0.271$; $p<0.10$); HR management capability ($\beta=0.221$; $p<0.05$); and organisational structure ($\beta=0.212$; $p<0.10$). Thus, this hypothesis was partially supported.

H_{5.2} proposed that JV strategy is supported by all the eight firm-specific resources and capabilities. As indicated, only the regression coefficients of project management capability ($\beta=0.269$; $p<0.10$), reputation/brand ($\beta=0.244$; $p<0.05$) and organisational culture ($\beta=0.230$; $p<0.10$) had significantly positive relationships with the dependent variable. Hence, this hypothesis was also partially supported.

H_{5.3} predicted that sophisticated contracting strategy is supported by six firm-specific resources and capabilities, excluding organisational structure and culture. The regression coefficients of the following four independent variables had significantly positive relationships with the dependent variable: technology and innovation capability ($\beta=0.203$; $p<0.10$); financial capability ($\beta=0.255$; $p<0.05$); project management capability ($\beta=0.199$; $p<0.10$); and reputation/brand ($\beta=0.196$; $p<0.10$). Therefore, this hypothesis was partially supported.

Discussion

Discussions related to wholly-owned subsidiary, JV, and sophisticated contracting strategies are presented below.

- **Wholly-owned subsidiary**

As indicated in Table 6.9, financing capability, marketing capability, HR management capability and organisational structure were proved to support wholly-owned subsidiary strategy. The results can be explained as follows:

(1) As international construction is a high turnover but low profit business compared to other industries, it requires large amount of capital investment to maintain the operation.

At the same time, financing requirements for international projects are becoming more popular and complex. Thus, those CCFs which pursue wholly-owned subsidiary strategy had to possess strong financial capability.

(2) Sole operation requires contractors to be resourceful and able to deal with every issue without the help of a JV partner. Strong marketing capability could help CCFs to: build up good relationships with external parties; reduce market uncertainty; maintain business continuity; acquire financial resources; and ensure better access to quality materials and subcontracting services; etc. Hence, it is logical that marketing capability contributed to this strategy.

(3) Sole operation for international construction requires sufficient human resources at all levels and the effective HR management, in order to ensure the quality and timely delivery of projects, and to reduce operational costs and minimize decision-making risks. Besides, as wholly-owned subsidiary is set up to drive a business venture of a longer term, compared to JV and sophisticated contracts which are initiated more on a project-by-project basis, HR management capability is thus more relevant to this strategy since such soft skills are even more important in running a full-fledged organization than a project team. Therefore, CCFs with strong HR management capability could pursue this strategy.

(4) Sole operation requires expatriate managers to have more autonomy and power to make flexible decisions on the operation of foreign subsidiaries. It implies that a decentralised organisational structure was preferred. At the same time, formalised rules and procedures could standardize the operation of foreign subsidiaries, which would improve operational efficiency and provide guidance in decision-makings. Thus, effective organisational structure also contributed to this strategy.

Four other firm-specific resources and capabilities in H_{5.1} were not proved to support this strategy. The possible reasons are discussed below.

(1) The construction industry in CCFs' traditional foreign markets (LDCs and NICs) might not be significantly driven by technology. Most large CCFs had the capability to utilise a reasonable level of technology to carry out the construction projects in these markets. Even those CCFs which were not technology-savvy were also able to solely undertake such projects. Thus, contribution of technology and innovation capability was not significant.

(2) The contribution of project management capability to this strategy was not obvious due to the similar reason. Most projects in these traditional markets are neither large in scale nor complicated. The expectations of the project clients in these markets might not be higher than those in China, in terms of quality, time, safety and environmental management. Large CCFs could solely meet the requirements of these clients in project management capability.

(3) Reputation/brand did not contribute to wholly-owned subsidiary strategy due probably to the following reasons. Reputation might not be the key considerations of the clients in the traditional markets, compared to budget control, financing packages and other factors that suit the specific conditions of different countries. Besides, the value and sophistication level of projects in such markets were generally low, thus not justifying the importance of reputation/brand for such strategy.

(4) As discussed earlier, historically Chinese SOEs had an ineffective organisational culture, which tended to neglect the pursuit of innovation, organisational learning and internal communication. Further, bureaucracy had been prevalent and the culture for participative management was absent. Adopting a wholly-owned subsidiary strategy was often resulted from the timely judgments of top managers to seize market opportunity that prevail, and seldom based on a valuable organisational culture which would take time to cultivate.

- JV strategy

Project management capability, reputation/brand and organisational culture contributed to JV strategy. The results confirmed the following. (1) Project management capability supported CCFs to pursue JV strategy. CCFs had accumulated extensive experience in project management in both the home and overseas markets. AIC contractors would like to cooperate with CCFs to minimize their expatriate project management personnel for cost reduction. Likewise, local contractors in NICs and LDCs might also cooperate with CCFs to tap their capability to achieve quality control, progress control, and safety and environmental management. (2) Reputation/brand enables CCFs to be recognised by their potential partners. Obviously, foreign contractors preferred to cooperate with CCFs to increase the chances of winning projects in which the latter were reputable. Cooperation with reputable CCFs would also reduce risks pertaining to fulfillment of contract obligations. (3) Unlike the case of sole operation, organisational culture was crucial for the JV strategy. When a Sino-foreign JV was reached, staff from partnering firms with different cultures had to work together. Those CCFs with valuable organisational culture were more inclined and able to cooperate with the partners to build up teamwork and synergy. Hence, organisational culture contributed to JV strategy.

Five firm-specific resources and capabilities in H_{5.2} were not proved to be significantly related to JV strategy. The possible reasons are presented as below.

(1) Technology and innovation capability and financial capability did not contribute to JV strategy due to the inherent weaknesses of CCFs in these two areas. One of the fundamental motives for adopting JV strategy is that firms should possess complementary advantages with their partners. However, CCFs were lacking of proprietary technology and financing channels (see Chapter 3). Even for those CCFs which fared better in these two areas, they had yet to build up sufficient complementary strengths to partner with AIC contractors. Thus, technology and innovation capability and financial capability failed to favour JV strategy.

(2) As discussed earlier, marketing capability was one of the major weaknesses of CCFs. Few of them had international marketing departments, let alone engaging experienced

international marketing professionals. Marketing capability thus did not contribute to JV strategy as CCFs would usually rely on their partners from the LDC and NIC markets to secure traditional projects from the clients. On the other hand, for sophisticated projects in international markets, CCFs' partners tended to be AIC contractors whose marketing capability was drawn upon to secure the contracts. CCFs seldom participated in marketing of the JV.

(3) It was surprising that HR management capability was found to be not supporting JV strategy. This could be attributed to the fact that for JVs with LDC or NIC contractors, CCFs tended to act as general contractors and subcontract the works to their partners. They would provide only construction coordination services. However, such roles were revised when they partnered with AIC contractors. The latter would then become the general contractors and CCFs would be responsible for the works as subcontractors. In both instances, the importance of HR capability would be much reduced.

(4) For similar reasons ascribed to HR management capability, organisational structure was also proved to not support JV strategy. The reduced role of HR management capability means that the attendant organisational structure would not contribute to JV strategy. Besides, foreign contractors might not consider the effectiveness of CCF's organisational structure as criteria of partner selection. In contrast, they might prefer to sign JV contracts with top management from the HQs of CCFs to reduce the risks of breach of trust or disputes.

- Sophisticated contracting

As indicated, technology and innovation capability, financial capability, project management capability and reputation/brand were proved to be significantly related to sophisticated contracting strategy. The reasons for this result are explicit (see Chapter 4). As sophisticated contracting modes were pertinent to the financing, engineering, and management-related projects (see Chapter 2), only those CCFs with strong capabilities in technology and innovation, financing, and project management could have chances to secure such projects. Likewise, due to the complexity of such projects, only CCFs with

good reputation in quality control, safety and environmental management, and fulfillment of contract obligations were sought by the clients.

Marketing capability and HR management capability were not confirmed to be significantly related to sophisticated contracting. Strong marketing capability can help CCFs to build up relationship with external parties and obtain more project information. However, such sophisticated projects are usually large in scale and highly complex. Clients of such projects would emphasize the 'real' strengths of contractors to execute the works, such as technology, financial capability and relevant project experience, rather than on relationship. Thus, marketing capability was not proved to support sophisticated contracting. HR management capability did not contribute to sophisticated contracting strategy as CCFs were lacking in experienced personnel to manage the construction of sophisticated projects in international markets. CCFs which won such projects did so on the basis of capabilities mentioned above and not on the HR management capability. For example, Sinohydro secured several international BOT and EPC projects through its construction technology and management in hydropower plant projects; China Metallurgical Construction Corp secured numerous large EPC projects overseas by virtue of its construction and manufacturing capability for mining projects. These CCFs did not possess any distinct advantage in HR management over their competitors, thus confirming that this capability failed to support the sophisticated contracting strategy.

6.4 Chapter Summary

In this chapter, the validity of all the research hypotheses was examined through the multiple regression analysis on survey data collected. Hypothesis testing followed the sequence of hypothesis development. Research findings were discussed accordingly. The hypothesis testing results are summarized next.

For the hypotheses in which the international performance serves as the dependent variable, the testing results are summarized in Table 6.10. Three supporting levels are defined as follows:

- Strongly supported – which means that an independent variable (strategy, resource or capability) is positively related to both sales growth and profit growth.
- Supported – which means that an independent variable is positively related to either sales growth or profit growth.
- Not supported – which means that an independent variable is not positively related to both sale growth and profit growth.

As indicated, three hypotheses were strongly supported, nine hypotheses were supported, and three hypotheses were not supported.

For the hypotheses in which the generic competitive strategies serve as the dependent variables, hypothesis testing results are summarized in Table 6.11. Three supporting levels are defined as follows:

- Supported – which means that all related resource/capability variables are positively related to a strategy variable.
- Partially supported – which means that part of the related resource/capability variables are positively related to a strategy variable.
- Not supported – which means that no related resource/capability variables are positively related to a strategy variable.

As indicated, all hypotheses were partially supported.

For the hypotheses in which market entry strategies serve as the dependent variables, hypothesis testing results are summarized in Table 6.12. Three supporting levels are defined as the same as the generic competitive strategies case. As indicated, all hypotheses were also partially supported.

Hypothesis testing results signal the completion of the main part of this research. Based on these results, the conceptual model will be revised in next chapter when concluding the whole research.

