China's construction regulatory framework and its effects on the performance of foreign AEC firms

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**CHINA'S CONSTRUCTION REGULATORY FRAMEWORK
AND ITS EFFECTS ON THE PERFORMANCE OF
FOREIGN AEC FIRMS**

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School of Civil and Environmental Engineering

A thesis submitted to the Nanyang Technological University
in fulfillment of the requirement for the degree of
Doctor of Philosophy

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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 World Trade Organization (WTO) in 2001, foreign architecture, engineering and construction (AEC) firms are presented with tremendous opportunities to participate in construction activities in China. However, the construction regulatory framework which governs foreign AEC firms has constrained their market access and business operations in China. This research aims to explore the impact of construction regulatory framework on foreign AEC firms and their adaptation to such impact in China's post-WTO era.

In an attempt to answer the above research questions, this research tackles the main regulatory issues faced by foreign AEC firms in China. After reviewing extant literatures, 28 regulatory risks were identified as main regulatory issues which strongly affect foreign AEC firms. Furthermore, a comparative study was carried out to identify the main changes of regulations promulgated before and after China's WTO entry. This comparative study highlighted the main regulatory requirements which are related to those regulatory risks identified in literature review.

To explore the impact of the identified regulatory risks and the firm-level adaptation, this research integrates the theoretical perspectives of business-government interdependence, strategic management and resourced-based view (RBV). Based on these three approaches, a conceptual framework was formulated and four research constructs were postulated to include regulatory risks, firm's strategies, capabilities and performance. Five hypotheses and 29 sub-hypotheses were developed and tested through questionnaire survey and interview conducted on foreign AEC firms in China. The conceptual framework was revised based on the hypothesis testing results.

Based on the data collected from foreign AEC firms, the research findings suggest that all the regulatory risk variables have significant impact on foreign AEC firm's performance. It is indicated that six capabilities, i.e. management skill, technical ability, financing ability, marketing ability, social influence and contribution to

project objectives, lead to better business performance and less severity of impact from regulatory risk variables. Proper utilization of six business strategies, i.e. market entry mode, services provided, market segment (project types), skill qualification certificate (SQC), contract modes and target clients, can moderate the adverse impact of one or more regulatory risk variables and improve foreign AEC firm's performance.

Ultimately, this research provides a better understanding of China's construction regulatory framework which governs foreign AEC firms in post-WTO era. The research findings expand the body of knowledge in government regulations and firm's adaptation in the context of China's construction industry. In practice, this research provides a good reference for foreign AEC firm's decision making before their entry into China's construction market. The regulatory risks identified can be used by foreign AEC firms as a checklist of important regulatory requirements. Under the current construction regulatory environment, firm's strategies and capabilities recommended in this research can enhance foreign AEC firm's performance and moderate the adverse impact of regulatory risks in China.

Keywords: China, Construction industry, Foreign AEC firms, Regulatory risks, Strategic management, RBV, Performance

Chapter 1 Introduction

1.1 Research Background

China's economy has made remarkable progress in recent years. It has been due to Deng Xiaoping's policy on economic reforms in 1978, which is further augmented by China's development strategy shifting from a close-door to an open-door orientation. Since the beginning of economic reform, China's rapid economic growth measured by gross domestic product (GDP) maintains on average 9.37% per year (Holz, 2008). In 2002, US\$53 billion foreign direct investment (FDI) flowed into China, which makes it the world's largest host country for FDI (UNCTAD, 2003). The FDI inflows into China reached the new record of US\$72 billion in 2005, corresponding to a 20% rise from 2004 (UNCTAD, 2007).

In line with the impressive economic growth, there is an immense demand for infrastructure facilities, such as roads, bridges, plants, factories, buildings, etc. With the development of more large scale projects such as Beijing Olympics and Shanghai World Expo, China's construction industry is expanding rapidly and is projected to become the largest construction market in the world by 2010 (Howlett, 2006a).

The gross output of the construction industry in China has increased sharply from 1991 to 2007, as shown in Figure 1.1. The annual output of the construction industry has reached US\$ 747 billion in 2007 (CSYB, 2008). By 2007, the construction industry employed 31.3 million people, compared to 8.8 million in 1978 (CSYB, 2008). The contribution of China's construction industry to the national economy can be measured by the proportion of construction value-added to the GDP, which increased from 5.4 percent in 1991 to 6.4 percent in 2007, as shown in Figure 1.2. It was only 3.8% in 1978 (CSYB, 2008). Evidently, the rapid growth in construction has been a major driver of the national economy.

(Source: Data from China Statistical Yearbook 2008)

Figure 1.1 Total Construction Output Value 1991-2007 (RMB Billion)

(Source: Data from China Statistical Yearbook 2008)

Figure 1.2 Construction Value Added as a Proportion of GDP 1991-2007 (%)

Armed with a strong mandate to open the country’s economy gradually, the Chinese authorities now appreciate the importance of channeling business opportunities to foreign firms in order to elevate the prestige and quality of major projects as well as to import new ideas and technologies (Cheah et al., 2006). In response to the Chinese government’s drive to attract FDI, foreign firms have been streaming into China’s construction industry to tap the low labor costs and the large market potential.

The flourishing construction market and the entry of foreign firms make it necessary

to establish an appropriate construction regulatory framework governing foreign firms in China's construction industry (Lam and Chen, 2004). As China became a member of World Trade Organization (WTO) in 2001, it promised to open the construction market to the rest of world and to carry out reforms on its construction regulatory framework. To initiate the regulatory reform, the Ministry of Construction (MOC) established a special working team to check the compliance of laws and regulations to the WTO requirements and to establish new regulations. According to the MOC, the main objectives of this regulatory reform are to further open the market, to attract the foreign firms, to regulate and provide standards for the foreign activities in the construction industry and to meet the WTO commitments China has made. In this regulatory reform, the Chinese government has made great effort to repeal outdated regulations, to amend the existing laws and regulations and to promulgate new regulations and implementation measures.

From the perspective of foreign firms, however, the regulatory reform has made it more difficult for them to access China's construction industry. The major amendments on the construction regulations mean that foreign firms carrying out regulated activities in China have had to substantially restructure their business activities in China to ensure their survival. Foreign construction-related firms have only a tiny share of the market which is only in niche or high-technology areas (Howlett, 2006b). A number of foreign construction and consultancy firms pointed out that the new regulations established after China's WTO accession are very restrictive and controversial (Kosmvatz, 2004). Foreign construction and consultancy firms face stiffer market entry requirements than ever before. It was expressed by the US embassy representative in 2006 that China is far from fulfilling its promises made to the WTO concerning expanding market access to foreign firms in the construction sector (McGraw-Hill, 2006).

As pointed out by many researchers (Moon and Lado, 2000; Shaffer, 1995), FDI host country's intervention by policies and regulations imposes severe constraints on foreign firm's operations and the main response of foreign firm to the government intervention is adaptation. Therefore, foreign firms have to understand the impact of China's construction regulatory framework and identify the regulatory risks that they may encounter from market entry to business operations (Gunhan and Arditi, 2005;

McConville, 1996). The firm-level strategic adaptation to the legal environment in China is the best approach to moderate the adverse impact of the regulatory risks. However, previous studies on China's construction regulatory framework governing foreign firms are not sufficient to address the problems in post-WTO era. In addition, there is a lack of firm-level study on the strategic adaptation for foreign firms to circumvent the regulatory constraints in China's construction industry.

1.2 Research Questions and Objectives

Based on the research background in Section 1.1, the research questions are formulated as follows:

- a) What is the impact of China's construction regulatory framework on foreign firms in China's construction industry?*
- b) How can foreign firms respond to the impact of China's construction regulatory framework governing them?*

In post-WTO era, an increasing number of foreign architecture, engineering and construction (AEC) firms entered China and became the major foreign participants in the construction industry. The market entry and business operation of these foreign AEC firms are regulated by the existing construction regulatory framework promulgated by the Chinese government. Therefore, this research focuses on the construction regulatory framework that governs the foreign AEC firms in China. Other foreign participants, such as foreign project developers and materials suppliers, are not included in this research.

The aim of this research is to better understand China's construction regulatory framework. Firm-level strategies and capabilities are recommended to foreign AEC firms to moderate the adverse effects of the regulatory risks and improve their business performance. Therefore, the objectives of this research include the followings:

1. To review and compare the existing construction regulations that govern foreign AEC firms with those established before China's WTO entry to identify the major changes;

2. To summarize the regulatory risks that could be encountered by foreign AEC firms in previous literatures and through conducting comparative studies on regulations;
3. To determine the significant regulatory risk variables influencing the performance of foreign AEC firms in China;
4. To investigate the effects of foreign AEC firms' capabilities and strategies in moderating the adverse impact of the regulatory risks, thereby promoting the performance of these firms.

1.3 Research Methodology

In order to achieve the objectives mentioned above, the methodology employed in this research includes both qualitative and quantitative approaches.

1.3.1 Qualitative Approach

- Literature Review

Literature review and comparative study are both key methodologies in most legal and regulatory studies. In this research, a comprehensive literature review is conducted to obtain an overall understanding of the foreign AEC firms in China and its governing regulations in China's construction industry. The regulatory risks that may be encountered by foreign AEC firms in China are also summarized through reviewing the literature. The sources of literature cover a wide range of books, journal papers, government reports, international organization's publications, and reports from law firms.

- Comparative Study

After reviewing the literature, comparative study is conducted between the existing construction regulations and the old regulations which have been repealed upon China's WTO entry. This comparative study provides a better understanding on the major changes of construction regulatory framework in recent years. The main construction regulatory requirements on foreign AEC firms can then be identified. The regulatory risks reported in literature are proven to be consistent with the existing

construction regulations that govern the foreign AEC firms. Therefore, the summarized regulatory risks can be used as a basis for the questionnaire design.

- Interview

Besides literature review and comparative study, interviews are particularly useful for further exploring the reasons behind their survey response (McNamara, 1999). It is more appropriate for complex situation. In-depth information behind the complexity can be obtained through a face-to-face interview. In addition, the researcher can either repeat a question or explain it to avoid misunderstanding of interviewees. In this research, the interviews are carried out in the pilot study and in the follow-up stage after the questionnaire survey. It aims to elicit opinions and knowledge from industry professionals on construction regulatory risks faced by foreign AEC firms.

1.3.2 Quantitative Approach

- Questionnaire Survey

Questionnaire survey is conducted in this research as quantitative approach. According to Hackett (1981), questionnaires are cost effective, easy to analyze, familiar to most people, less intrusive and have less bias. Based on the regulatory risks identified in literature review and comparative study, a questionnaire survey is conducted among foreign AEC firms in China. The information collected in the questionnaire survey mainly includes their assessment on regulatory risks and their company information. The results of the questionnaire survey are analyzed through statistical methods to test the hypotheses.

1.4 Scope of the Research

As a result of the regulatory reform, the Chinese government has established a vast number of laws and regulations in construction industry. To study China's construction regulatory framework is not easy as it is too broad and complicated. Furthermore, the laws and regulations in China are changing very frequently as Chinese government has been improving the legal environment especially after its entry into WTO. Therefore, the scope of this research should be clearly stated, as follows, so that the research can be carried out effectively and efficiently.