Table 6.10 Summary the Testing Results for the Hypotheses in Which Performance is the Dependent Variable

Independent Variables	Dependent Variables			Testing Results
	Sales Growth	Profit Growth	Overall Performance	
Generic Competitive Strategies				
Cost Leadership ($H_{1,1}$)	√	√	√	Strongly supported
Differentiation ($H_{1,2}$)	√	√	√	Strongly supported
Geographical Scope Diversification ($H_{1,3}$)				Not Supported
Business Scope Diversification ($H_{1,4}$)	√		√	Supported
Market Entry Strategies				
Wholly-Owned Subsidiary ($H_{2,1}$)		√	√	Supported
JV ($H_{2,2}$)	√		√	Supported
Sophisticated Contracting ($H_{2,3}$)	√	√	√	Strongly supported
Firm-Specific Resources and Capabilities				
Technology and innovation capability ($H_{3,1}$)	√		√	Supported
Financial capability ($H_{3,2}$)	√		√	Supported
Marketing capability ($H_{3,3}$)	√		√	Supported
Project management capability ($H_{3,4}$)		√	√	Supported
HR management capability ($H_{3,5}$)		√	√	Supported
Reputation/brand ($H_{3,6}$)	√		√	Supported
Organisational structure ($H_{3,7}$)				Not Supported
Organisational culture ($H_{3,8}$)				Not Supported

Note: √ denotes that the corresponding dependent and independent variables are positively related.

Table 6.11 Summary the Testing Results for the Hypotheses in Which Generic Competitive Strategies are Dependent Variables

Independent Variables: Firm-Specific Resources and Capabilities	Dependent Variables: Generic Competitive Strategies			
	Cost Leadership (H _{4.1})	Differentiation (H _{4.2})	Geographical Scope Diversification (H _{4.3})	Business Scope Diversification (H _{4.4})
Technology and innovation capability		√		√
Financial capability		√		√
Marketing capability			√	
Project management capability	√	√		
HR management capability	√			√
Reputation/brand		√	√	
Organisational structure	√			
Organisational culture				
Testing Results	Partially Supported	Partially Supported	Partially Supported	Partially Supported

Note: (1) √ denotes that the corresponding dependent and independent variables are positively related.

(2) Highlighted areas denote the related independent variables which were identified in hypotheses.

Table 6.12 Summary the Testing Results for the Hypotheses in Which Market Entry Strategies are Dependent Variables

Independent Variables: Firm-Specific Resources and Capabilities	Dependent Variables: Market Entry Strategies		
	Wholly-Owned Subsidiary (H _{5.1})	JV (H _{5.2})	Sophisticated Contracting (H _{5.3})
Technology and innovation capability			√
Financial capability	√		√
Marketing capability	√		
Project management capability		√	√
HR management capability	√		
Reputation/brand		√	√
Organisational structure	√		
Organisational culture		√	
Testing Results	Partially Supported	Partially Supported	Partially Supported

Note: The meanings of mark '√' and highlighted areas are the same as those in Table 6.11.

Chapter 7 Conclusions

7.1 Executive Summary

As globalisation brings new opportunities, benefits and risks to construction firms, ISM is becoming more important to construction firms in today's economic system. However, studies on ISM in construction lag behind that in other industries. Studies on the ISM of CCFs are even more limited. CCFs have not been able to gain sufficient insights and contributions from the academic world to help build their international competitiveness. This research aims to fill this gap. Beginning with the five research questions raised in Chapter 1, this research was systematically conducted in the following procedures:

First, the research scope was defined at the beginning of this study, which is focused on large CCFs and their strategic management issues at corporate and business levels. The thesis structure and overall research design were also outlined at the beginning to provide a whole picture for readers.

Second, extensive literature were reviewed, aiming to examine the related past research, select related theories, build research model, and identify research variables. The RBV and IO theories were the major theoretical bases for this research. As they were applied in the international context, other international strategy theories were also covered, which include Porter's Diamond framework, transaction cost theory, and Dunning's eclectic paradigm.

Third, based on literature review, a path-analysis conceptual model was postulated, and research variables were identified. These research variables include firm-specific resources and capabilities, generic competitive strategies, market entry strategies, and the international performance of CCFs.

Fourth, the external environment of CCFs was analysed in terms of the international construction market and the Chinese construction industry. The related strategies and firm-specific resources and capabilities were suggested, which could help CCFs cope with the environmental conditions. Such an analysis ascertained the research variables which were identified through literature review. Besides, SWOT analysis was conducted based on the environmental analysis, the international performance of CCFs, and other relevant literature.

Fifth, twenty-two hypotheses were developed based on literature review to validate the conceptual model. Questionnaire survey was adopted as the principal research method. To ensure the validity and reliability of the questionnaire, measures for major research variables were derived from literature review and personal interviews with senior executives from CCFs. Finally, research hypotheses were tested through regression analysis, and the testing results were discussed. Based on these results, the conceptual model will be revised in this chapter.

7.2 Conclusions and Contributions

There are no previous studies on the ISM of CCFs that use quantitative research method to examine the relationships among firm-specific resources/capabilities, strategies, and international performance. This research bridged such a literature gap. Besides, the following three parts of this thesis could also contribute to literature: a thorough review of Chinese research on the ISM of CCFs; the analysis on the country-specific advantages/disadvantages of CCFs using Porter's Diamond framework; and the SWOT analysis on CCFs in the international context. This section concludes the whole research by summarizing the answers to the five research questions, as presented below.

The question on the literature gaps for the ISM of CCFs was answered in Chapter 2. The following four gaps were identified: (1) lack of related studies in international refereed publications; (2) lack of in-depth related studies, especially by quantitative research

methods; (3) lack of studies on corporate and business level strategies, including generic competitive strategies and market entry strategies; and (4) lack of path-analysis studies to examine the relationships among resources, strategies, and firm's performance.

The question on the impact of the environment was answered in Chapter 3. From IO economics view, the impact of the environment on the selection of strategies and the cultivation of firm-specific resources and capabilities was analysed. Research variables in the conceptual model were thus ascertained to be valid (see Table 3.13).

The answers to the other three research questions are the core of this research. In order to explain these answers, the conceptual model was revised based on the hypothesis testing results, as indicated in Figure 7.1. The positive impact of resources/capabilities and strategies on the two performance indicators: sales growth and profit growth are indicated by (a) and (b) on the respective relationship linkages. The positive impact of resources/capabilities on strategies is indicated by the numbers □ to □ on the respective relationship linkages, showing what resources and capabilities significantly influenced the relevant strategies. Three answers and their implications are presented next.

(1) The impact of generic competitive strategies on the international performance of CCFs is summarized as follows:

- Cost leadership strategy contributed directly to sales growth and profit growth. It was supported by project management capability, HR management capability and effective organisational structure.
- Differentiation strategy also contributed to sales growth and profit growth. It was supported by technology and innovation capability, financial capability, project management capability and reputation/brand.
- Business scope diversification contributed to sales growth. It was supported by technology and innovation capability, financial capability and HR management capability.

- Geographical scope diversification did not contribute to sales growth and profit growth. But it was supported by marketing capability and reputation/brand.

Figure 7.1 The Revised Research Model

Implications:

The results indicated that, in order to improve and sustain their international performance, CCFs should pursue cost leadership and differentiation strategies to compete internationally. For those sales-oriented CCFs, they can also diversify their business scope in international markets, by participating in various types of construction projects and other related and unrelated businesses. When they pursue these strategies, the corresponding resources/capabilities that favour these strategies should be emphasized.

However, it may not be the right time for most CCFs to compete in a broad range of geographical markets. They could focus on a number of markets where they have competitive niches and expand geographical coverage gradually. With the improvement in their marketing capability and reputation, CCFs can enter more foreign markets in the future, as these two variables are the determinants of geographical scope diversification.

(2) The impact of market entry strategies on the international performance of CCFs is concluded as follows:

- Wholly-owned subsidiary strategy contributed to profit growth. It was supported by financial capability, marketing capability, HR management capability and organisational structure.
- JV strategy contributed to sales growth. It was supported by project management capability, reputation/brand and organisational culture.
- Sophisticated contracting strategy contributed to both sales growth and profit growth. It was supported by technology and innovation capability, financial capability, project management capability and reputation/brand.

Implications:

It is indicated that all these three market entry strategies are appropriate for CCFs. In particular, CCFs should shift the focus from their traditionally preferred main-contracting and subcontracting modes to sophisticated contracting modes, as the level of sophistication was proved to be positively related to both sales growth and profit growth. As the CCFs pursuing JV strategy had not achieved the expected profit growth compared to their sales growth, these CCFs should give more attention to strengthening their project management capability and nurturing their organisational culture, in order to improve operational efficiency and thus increase their profitability. On the other hand, the CCFs adopting wholly-owned subsidiary strategy achieved better profit growth than sales growth. These CCFs should put extensive effort to increase their sales volume. It also implies that CCFs might achieve better performance if the wholly-owned subsidiary and

JV strategies are pursued concurrently. When these strategies are adopted, the related resources and capabilities that support them should be strengthened.

Top management of CCFs should also pay more attention to the interaction of the generic competitive strategies and market entry strategies. For example, CCFs could first partner with their foreign counterparts to undertake projects in China. Upon building up their mutual trust and relationship, CCFs could seek the reciprocal assistance from their foreign partners to venture into their home or third country markets. Besides, forming JVs with foreign contractors specialised in different project segments could also be a good channel for CCFs to diversify their business scope. In this way, the initial investment and attendant risk arising from unfamiliarity for such projects would be minimized. Thus the flexible application of a portfolio of strategies could be an avenue for future success of CCFs in international markets.

(3) The impact of firm-specific resources/capabilities on strategies and the international performance of CCFs is concluded as follows:

Resources/capabilities – performance relationship

- Four resources/capabilities contributed to sales growth, i.e., technology and innovation capability, financial capability, marketing capability, and reputation/brand.
- Project management capability and HR management capability contributed to profit growth.
- Organisational structure and culture were not confirmed to be significantly related to sales growth and profit growth.

Resources/capabilities – strategies relationship

- Technology and innovation capability contributed to three strategies: differentiation, business scope diversification, and sophisticated contracting.
- Financial capability contributed to four strategies: differentiation, business scope diversification, wholly-owned subsidiary, and sophisticated contracting.

- Marketing capability contributed to geographical scope diversification and wholly-owned subsidiary strategies.
- Project management capability contributed to four strategies: cost leadership, differentiation, JV, and sophisticated contracting.
- HR management capability contributed to three strategies: cost leadership, business scope diversification, and wholly-owned subsidiary.
- Reputation/brand contributed to four strategies: differentiation, geographical scope diversification, JV, and sophisticated contracting.
- Organisational structure contributed to cost leadership and wholly-owned subsidiary strategies.
- Organisational culture only contributed to JV strategy.

Based on the above results, these firm-specific resources and capabilities are classified into five groups according the number of strategies and the performance they supported, as shown in Table 7.1.

Table 7.1 Classification of Firm-Specific Resources and Capabilities Based on Their Contribution to Strategies and Performance

Group	Firm-specific Resources and Capabilities	Number of Strategies Supported	If Performance is Supported
1	<ul style="list-style-type: none">• Financial capability• Project management capability• Reputation/brand	4	Yes
2	<ul style="list-style-type: none">• Technology and innovation capability• HR management capability	3	Yes
3	<ul style="list-style-type: none">• Marketing capability	2	Yes
4	<ul style="list-style-type: none">• Organisational structure	2	No
5	<ul style="list-style-type: none">• Organisational culture	1	No

Implications:

The results show that these firm-specific resources and capabilities have different importance due to their contribution to strategies and performance. As indicated, financial capability, project management capability and reputation/brand show the greatest importance, followed by technology and innovation capability and HR management capability. Marketing capability shows a moderate importance. Organisational structure and culture show less importance and just indirectly contributed to performance through their influence on related strategies.

Top management of CCFs should give first priority to cultivate the fundamental firm-specific resources and capabilities, as these variables could directly or indirectly influence their international performance. At the same time, the top management should synthesise the “outside-in” and “inside-out” approaches for the ISM of their firms. The cultivation of resources and capabilities should consider the strategy selection, as different strategies are supported by different resources and capabilities. Conversely, the strategy selection should also consider firm’s actual possession of resources and capabilities. Some top managers prefer to use the “outside-in” approach, whereas others tend to pursue the “inside-out” approach. Regardless of whichever approach is preferred, these preferences do not strictly conflict with the relationships among various variables in Figure 7.1.

Some variables and relationships in the hypotheses were not supported by the testing results. However, it is prudent for the management of CCFs to monitor them. Such relationships could change over time, as often time they are situation-oriented. For example, cost leadership might not be so important in future, with the gradual erosion of CCFs’ comparative cost advantage; each of the eight firm-specific resources and capabilities could become a complementary strength of one firm over another, favouring a JV strategy.

7.3 Limitations and Recommendations for Future Research

There are some limitations in terms of the scope of this research, which lead to the recommendations for others to research in future. These limitations and recommendations are discussed next.

This research focuses on large CCFs and in particular SOEs. However, the number of large private CCFs has been increasing. Private CCFs are very active in the home market. They have evident advantages in numerous aspects, such as a more flexible management system and progressive corporate culture over SOEs. A number of large private CCFs have also begun to participate in international construction, such as Guangsha Group and Baoye Corporation. They are expected to assume an important role in the international arena in future. Thus, the study of the ISM of private CCFs warrants future research. Besides, construction SMEs, especially those specialised contractors, might also begin to internationalise due to the intense competition at home. They would adopt different strategies to excel. The ISM of construction SMEs can also become a future research area.

The external environment was descriptively studied in this research. It could also be studied through quantitative research method in future. One example is Li (1998), who used quantitative research method to examine the relationships among marketing strategies, environmental determinism and new venture performance in China. In particular, Chinese government support/policies as an important environmental factor should warrant more attention. The Chinese government is both the legislator and the shareholders of SOEs. Its influence is substantial in promoting the internationalisation of CCFs (Fox et al. 1999). Future research on the related support/policies from the Chinese government is therefore strongly suggested.

The questionnaire survey mainly targeted CCFs. In fact, opinions of project owners, government officials, design and consulting firms, and related researchers would also be valuable. As non-contractors, these firms/professionals would be able to provide a more objective view about key strategies and firm-specific resources/capabilities that would

lead to the international competitiveness of CCFs. In future research, it would be good to sample opinions from these parties.

The hypothesis testing results were based on the current status of CCFs and their international performance for the past three years. Due to the dynamic nature of the measures for the research variables, future research is required to constantly update the conceptual model to reflect the new circumstances when situation changes.

This research examined the inter-relationships among research variables. In fact, there should be certain 'intra-relationships' within the resource/capability variables and strategy variables. For example, an effective organisational structure may influence project management capability; strong project management capability may lead to good reputation; differentiation strategy may be strongly related to sophisticated contracting strategy as they were proved to be supported by the same resources/capabilities; etc. These 'intra-relationships' deserve future research.

In this study, only the selected market entry strategies were studied. Other entry modes could also become more important to CCFs, such as M&A. Western contractors have been treating M&A as an important entry mode. A number of large CCFs have also executed M&As within Chinese enterprises over the past few years. Several M&A transactions are successful in enhancing the international competitiveness of CCFs. This phenomenon tends to continue under the guidance of the Chinese government. Thus, M&A strategy should be considered in future research.

In summary, this research provides overall guidelines for CCFs to understand their international strategic position and external environments, to know the major ISM aspects to be emphasized, and what strategies and firm-specific resources and capabilities are critical for improving their international performance. Corporate managers of CCFs should take further actions to formulate concrete strategies from a long-term strategic management perspective, by considering these guidelines, other strategic management knowledge, and their firms' specific status.

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APPENDICES

Appendix 1 Summary of Chinese Research on the ISM of CCFs from IEC and IPCLS

Appendix 2 How the Top International Contractors Shared the 2004 Market

Appendix 3 Where ENR Top 225 International Contractors Were Working in 2003

Appendix 4 Questionnaire

- Appendix 4a Questionnaire (English Version)
- Appendix 4b Questionnaire (Chinese Version)

Appendix 1 Summary of Chinese Research on the ISM of CCFs from IEC and IPCLS

IEC		IPCLS
Environment		
Environmental/Industry analysis	(see the last page)	(see the last page)
Culture (National)	Huang L (2002.4)	Zhang HS(2005.7), Wei M(2005.5), Zhang ZH(2005.4), Zhang HS(2005.4)
WTO impact	Hao ZJ (2002.10), Liu XY (2002.2)	Jin Y(2005.1)
Security (including anti-terror)	Xu HX (2004.10), Jin Y (2004.10)	Zhou KX(2005.4), Shang H(2004.12), Qian WY(2004.12), Zheng ZQ(2004.12), Feng SZ(2004.12)
Leadership and organisation		
Internal coordination (HQ-subsidary relationship)	Jin G (2003.5), Liu XR (2003.8), Yu SX (2002.11), Zheng C (2004.1), Hu JH (2004.8), Hu JH (2004.1), Lu WY (2002.8), Yu SX (2002.3)	Sun WJ(2005.7)
Decision making	Zheng C (2004.1), Zhang HS (2002.10), Li LZ (2003.2)	Sun WJ(2005.7), Zhang XL(2004.7)
Structure	Fu YW (2004.6), Zhao QX (2004.5), Sun WJ (2004.4), Xie and Zhang (2004.3), Hu JH (2004.1), Sun WJ (2003.10), Lu GJ (2003.10), Liu JM (2003.8), CNME (2003.8), Jin G (2003.5), Li LZ (2003.2), Yu SX (2002.11), Wang J (2002.11), Hao ZJ (2002.10), Zhang HS (2002.10), Ma YL (2002.8), Lu WY (2002.8), Zhu et al (2002.7), Zhou XL (2002.7), Li H (2002.6), Shao XL (2002.3), Wang O (2002.2)	Sun WJ(2005.7), Chen QT(2005.6), Huang W(2005.5), Yang QX(2005.1), Xing HY(2005.1), An R(2005.1), Xiao GP(2004.12), Wang and Ren (2004.11), Ma and Xie (2004.6), Ren W(2003.11)
The reform/restructuring on SOEs: establish "modern enterprise system (MES)" - ownership diversification (shareholding structure), formalisation, and others	Yang QB (2004.10), An ZJ (2003.1), Xu ZM (2002.3)	Zhang YF(2003.9)
Culture		

Strategy

Enterprise strategy (social issues)

Social responsibility

Corporate strategy

Business diversification

M&A

Business strategy

Generic competitive strategy

Strategic alliances

Market entry

Contracting mode analysis or selection

Comparison of contracting modes

EPC

BOT

PM

PPP, PFI

ADB-sponsored projects
Public projects

Ge SQ and Li CB (2003.9)

Hu JH (2004.8), Sun WJ (2003.10), Zhu et al (2002.7), Li H (2002.6)

Kou LL (2005.1), Wang J (2002.11), Qian ZQ (2005.1), He FH (2004.11), Xing HY (2004.4), Shao XL (2002.3)

Zhang HY (2005.1), Sun WJ (2003.10), Xing HY (2004.4)

Hu JH (2004.8), Yao XC (2004.8), Zhao QX (2004.5), Liu JP (2004.1), Fu YW (2004.6), Huo JJ (2004.4), CNME (2003.8), Hao ZJ (2002.10), Hu JH (2002.8), Li H (2002.6), Shao XL (2002.3), Ji J (2004.4), Lu GJ (2003.10), Tian W (2003.4), Xing HY (2004.1), Fu YW (2004.6), Zheng C (2004.1), Wang Q (2002.2), Zhang HS (2002.10)

Liu and Ren (2003.8); Ji J (2004.4)

Meng and Zhao (2004.12), Meng et al. (2004.11), Cai CS (2004.9), Tian W (2004.7), Tian W (2003.11), Zhang and Zhang (2003.10), Wang Y (2003.5), Yao XC (2003.11), Lu TJ (2003.8), Wang L (2003.4), Shi XY (2003.4), Yan and Yuan (2003.1), Zhu HW (2002.8), Si ZR (2002.7) Qi GS (2003.7)

Che and Zhang (2002.5)

Zou and Tian (2002.2)
Li SR (2002.7)

Ouyang H(2005.3), Wang YL(2004.3), Xu SR(2003.9)

Diao CH(2005.7), CHINCA (2005.1), Wang YL(2004.3)

Fu YS(2005.9), Zi W(2005.3), Gang C(2005.9)

Liu ZG(2005.3), Xue ZY(2003.9), Zhou and Yan (2003.9), Lu et al.(2003.7), CHINCA(2003.2), Sun WJ(2005.7), Wang and Song (2005.2), Lu et al.(2003.7), CHINCA(2003.2)

Tan X(2005.9), Xu SR(2005.9), Lu YJ(2005.9), Gang C(2005.9), Li JF(2005.7), CHINCA (2005.1), Zheng WX(2005.8)

Yang DL(2005.7), Liu ZG(2005.5), Yuan and Yan (2005.4), Tian W(2004.11), Chen and Hua (2003.8),

Ye SD(2005.6), Tan X(2005.6), Wang SQ(2005.6), Xu SR(2005.4), Ou XM(2005.4), Liu and Zhang (2005.4), Zhou and Yang (2005.2), Wang SQ(2004.9), Peng M(2003.7) Huang DZ(2005.11), Tan JY(2003.12)

Ye SD(2005.6), Yan Z(2005.6), Wang SQ(2005.6), Huang and Sun (2005.5), Xu SR(2005.4), Chen LQ(2005.4)