- 1) The object of this research is foreign architecture, engineering and construction (AEC) firms in China. All the main regulations covered in this research were promulgated by China's Ministry of Construction (MOC). These regulations are specifically targeted at foreign AEC firms in China. The common regulations that generally govern both Chinese enterprises and foreign firms are not included in the detailed reviews and comparative study in this research. Nonetheless, a few relevant clauses in these common regulations will still be quoted for reference where necessary.
- 2) Even though this research does not include the review and comparative study on those common regulations, the regulatory risks related to those common regulations will be included in the questionnaire survey questions. These regulatory risks are encountered by foreign AEC firms due to their foreign nature. As required by WTO agreements, foreign firms in China are to be treated in the same manner as Chinese enterprises. Under this circumstance, foreign firms will face more problems in order to satisfy the same regulatory requirements as Chinese enterprises. These problems cannot be neglected as they are normally hidden behind the national treatment and would have a severe impact on foreign AEC firms.
- 3) As China's laws and regulations are evolving rapidly, the regulatory risks discussed in this research are summarized from the existing construction regulations that are still effective upon the completion of the research works.

In summary, this research is not to study into the laws, but to focus on the impact of China's construction regulatory framework on foreign AEC firms and their adaptation to such impact.

1.5 Significance of the Research

The findings of this research are significant as it contributes to both the existing academic research and to industry practice.

1.5.1 Academic Contribution

Although a number of literatures have indicated the regulatory risks faced by foreign

AEC firms, there still lacks an empirical research on the existing construction regulations promulgated after China's WTO entry. Many of the previous regulatory research on foreign AEC firms in China are outdated as China's regulatory framework has been changing rapidly. Some of the problems identified before China's entry into WTO may no longer exist or are only applicable to a small number of firms. This research conducts the first large-scale questionnaire to investigate the most up-to-date regulatory risks faced by foreign AEC firms in China and contributes to the knowledge of regulatory research in China's post-WTO era.

After analyzing the construction regulatory risks in China, this research will conclude with a summary of firm-level strategies and capabilities for foreign AEC firms to adapt to the impact of construction regulatory framework. The research result on firm-level adaptation will contribute to international strategic management on construction industry and firm's resource-based theory.

1.5.2 Practical Contribution

This research is beneficial to foreign AEC firms in China's construction industry, especially in the early stage of their entry, in understanding and responding to the impact of China's construction regulatory framework. Foreign AEC firms have been playing an important role in importing new technology, management skill and capital to China's construction industry. To attract more foreign AEC firms to China, the regulatory risks faced by them must be properly addressed. This research also recommends strategies and capabilities required by foreign AEC firms to achieve better performance in China.

Besides the benefits to foreign AEC firms, this research can provide the Chinese government with the perspectives of foreign firms on China's existing regulatory framework. The research findings would be a valuable reference for Chinese government to amend or establish new regulations in the future.

1.6 Organization of the Thesis

This thesis consists of seven chapters. This chapter gives the background information of the research. It discusses the research elements in terms of research questions,

objectives, methodology and scope. The significance of the research is also highlighted and the structure of the thesis is outlined here below.

Chapter 2 reviews the development of the Chinese construction regulatory framework, with particular emphasis on the construction regulations that govern the foreign AEC firms in China. The regulatory risks that foreign AEC firms are facing in China are summarized into a list from current literature.

Chapter 3 conducts a review on the main regulations governing foreign AEC firms. A comparative study is also conducted to identify the major changes between the construction regulations promulgated before and after China's entry into WTO. The major changes of the regulations will be discussed to better understand the regulatory risks identified in Chapter 2.

Chapter 4 aims to establish the theoretical basis for the relationship between China's construction regulatory risks faced by foreign AEC firms and their strategic adaptation to these regulations. Research variables and the relationship among them are identified. A conceptual framework is postulated to build up hypotheses based on the theoretical foundation and literature reviews.

Chapter 5 discusses the research methodology covering both quantitative and qualitative methods, i.e. questionnaire survey and interviews. The scope, methods of data collection and statistical analysis techniques are explained here.

Chapter 6 presents the results of the statistical analysis on questionnaire survey and the hypothesis are tested out. The interviews results are also quoted for reference in analyzing the survey results. A summary of research findings is provided here.

Chapter 7 reviews the research work and concludes the research findings based on the previous chapters. The research contributions are highlighted here. The limitations of the research are explained. From the discussions on the limitations, recommendations for future research are provided.

Chapter 2 China's Construction Regulatory Framework for Foreign AEC Firms

2.1 Introduction

China is a fast developing country and its regulatory framework for the construction industry is experiencing revolutionary changes upon its entry into the World Trade Organization (WTO) in 2001. Foreign AEC firms which want to enter China's market are subject to the governance of construction regulations and policies. This chapter begins by giving an overview of China's construction industry and the foreign participants in this industry. The existing construction regulations which govern foreign AEC firms are then presented. The regulatory risks that foreign AEC firms are facing in China are examined and summarized from extant literatures.

2.2 The Growing Construction Industry and the Demand for Foreign Participants

In China, infrastructure, rural and urban housing and tourism are three main areas that are continuing to increase substantially. Infrastructure projects are surging either in the major cities along the east coast or in the inland cities that are of importance in transportation and resource development (Chen and Wills, 1996). China's demand for infrastructure projects is largely driven by urbanization, industrialization, privatization, and globalization (Chen and Doloi, 2008; Luo and Gale, 2000). The scale of infrastructure demand can be illustrated further by China's plan to create 81 new power plants by 2010, and intensifying the development of railway, highway and civil aviation airports. Housing demand is also huge as China is expected to increase 5.5 to 6 billion square meters of housing floor space, or 70 million sets of houses, in the coming ten years (Guo, 2004). Residential housing and infrastructure will be two key elements of this large construction activity (Chen and Wills, 1999). Besides, as tourist

arrivals have been increasing rapidly, international standard hotels have sprung up in major cities, which further enhance the construction demand.

The participants in China's construction industry include contractors, designers, and supervision and engineering consultants. The contractor is always an important entity in any construction activities. There are three major types of Chinese contractors, i.e. state-owned enterprises (SOEs), urban and rural collectives (URCs), and rural construction teams (RCTs) (Wang et al., 2006). The SOEs are usually larger in scale than the other two types in terms of both employment and production (Chen, 1998). Foreign contractors also entered China's market since the open-door policy in 1978 and became more prominent after the WTO accession, although they are restricted in undertaking certain projects in China.

Besides operating in local construction industry, Chinese construction enterprises are also actively involved in overseas contracts for engineering projects and manpower services. Since 1979, the cumulative amount of overseas contracts was worth US\$ 153.2 billion and about 3 million workers had been sent abroad by the end of 2003 (CHINCA, 2004). As reported by the Engineering News Record (ENR), 51 Chinese corporations were included in the list of top 225 international contractors in 2008 (ENR, 2008).

The growth rate of China's construction industry is likely to remain high in the foreseeable future. However, China is still a developing country and a number of problems exist in the large construction industry. Many of the Chinese construction enterprises have attained low profits or even losses, and some are even bankrupt. From 1996 to 2001, the average value of net profit margin of Chinese construction enterprises is only 1.13%, which is attributed to many factors arising from both the internal and external environments. Chen (1998) and Li (2001) summarized the problems and challenges faced by the Chinese industry in terms of regulatory framework and institutional mechanism, industrial structure, and technology factors.

First, China is facing challenges in developing and improving its legislation and legal framework in the construction industry. Due to rapid and frequent changes during the transition from planned economy to a market economy, laws and regulations are often difficult to implement, and even inappropriate or outmoded by the time they are enacted and put into force (Li, 2001). Second, it is difficult for Chinese construction enterprises to provide good project management and finance management capability to large projects. China needs advanced managerial skills from overseas for more effective management information systems with effective cost control, construction planning, resource allocation, value management, risk management, life cycle appraisal, safety management and quality assurance system (Li, 2001). Moreover, China has been lagging behind many Western and developed countries in the aspect of construction technology. Construction industry is still considered one of the labor-intensive industries in China, largely due to its low labor cost (Cheah and Chew, 2005).

To gradually rectify the above problems, China has introduced new strategies to reform the construction industry, including encouraging foreign construction and consultancy firms to enter the construction industry. Shen et al. (2006) concluded that typical strengths of foreign firms include good project management skills, better information management systems, advanced machinery and equipment, higher labor productivity, sophisticated financing capability, proper debt-asset ratio, superior cost-control skill and good human resource practices. Attracting foreign firms can help to promote the development of Chinese construction industry.

2.3 An Overview of China's Construction Regulatory Framework

The regulatory framework is used here to describe not only the content of laws, but also all the institutions and officials who are involved in the creation and implementation of law, including courts and judges, bureaucrats, and politicians, in their capacity as makers and implementers of law.

In the early history of modern China, laws and regulations did not exist in the construction industry; neither are they present in other economic sectors. Although subsequent laws and regulations were developed by different levels of government, they were of insignificant effect in so far as implementation and enforcement are concerned. The transition from the planned economic system to a market-based economic system has brought significant pressure for the establishment of appropriate legal institutions and clear regulations for the construction industry. In 1991, the Ministry of Construction (MOC) promulgated the “Legislative Programme of Construction Laws System”, resulting in a clearer scope and better quality of construction legislation for the past decade. By the end of 1999, the objective of this Programme was partially fulfilled when 4 construction laws, 25 construction ordinances and 69 construction regulations were created (Zhu et al., 2001). Since then, the construction regulatory framework was gradually established and developed with more and clearer regulations added into the system.

2.3.1 Chinese Construction Administrative Hierarchies

Before discussing the construction regulatory framework, it is useful to explain the administrative authorities that govern the construction industry and approve construction laws and regulations. Based on research by Wang (2001) and Xu (2004) which pertain to the construction administrative hierarchy and the legal system, the basic structure of the governing authorities is shown in Figure 2.1. Essentially, the Chinese construction administrative hierarchy consists of three tiers: the central government, the provincial committee and the local committee.

At the central government level, the Ministry of Construction (MOC) is one of the forty ministries under the State Council (SC) (Wang, 2001). Re-established in 1988 as a result of a reorganization of the State Council in that year, the MOC is responsible mainly for areas such as urban and rural planning and development, dwelling and real estate, municipal works, etc. The MOC is empowered to formulate construction

policies, prepare urban and rural development programmes and monitor implementation, grant approval licenses for construction enterprises and design institutes, improve construction technology, promote overseas construction operations, etc (Wang, 2001; Xu, 2004).

Figure 2.1 Construction Administration Hierarchies and Regulatory Framework

Other line ministries under the SC, such as the Ministry of Transportation, Ministry of Railway, Ministry of Electronic Power, and Ministry of Coal Industry, oversee and administer construction enterprises and arrange construction projects to be carried out

within their respective industries. For instance, the Ministry of Transportation (MOT) is mainly responsible for highway, bridges, etc. These line ministries were also authorized to issue regulations of construction activities within their respective industry, and they own and administer the major construction and design enterprises in their industries. The MOC, together with other industrial ministries, have traditionally exercised and are inclined to protect their regulatory authority over construction works within their own industries.

The provincial construction committee is authorized to issue provincial construction design code and approve qualification level lower than the third grade for construction enterprises, design institutes, and investigative institutes (Xu, 2004). As provided in the construction regulations, all construction projects have to be approved and registered by the local construction committee before they can be commenced (Xu, 2004). The local construction committee works together with the various municipal bureaus, such as the planning bureau, fire fighting bureau, and the engineering bureau, to supervise the design and construction activities.