Marketing strategy		
Strategic market selection - top management's overall guidance	CNME (2003.8), Li H (2002.6)	Sun TL(2003.3)
Engage marketing professionals	Zheng C (2004.1), Shao XL (2002.3)	Sun TL(2003.3)
Exploit information channels		
Financing strategy		
Cooperation with banks and financial institutions	Liu JP (2004.1), Zhang HS (2002.10), Lu HL (2005.1)	Wang ZM(2005.5), Ren W(2005.5), Hao P(2004.11), Zhou and Yan (2003.9), Xu LF(2003.7), CHINCA(2003.2), Shen GW(2004.7), Li Y (2003.3)
Public listing	Xing HY (2004.4), Yu SX (2002.11), Shao XL (2002.3)	Su Y(2004.12)
Buy shares of commercial banks	Ding F (2001.1)	
Cooperation with firms from AICs	Ding F (2001.1), Zhang HS (2002.10)	Hao P (2004.11)
Localisation		
HR localisation	Shan GY (2005.1), Hu JH (2004.8), Ji J (2004.4), Liu JP (2004.1), Sun WJ (2003.10), Xia YJ (2003.6), Jin G (2003.5), Li LZ	Sun WJ(2005.7), Yan ZK(2005.3), CHINCA (2005.1), Wang and Zhang (2004.5)
Marketing localisation	Shan GY (2005.1), Hu JH (2004.8)	
Capital operation localisation including public listing overseas	Shan GY (2005.1), Jin G (2003.5)	
Manufacturing localisation	Shan GY (2005.1), Hu JH (2004.8)	
Corporate culture localisation	Shan GY (2005.1), Sun WJ (2003.10), Jin G (2003.5)	Sun WJ(2005.7)
Administration mode localisation	Sun WJ (2003.10)	Sun WJ(2005.7)
Core competency/capability (Source of competitiveness)		
Effective organisational structure	Zhao QX (2004.5), Sun WJ (2004.4), Hu JH (2004.1), Sun WJ (2003.10), Lu GJ (2003.10), Liu JM (2003.8), Wang J (2002.11), Ma YL (2002.8), Zhou XL (2002.7), Shao XL	Chen QT(2005.6), Huang W(2005.5), Xing HY(2005.1), An R(2005.1), Xiao GP(2004.12), Wang and Ren (2004.11), Ma and Xie (2004.6), Ren W(2003.11)
Technology and innovation capability (including IT application)	Zhang HY (2005.1), Fu YW (2004.6), Zheng C (2004.1), Liu JP (2004.1), Sun WJ (2003.10), Liu XR (2003.8), Lu WY (2002.8), Zhu et al (2002.7), Wang Q (2002.2), Chen TT (2002.2), Hao ZJ (2002.10)	Zhang et al.(2005.3), Xiao GP(2004.12), Ma LP(2004.7), Zhou and Yan (2003.9), Ma ZL(2005.5), Luo DL(2005.1), Shang M(2003.8)

Project management capability	Zheng C (2004.1), Zhu et al (2002.7)	Zhang et al.(2005.3), Ma LP(2004.7), Zhou and Yan (2003.9)
Special human resources and its management (including leadership)	Zheng C (2004.1), Lu WY (2002.8), Shao XL (2002.3)	Zhang et al.(2005.3), Ma LP(2004.7), Zhang XL(2004.7), Xiao GP(2004.12)
Financing capability	Zheng C (2004.1), Zhu et al (2002.7), Shao XL (2002.3), Fu YW (2004.6), Ji J (2004.4), Li LZ (2003.2), Yu SX (2002.11)	Ren W(2005.5), Zhang et al.(2005.3), Ma LP(2004.7), Zhou and Yan (2003.9), Wang ZM(2005.5), Xie YH(2004.5)
Marketing capability	Lu WY (2002.8), Chen TT (2002.2)	Ma LP(2004.7)
Reputation/branding	Shao XL (2002.3), Sun WJ (2003.10)	Liu HF(2005.11), Yang CH (2005.11), Wang ZM (2005.11), Xie FL (2005.11), Xiao GP(2004.12)
Valuable organisational culture	Lu WY (2002.8), Yang QB (2004.10), An ZJ (2003.1), Xu ZM (2002.3)	Zhang YF(2003.9)
Chinese INVs strategies ("Window-type" CCFs)	Guo H (2003.8), Chen YG (2003.6), Yang QS (2003.5), Xu SR (2003.1), Du XD (2002.9), Liu SD (2002.5)	WuLan ML(2005.9), Yang YX(2004.2), Xu LF(2003.10), Chen YG(2003.7), PuZY(2003.7), Wu HQ(2003.7), Xu JG(2003.7), Wang J(2003.1)
Functional/Operational strategy		
HR management		
HR management with humanity		Ren W(2004.8), Chen et al.(2004.8), Wang W(2004.8), Zhao H(2004.8), Ba QH(2004.4)
Different HR management methods for various phases of internationalisation	Qiu and Wang (2002.12), Hao ZJ (2002.10)	
System reform, cultivate talents for international business	Liu JM (2003.8), Hu JH (2002.8), Zhu et al (2002.7), Li H (2002.6), Sun and Sun (2002.5), Wang Q (2002.2)	Yan ZK(2005.3), CHINCA (2005.1), Chen ZY(2005.1), Ren W(2004.8), Zhu Q(2004.8), Ba QH(2004.4), Wu T(2003.12), Wang JR(2003.5)
Reward system for preventing talents 'creaming off'	Zheng Q (2004.7), Sun WJ (2004.4), Zheng C (2004.1), Li LZ (2003.2), An ZJ (2003.1), Hao ZJ (2002.10), Li H (2002.6)	Yan ZK(2005.3), Ren W(2004.8), Zhu Q(2004.8), Ba QH(2004.4), Zhou and Yan (2003.9)
Global transfer		Yan ZK(2005.3),
Team working	Zheng Q (2004.7), Sun WJ (2003.10), Hu JH (2002.8)	Yan ZK(2005.3), Ren W(2004.8), Zhu Q(2004.8)
Manage 'Culture Shock'	Huang L (2002.4)	
Enhance management of key expatriate managers	Li and Zhang (2004.12)	Wang and Zhang (2004.5), Zhuang W(2003.12), Zhou and Yan (2003.9)

Training	Zheng Q (2004.7), Fu YW (2004.6), Sun WJ (2003.10), Liu JM (2003.8), Lian K (2003.7), Li LZ (2003.2), An ZJ (2003.1), Zhang HS (2002.10), Liu SD (2002.8), Hu JH (2002.8) An ZJ (2003.1), Shao XL (2002.3)	Yan ZK(2005.3), Ba QH(2004.4)
Expand channels of recruitment		Sun WJ(2005.7), Yan ZK(2005.3) Song YL(2005.4), Sun ZM(2005.3), Shi S(2005.7), Sun ZM(2005.2), Sun ZM(2004.6), Zhang YF(2004.4), Liu SD(2004.1), Zhou WL(2003.10) Qiu CJ(2005.2)
Labour management		Luo and Qing (2005.10), Zhou and Yan (2003.9)
Technology Management	Li and Zhu (2004.12)	
Improve technological capability	Hu JH (2004.8)	
R&D on new technology and material	Zhao QX (2004.5), Liu JM (2003.8), Li LZ (2003.2)	
and its application		
Variation through construction method improvement	Li and Zhu (2004.12)	
Marketing/Tendering		Li ZF(2005.8), Wang and Peng (2005.2), Yu Z(2005.1), Shao and Yang (2005.1), Ma LP(2004.8), Liu N(2004.7), Zhou Y(2004.6), Wang and Yuan(2004.3), Song DS(2004.2), Lu B(2004.1), Song DS(2003.11), Lu B(2003.10), Li HL(2003.9), Yan et al.(2003.4), Wang XG(2003.3), Ma L(2003.2), Hu Yang and Jin (2003.2)
Tendering and negotiation skills	Zhu H (2005.1), Zhang and Xu (2004.4), Liu SD (2002.6), Wang DH (2002.3)	
The importance of project feasibility or pre-bid study	Ji J (2004.4), Gong HM (2003.8)	
Labour export		Ning S(2005.11), Luo LC(2005.9), Fu HP(2005.8), Xu W(2005.8), Cui CL(2005.7), Zhang YF(2005.3), Zhang YF(2005.3), Yan Z(2005.3), CHINCA (2005.1), Diao CH(2004.12), Liu and Liang (2004.11), Diao CH(2004.9), Xin and Fu (2004.9), Luo LC(2004.8), Deng J(2004.8), Mu R(2004.6), Liu Y(2004.6), Zhang KH(2004.5), Sun ZM(2004.4), Xu and Li (2004.4), Zhou LM(2004.1), Zhang KH(2004.1), Diao CH(2003.11-12), Zhao and Xu (2003.10), Liu and Tan (2003.10), Zhang YF(2003.8), Zhang KH(2003.8), Sang Q(2003.7), Zhou M(2003.5), Huang B(2003.4), Zhang ZM(2003.3), Lu and Zheng (2003.3), CHINCA(2003.2)

Control and accounting	Li WP (2004.5), Liu JM (2003.8)	Ning S(2005.11), Luo LC(2005.9), Fu HP(2005.8), Xu W(2005.8), Cui CL(2005.7)
Cost control	Yuan SY (2004.6), Zhang SP (2004.5), Ji J (2004.4), Liu XR (2003.8), Hao ZJ (2003.7), Hao ZJ (2002.10), Wang DH (2002.5), Shao XL (2002.3)	Yuan and Yan (2005.4), Liang XY(2004.12), Wu ZX(2004.6), Liu and Qi (2004.2), Liu YJ(2003.12), Liu JX(2003.11), Liu and Liang(2003.8)
Progress control	Yuan SY (2004.6), Liu SD (2002.8), Yao XC (2002.7)	
Project planning	Qi W (2003.6), Liu SD (2002.8)	
Quality management	Yuan SY (2004.6), Li TC (2004.6)	
Management in accounting and tax	Peng T (2004.5), Liu XR (2003.8), Liu XR (2003.6)	Li TC(2004.7), Cao SS(2004.7), Zhang XD(2004.1), Jiang and Qin(2003.4)
Information management	Jin XC (2004.2)	Jiang XY(2005.10), Tang J(2004.1), Liu YZ(2004.1), Liu XR(2003.5), Tai QL(2003.4)
Project Risk Management	Meng and Zhao (2004.12), Cai CS (2004.9), Shen GW (2004.6), Zheng C (2004.1), Zhang and Zhang (2003.10), Wang Y (2003.5), Yan and Yuan (2003.1), Zhang HS (2002.10), Zhu et al (2002.7), Zhu H (2002.3), Jin and Li (2002.3)	Wang Y(2005.11), Qiu LX(2005.2), Yang NB(2004.4), Liu and Hua(2004.3), Liu and Liao (2003.5), Ma ZL(2003.5), Tan Y(2003.5), Zhang HY(2003.5), Yang FC(2003.5), Zhang and Jiang (2003.2)
Contract Documentation & Management	Meng and Zhao (2004.12), Yang QS (2004.6), Meng and Zhou (2004.4), Meng and Zhou (2004.2), Meng and Zhou (2003.12), Tian W (2003.11), Zhang and Zhang (2003.10), Li and Lin (2003.6), Wang Y (2003.5), Shi XY (2003.4), Huang M (2003.4), Ma Z (2003.2), Wang XG (2003.2), Hao ZJ (2002.10), Zhu H (2002.8), Zhang and Zhang (2002.7), Zhu H (2002.4), Sun YH (2002.4), Wang and Jiang (2002.2), Cheng and Zhu (2002.2), Fang ZD (2002.1), Hong JL (2002.1)	Si ZR(2005.11), Wang YH(2005.10), Wang N(2005.10), Wang and Yu(2005.10), Yu SR(2005.9), Luo HY(2005.9), Zhu and Zhu(2005.8), Huang JM(2005.8), Tan X(2005.6), Liu YJ(2005.6), Mu G(2004.12), Hao P(2004.11), Chen and Yang (2004.11), Jian ND(2004.9), Liu YJ(2004.9), Wang L(2004.7), Wu XM(2004.7), Qiu JX(2004.7), Li YN(2004.4), Xu LF(2003.11), Li WJ(2003.8), Wang J(2003.8), Wang JP(2003.8), Peng M(2003.7), Wang JP(2003.4)

Relationship Management	Wang and Wang (2004.1)	Si ZR(2005.11), Luo DL(2005.10), Yu SR(2005.9), Li and Tong (2005.8), Tan JY(2005.6), Wu T(2005.5), Zhang L(2005.5), Wang and Song (2005.2), Zhou and Yang (2005.2), Yao SG(2004.12), Chen and Yang (2004.11), Zhou Y(2004.6), Jian YX(2004.6), Zhang CW(2004.5), Shen FT(2004.4), Zhang Q(2004.4), Zhou Y(2004.4), Wang SF(2004.3), Zhao QX(2004.3), Qi et al.(2004.2), Wang SB(2004.2), Zhang XD(2004.1), Tan JY(2003.12), Song DS(2003.11), Li Y(2003.8), Tan Y(2003.8), Gong HM(2003.5), Yan et al.(2003.4), Cong and Yu (2003.3), Ren W(2003.2), Zheng ZH(2003.2), Jiang SG(2003.1),
Project case analysis		
Public/government policy	Xing HY (2004.8), Wu XL (2004.4), Zheng C (2004.1), Qin and Li (2003.7), Wang and Yue (2003.4), Jiang and Liu (2002.4), Xu DS (2002.4), Xu DS (2002.4), Wang Q (2002.2)	WuLan ML(2005.9), Wu XL(2003.10)
Laws, rules and regulations		
Financial support	Li ZY (2004.9), Wu XL (2004.4), Zheng C (2004.1), Sun WJ (2003.10), Qin and Li (2003.7), Wang and Yue (2003.4), Jiang and Liu (2002.4), Wang Q (2002.2), Li and Deng (2005.1), Shen GW (2004.6), Wang J (2002.11), Xu DS (2002.4)	WuLan ML(2005.9), Diao CH(2005.7), Chen QT(2005.6), Ren W(2005.2), Yin XY(2005.2), CHINCA (2005.1), Li ZY(2004.5)
Guidance for restructuring and M&As among domestic enterprises	Kou LL (2005.1), Zheng C (2004.1), Chen TT (2002.2)	Chen QT(2005.6), CHINCA (2005.1), Li ZY(2004.5),

Enhancing the coordination and supervision role of Chinese government agencies	Li ZY (2004.9), Wu XL (2004.4), Diao CH (2004.2), Zheng C (2004.1), Qin and Li (2003.7), Jiang and Liu (2002.4), Wang and Yue (2003.4)	WuLan ML(2005.9), Diao CH(2005.7), Chen QT(2005.6), Ren W(2005.2), Yin XY(2005.2), CHINCA (2005.1), Li ZY(2004.5), Diao CH(2004.3), Wu XL(2003.10), Wang JR(2003.9), Zhang Y(2003.9), Ren W(2003.1)
Strengthen multilateral cooperation to create more opportunities	Wang Z (2004.10), Wu XL (2004.4), Ji J (2004.4), Xu DS (2002.4), Li ZY (2004.9)	Chen QT(2005.6), Li GH(2004.9), Li ZY(2004.5)
Role as information provider	Li ZY (2004.9), Wu XL (2004.4), Qin and Li (2003.7), Wang and Yue (2003.4)	Chen QT(2005.6), Li ZY(2004.5)
Simplify all kinds of government approval procedures	Sun WJ (2003.10), Wang and Yue (2003.4), Xu DS (2002.4)	WuLan ML(2005.9), Chen QT(2005.6)
Establishing "clusters" among CCFs		CHINCA (2005.1)
Performance		
Relevant performance	Jin Y (2004.10), Jin Y (2004.8), Yang ZP (2004.2), Tong JS (2003.12), Jin Y (2003.8), Jin Y (2003.7), Yang JR (2003.2), Xing HY (2002.6)	Zhu and Zhu (2005.8), Tan JY(2005.6), Huang W(2005.5), Jiang and Yang (2005.5), Zhang L(2005.5), He Z(2005.3), CHINCA (2005.1), Cao HX(2004.11), An R(2004.9), Shi J(2004.6), Sun WJ(2004.5), An and Tan (2004.4), Jin Y(2004.3), Zhang X(2004.3), Ren W(2004.2), Zhou LM(2004.1), Gong HM(2004.1), Ai YF(2004.1), An R(2003.11), Zhong H(2003.9), Zhong H(2003.9), Jin D(2003.9), Wang and Li(2003.9), Liu and Tan(2003.9), Xu GL(2003.9), Zhou and Yan (2003.9), Sun Y(2003.4), Li CT(2003.4), CHINCA (2003.4), CHINCA(2003.2), Sun WJ(2003.1)

Environmental/ Industry analysis	IEC	Jin Y (2004.10), Jin Y (2004.8), Fu YW (2004.6), Tang DM (2004.6), Shi X (2004.4), Yuan CH et al.(2004.4), Ji J (2004.4), Jing SC (2004.4), Zhang YJ (2004.3), Yang ZP (2004.2), Tong JS (2003.12), Zhang XY (2003.8), Jin Y (2003.8), Jin Y (2003.7), He S (2003.3), Han XS (2003.3), Yang JR (2003.2), Lin XX (2002.10), Liang GN (2002.10), Huang ZQ (2002.8), Xing HY (2002.6), Guo H (2002.4)
	IPCLS	Jin YJ(2005.11), Zheng WX(2005.11), Zhao X(2005.11), Wang LH(2005.11), Liu and Wang (2005.11), An M(2005.10), Wu CB(2005.10), Hu SX(2005.10), Niu XM(2005.10), Zhao X(2005.10), An R(2005.10), Sun ZM(2005.10), Fu YS(2005.9), An X(2005.9), Yang B(2005.9), Wang LH(2005.9), Niu XM(2005.8), Yang B(2005.8), Diao CH(2005.7), Tan SF(2005.7), Ye H(2005.7), Wang LH(2005.7), Tang DM(2005.6), Liu J(2005.6), Niu XM(2005.5), Liu W(2005.5), Wu CB(2005.5), Sun ZM(2005.4), Liu W(2005.4), Jin XJ(2005.4), Tan X(2005.3), Wang YL(2005.3), Lu B(2005.3), Hao B(2005.3), Niu XM(2005.2), Liu MQ(2005.2), Yang B(2005.2), Jiang ZB(2005.2), Mou R(2005.2), CHINCA (2005.1), Wang JG(2005.1), Wu and Zhang (2005.1), Ye H(2005.1), An R(2005.1), Gai WL(2004.12), Mou R(2004.12), Yang XG(2004.12), Wu WH(2004.11), Yuan PH(2004.11), Wu FG(2004.11), Li B(2004.11), An R(2004.9), Li XG(2004.9), Tan X(2004.9), Xin and Fu (2004.9), Fu YW(2004.9), Wang YK(2004.9), Mou R(2004.8), Hu YT(2004.8), Ai YF(2004.8), Sun ZM(2004.8), Ai YF(2004.7), Xie GX(2004.7), Lu B(2004.7), CHINCA(2004.6), Liu YJ(2004.6), Chou N(2004.6), Zhang WC(2004.6), Du P(2004.5), Tan X(2004.5), Wang TH(2004.5), Bian YL(2004.5), Ren W(2004.4), Shi HQ(2004.4), Wang CB(2004.4), Niu XM(2004.4), An BJ(2004.4), Zi W(2004.4), Jin Y(2004.3), Jin XJ(2004.3), Niu XM(2004.3), Liu YM(2004.3), Zhang ZW(2004.3), Yan HF(2004.3), Wang YL(2004.2), Wang LJ(2004.2), Xu GM(2004.2), Liu YM(2004.2), Niu XM(2004.2), Jin G(2004.1), Ai YF(2004.1), Bao YH(2004.1), Li S(2004.1), Bao YH(2003.6-12), Xu GL(2003.12), Niu XM(2003.11), Sun ZM(2003.10-11), Wu XL(2003.10), Jiang YW(2003.10), Liu MQ(2003.8), Chen and Xue (2003.7), Chen J(2003.7), Guo W(2003.7), Sun ZM(2003.5), Sun Y(2003.4), Li CT(2003.4), Wei H(2003.4), Xu SR(2003.4), Zhou P(2003.4), Zhang H(2003.3), Liu MQ(2003.3), CHINCA(2003.3), Xie HD(2003.3), Li SS(2003.2), Liu MQ(2003.1), Lu B(2003.1)

Note: IEC - International Economic Cooperation Magazine
IPCLS - International Project Contracting and Labour Services Magazine
Source: IEC (2002-2004); IPCLS (2003-2005)