2.3.2 Governing Laws and Regulations of China's Construction Industry

With the development of the construction industry over the years, China has established a regulatory framework which governs construction activities. Approved by administrative authorities in different tiers, the construction laws and regulations are categorized into four levels (Figure 2.1). They are:

1st Level: Laws approved by the National People's Congress (NPC) and its Standing Committee;

2nd Level: Administrative laws and regulations approved by the State Council;

3rd Level: Departmental regulations approved by the Ministry of Construction;

4th Level: Local regulations approved by the Construction Commissions and People's

Congress with their Standing Committee at local level.

Detailed introduction of the respective levels of laws and regulations is as follows:

1st Level: Laws

Governing planning, design, and construction activities throughout the country, the highest level of construction regulatory framework is the *National Construction Law* (1997). With eight chapters and 85 articles, the *National Construction Law* is the highest governing legislation and a consolidation of the basic legal principles for the Chinese construction industry. It took 13 years to draft the Construction Law, from 1984 till its promulgation by the NPC in 1997. As stated in Article 1 of the Construction Law, the objectives of the Construction Law are as follows (NPC, 1998):

“This Law is formulated in order to strengthen the supervision and administration of construction activities, to maintain order in the construction market, to ensure the quality and safety of construction projects, and to promote the healthy growth of the construction industry.”

The four stated objectives reflect the legislative background of the Construction Law, which are formulated to eliminate irregular practices and to resolve quality and safety problems.

2nd Level: Administrative Laws and Regulations

The second level is the administrative laws and regulations promulgated by the State Council. At this level, there are a total of 17 different laws and regulations which are mainly concerned with important issues, such as construction quality and safety management, and regulations on architects' registrations, etc.

3rd Level: Departmental Regulations

In the third level, all the departmental regulations in the construction industry are promulgated by the MOC. The number of departmental regulations is much more than that of administrative laws and regulations in the 2nd level of the regulatory framework. Compared with the general guidelines stipulated in the administrative laws and regulations, the departmental regulations concern many aspects of construction activities in a more detailed manner. In this research, all the regulations governing foreign AEC firms to be studied are from this level of regulatory framework.

4th Level: Local Regulations

The fourth level concerns local regulations which govern the local construction matters within cities, counties, townships and districts under the provincial government's purview. Nelson and Chan (1999) pointed out that local construction commissions are primarily controlled by their respective local governments instead of the central ministry, i.e. the MOC. The MOC can only exercise indirect control over the local construction administration through promulgation of ministry rules, standards and guidelines. As a result, regulations established by the local People's Congress can have higher regulatory and practical influence over local construction activities than those regulations issued by the MOC.

These four levels of laws and regulations act in tandem and together establish the construction regulatory framework in China. Besides the laws and regulations within these four levels, there are also other relevant laws, regulations, standards and implementation measures that the participants in the construction industry have to comply with. For example, provisions on signing, execution, change and cancellation of construction contracts are clearly stated in the Contract Law, for which industry participants must adhere to.

2.3.3 Problems of China's Construction Regulatory Framework

Despite significant progress on establishing the Administrative Hierarchies and the regulatory framework, deficiencies in the implementation and management of construction laws and regulations still exist. The main issues that China is facing in further improving and developing the construction regulatory framework are summarized below.

- **Lack of Enforcement and Supervision**

As the principal constraints on the construction regulatory framework, the lower level regulations must be consistent with the upper level laws and be amended to meet the principles of upper level laws. Similarly, the lower level legislative departments should be guided by their upper-ordinate legislators. However this is not the case in practice. Since some local legislative bodies act not only as legislators but also interested or vested parties, they illegitimately control or manipulate the local level construction industry for their own profit. The punishment for such activities for local legislative department will merely be a disciplinary sanction. Therefore, it is urgently needed to improve the current regulatory framework to clarify the legal roles and responsibilities of government authorities. Therefore it is important to create qualified legislative authorities to promote and oversee the enforcement of laws and regulations.

- **Insufficient Regulations on Quality Control**

According to the MOC, about twenty percent of the more than 100,000 new building and refurbishment construction projects in 1999 did not reach the national quality standards (Zhu et al., 2001). One of the main reasons concerns insufficient regulations on responsibility allocation to quality problems among different contractual parties in a construction project. Currently, only the responsibility of contractors on quality control is stipulated in the regulations. The responsibility of other parties, such as project owner, designer and engineering consultant, is not prescribed in details in

construction regulations.

- **Insufficient Regulations on Health and Safety**

Safety problem often occurs in the construction process mainly due to the lack of basic knowledge about health and safety by rural workers in construction works. According to the MOC, the fatality rate of construction workers ranked second, just behind the mining industry (Zou et al., 2007a). Safety regulations, education and supervision are insufficient due to the absence of detailed and clear definition of responsibilities towards safety problems (Zhu et al., 2001).

- **Fragmentation of Legislative and Enforcement Responsibilities**

As discussed in Section 2.3.1, the multitude layers of responsibilities are inherently not well integrated in the construction regulatory framework. Although in principle the lower-level legislative bodies are guided by their upper-level legislatures, this hierarchical relationship is not strictly followed due to the substantial power the former has in legislation and enforcement. The problem is further complicated by contradictions not only between the legislative authority of central government and the local authority but also between different industrial ministries. These industrial ministries have enforcement power on laws and regulations within their own fields; and the extent of exercising enforcement power depends on the subjective conception of their regulatory staff. Zhu (2001) opined that the legislative and enforcement authorities should be integrated to ensure the consistency and quality of construction regulations.

Despite the great progress made in the economy, China still lacks experience in creating, enforcing, and interpreting laws and regulations. The experience and lessons from other countries will be instructive to the Chinese legislators who are developing and implementing the regulatory framework (Zhu et al., 2001). Understandably, attracting foreign participants to China's construction industry can help improve its construction regulatory framework. Furthermore, a sound regulatory framework can

help promote foreign investment in China.

2.4 Foreign Participants in China's Construction Industry

China's vast natural resources, extensive market potential and wide pool of cheap labor, have attracted a large number of foreign firms to enter into its construction industry. This attractiveness is likely to remain for the foreseeable future and has been further enhanced by China's accession to the WTO.

2.4.1 Foreign Participants' Roles in Construction Industry

Most of the foreign participants in China's construction industry provide consultancy services, namely engineering design, project management, supervision and training for the large Chinese construction enterprises (Chen, 1997). According to China's Statistical Yearbook (2008), there are 847 foreign-invested construction-related firms in 2007 including firms invested by Hong Kong, Macau and Taiwan.

- **Contractor**

According to Engineering News-Record, the number of top foreign construction firms undertaking projects in China was 57 out of the 225 top international contractors in 2008 (ENR, 2008). In China, foreign construction firms often act as main contractor and specialist contractor. In fact, China has been restricting wholly foreign-owned contractors and only allow them to undertake four kinds of projects, which include Sino-foreign joint venture projects, World Bank projects, foreign-aid projects and those projects that require advanced technology beyond the capability of Chinese contractors. In contrast, the foreign specialist contractors are encouraged to aid in the technology transfer process. For example, foreign electrical and mechanical specialist contractors are employed by most Sino-foreign joint ventures, especially in hotel and commercial building projects, for their technological advances and expertise. Foreign construction firms also participate in turkey projects as turkey contractor when the clients lack the expertise to handle such complex projects.

- **Engineering and Design Consultant**

Foreign engineering and design consultants are encouraged to offer their services in China because they possess in-depth knowledge and concepts on construction projects development. Their experiences on innovative design methods and use of sophisticated techniques and equipments could be transferred to their Chinese partners through the establishment of construction joint ventures or partnering.

- **Project Manager**

Being advantageous in terms of project management expertise and experiences, foreign firms are often employed by the clients to oversee the construction of technologically sophisticated projects (Chen, 1997). They are responsible for project planning, executing, coordinating, and controlling in hi-tech projects such as power plants, petrochemical complexes, mega infrastructure and building projects.

- **Project Developer**

Besides acting as contractor or designer, direct investment is another form of foreign firm's participation in China's projects. Foreign firms and multi-lateral organizations can directly invest in private and public projects, which include commercial and institutional projects.

In summary, the first three categories of the above-mentioned foreign firms have played a significant role in providing construction and engineering design services in China's construction industry. This research will focus on the major players among foreign participants in China's construction industry, i.e. foreign architecture, engineering and construction (AEC) firms. The foreign project developers are outside the scope of this research, as they only invest capital and are not practically involved in providing construction-related services.

2.4.2 Risks Faced by Foreign AEC Firms in China's Construction Industry

Surveys were conducted in 1985, 1987 and 1995 to investigate the risks faced by Hong Kong construction firms in China's construction industry (Chen, 1997). The results of another survey on the problems faced by top international construction firms undertaking projects in China have also been analyzed (Zhang et al., 1996). These survey results cover risks not only from the regulatory framework but also the operational aspects that foreign firms have to consider in China. These studies were completed before China's accession to WTO in 2001. The results may appear to be not up-to-date; nonetheless they serve as good references for researchers to understand the risks and obstacles faced by foreign AEC firms in China's construction industry. Key findings of the surveys are presented as follows:

- **Bureaucracy and Regulatory Framework**

Bureaucratic red-tape is the most important risk ranked by top international construction firms in China. The communication process with government authorities and the approval period for establishing a business entity are cumbersome and time-consuming due to the bureaucracy and the multiple layers of administrative system. Among different level of authorities, the local construction authorities appear to have more influence over the central authorities on the entry and operation of foreign AEC firms. An effective way suggested in the literature (Chen, 1997; Zhang, 1996) is to create a good relationship with local government officials to minimize the risk of bureaucracy.

Another serious obstacle lies in the uncertainties in regulatory aspects (Chen, 1997). China's regulatory framework is unique and different from the international practice, which makes it difficult for foreign AEC firms to operate their business in a similar way to their home practice. For example, China's current contract law is not adequate in handling complicated international projects which may involve both Chinese construction enterprises and foreign AEC firms. Furthermore, many detailed rules

established within respective construction authorities are not easily accessed by foreign firms. For Sino-foreign construction joint ventures, the risks from policies and regulations are found to have significant impact on their operations (Shen et al., 2001). Although China has made great effort to reform the construction laws and regulations after China's WTO accession, more work needs to be done to establish a clear and appropriate regulatory framework to minimize the current regulatory problems faced by foreign firms in China.

- **Construction Materials**

Foreign AEC firms have to deal with the shortage of construction materials in China. Due to the high growth rate of Chinese construction industry, even the three basic materials, namely timber, cement and steel, have to be imported to meet the huge domestic demand. High-quality materials produced by Chinese enterprises are often exported to earn foreign currency. The rest of the local materials may not be able to meet the needs of foreign AEC firms, considering the requirements of the international code and standard on construction materials for large projects.

Without a good relationship and support from local suppliers, foreign firms have to rely on imported materials. In general, construction materials cannot be imported freely into China. Both foreign and Chinese construction firms have to apply for an import license from the the Ministry of Commerce (MOFCOM), formerly the Ministry of Foreign Economic Relation and Trade of China (MOFTEC). However, the application procedures are unduly time-consuming; the process often takes two or three months, which may result in the delay of the overall construction schedule. Moreover, delay during the transportation of the materials also affects the work schedule. In China, building materials are always transported by train and ship. Even in major cities, such delay occurs frequently due to the lack of berths and trains. Thus foreign firms have to learn to adapt and deal with such uncertainties and situations.