Appendix 2 How the Top International Contractors Shared the 2004 Market

Contractor	No. of Firm	Int'l Billings		Middle East		Asia		Africa		Europe		U.S.		Canada		Latin America/Caribbean	
		\$ mil.	%	\$ mil.	%	\$ mil.	%	\$ mil.	%	\$ mil.	%	\$ mil.	%	\$ mil.	%	\$ mil.	%
Nationality																	
AMERICAN	55	32299.2	19.3	11,873.9	46.7	2,677.1	8.8	1,976.6	13.8	9,850.7	16.3	NA	NA	3,476.4	70.1	2,444.5	27
CANADIAN	4	294.3	0.2	27.9	0.1	25.5	0.1	0.5	0	17.4	0	223.0	1	NA	NA	0	0
EUROPEAN	56	99672.4	59.6	7,224.3	28.4	11,644.5	38.2	7,129.5	49.9	46,375.7	77	20461.0	89.8	1,483.8	29.9	5,353.6	59.1
British	5	10015.4	6	691.0	2.7	1,556.4	5.1	406.2	2.8	3,974.9	6.6	3299.0	14.5	72.0	1.5	16.0	0.2
German	6	18599.4	11.1	199.7	0.8	7,188.4	23.6	715.1	5	2,969.9	4.9	7295.6	32	27.1	0.5	203.7	2.2
French	8	25668.8	15.3	1,738.6	6.8	1,741.3	5.7	3,527.4	24.7	13,966.7	23.2	2968.0	13	916.0	18.5	810.7	9
Italian	12	6682.4	4	1,970.3	7.8	317.6	1	1,294.1	9.1	1,220.5	2	317.7	1.4	0.0	0	1,562.3	17.3
Dutch	2	4983.0	3	0	0	0	0	2.0	0	4,619.0	7.7	358.0	1.6	4.0	0.1	0.0	0
Spanish	7	8742.7	5.2	381.9	1.5	138.0	0.5	347.9	2.4	4,937.1	8.2	232.1	1	353.4	7.1	2,352.3	26
Other European	16	24980.8	14.9	2,243.0	8.8	702.8	2.3	836.8	5.9	14,687.5	24.4	5990.7	26.3	111.4	2.2	408.6	4.5
JAPANESE	18	14555.1	8.7	2,486.7	9.8	7,384.5	24.2	778.0	5.4	2,023.7	3.4	1697.0	7.4	1.4	0	183.8	2
CHINESE	49	8829.1	5.3	1,034.1	4.1	5,112.8	16.8	2,106.8	14.7	255.2	0.4	174.4	0.8	0	0	145.8	1.6
KOREAN	8	3076.2	1.8	911.1	3.6	1,454.8	4.8	643.3	4.5	27.1	0	19.6	0.1	0	0	20.3	0.2
TURKISH	14	2178.1	1.3	456.7	1.8	527.1	1.7	284.6	2	909.8	1.5	0	0	0	0	0	0
ALL OTHERS	21	6337.4	3.8	1,400.6	5.5	1,639.0	5.4	1,364.5	9.6	806.3	1.3	220.4	1	0.9	0	905.7	10
ALL FIRMS	225	167241.9	100	25,415.4	100	30,465.3	100	14,283.8	100	60,265.9	100	22795.4	100	4,962.6	100	9,053.6	100

Source: ENR (2005)

Appendix 3 Where ENR Top 225 International Contractors Were Working in 2003

Country/Region (Nos of all ICs)	Nos of CCFs	Country/Region (Nos of all ICs)	Nos of CCFs	Country/Region (Nos of all ICs)	Nos of CCFs
North America		Netherlands (30)	0	Papua New Guinea (10)	3
Canada (50)	1	Norway (11)	0	Philippines (47)	8
United States (45)	7	Poland (33)	1	Singapore (58)	12
		Portugal (25)	0	Sri Lanka (16)	4
Caribbean Islands		Romania (25)	1	Taiwan (39)	2
Greater Antilles (21)	1	Russia (41)	3	Tajikistan (2)	0
Puerto Rico (24)	0	Slovakia (11)	0	Thailand (44)	6
Cuba (11)	5	Slovenia (3)	0	Turkmenistan (7)	0
Lesser Antilles (24)	2	Spain (29)	0	Uzbekistan (11)	2
		Sweden (12)	0	Vietnam (40)	10
		Switzerland (18)	0		
Latin America		Ukraine (14)	1	North Africa	
Argentina (19)	1	United Kingdom (49)	2	Algeria (27)	3
Bolivia (11)	0	Yugoslavia (former) (6)	1	Egypt (36)	2
Brazil (33)	0			Ethiopia (15)	5
Chile (23)	0	Middle East		Libya (28)	4
Colombia (11)	1	Afghanistan (11)	2	Morocco (19)	3
Costa Rica (8)	0	Bahrain (9)	0	Niger (3)	2
Ecuador (10)	1	Cyprus (4)	1	Somalia (0)	0
El Salvador (4)	0	Iran (33)	13	Sudan (16)	12
Guatemala (7)	0	Iraq (18)	4	Sub Sahara (17)	3
Guyana (1)	0	Israel (12)	3	Tunisia (13)	3
Honduras (11)	0	Jordan (11)	1		
Mexico (41)	1	Kuwait (21)	4	Central South Africa	
Nicaragua (4)	0	Lebanon (10)	0	Angola (20)	4
Panama (9)	0	Oman (19)	1	Benin (11)	4
Paraguay (0)	0	Pakistan (26)	16	Botswana (12)	6
Peru (21)	3	Qatar (32)	1	Burkina Faso (6)	1
Suriname (6)	2	Saudi Arabia (50)	5	Burundi (2)	2
Uruguay (4)	0	Syria (3)	0	Cameroon (18)	3
Venezuela (29)	4	Turkey (20)	1	Cape Verde Isl. (0)	0
		U.A.E. (44)	7	Congo Democr.(Zaire) (5)	4
Europe		Yemen (9)	1	Congo Republic (9)	3
Albania (5)	1			Gabon (7)	3
Armenia (2)	1	Asia/Australia		Gambia (0)	0
Austria (17)	0	Australia (30)	1	Ghana (17)	3
Azerbaijan (12)	0	Bangladesh (21)	11	Guinea (19)	5
Belgium (25)	0	Brunei (3)	0	Ivory Coast (8)	3
Belarus (0)	0	China (P.R.C.) (53)	0	Kenya (12)	5
Bosnia & Herz. (6)	0	Diego Garcia (2)	0	Lesotho (7)	2
Bulgaria (15)	0	Hong Kong (47)	15	Liberia (0)	0
Croatia (9)	0	India (38)	3	Malawi (4)	1
Czech Republic (24)	0	Indonesia (47)	6	Mozambique (15)	2
Denmark (16)	0	Japan (20)	6	Nigeria (32)	4
Estonia (3)	0	Kazakhstan (20)	2	Rwanda (4)	1
Finland (9)	0	Korea, South (21)	1	Senegal (9)	2
France (24)	1	Korea, North (3)	0	Sierra Leone (5)	2
Georgia (6)	1	Kyrgyzstan (4)	3	South Africa (22)	2
Germany (38)	3	Laos (19)	10	Swaziland (4)	0
Greece (20)	1	Macau (13)	10	Tanzania (15)	7
Hungary (21)	0	Malaysia (52)	9	Uganda (14)	3
Ireland (26)	0	Mongolia (10)	6	Zambia (16)	11
Italy (30)	1	Myanmar (10)	8	Zimbabwe (9)	5
Latvia (4)	0	Nepal (11)	4		
Lithuania (6)	0	New Zealand (11)	0	Antarctic/Arctic	
FYR Macedonia (3)	1	Pacific Islands (19)	2	antarctic/ arctic (3)	0
Moldova (2)	0				

Note: ICs denotes international contractors

Highlighted markets denote that more than three CCFs were working there.

Source: ENR (2004)

Questionnaire Survey on International Strategic Management of Chinese Construction Firms (CCFs)

Dear Sir/ Madam,

This survey is conducted by a PhD candidate from School of Civil and Environmental Engineering, Nanyang Technological University, Singapore. The main objective of this survey is to examine the international performance and strategies of Chinese international contractors.

Experiential knowledge is vital for this research. As a reputed expert in construction management area, you are cordially invited to share your valued experience. Your participation in this survey must therefore lead to meaningful results. The information you provide will be kept in strict confidence, and will only be used for academic purposes. Moreover, an overall summary of consolidated results will be disseminated to interested parties with a view to improving firm's strategic management. If you would like a summary of the survey findings, please fill the reply slip below and return it with the completed questionnaire.

Completing the survey will take 10-15 minutes of your valuable time, and I thank you for taking the time to participate in the survey.

Yours sincerely,

Liu Guozhi
School of Civil and Environmental Engineering
Nanyang Technological University, Singapore

.....
☐ Please let me have a summary of the survey findings.

Telephone/Handphone:

Fax:

E-mail:

Appendix 4a - Questionnaire (English Version)

1. General Information (requested for survey sample profiling purposes only):

Designation of Respondent:

Firm Type: ☐ Building Construction -- ☐ Headquarter ☐ Subsidiary
☐ Civil Engineering Construction -- ☐ Headquarter ☐ Subsidiary

Firm Size - total number of employees in the firm:

1. <500 ☐; 2. 501-1000 ☐; 3. 1001-10000 ☐; 4. 10001-50000 ☐; 5. >50000 ☐

Years of International operation:

1. <5 ☐; 2. 6-10 ☐; 3. 11-15 ☐; 4. 16-20 ☐; 5. >20 ☐

2. International Performance

2.1 What is the average growth rate (Rs) of the international sales of your firm for the past 3 years?

1. $R_s < 10\%$ ☐; 2. $10\% \leq R_s < 20\%$ ☐; 3. $20\% \leq R_s < 30\%$ ☐; 4. $30\% \leq R_s < 40\%$ ☐;
5. $R_s \geq 40\%$ ☐

2.2 What is the average net profit growth rate (Rp) of the international business of your firm for the past 3 years?

1. $R_p < 10\%$ ☐; 2. $10\% \leq R_p < 20\%$ ☐; 3. $20\% \leq R_p < 30\%$ ☐; 4. $30\% \leq R_p < 40\%$ ☐;
5. $R_p \geq 40\%$ ☐

3. Generic competitive strategies: please rate the following generic competitive strategies.

3.1 Cost leadership strategy. Please indicate to what extent your firm emphasize the following cost factors for international competition.

Factors		1 - Not at all; 3 - Moderately; 5 - Extremely				
		1	2	3	4	5
1	Labour cost	☐	☐	☐	☐	☐
2	Material and equipment cost	☐	☐	☐	☐	☐
3	Overhead cost	☐	☐	☐	☐	☐
4	Project and operational cost control	☐	☐	☐	☐	☐
5	Ability to access low-cost resources	☐	☐	☐	☐	☐
6	Economies of scale or scope	☐	☐	☐	☐	☐
7	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Appendix 4a - Questionnaire (English Version)

3.2 Differentiation strategy. Please indicate to what extent your firm emphasize the following differentiation factors for international competition.

Factors		1 – Not at all; 3 – Moderately; 5 – Extremely				
		1	2	3	4	5
1	Quality	☐	☐	☐	☐	☐
2	Delivery time	☐	☐	☐	☐	☐
3	Attractive financing packages	☐	☐	☐	☐	☐
4	Good relationship with external parties	☐	☐	☐	☐	☐
5	Technology and innovation	☐	☐	☐	☐	☐
6	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

3.3 Geographical scope diversification. Please indicate the number of international markets (countries or regions) your firm operates in.