- **Local Labor Supply and Quality**

Abundant local labor supply and its low labor cost are the main reasons why foreign contractors are attracted to China's construction industry. However, the total labor cost of a project could be significantly higher than simply the salaries and wages incurred, which is unexpected and usually takes foreign contractors by surprise. Besides the salary, the payments of retirement and pension funds, unemployment insurance and housing or housing subsidy fund have to be provided to each worker. The eventual total labor cost for each worker can amount to two to three times the individual salary. Foreign contractors would experience operational difficulties if such costs are underestimated.

In addition, the labor force in China's construction industry is largely unskilled and inefficient. More than half of the construction workers were originally farmers with low education level. Not only incapable of undertaking advanced technical works, they often incur additional material wastage due to their poor workmanship. To overcome this problem, foreign firms have to provide intensive training for these workers and the less skilled site supervisors from the local Chinese firms. Such training provisions inevitably increase the construction cost borne by for the foreign contractors.

- **Management and Coordination**

In a Sino-foreign joint venture, Chinese and foreign managers at the top management level are expected to work closely in order to make decisions effectively. Normally the salary of the Chinese manager is much lower than that of the foreign manager in the same management level. This remuneration discrepancy often leads to low morale and negative attitudes from the Chinese managers towards their foreign counterparts. Moreover, communication problems between the Chinese and foreign managers often occur due to language, education and cultural differences. Such problems could affect the coordination of construction works in a joint venture. It is important for foreign

contractors to hire Chinese personnel with bilingual and bicultural background. Such personnel can act as a bridge for effective communication between Chinese and foreign partners.

Among all the four major risks identified in the surveys by Chen (1997) and Zhang et al. (1996), the risks from regulatory framework have also been emphasized in other studies as one of the most important risks faced by foreign firms in China. In a research on cross-border construction in East Asia, majority of the difficulties associated with international construction projects in China arise from the complex regulatory system prevailing in the construction industry (Chua et al., 2003). The researchers opined that construction law and regulations, as well as other regulatory rules relating to foreign firms in terms of foreign participation, certification, tax, duty, import and export policies are constantly changing. As a consequence, foreign AEC firms are likely to incur significant costs operating under such a constantly changing regulatory environment.

In a recent study which focuses on law-related risks, Ling et al. (2007) found six legal risks encountered by foreign AEC firms in China. The six legal risks are: compliance with existing law, compliance with new laws that are frequently enacted, delays in contract formation, lack of sanctity of contract, non-performance of contract and contractual dispute. Although these six legal risks are key issues to be considered by foreign AEC firms in China, they are generic in nature and not linked to any detailed regulations which may impact negatively on the foreign AEC firms. In contrast, regulatory restrictions, contractual arrangements and differences in standards identified by Chua et al. (2003) are all associated with relevant rules and regulations promulgated by the government. This research will focus on the construction regulations that specifically target the foreign AEC firms, beginning with their market entry and moving onto subsequent business operations in China. Detailed articles on the relevant regulations with which the risks may be associated will be reviewed and analyzed in Chapter 3.

2.5 China's Construction Regulatory Framework on Foreign AEC Firms

China officially became a member of WTO in December 2001. WTO principles and agreements require China to implement unified administrative system throughout the country, adjusting its policies and laws to provide national treatment for foreign businesses (Lai, 2002). To reform the construction regulatory framework, the State Council and the MOC have established a special working group to review the laws and regulations. This effort aims to modify and abolish those regulations which are contradictory to the WTO rules. Subsequently, some outdated departmental rules and regulations have been revised or repealed to comply with the requirements of WTO. The following four specific regulations governing foreign AEC firms in China's construction industry from 1986 to 1995 have either been repealed before or after the WTO accession.

- *1986 Chinese Foreign Cooperative Design Regulation (Decree 840) (Repealed with effect from 18 October 2001)*
- *1992 Regulation for Administration of Approval for Establishment of Chinese-foreign Joint Venture Design Institutes (Decree 190) (Repealed with effect from 1 December 2002)*
- *1994 Tentative Measure on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China (Decree 32) (Repealed with effect from 1 December 2002)*
- *1995 Foreign-invested Construction Enterprises Regulation (Decree 533) (Repealed with effect from 1 October 2003)*

Upon the WTO accession, the MOC has since established a number of new regulations which govern foreign AEC firms, i.e. foreign-invested construction enterprises, foreign-invested construction engineering design enterprises, and

foreign-invested construction engineering services enterprises. Besides complying with these regulations, foreign AEC firms also have to follow other construction laws and regulations issued by the MOC and MOFCOM as well as the general foreign investment laws and regulations (Nelson and Chan, 1999). This research focuses on the specific construction rules and regulations which govern foreign AEC firms.

2.5.1 Regulations on Foreign-invested Construction Enterprises (FICEs)

In compliance with WTO provisions, Decree 32 (1994) and Decree 533 (1995) have been repealed and replaced by the *Regulation on Administration of Foreign-invested Construction Enterprises (FICEs)* (Decree 113) in 2002. Decree 113 has become the main regulation governing foreign construction firms in China. It sets out the steps that foreign firms must follow in registration and skill qualifications application before they can undertake projects in China.

Following the promulgation of Decree 113, there are some other amendments made by the MOC and the MOFCOM. On 8 April 2003, the MOC issued the *Implementation Measure on Administration of Skill Qualifications in Regulation on Administration of Foreign-invested Construction Enterprises* (Decree 73), which provide further guidance on qualification categorizing of FICEs and some specific requirements of application. The MOC also issued the *Circular on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China* (Decree 193) on 28 September 2003, which further stipulates the application and the usage of qualification certificates of FICEs. On 1 January 2004, the MOC and the MOFCOM jointly promulgated the *Supplementation on Regulation on Administration of Foreign-invested Construction Enterprises* (Decree 121) in order to promote trade between Mainland China with Hong Kong and Macao. A new *Circular on Administration of Skill Qualifications of Foreign-invested Construction Enterprises* (Decree 159) was also established on 6 September 2004 to make it easier for large foreign construction firms to enter China's construction industry.

In summary, these FICEs regulations, measures and circulars help to regulate the business environment of foreign firms in China's construction industry. These relevant regulations and measures are shown in Table 2.1 and they will be reviewed in detail and compared with the regulations established before WTO in Chapter 3.

Table 2.1 Regulations on Foreign-invested Construction Enterprises as in 2009

Level	Titles of Laws and Regulations (Decree No.)	Date of Promulgation	Date with Effect
Departmental Regulations	Regulation on Administration of Foreign-invested Construction Enterprises (113)	27 Sep 2002	1 Dec 2002
	Supplementation on Regulation on Administration of Foreign-invested Construction Enterprises (121)	19 Dec 2003	1 Jan 2004
Relevant Measures and Circulars	Implementation Measure on Administration of Skill Qualifications in Regulations on Administration of Foreign-invested Construction Enterprises (73)	8 Apr 2003	8 Apr 2003
	Circular on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China (193)	28 Sep 2003	28 Sep 2003
	Circular on Administration of Skill Qualifications of Foreign-invested Construction Enterprises (159)	6 Sep 2004	6 Sep 2004

2.5.2 Regulations on Foreign-invested Construction Engineering Design Enterprises (FIDEs)

Following the promulgation of regulations on FICEs, another important regulation governing foreign-invested construction and engineering design enterprises (FIDEs), Decree 114, was issued in 2002. This regulation spells out the requirements ranging from registration to skill qualification application for foreign construction and engineering design firms which undertake design works in China. In addition, the

MOC and the MOFCOM jointly promulgated the *Supplementation on Regulation on Administration of Foreign-invested Construction and Engineering Design Enterprises* (Decree 122) on 19 December 2003. The main objective of Decree 122 is to promote trade in design service between Mainland China with Hong Kong and Macao.

On 10 May 2004, the MOC issued the *Tentative Regulation on Administration of Foreign Enterprise for Undertaking Engineering Design Works within Territory of China* (Decree 78), which became effective on 10 June 2004. This Decree 78 requires foreign design firms to work in cooperation with locally qualified design institutes if the offshore (outside China) services involve design beyond the basic initial conceptual and schematic design stage.

The most important *Implementation Rule to the Administrative Regulation on Foreign-invested Construction and Engineering Design Enterprises* (Decree 18) has not been issued and put into force until January 2007 by the MOC. This final Implementation Rule is a considerable improvement on the vacuum existing in the current regulations on FIDEs. The summary and discussion of these regulations and rules as shown in Table 2.2 will be presented in Chapter 3.

Table 2.2 Regulations on Foreign-invested Construction Engineering Design Enterprises as in 2009

Level	Titles of Laws and Regulations	Date of Promulgation	Date with Effect
Departmental Regulations	Regulation on Administration of Foreign-invested Construction and Engineering Design Enterprises (Decree 114)	27 Sep 2002	1 Dec 2002
	Supplementation on Regulation on Administration of Foreign-invested Construction and Engineering Design Enterprises (Decree 122)	19 Dec 2003	1 Jan 2004
Relevant Measures and Circulars	Tentative Regulation on Administration of Foreign Enterprise for Undertaking Engineering Design Works within Territory of China (Decree 78)	10 May 2004	10 Jun 2004

	Implementation Rule to the Administrative Regulation on Foreign-invested Construction and Engineering Design Enterprises (Decree 18)	5 Jan 2007	5 Jan 2007
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2.5.3 Regulations on Foreign-invested Construction Engineering Service Enterprises (FISEs)

Following the promulgation of FICEs and FIDEs regulations, the MOC has provided a new vehicle for foreign engineering services firms operating in China. On 22 January 2007, the MOC published the *Regulation on Foreign-invested Construction and Engineering Services Enterprises* (FISEs), Decree 155, as shown in Table 2.3. This Regulation allows foreign engineering services firms to set up three types of foreign-invested engineering services enterprises, namely construction supervision, tender agency services and cost consultancy enterprises. This is a further step to open up the market for engineering services in accordance with China's commitments to the WTO (Cox and Xu, 2006). The Regulation will for the first time provide a clear channel for foreign engineering services firms to set up FISEs in China. This Regulation was well received by the foreign firms, particularly those that have already established their construction engineering consultancy entities in China. However, the Regulation has not specified all the requirements for applying for the relevant skill qualifications. The foreign firms are required to use the same general standards as practiced by the Chinese enterprises. These requirements are generally not as difficult to satisfy as the requirements for construction and design skill qualifications (Raymont et al., 2005).

Table 2.3 Regulations on Foreign-invested Construction Engineering Services Enterprises as in 2009

Level	Titles of Laws and Regulations	Date of Promulgation	Date with Effect
Departmental Regulations	Regulation on Administration of Foreign-invested Construction and Engineering Services Enterprises (Decree 155)	22 Jan 2007	26 Mar 2007

Currently, the main target markets for foreign AEC firms are in construction and design consultancy service considering the size of the China's market and the potential of profit. Foreign AEC firms are mostly affected by the three categories of regulations as discussed in Section 2.5.1 to 2.5.3. Besides all these regulations on FICEs, FIDEs and FISEs, the MOC also established the *Regulation on Foreign-invested Urban Planning Enterprises* in China in 2003. However, due to the limited presence of such foreign-invested urban planning enterprises in China's construction industry, this Regulation will not fall within the scope of this research.

Although the regulations on foreign AEC firms have been issued, they are however not clear enough for foreign firms. The regulations have to be read together with other rules and regulations that govern both foreign and Chinese firms. Therefore, the relevant rules in other general regulations will be quoted for reference and reviewed in the discussion of Chapter 3.