1. ≤ 3 ☐; 2. 4-6 ☐; 3. 7-10 ☐; 4. 11-15 ☐; 5. > 15 ☐

3.4 Business scope diversification. Please indicate the number of trade sectors that your firm is involved in international markets, such as building projects, transportation projects, harbour projects, metallurgical projects, oil and gas projects, water and sewage treatment projects, material or equipment manufacturing/supply, real estate development, resource exploitation, and other unrelated businesses.

1. 1 ☐; 2. 2-3 ☐; 3. 4-5 ☐; 4. 6-7 ☐; 5. > 7 ☐

4. Market entry strategies: Please rate each of the following market entry modes that your firm adopted in international markets.

4.1 Wholly owned subsidiary mode

What is the average percentage (P) of your firm's international business which was carried out by sole operation in the past three years?

1. $P < 20\%$ ☐; 2. $20\% \leq P < 40\%$ ☐; 3. $40\% \leq P < 60\%$ ☐; 4. $60\% \leq P < 80\%$ ☐;
5. $80\% \leq P < 100\%$ ☐

Appendix 4a - Questionnaire (English Version)

4.2 Joint Venture (JV) mode

Please rate the application of JV strategy of your firm for international construction in the past three years **(Select one only)**. If your firm has not adopted JV strategy yet, you need not to answer it.

- 1 – Significant decrease in international contracts by JVs ☐
- 2 – Slight decrease in international contracts by JVs ☐
- 3 – No obvious change in international contracts by JVs ☐
- 4 – Slight increase in international contracts by JVs ☐
- 5 – Significant increase in international contracts by JVs ☐

4.3 Sophisticated contracting

Project contracting modes are classified into three categories:

- (i) Sophisticated contracting modes, which include BOT, PPP and similar modes (financing-focused), CM and PM (management-focused), and EPC and D&B (Engineering-focused);
- (ii) Main contracting (construction-focused); and
- (iii) Subcontracting (construction-focused but less sophisticated)

Please indicate the application of contracting modes by your firm **(Select one only)**.

- 1 – Subcontracting only ☐
- 2 – Main contracting and subcontracting are concurrently used, with subcontracting being dominant ☐
- 3 – Main contracting and subcontracting are concurrently used, with main contracting being dominant ☐
- 4 – Main contracting and sophisticated contracting are concurrently used, with main contracting being dominant ☐
- 5 – Sophisticated contracting is the dominant contracting mode ☐

Appendix 4a - Questionnaire (English Version)

5. Firm-specific resources and capabilities: Please rate your firm on each of the following resources and capabilities.

5.1 Technology and innovation capability. Please rate your firm on each of the following variables as a potential source of competitive advantage in international markets.

Factors		1 -Lowest; 3 -Moderate; 5 -Highest				
		1	2	3	4	5
1	new materials and products	☐	☐	☐	☐	☐
2	new machinery and equipment	☐	☐	☐	☐	☐
3	new technology and techniques	☐	☐	☐	☐	☐
4	design capability	☐	☐	☐	☐	☐
5	IT application	☐	☐	☐	☐	☐
6	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

5.2 Financial capability. Please rate your firm on each of the following variables as a potential source of competitive advantage in international markets.

Factors		1 -Poor; 3 -Normal; 5 -Excellent				
		1	2	3	4	5
1	Building good relationship with banks and financial institutions	☐	☐	☐	☐	☐
2	Public-listing	☐	☐	☐	☐	☐
3	Cooperation with firms from AICs	☐	☐	☐	☐	☐
4	Strategic investment	☐	☐	☐	☐	☐
5	Financial/accounting management	☐	☐	☐	☐	☐
6	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Appendix 4a - Questionnaire (English Version)

5.3 Marketing capability. Please rate your firm on each of the following variables as a potential source of competitive advantage in international markets.

Factors		1 –Poor; 3 –Moderate; 5 - Excellent				
		1	2	3	4	5
1	Using experienced international marketing professionals	☐	☐	☐	☐	☐
2	Top management's overall guidance	☐	☐	☐	☐	☐
3	Sufficient information channels	☐	☐	☐	☐	☐
4	Promotion through various marketing channels	☐	☐	☐	☐	☐
5	Good relationship with various external parties	☐	☐	☐	☐	☐
6	Adopting internal marketing by creating an environment of employee support	☐	☐	☐	☐	☐
7	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

5.4 Project management capability. Please rate your firm on each of the following variables as a potential source of competitive advantage in international markets.

Factors		1 –Poor; 3 –Moderate; 5 - Excellent				
		1	2	3	4	5
1	Schedule/progress control	☐	☐	☐	☐	☐
2	Cost control	☐	☐	☐	☐	☐
3	Quality management	☐	☐	☐	☐	☐
4	Contract management	☐	☐	☐	☐	☐
5	Procurement management	☐	☐	☐	☐	☐
6	Safety and environmental management	☐	☐	☐	☐	☐
7	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Appendix 4a - Questionnaire (English Version)

5.5 HR management capability. Please rate your firm on each of the following variables as a potential source of competitive advantage in international markets.

Factors		1 –Poor; 3 –Moderate; 5 - Excellent				
		1	2	3	4	5
1	Training for international business	☐	☐	☐	☐	☐
2	Reward management to prevent talent poaching and build loyalty	☐	☐	☐	☐	☐
3	Level of international recruitment	☐	☐	☐	☐	☐
4	International experience and ability of expatriate managers	☐	☐	☐	☐	☐
5	Quality (job skills and international experience) of management and technical staff	☐	☐	☐	☐	☐
6	Quantity of technical and managerial staff (proportion of staff with higher education)	☐	☐	☐	☐	☐
7	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

5.6 Reputation/brand. Please rate your firm on each of the following variables as a potential source of competitive advantage in international markets.

Factors		1 –Poor; 3 –Moderate; 5 - Excellent				
		1	2	3	4	5
1	Fulfillment of contract obligations	☐	☐	☐	☐	☐
2	Awards of good quality projects	☐	☐	☐	☐	☐
3	Reputation for superior management	☐	☐	☐	☐	☐
4	Reputation for technological innovation	☐	☐	☐	☐	☐
5	Social responsibility	☐	☐	☐	☐	☐
6	International recognition by scale	☐	☐	☐	☐	☐
7	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Note: Please rate "international influence" referring to relevant rankings: 5. 1 – 100 of ENR Top 225; 4. 101 – 225 of ENR Top 225; 3. Top 60 CCFs; 2. Top 500 Chinese enterprises; 1. Others.

Appendix 4a - Questionnaire (English Version)

5.7 Organisational structure. Please indicate the suitability of the organisational structure of your firm from formalisation and centralisation dimensions.

Formalisation. Please indicate the extent to which the following systems of your firm are formalised or informalised.

Factors		1 –Most informalised; 3 –Moderate; 5 -Most formalised				
		1	2	3	4	5
1	Quality management system	☐	☐	☐	☐	☐
2	HR management system	☐	☐	☐	☐	☐
3	Contract management system	☐	☐	☐	☐	☐
4	Financial management system	☐	☐	☐	☐	☐
5	Cost control system	☐	☐	☐	☐	☐
6	Marketing system	☐	☐	☐	☐	☐
7	Others. Please specify:					
		☐	☐	☐	☐	☐

Centralisation. Please indicate the extent to which the following activities or decisions of your firm are centralised or decentralised.

Factors		1 –Most centralised; 3 –Moderate; 5 -Most decentralised				
		1	2	3	4	5
1	Entering into new markets	☐	☐	☐	☐	☐
2	Appointment of key managers of foreign subsidiaries	☐	☐	☐	☐	☐
3	Selection of functional department managers of foreign subsidiaries	☐	☐	☐	☐	☐
4	Global transfer of human resources	☐	☐	☐	☐	☐
5	Capital control of foreign subsidiary	☐	☐	☐	☐	☐
6	Procurement management	☐	☐	☐	☐	☐
7	Setting up of project team	☐	☐	☐	☐	☐
8	Others. Please specify:					
		☐	☐	☐	☐	☐

Note: Most centralised means that the decision is made exclusively by the top management of the Group; most decentralised means that the decision is exclusively made by the directly related person-in-charge.

Appendix 4a - Questionnaire (English Version)

5.8 Organisational culture. Please rate your firm on each of the following variables as a potential source of competitive advantage in international markets.

Factors		1 –Poor; 3 –Moderate; 5 - Excellent				
		1	2	3	4	5
1	Customer-orientation	☐	☐	☐	☐	☐
2	People-orientation	☐	☐	☐	☐	☐
3	Identification with the firm	☐	☐	☐	☐	☐
4	Internal communication	☐	☐	☐	☐	☐
5	Organisational learning	☐	☐	☐	☐	☐
6	Pursuit of innovation	☐	☐	☐	☐	☐
7	Others. Please specify:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Thank you very much for your valuable time and efforts on this survey.
A summary of the findings of this survey will be sent to you soonest possible as per the details given at the first page.

调 查 问 卷

关于中国建筑企业国际发展战略的调查研究

尊敬的先生/女士:

此次调查系由新加坡南洋理工大学土木与环境工程学院研究学者所展开的。旨在调查中国国际承包商的高层经理对有关中国建筑企业国际化战略的看法。

丰富的相关经验对此项调查至关重要。作为工程及战略管理领域的专家，您被诚邀来分享您在这个领域的宝贵经验。您的参与将为此项调查的结果产生非常重要的影响。您所提供的看法将严格作为机密处理，并仅限于学术用途。此外，该调查结果的汇总将被发放给感兴趣的参与者，希望它对贵公司的战略管理起到一定作用。如果您对此调查结果感兴趣，请在下面的回执条处确认，连同填好的调查问卷交回。

回答此问卷大致会占用您 10-15 分钟的时间。

谢谢！

刘国志
新加坡南洋理工大学土木与环境工程学院

..... 回 执

☐ 本人想要一份调查结果的汇总。

电话/手机:

传真:

电邮（重要）:

Appendix 4b - Questionnaire (Chinese Version)

1. 基本信息 (仅供数据分类之用):

职务:

公司类别:

- ☐ 房建类建筑公司 --- ☐ 总部 ☐ 境外分公司
☐ 土木工程类建筑公司 --- ☐ 总部 ☐ 境外分公司

公司规模 (员工总数):

1. <500 ☐; 2. 501-1000 ☐; 3. 1001-10000 ☐; 4. 10001-50000 ☐; 5. >50000 ☐

开展国际业务时间 (年):

1. <5 ☐; 2. 6-10 ☐; 3. 11-15 ☐; 4. 16-20 ☐; 5. >20 ☐

2. 公司国际表现

2.1 请标明公司最近 3 年的国际营业额平均增长率 (Rs) 是多少?

1. $R_s < 10\%$ ☐; 2. $10\% \leq R_s < 20\%$ ☐; 3. $20\% \leq R_s < 30\%$ ☐; 4. $30\% \leq R_s < 40\%$ ☐; 5. $R_s \geq 40\%$ ☐

2.2 请标明公司最近 3 年的国际净利润平均增长率 (Rp) 是多少?

1. $R_p < 10\%$ ☐; 2. $10\% \leq R_p < 20\%$ ☐; 3. $20\% \leq R_p < 30\%$ ☐; 4. $30\% \leq R_p < 40\%$ ☐; 5. $R_p \geq 40\%$ ☐

3. 基本竞争战略: 请对贵公司的基本竞争战略的国际应用情况给予评价。

3.1 成本领先战略。请标明公司在国际竞争中对如下方面的重视程度。

要素		1 – 最低; 3 – 适中; 5 – 最高				
		1	2	3	4	5
1	人工成本	☐	☐	☐	☐	☐
2	材料/设备采购成本	☐	☐	☐	☐	☐
3	管理费用	☐	☐	☐	☐	☐
4	项目及公司运营成本的控制	☐	☐	☐	☐	☐
5	在国际市场利用低成本资源的能力	☐	☐	☐	☐	☐
6	规模经营带来的成本优势 (资源共享)	☐	☐	☐	☐	☐
7	其它。请注明:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Appendix 4b - Questionnaire (Chinese Version)

3.2 差异化战略。 请标明公司在国际竞争中对如下方面的重视程度。

要素		1 – 最低; 3 – 适中; 5 – 最高				
		1	2	3	4	5
1	项目质量	☐	☐	☐	☐	☐
2	项目进度控制	☐	☐	☐	☐	☐
3	有吸引力的融资方案	☐	☐	☐	☐	☐
4	良好的外部关系	☐	☐	☐	☐	☐
5	技术与创新	☐	☐	☐	☐	☐
6	其它。请注明:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

3.3 区域扩张战略。 请标明公司在多少个国家或地区开展业务？

1. ≤ 3 个 ☐; 2. 4-6 个 ☐; 3. 7-10 个 ☐; 4. 11-15 个 ☐; 5. >15 个 ☐

3.4 多元化战略。 请标明公司在国际市场上涉及多少个业务领域？ 比如房建、交通、港口、冶金、石油与天然气项目、水利及污水处理、材料设备的生产、房地产、资源开发、及其它非相关业务。

1. 1 项 ☐; 2. 2-3 项 ☐; 3. 4-5 项 ☐; 4. 6-7 项 ☐; 5. >7 项 ☐

4. 市场进入战略: 请对贵公司的市场进入战略的国际应用情况给予评价。

4.1 独资企业/独立运作

请标明公司过去三年的国际业务中有多大比例（P）是独自承揽或独资运作的？

1. P<20% ☐; 2. 20%≤P<40% ☐; 3. 40%≤P<60% ☐; 4. 60%≤P<80% ☐; 5. 80%≤P<100% ☐

Appendix 4b - Questionnaire (Chinese Version)

4.2 合资公司或联营体 (JV)

请标明公司过去三年的国际业务中以 JV 模式承揽业务的增加情况（只选一项）。

若公司尚未采用 JV，请不用填写。

- 1 – JV 合同额显著减少 ☐
- 2 – JV 合同额略微减少 ☐
- 3 – JV 合同额无明显变化 ☐
- 4 – JV 合同额略微增加 ☐
- 5 – JV 合同额显著增加 ☐

4.3 复杂的承包方式

此项研究将承包方式按其复杂程度划分为三种类型：

- (i) 复杂的承包模式：包括融资型（BOT、PPP、及类似模式）；管理型（CM、PM）及技术型（EPC/D&B）
- (ii) 施工总承包模式
- (iii) 各种分包模式

请标明公司的国际承包模式的应用情况（只选一项）。

- 1 – 仅参与分包项目 ☐
- 2 – 施工总承包和分包同时采用，以分包为主，或两者相差不多 ☐
- 3 – 施工总承包和分包同时采用，以施工总承包为主 ☐
- 4 – 施工总承包是主要承包模式，复杂的承包模式也得到应用 ☐
- 5 – 复杂的承包模式为主 ☐

Appendix 4b - Questionnaire (Chinese Version)

5. 公司的资源与能力: 请对贵公司的资源与能力情况给予评价。

5.1 技术创新能力。请标明公司在如下方面的国际竞争优势。

要素		1 –最低; 3 –适中; 5 –最高				
		1	2	3	4	5
1	新材料/新产品	☐	☐	☐	☐	☐
2	新机械设备	☐	☐	☐	☐	☐
3	新技术/新工艺	☐	☐	☐	☐	☐
4	设计咨询能力	☐	☐	☐	☐	☐
5	IT 应用	☐	☐	☐	☐	☐
6	其它。请注明:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

5.2 金融能力。请标明公司在如下方面的国际竞争优势。

要素		1 –最低; 3 –适中; 5 –最高				
		1	2	3	4	5
1	同银行及金融机构建立良好的合作关系	☐	☐	☐	☐	☐
2	上市融资	☐	☐	☐	☐	☐
3	同金融势力较强的外国企业合作	☐	☐	☐	☐	☐
4	战略投资	☐	☐	☐	☐	☐
5	财务/金融管理	☐	☐	☐	☐	☐
6	其它。请注明:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Appendix 4b - Questionnaire (Chinese Version)

5.3 市场营销能力。请标明公司在如下方面的国际竞争优势。

要素		1 –最低; 3 –适中; 5 –最高				
		1	2	3	4	5
1	聘请经验丰富的国际营销专才	☐	☐	☐	☐	☐
2	企业高层对国际营销的宏观指导	☐	☐	☐	☐	☐
3	开辟足够的信息渠道并进行有效的信息筛选	☐	☐	☐	☐	☐
4	通过多种方式加强对外宣传	☐	☐	☐	☐	☐
5	同外界各方建立良好的关系	☐	☐	☐	☐	☐
6	内部营销：通过多种方式提高雇员的支持度，雇员的优质服务和贡献会提高客户的满意度和拓宽信息渠道、从而达到营销的目的。	☐	☐	☐	☐	☐
7	其它。请注明：					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

5.4 项目管理能力。请标明公司在如下方面的国际竞争优势。

要素		1 –最低; 3 –适中; 5 –最高				
		1	2	3	4	5
1	工程进度控制	☐	☐	☐	☐	☐
2	成本控制	☐	☐	☐	☐	☐
3	质量控制	☐	☐	☐	☐	☐
4	合同管理	☐	☐	☐	☐	☐
5	采购管理	☐	☐	☐	☐	☐
6	安全与环境管理	☐	☐	☐	☐	☐
7	其它。请注明：					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

Appendix 4b - Questionnaire (Chinese Version)

5.5 人力资源管理能力。请标明公司在如下方面的国际竞争优势。

要素		1 –最低; 3 –适中; 5 –最高				
		1	2	3	4	5
1	国际业务培训	☐	☐	☐	☐	☐
2	绩效考核及激励机制	☐	☐	☐	☐	☐
3	面向国际市场招聘人才	☐	☐	☐	☐	☐
4	外派经理的国际经验与能力	☐	☐	☐	☐	☐
5	中层技术及管理人员的工作能力和国际经验	☐	☐	☐	☐	☐
6	高学历技术及管理人员所占的比例	☐	☐	☐	☐	☐
7	其它。请注明:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

5.6 公司信誉/品牌。请标明公司在如下企业信誉方面的国际表现。

要素		1、最不理想; 3、一般; 5、最好				
		1	2	3	4	5
1	履约情况	☐	☐	☐	☐	☐
2	优质项目获奖情况	☐	☐	☐	☐	☐
3	管理能力方面的影响力	☐	☐	☐	☐	☐
4	技术创新方面的影响力	☐	☐	☐	☐	☐
5	社会责任方面的影响力	☐	☐	☐	☐	☐
6	国际规模方面的影响力	☐	☐	☐	☐	☐
7	其它。请注明:					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

注：评价国际规模方面的影响力时，请参照有关的排名：5 – 进入 ENR 的前 100 名；4 - 进入 ENR 的第 101 – 225 名；3 - 进入中国大型承包商 的前 60 名；2 – 未进入以上排名，但进入中国企业 500 强；1 - 其他。

Appendix 4b - Questionnaire (Chinese Version)

5.7 公司组织结构。请从规范化和决策集中度两个方面评价公司的结构合理性。

(1) 规范化。请标明公司在如下管理体系方面的规范化程度。

要素		1、最不规范； 3、一般； 5、 最规范				
		1	2	3	4	5
1	质量管理体系	☐	☐	☐	☐	☐
2	人力资源管理体系	☐	☐	☐	☐	☐
3	合同管理体系	☐	☐	☐	☐	☐
4	财务/金融管理体系	☐	☐	☐	☐	☐
5	成本控制体系	☐	☐	☐	☐	☐
6	营销体系	☐	☐	☐	☐	☐
7	其它。请注明：					
		☐	☐	☐	☐	☐

(2) 决策集中度。请标明公司在如下方面的决策集中情况。

要素		1、最分散； 3、一般； 5、 最集中				
		1	2	3	4	5
1	进入新的国际市场	☐	☐	☐	☐	☐
2	任命境外分公司经理	☐	☐	☐	☐	☐
3	选择境外分公司的部门经理	☐	☐	☐	☐	☐
4	人力资源的全球调动	☐	☐	☐	☐	☐
5	境外分公司的资金控制	☐	☐	☐	☐	☐
6	国外项目采购管理	☐	☐	☐	☐	☐
7	组建项目部	☐	☐	☐	☐	☐
8	其它。请注明：					
		☐	☐	☐	☐	☐

注：“最集中”指该决策由企业最高管理层决定；“最分散”指该决策由最直接管理人决定。

Appendix 4b - Questionnaire (Chinese Version)

5.8 公司企业文化。请标明公司在如下企业文化方面的表现。

要素		1、最不理想； 3、一般； 5、 最好				
		1	2	3	4	5
1	客户第一的宗旨	☐	☐	☐	☐	☐
2	以人为本的理念	☐	☐	☐	☐	☐
3	公司认同感/归属感	☐	☐	☐	☐	☐
4	内部沟通能力	☐	☐	☐	☐	☐
5	企业学习能力	☐	☐	☐	☐	☐
6	追求创新的理念	☐	☐	☐	☐	☐
7	其它。请注明：					
		☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐

非常感谢您在百忙之中认真回答这些问题。
此项调查结果的汇总将尽快发送给您。