2.6 Literatures on Construction Regulatory Risks Faced by Foreign AEC Firms in China

Although new regulations in construction industry were promulgated, a number of articles were published which report on the risks that foreign AEC firms have to bear under the existing construction regulatory framework in China (Luo, 2002a; Dudek et al., 2002; Murphy, 2004; Zhang, 2003). According to China Business Review (2004), foreign construction firms have encountered numerous risks simply maintaining the presence they had before China entered WTO, let alone trying to secure greater access (Hoenig, 2004). As highlighted in two reports of Engineering News-Record (ENR), foreign contractors working in China are reeling from the two new Chinese regulations that greatly change the way they do business and threaten their short-term operations (Tuchman, 2003; Kosmvtatz, 2004). As a lawyer specializing in China construction, Hew (2004) also concluded that the construction regulations established after China's WTO accession appeared to have made it more difficult for foreign

contractors to undertake projects in China.

As shown in Figure 2.2, there are five stages that foreign AEC firms have to undergo before they can realise their business performance. These five stages include market entry, establishment of local entity, skill qualification application, contracting and operation. They are summarized from the procedures stipulated in the construction regulations on FICEs, FIDEs and FISEs. In other words, all foreign AEC firms have to follow these five stages in China. The obstacles faced by foreign AEC firms in each stage are discussed hereunder.

Figure 2.2 Stages of Foreign AEC firms' Penetrating into China's Market

2.6.1 Market Entry

Among all the literatures, the repeal of “Registered Contractor System” is reported as the most debating issue that has hindered the liberalization of construction industry.

Before the promulgation of Regulations on FICEs, most foreign construction firms operated quite well on a project-by-project basis, which was called “Registered Contractor System”. Currently, foreign construction firms have to set up a Chinese corporate entity and to obtain the qualification certificate before they can undertake any projects in China. European construction firms complained that the new system effectively close the market for them (EIC, 2004). During a global construction conference organized by McGraw-Hill Construction, some attendees who are in the higher management level of top foreign contractors responded negatively to the new regulations on FICEs in China (Kosmvatz, 2004). They even pointed out that the repealing of “Registered Contractor System” would threaten the short-term operations of many foreign construction firms in China. The US government and business officials have claimed that such new rulings are not in compliance with the WTO provisions and urged China to reconsider the regulations (USCBC, 2005).

The business scope of foreign construction firms is also restricted in terms of project value and types. Foreign contractors are not allowed to undertake projects with a contract value of more than five times their registered capital unless they possess special grade qualification. This ruling effectively prevents those foreign contractors with low capitalization but specialization work nature from competing in the industry (Howlett and Li, 2007). The cap on contract value may preclude FICEs from working on large projects for multinational clients. The wholly-owned foreign construction firms are only allowed to undertake four categories of the projects, i.e., those that are financed and invested by foreign investment; those funded by multi-lateral institutions and; those that cannot be completed by Chinese enterprises due to technical reasons (Dudek et al., 2002).

For foreign design and engineering firms, offshore service is allowed but they must team up with local design institutes if such offshore service goes beyond the initial conceptual design stage (Howlett and Li, 2007).

2.6.2 Establishment of Local Entity

For foreign contractors, the registered capital of RMB300 million (US\$44 million) is considered extremely high for the special Class qualification (AmChan-China, 2007). The MOC also requires construction enterprises to pay the registered capital in full prior to obtaining the construction license (Wallack, 2005). However, China's Foreign Investment Laws and Regulations generally allow foreign invested firms to pay their registered capital in installments (Hew, 2004). Considering the restricted scope of projects discussed in Section 2.6.1, foreign contractors are reluctant to pay up such a large amount of registered capital as fixed assets. In addition, bonds or financial guarantees from corporate head offices outside of China are not recognized (Lorenzetto, 2004). Foreign equity ownership is also capped at 75 percent of the total capital in a Joint Venture although neither the pre-existing legal regime nor China's WTO commitments contain such limitations (Dudek et al., 2002).

2.6.3 Skill Qualification Application

To apply for Class 1 construction qualification, FICEs must maintain 300 technical and managerial personnel (Howlett and Li, 2007). For FICEs applying for special Class qualification, there is no requirement on minimum total number of technical and managerial personnel but the number of registered project manager must be maintained at 50 or more (Howlett, 2006c). All foreign technical and managerial personnel must reside within China for at least three months in a year. It is difficult for FICEs to keep such a large number of employees in China.

Upon assessing the track record in skill qualification application, overseas track record can be taken into account only when it is from the investor company instead of the parent or affiliated companies (AmChan-China, 2007; Howlett and Li, 2007). Foreign construction firms may wish to establish a special-purpose vehicle (SPV) in a tax-efficient location to be the investor of a FICE in China. Such FICEs will face difficulty as the investor, the SPV, may not have any track record in undertaking

construction projects. This restricts the ability of foreign construction firms to structure their China investments in the most efficient and effective way.

For FIDEs, a minimum of 500 technical personnel is required to apply for a Grade A comprehensive engineering design qualification (AmCham-China, 2007). At least one track record in FIDE's investor's home country is required to apply for skill qualification. Similar to the track record requirement for FICEs, it also restricts the use of SPVs as investors in FIDEs. The parent and affiliated companies' track record should be open for examination (Howlett and Li, 2007).

According to the *Trial Measures on Construction Project Management (Decree 200)*, foreign project management service firms were also required to hold a formal Chinese qualification certificate with minimum registered capital, track record and personnel (EC, 2006/2007; Howlett, 2005). According to Howlett (2007), this greatly hampers the transfer of project management technology from foreign firms to their local partner and put the foreign project management firms into a very disadvantageous position.

2.6.4 Contracting Issues

The draft Construction Law stipulated that the main contractor and the subcontractor would be jointly liable to the owner for the contracted work (Cox, 2005). Such an article also exists in the existing National Construction Law (1997). It is not clear as to which contractual terms would specify the liability of subcontractor to the owner as there is no direct contractual relationship between the two parties (Cox, 2005). According to international practice, the subcontractor needs only to be responsible to the main contractor based on the contract between them. Under the National Construction Law, it would be difficult for the subcontractors to be clear about their liability to the owner. Such ambiguity might give rise to contractual problem for foreign subcontractors working in China.

Another problem highlighted by Cox is the inconsistency of the two contracts that the

owner and contractor enter into for the same work, which is a common phenomenon in China (Cox, 2005). The two contracts include one official contract that is registered with government and a second contract that sets out the real commercial deal agreed between the parties but is not declared to the government authorities (Zhou, 2005). Should the project run into difficulties, there is an inevitable conflict between the owner and contractor regarding the two contracts. According to Cox (2005), this problem is also partly due to the complicated approval process of construction projects.

Howlett (2006a) also indicated a few contracting issues faced by foreign AEC firms in China. One of the issues concerns the standard forms of construction contract issued by the MOC, which is based on the traditional form of contracting instead of the design-and-build procurement. This traditional form of contract is not suitable for foreign AEC firms to undertake projects with sophisticated contracting modes. Another contracting issue is the prohibition upon owner's dividing up the construction projects, which is inconsistent with international practice. Moreover, the restriction on subcontracting also affects foreign AEC firms in their effective operation during the construction stage. As stipulated in the National Construction Law, owner's consent is needed for main contractor to subcontract construction works. This requirement effectively restricts the main contractor's right to select his sub-contractor, which is not conforming to the international practice. Even though, it is not clearly stated that the owner needs to consent on either the appointment of subcontractors or to consent on the works to be subcontracted. Consequently, delay occurs when owner does not agree with the contractor's choice of subcontractor and withhold his consent letter.

Besides the above issues, China's National Construction Law requires the main contractor to complete the main part of the construction projects, which can be problematic for foreign contractors. Firstly, it is not clear what the "main part" of a construction project means. Secondly, this requirement prohibits the foreign contractor to act as the management contractor to the owner in undertaking the construction project. The management contractors do not typically maintain a large

workforce and complete the main part of the construction works. Therefore, management contracting as a procurement strategy is unlikely to prosper in China under the existing law even though it is popular in Europe and the United States.

In addition, the prohibition of sub-sub-contracting by the National Construction Law is another contracting issue that foreign AEC firms have to contend with. This prohibition can certainly avoid the problem associated with multiple sub-contracting which could result in poor quality and safety performance during the construction stage due to the low profit margin. However, this prohibition can cause contractual and operational difficulties for specialist subcontractors who normally provide special technical expertise and supply materials and equipment. Such prohibition will stifle the development of expertise needed for those crucial niche areas of construction specialization, and will not benefit for the industry as a whole (Howlett, 2006a).

2.6.5 Operation- Code and Standard Issues

In the stage of operation, the main problems rise from code and standard issues in China's construction industry. As indicated by law firm Lehman, the major barriers that prevent foreign firms' permanent presence in China's engineering and design sector are the nature of code and standard and material specifications (Lehman, 2007). Architectural and engineering firms are not allowed to specify products by name in their designs, which inadvertently allows contractors substantial latitude to substitute inferior materials without the written approval of the designer or owner. Subsequently, this results in poor construction quality (Wang and Yang, 2002).

According to American Chamber of Commerce in Shanghai, Chinese codes, standards and materials of construction are not easily accessible, and often differ from those recognized internationally (AmCham-China, 2001). This is particularly true of new high-technology areas where complex systems, equipment, materials and work processes are necessary for effective installations. Such barrier in building codes and standards has limited the choices of domestic materials as well as the alternatives of

using imported materials.

In conclusion, the perception of foreign AEC firms is that the rules are very restrictive and such regulations may substantially increase their operation cost. Some foreign construction firms from Japan, Europe and the US even attempt to collaborate to pressure China into reconsidering the new rules. Meanwhile many foreign AEC firms are shifting their business activities from construction service to engineering consultancy services, which are less affected by the new regulations.

2.7 Chapter Summary

This chapter first provided the overview of China's construction industry and the participation of foreign AEC firms in the industry. The overall construction regulatory framework has been examined. The researcher further reviewed the construction regulations governing foreign AEC firms in China, including foreign-invested construction enterprises (FICEs), foreign-invested construction and engineering design enterprises (FIDEs), and foreign-invested construction and engineering service enterprises (FISEs). All the rules and regulations specifically governing these foreign AEC firms in China are summarized in Table 2.4.

An extensive literature review regarding the regulatory issues faced by foreign AEC firms in China was presented and the following list provides a summary of the regulatory risks identified therefrom. These risks are related to the construction regulations which will be reviewed and compared in Chapter 3.

Table 2.4 Chinese Construction Regulations on Foreign AEC Firms as in 2009

Level	Titles of Laws and Regulations (Decree No.)	Date of Promulgation	Date with Effect
Departmental Regulations	Regulations on Administration of Foreign-invested Construction Enterprises (113)	27 Sep 2002	1 Dec 2002
	Regulations on Administration of Foreign-invested Construction and Engineering Design Enterprises (114)	27 Sep 2002	1 Dec 2002
	Supplementations on Regulations on Administration of Foreign-invested Construction Enterprises (121)	19 Dec 2003	1 Apr 2004
	Supplementations on Regulations on Administration of Foreign-invested Construction and Engineering Design Enterprises (122)	19 Dec 2003	1 Apr 2004
	Regulations on Administration of Foreign-invested Construction Services Enterprises (155)	22 Jan 2007	26 Mar 2007
Relevant Measures and Circulars	Implementation Measures on Administration of Skill Qualifications in Regulations on Administration of Foreign-invested Construction Enterprises (73)	8 Apr 2003	8 Apr 2003
	Circular on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China (193)	28 Sep 2003	28 Sep 2003
	Tentative Regulations on Administration of Foreign Enterprise for Undertaking Engineering Design Works within Territory of China (78)	10 May 2004	10 Jun 2004
	Circular on Administration of Skill Qualifications of Foreign-invested Construction Enterprises (159)	6 Sep 2004	6 Sep 2004
	Implementation Rules to the Administrative Regulations on Foreign-invested Construction and Engineering Design Enterprises (18)	5 Jan 2007	5 Jan 2007

A. Market Entry and Business Scope

1. Direct contracting is not allowed for foreign contractors, who have to establish a Chinese entity as the first step of entry into the China's market.
2. Direct contracting is allowed for foreign design consulting firms under the condition that they must select at least one Chinese design institute as partner.
3. Wholly foreign-owned firm in construction is limited to four types of projects.

4. Except for foreign construction firms with special Class qualification, the contract amount is limited to five times the registered capital.

B. Establishment of Local Entity

1. Foreign-owned firms who want to apply for special Class construction qualification (an unlimited qualification to undertake projects of all types and values) must pay at least RMB300 million (US\$44 million) as registered capital.
2. Foreign equity ownership in Sino-foreign JV is limited to 75 percent of the registered capital.
3. Registered capital in full must be paid before obtaining the construction license.
4. Bonding or financial guarantees from the parent company outside of China are not recognized as registered capital.

C. Application of Skill Qualification Certificate (SQC)

1. Firms engaged in project management must obtain at least one SQ certificate from any of the following areas: construction, design, surveying, construction supervision, tendering agent and cost consulting.
2. Firms must obtain the relevant SQ certificate in construction, design, supervision, survey, costing advisory and tendering agency to offer the respective service.
3. Residency requirement: foreign staff in a foreign-owned construction firm must stay for at least three months per year in China.
4. Foreign-invested engineering design firms have to maintain at least 500 technical personnel to apply for Grade-A General/Comprehensive Engineering Design qualification.
5. Foreign-invested construction firms are required to maintain at least 300 professionals for Class 1 qualification of general contractor, and more than 50 registered project managers for special Class of general contractor.

6. For both FICE and FIDE, overseas track record can be taken into account only if it is from the investor firm instead of the parent or affiliated companies.

D. Contracting Issues

1. Inconsistency between contract documents for official registration and for other purposes.
2. Ambiguity in construction law and contract document over the liability of subcontractor to project owner.
3. Problem arising from the use of standard form of contract issued by Chinese government.
4. Prohibitions on owner to “divide up” a construction project which is supposed to be undertaken by a general contractor.
5. Problem arising from the contract dispute resolution governed by China Law and presided by the People's Court in China.
6. Restriction on a main contractor's right to select his sub-contractor by owner's consent letter.
7. Ambiguity over the owner's consent on appointment of sub-contractors or the works to be sub-contracted.
8. Owner's delay in issuing consent letter.
9. The requirements of general contractors to complete the main part of the construction project (restriction on management contracting).
10. Prohibitions of sub-sub-contracting.

E. Code and Standard Issues

1. China's prescriptive building materials standards and design codes do not keep abreast with the level of product innovation.
2. Difficulty for foreign firms to obtain information on the various codes and standards in construction.

3. Difficulty for foreign firms to participate in or influence the establishment of the codes and standards.
4. Architectural and Mechanical & Engineering (M&E) firms are not allowed to specify products by name in their design.

Chapter 3 Review and Comparative Studies of Construction Regulations Affecting Foreign AEC Firms in China

3.1 Introduction

The review on China's construction regulations can deepen the researcher's knowledge of specific areas of the regulatory framework. It can be further achieved by comparative studies on the governing regulations issued on different stages for foreign AEC firms. As indicated in the overall research methodology in Chapter 1, a delicate comparative study is one of the most important parts in qualitative approach which serves as the basis for the quantitative and qualitative analysis. The list of regulatory risks identified in Section 2.6 will be further verified through reviewing and comparing the governing construction regulations and rules on foreign AEC firms. In this chapter, the development of China's construction regulatory framework on foreign AEC firms will be explicitly demonstrated and the improvement made by the government on regulations governing these foreign AEC firms will be identified through the comparative study.

Firstly, the comparison is made on the construction regulations before and after China's WTO entry. China's WTO accession in 2001 accelerates the process of construction regulatory reform. Following China's WTO commitments, the government promulgated the *Administrative Regulation on Foreign-invested Construction Enterprises (FICEs)* (Decree 113), and the *Administrative Regulation on Foreign-invested Construction and Engineering Design Enterprises (FIDEs)* (Decree 114) in 2002 and some other regulations thereafter. After comparing all these regulations, the key changes will be summarized and discussed together with the risks identified in Chapter 2. The Decree number of each regulation will be used when they are discussed below in this chapter.

3.2 Comparative Study of Construction Regulations Governing Foreign-invested Construction Enterprises (FICEs) in China

According to Decree 113, the *1994 Foreign Contractor Measure* and the *1995 Foreign-invested Construction Enterprises Regulation* were repealed because they do not conform to the WTO requirements. Therefore, the following three regulations are first compared to reflect the recent changes concerning FICEs.

- *Regulation on Administration of Foreign-invested Construction Enterprises (Decree 113) (Promulgated on 27 September and with effect from 1 December 2002)*
- *1995 Foreign-invested Construction Enterprises Regulation (Decree 533) (Repealed with effect from 1 October 2003)*
- *1994 Tentative Measure on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China (Decree 32) (Foreign Contractor Measures) (Repealed with effect from 1 December 2002)*

Following the promulgation of Decree 113, four major supplemental regulations on FICEs were published in 2003 and 2004 to make the necessary amendments to Decree 113 (refer to Table 2.1). These four supplemental measures are reviewed and compared with Decree 113 to identify the key changes and improvements in regulating FICEs. In short, the regulations and supplemental regulations to be compared in this comparative study are presented in Figure 3.1.

Figure 3.1 Scope of Comparative Study on Regulations on FICEs

3.2.1 Decree 113 versus Decree 32 and Decree 533

As the most important regulation governing FICEs, Decree 113 consists of five chapters which include general provisions, application for establishment and skill qualifications, scope of contracting, and supplemental provisions. It sets out the licensing, skill qualifications, skill categories and classification requirements, as well as formal application procedures and documents, to establish a FICE in China. On the other hand, Decree 32 (*1994 Foreign Contractor Measure*) only regulates the skill qualifications of foreign contractors undertaking projects in China (under the Registered Foreign Contractor System), and Decree 533 (*1995 Foreign-invested Construction Enterprises Regulation*) applies only on the administration of establishment of foreign-invested construction enterprises in China. Decree 113 combines the two regulations and made necessary revisions according to WTO commitments. Consequently, Decree 32 and Decree 533 established in 1994 and 1995 were repealed upon the implementation of Decree 113. The key changes that Decree 113 has made are identified into the following aspects.

3.2.1.1 Entry Mode and Business Scope of FICEs

According to WTO stipulations, construction and related engineering services can be delivered between member countries through a commercial presence or a presence of natural person(s) (WTO 1995) (Xu et al., 2005a). In the case of the commercial presence, foreign firms shall establish a business entity, such as a branch company, representative office or joint venture. Currently, there are alternative options in the

type of commercial presence for foreign construction firms which enter the Chinese market. In Decree 113, the term “foreign-invested construction enterprises” includes wholly foreign-owned construction enterprise (WFOE) and Sino-foreign equity or co-operative joint venture (JV) construction enterprise. According to Decree 533 in 1995, wholly foreign-owned construction firms were not permitted within the territory of China.

According to Decree 113, if a foreign investor intends to establish a construction enterprise and carry on construction activities within the territory of China, three certificates are needed. In the order of sequence, they are:

- a) The foreign investment enterprise approval certificate from relevant foreign trade and economic administration department;
- b) The registration letter from the State Administration of Industry and Commerce or the relevant local industry and commerce administrative department authorized by the State Administration of Industry and Commerce;
- c) The construction enterprise skill qualification certificate from the relevant construction administrative department.

Evidently, establishing a Chinese corporate entity, such as a WFOE or a JV, is a necessity before foreign contractors can undertake any projects within the country. In other words, a Chinese corporate entity is a must for foreign firms’ business presence in China. This is in contrast to Decree 32 in 1994 where foreign contractors can simply carry on construction works on a project-by-project basis by obtaining a Qualification Certificate from the Ministry of Construction (MOC) or the provincial-level construction authority. Before the promulgation of Decree 113, foreign contractors do not have to register a Chinese corporation in order to carry out construction works. The repeal of such a Registered Foreign Contractor System is the most debated issues among the foreign contractors.

Under Decree 113, wholly foreign-owned enterprises were permitted for the first time. Accordingly, the scope of projects undertaking was restricted to the following categories based on their skill qualifications:

- a) Projects financed or funded entirely by foreign investment or grants.
- b) Projects funded by international financial institutions and awarded through international tendering in accordance with provisions of the loan documents.
- c) Sino-foreign joint venture projects in which the foreign investment is 50 percent or more or in which the foreign investment is less than 50 percent. However, because of technical complexity, Chinese contractors are unable to undertake the projects independently.
- d) Domestically financed projects that Chinese contractors are unable to undertake independently due to technical complexity, and are jointly undertaken with WFOEs after the approval of provincial-level construction administrative department.

Unlike the WOFEs, a Sino-foreign equity joint venture or a Sino-foreign co-operative construction enterprise can carry on projects within the scope of their respective skill qualifications.

3.2.1.2 Establishment of a FICE in China

- **Requirements for Registered Capital**

According to Decree 113, there are no special requirements for minimum registered capital for the FICEs. However, in Article 12 therein, it was stated that the capital contribution of the Chinese party shall not be less than 25% of the total registered capital in a Sino-foreign equity joint venture or a Sino-foreign co-operative construction enterprise. Therefore, the requirement for minimum registered capital of FICEs is the same as that for Chinese contractors. Detailed conditions are spelt out in

the following two standards:

- *Skill Qualifications Standards of Construction Enterprises (Decree 82)*
(Promulgated on 1 July 2001)
- *Skill Qualification Standards on the Special Class of General Contractor*
(Decree 72) (Promulgated on 13 March 2007)

Stipulated in these two standards, the minimum registered capital for Special Class skill qualifications of construction firms is RMB 300 million (US\$ 44 million). The minimum registered capital for Class 1 skill qualification of construction firms is RMB 50 million (US\$ 7.3 million).

- **Procedure of Setting up a FICE**

The procedure for FICEs to apply for the approval of establishment and skill qualifications as stipulated in Decree 113 is shown in Figure 3.2. FICEs shall be registered and approved by the relevant authority before they apply for the skill qualifications.

However, in Decree 32 (the *Foreign Contractor Measure*), the certificate of qualification approved by the relevant authority was a necessary document in the registration procedure at the State Administration of Industry and Commerce. Therefore, foreign enterprises must obtain the certificate of skill qualification before they proceed to registration.

- **Fixed Time for Response**

Under Decree 113, the relevant department must respond within the set deadline in order to control the duration of the application process. This method greatly reduces the waiting time of the applicants, and increases the working efficiency of administrative departments.

Figure 3.2 Establishment and SQC Application Procedures for FICEs
(Summarized by Author)

3.2.1.3 Application of Skill Qualification Certificate (SQC)

FICEs which apply for different categories and different Class of the SQC are administered by the authority of State Council or the provincial-level administrative departments. The skill qualifications of construction enterprise can be classified into three categories- construction main contractor, specialist contractor and labor subcontractor. Each category has different classes to scale the qualifications.

Under Decree 32 in 1994, foreign contractors can undertake construction works within the territory of China if they have obtained the “certificate of skill qualification of foreign contractors” and registered at the State Administration of Industry and Commerce. This procedure means all the foreign contractors were in the same Class of skill qualification for contracting construction works in China. In Decree 533 established in 1995, skill qualifications were classified into three Classes without any identified categories. FICEs must provide at least US\$ 10 million as registered capital if they want to apply for first class skill qualifications.

3.2.2 Supplemental Regulations Promulgated Since 2002 on FICEs

The following four supplemental regulations were established as amendments to Decree 113 that further clarify the detailed implementing measures.

- *Implementation Measure on Administration of Skill Qualifications in Regulations on Administration of Foreign-invested Construction Enterprises (Decree 73)*
- *Notification on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China (Decree 193)*
- *Supplementation on Regulation on Administration of Foreign-invested Construction Enterprises (Decree 121)*
- *Circular on Administration of Skill Qualifications of Foreign-invested Construction Enterprises (Decree 159)*

3.2.2.1 Review of the Supplemental Regulations

In this section, the above-mentioned four supplemental regulations are reviewed to identify the major amendments.

i. Implementation Measure on Administration of Skill Qualifications in Regulations on Administration of Foreign-invested Construction Enterprises (Decree 73)

Although Decree 73 is concerned with the implementation of skill qualification application, it has other implications for foreign AEC firms which enter and operate in China. The detailed requirements of Decree 73 are explained as follows.

a) Other Options of Market Entry for Foreign AEC Firms

Decree 73 proposes another two forms of presence for foreign AEC firms in China, besides WFOEs and JVs. For existing foreign-invested firms in China, one approach to enter China's construction industry is to acquire an equity interest in an existing Chinese construction enterprise; the other approach is to invest and set up a new construction firm based on their existing corporation registered in China. The skill qualification of such newly-established construction firms shall be re-assessed. They shall obtain the certificate of skill qualifications for construction firms if they meet the requirements of the application. The certificate will not be awarded to the investor of such newly-established construction firms.

b) Defining the Construction Activities Referred in Decree 113

In Article 3 of Decree 113, the construction activities that FICEs can carry out in China refer to civil, building, pipeline, cabling and equipment installation or decoration works and the expansion and alternation of decoration works. This definition is broader than that stipulated in the 1997 National Construction Law, in which the construction activities are defined as the construction of buildings and auxiliary facilities and the installation of wires, cables, pipelines and equipment associated therewith. This means that FICEs can carry out civil engineering projects, such as highways, power plants and oil refineries.

c) Determination of Skill Qualifications of FICEs

Newly-established FICEs could obtain the lowest Class of skill qualification for one year in the area of discipline for which it is applying. For newly-established FICEs invested by foreign AEC firms which have been contracting works in China, they can apply for Class 2 skill qualification or above under the following conditions:

- Meet the requirements in Regulations on Administration of Skill Qualifications of Construction Enterprises, including the requirement of track record in China
- Obtain the SQC under Decree 32 (1994) before they were repealed on 30 September 2003
- To apply for the Skill Qualification for construction WFOEs, the track record of the foreign investors undertaking projects in China shall meet the requirements of skill qualification standards (Decree 72 & 82 as stated in Section 3.2.1.2); for Sino-foreign construction JVs, the track records from both the foreign party and the Chinese party in undertaking projects in China are combined and the total track records shall also meet the requirements of Decree 72 & 82.

d) Requirements of Foreign Professional Personnel

To meet the requirements of SQC application, contractors must employ a minimum number of qualified personnel. FICEs may employ staff from overseas. However, they must meet the personnel requirements in the regulations, including educational qualifications, experience and residency requirements.

If an FICE engages foreign personnel as the top manager of their firm, technical or managerial staff, the foreign personnel must possess the construction management experience or must be qualified for the technical or managerial standards as required in the skill qualification standards for construction firms (Decree 72 & 82). The

documentary evidence of foreign personnel's managerial or technical working experience in relevant engineering projects shall be provided when the FICEs apply for the skill qualifications.

According to Decree 72 & 82, the requirements on the minimum number of professional personnel are different when firms apply for skill qualification in different category and different Class. For instance, to apply for Class 1 of general construction skill qualification, there must be at least 10 technical personnel of senior qualification and 60 of middle-level qualification in the enterprise. Under this Implementation Measure (Decree 73), foreign technical or managerial personnel with a university degree and at least 10 years of experience in his specialized area can be considered to have senior qualification. To qualify as middle-level qualification, foreign technical or managerial personnel should possess a diploma and a five-year experience in his specialized area. In addition, the foreign technical and managerial staff in an FICE shall reside in China for more than three months each year.

The qualification of foreign professional personnel engaged as project managers is categorized into three levels. To qualify as the highest level of project manager, foreign professional personnel must have worked as the main construction project manager for at least one project that only the construction firm with Class 1 skill qualification can undertake, or at least two projects that the construction firm with Class 2 skill qualification can undertake. The number of project managers who are foreign professional personnel cannot exceed one third of the total number of project managers required under the skill qualification standards (Decree 72 & 82). For example, a construction firm must have at least 12 project managers of the highest level qualification to qualify for Class 1 of skill qualification. Accordingly, the number of foreign project managers shall be less than four.

e) Requirements of Track Record

In this Implementation Measures (Decree 73), the scope on track record is broader

than that in Decree 113. If the foreign investors of a FICE have jointly undertaken construction projects with a Chinese construction company or subcontracted the construction works to Chinese companies outside the territory of China, the track record of these projects could be used by this FICE to apply for SQC. Thus, the track record is no longer limited to that within the territory of China.

f) Transition from Decree 32 (1994) to Decree 113 (2002)

Decree 113 took effect on December 1, 2002 while Decree 32 was repealed only on October 1, 2003. There is a transition period of ten months, during which both regulations were effective. Before October 1, 2003, foreign firms can still apply for the old “certificate of skill qualification of foreign contractors” under Decree 32. If the foreign firms have owned this certificate under Decree 32, they shall carry on the construction projects, fulfill their on-going projects, and even apply for extension of the duration of their “certificate of skill qualification of foreign contractors”. However, foreign construction firms are not allowed to do as such after the transition period was over by October 1, 2003. If the contract of a construction project was signed by foreign firms prior to October 1, 2003 and the duration of this contract would extend after this date, foreign firms still can complete such projects according to the Implementation Measure (Decree 73).

ii. *Notification on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China (Decree 193)*

The deadline for the repeal of the “Registered Foreign Contractor System” was extended from October 1, 2003 to April 1, 2004. For those foreign firms which have obtained the old “certificate” under Decree 32 but have not obtained the new SQC under Decree 113, they could still apply for extending the period of validity of the old “certificate” and expand the geographical areas in which they are allowed to contract before April 1, 2004. The preliminary application should first be submitted to the construction authorities at the regional level. Upon the approval of the preliminary

application, the MOC shall examine and approve the final application. For FICEs which have been issued with the SQC under Decree 113, the old “certificate” under Decree 32 cannot be used for undertaking projects and should be returned to the regional-level construction authorities upon awarding of the new SQC.

iii. Supplementation on Regulation on Administration of Foreign-invested Construction Enterprises (Decree 121)

The supplementations concern the FICEs from Hong Kong and Macao. In order to encourage the participation of foreign firms from Hong Kong and Macao, certain benefits are provided, which include:

- Permission to use the track record of contracting works in Hong Kong, Macao, and mainland China to apply for SQC in China.
- Permission for foreign firms from Hong Kong and Macao to acquire Chinese construction companies in the mainland with full equity interest.
- Permission for foreign firms from Hong Kong and Macau to undertake Sino-foreign joint venture projects without any limitation on the percentage of the foreign investment in the total equity. This is in contrast to WOFEs from other countries which can only undertake Sino-foreign joint venture projects in which the foreign investment is 50 percent or more or in which the foreign investment is less than 50 percent but, because of technical difficulties, Chinese contractors are unable to undertake the projects independently.

iv. Circular on Administration of Skill Qualifications of Foreign-invested Construction Enterprises (Decree 159)

The deadline for the repeal of the old “certificate” under Decree 32 has been extended from April 1, 2004 to July 1, 2005. For those FICEs that have not received the SQC under Decree 113 before July 1, 2005, they could obtain a special certificate from the MOC for contracting construction works by submitting the signed contract of

construction project along with the old “certificate” under Decree 32. Without the SQC under Decree 113, FICEs are not allowed to contract construction works in China after July 1, 2005.

To encourage the top foreign AEC firms to participate in China’s construction industry, the construction track record of a foreign AEC firm outside the territory of China can be used to apply the SQC for a newly-established FICE in China it has invested in. Furthermore, it is indicated in Decree 159 that there is no restriction on the number of foreign professional personnel engaged as project managers in a FICE. The clause in the *Implementation Measure* (Decree 73) that the number of project managers engaged using foreign professional personnel cannot exceed one third of the total number of project managers in a FICE has been repealed by Decree 159.

3.2.2.2 Summary on the Key Amendments of Supplemental Regulations to Decree 113

After scrutinizing the four supplemental regulations, it can be concluded that these supplementations have provided specific methods and details of improvement to enforce Decree 113. In other words, such amendments facilitate the gradual opening of the construction industry in China.

Despite these improvements, some clauses in above four supplemental regulations remain vague or even contradictory. For example, contractors from Hong Kong and Macao can acquire Chinese construction companies with full equity. However, it is not clearly stated in the *Implementation Measure* (Decree 73) whether FICEs from other countries can do likewise or can only acquire part of the equity. Moreover, it is stated in the *Implementation Measure* that “*If the foreign professional personnel is to be qualified as the first level of project manager, he/she must have been working in a project that only the construction company of Class 1 skill qualification can undertake, or have been fully responsible for two projects that can only be undertaken by construction company of Class 2 skill qualification.*” If the foreign professional

personnel to be qualified has never worked on projects in China, it is difficult to justify if the projects he/she has worked for in other countries are equivalent with the projects in China that can be undertaken by Chinese construction companies with Class 1 or Class 2 skill qualification.

In addition, construction WFOEs are more restricted than Sino-foreign JVs. Projects undertaken by WFOEs are limited to only four categories as discussed in Section 3.2.1.1, while no such restriction is placed on Sino-foreign construction JVs. Therefore, forming a JV with a Chinese company is recommended for foreign contractors which enter the Chinese construction industry for the first time. However, there is no regulation stipulating that the Chinese party in a Sino-foreign construction JV must be a construction company when the foreign contractor is selecting the Chinese partner. It means that the Chinese party could be a company from any industry, construction or otherwise.

3.2.3 Summary on Comparative Study on Regulations Governing FICEs

In summary, all the regulations directly related to FICEs in the existing construction regulatory framework have been reviewed and compared. The main regulatory requirements that FICEs must satisfy are listed as below:

- **Entry mode and the scope of business activity**

As shown in Figure 3.3, FICEs can enter China construction market by establishing a WOFE or a JV. Without applying SQC, they are not allowed to undertake any construction projects in China. The scope of business activities for WOFEs is more restricted than that for JVs.

- **Establishment of local entity**

- Registered capital
- Procedure of setting up a FICE

- Fixed time for governing authority to respond

Figure 3.3 FICE's Choice on Entry Mode and Business Scope

- **SQC application**

- Personnel requirements
- Track record

Through the comparative study on FICEs regulations before and after China's accession into WTO, it is found that China has been removing restrictions on FICEs and tried to provide national treatment to FICEs in accordance with the WTO provisions. However, the regulatory framework on FICEs has to be improved. All the above regulatory requirements must be considered by foreign construction firms before they enter China's construction industry. If not well adapted, these requirements are set to greatly affect the market entry and business operation of FICEs in China.

3.3 Comparative Study of Construction Regulations Governing Foreign-invested Construction and Engineering Design Enterprises (FIDEs) in China

Similar to the regulations governing FICEs, the regulatory framework for foreign construction engineering and design firms in China is also undergoing significant changes. As the first and the most important regulation governing FIDEs, *Regulations on Administration of Foreign-invested Construction and Engineering Design Enterprises* (Decree 114) was promulgated in 2002 to meet the WTO requirements. Meanwhile, the *1992 Joint Venture Design Institute Regulation* (Decree 190) were repealed. Another regulation on foreign engineering design firms was the *Provisional Regulations on Chinese-Foreign Cooperative Design of Engineering Projects* (Decree 840) established in 1986. It was also repealed by the State Council (SC) to clear up the outdated Regulations promulgated before 2000. Thus Decree 840 (1986) and Decree 190 (1992) are the two Regulations on FIDEs that have been repealed upon China's WTO entry. To identify the regulatory changes on FIDEs before and after WTO, Decree 114 (2002) will be reviewed and compared with Decree 840 (1986) and Decree 190 (1992). The three regulations to be compared are listed herein, as below:

- *2002 Regulation on Administration of Foreign-Invested Construction and Engineering Design Enterprises (Decree 114) (Promulgated at 27 September with effect from 1 December 2002)*
- *1992 Joint Venture Design Institute Regulation (Decree 190) (Abrogated with effect from 1 December 2002)*
- *1986 Provisional Regulation on Chinese-Foreign Cooperative Designing of Engineering Projects (Decree 840) (Abrogated with effect from 6 October 2001)*

After the promulgation of Decree 114, three new supplemental regulations on FIDEs were published in 2003, 2004 and 2007 respectively, to make amendments to Decree

114. These three supplemental regulations are then reviewed and compared with Decree 114 herein to identify the major changes and improvements in regulating FIDEs. All the regulations and supplementation measures to be reviewed and compared in this section are presented in Figure 3.4.

Figure 3.4 Scope of Comparative Study on Regulations on FIDEs

3.3.1 Decree 114 versus Decree 840 and Decree 190

The promulgation of Decree 114 by the MOC and the Ministry of Commerce (MOFCOM) in 2002 signified a step towards opening up China's construction engineering design market to foreign AEC firms. Decree 114 sets out the steps that must be taken and the qualifications that must be obtained in order for FIDEs to provide engineering design services in China, while Decree 840 and Decree 190 simply regulated the construction engineering design services on the basis of Sino-foreign equity or co-operative joint ventures.

3.3.1.1 Entry Mode and Business Scope of FIDEs

Prior to the promulgation of Decree 114, foreign AEC firms generally have three options in order to undertake construction engineering & design works in China:

- (1) Establish a JV
- (2) Register a “project branch”
- (3) Provide limited engineering, design, procurement and consulting services from offshore.

The project branch mode for foreign engineering design firms was similar to the “Registered Contractor System” for foreign contractors prior to Decree 113. Both the project branch and offshore service were popular with foreign engineering design firms as these two options do not require injection of paid-in registered capital or full compliance with local qualification requirements.

According to Decree 114, to undertake design works in China, a foreign engineering design company must establish a local presence by setting up a Chinese legal entity (either a WFOE or a Sino-Foreign JV). This Chinese legal entity must also apply for a design SQC (Grade A, Grade B, or Grade C, in particular industry categories). Similar to FICEs, it is the first time that construction engineering design WOFEs are allowed to be established in China.

3.3.1.2 Establishment of a FIDE in China

- **Required Registered Capital**

Compared with a FICE, the establishment of a FIDE in China (under Decree 114) requires a significantly smaller amount of registered capital. For instance, a comprehensive engineering design qualification requires a registered capital of RMB60 million, compared with RMB300 million for the construction special grade qualification. Similarly, RMB6 million is required for a Grade A engineering design SQC, compared with RMB50 million for a Class 1 construction SQC.

Similar with FICEs, foreign engineering design firms can establish a JV in China. The minimum 25 percent of equity participation by a local partner is required.

- **Procedure for Setting up a FIDE**

A detailed procedure for FIDEs to apply for the approval of establishment and skill qualifications is stipulated in Decree 114. It is exactly the same as the application procedures in setting up a FICE as presented in Figure 3.2. FIDEs shall be approved and registered with the relevant authority before they apply for the SQC.

- **Fixed Time for Response**

Similar to Decree 113, Decree 114 also requires the relevant authority to give response within the set deadline in order to control the processing time in the complicated procedure of application for FIDEs. It greatly increases the transparency within the application procedures and the working efficiency of administrative departments. In contrast, there is no such fixed response time in Decree 840 and Decree 190.

3.3.1.3 Application for SQC

FIDEs that apply for different categories and different grades of SQC are administered by the authority of State Council or the Provincial-level administrative departments. According to the *Engineering Design Qualification Standards* issued in 2007, the skill qualifications of engineering design enterprises can be classified into four categories:

- (1) Comprehensive engineering design qualification;
- (2) Industry engineering design qualification;
- (3) Specialist engineering design qualification;
- (4) Engineering design qualification on specific technology and sector.

The comprehensive engineering design qualification has only one level, namely Grade A. The second and the third qualification categories have two levels, Grade A and B. Grade C also applies for some of the industries. Only the construction industry design qualification in the second category has four levels, namely Grade A, B, C and D. The last qualification category has not been classified to different level. It will be determined case by case. There is no such detailed classification of SQC in the repealed Decree 840 and Decree 190.

Although the procedure of setting up a FIDE appears to conform to the usual standard, there are high thresholds required to obtain the SQC from the MOC. To apply for the

highest and the only Grade in comprehensive engineering design qualification, for example, the proposed FIDE must be staffed with at least 500 technical personnel. For other design qualification categories, the requirements on the number of technical personnel are largely lowered down. For Grade A qualification in industry engineering design, firms must employ at least 34 technical personnel with more than 12 registered engineers. All foreign technical personnel must reside in China for at least 6 months per year under Decree 114. In addition, 25 percent of all architects and engineers employed by the engineering design WOFEs must be foreign technical staff. Furthermore, 25 percent of the foreign technical staff of an engineering design WOFE must be qualified as registered architects and registered engineers in China. The corresponding figures for design JVs are 12.5%.

3.3.2 Supplemental Regulations Promulgated Since 2002 on FIDEs

Following the promulgation of Decree 114, three supplemental regulations were established as the amendments and to address some uncertain clauses in Decree 114. These three supplemental regulations to be reviewed in this Section are presented as follows:

- *Supplementation on Regulation on Administration of Foreign-invested Construction and Engineering Design Enterprises (Decree 122)*
- *Tentative Regulation on Administration of Foreign Enterprises for Undertaking Engineering Design Works within Territory of China (Decree 78)*
- *Implementation Rule on the Administrative Regulation on Foreign-invested Construction and Engineering Design Enterprises (Decree 18)*

Among the three regulations, Decree 18 issued in 2007 is considered to be the most important regulation to implement Decree 114 in China. Decree 18 even relaxed some of the restrictions on FIDEs as stipulated in Decree 114. Therefore, it is favored by

foreign AEC firms engaged in construction and engineering design services in China.

3.3.2.1 Review of the Supplemental Regulations

The main changes and improvement made by the three Supplemental Regulations are summarized hereunder.

i. Supplementation on Regulation on Administration of Foreign-invested Construction and Engineering Design Enterprises (Decree 122)

The key amendment to the previous regulation is that firms from Hong Kong and Macau can establish engineering design WOFEs in China Mainland from January 1, 2004. According to China's WTO commitments, engineering design WOFEs are only allowed five years after China's entry into WTO. Therefore, this Supplemental Regulation provides competitive advantage for engineering design firms from Hong Kong and Macau as they can set up design WOFEs two years ahead of other foreign firms.

Hong Kong and Macau firms which want to establish FIDEs in China must abide by the Regulations on FIDEs (Decree 114) and any other relevant regulations. The MOFCOM and the MOC shall each be responsible for the interpretation and administration of the regulations.

ii. Tentative Regulation on Administration of Foreign Enterprises for Undertaking Engineering Design Works within Territory of China (Decree 78)

The *Tentative Regulation* (Decree 78) was issued by the MOC on May 10, 2004 and took effect on June 10, 2004. Unlike construction works, engineering design works in China can be performed by foreign design firms outside of China, namely offshore services, as permitted by Decree 78. Foreign engineering and design firms have to work in cooperation with locally qualified engineering design institutes if the offshore services involve engineering design beyond the basic initial conceptual (schematic) design. Decree 78 does not apply to those FIDEs which only provide conceptual

design. It means that the initial conceptual (schematic) design of a construction project is the unregulated area for FIDEs. Such exclusion was not mentioned in Decree 114. Therefore, FIDEs have more choices than FICEs as they can choose to provide either offshore or onshore engineering design services.

iii. Implementation Rule on the Administrative Regulation on Foreign-invested Construction and Engineering Design Enterprises (Decree 18)

The *Implementation Rule* was finally issued in 2007. It is a considerable improvement on the gaps that had previously existed. Major improvements are summarized as follows:

a) Track Record

Foreign firms can make use of their overseas track record in the initial application of design SQC. At least two project track records in China have to be provided by the FIDEs to upgrade the initial SQC.

b) Personnel Requirements

Under Decree 114, the qualifications of foreign engineers and architects are examined during the application process. Foreign engineers and architects have to obtain the Chinese design qualification certificate and FIDEs must employ a number of foreign engineers and architects with such qualification certificates. However, *Implementation Rule* (Decree 18) stipulates that foreign engineers and architects need not have to pass the Chinese qualification examinations. Foreign engineers and architects will be assessed based on their academic qualification, years of working experience in design, track record and reputation. FIDEs can temporarily meet the requirements of 25 percent minimum foreign qualified engineers and architects in Decree 114 by employing Chinese engineers and architects with the same qualification. The six-month residency requirement under Decree 114 may not be examined if it cannot be met temporarily.

3.3.2.2 Summary on the Key Amendments of Supplemental Regulations to Decree 114

Having examined all the three supplemental regulations, it can be concluded that they have improved the way FIDEs are regulated under Decree 114. The key amendments include the permission of offshore service, the permission of overseas track record used in SQC application, the relaxation on personnel requirements, and the better market access for foreign AEC firms from Hong Kong and Macau.

3.3.3 Summary on Comparative Study of Regulations Governing FIDEs

In summary, all the regulations on FIDEs within the current construction regulatory framework have been reviewed and compared. The main aspects of these regulations are listed as follows:

- **Entry mode and the scope of business activities**

FIDEs can choose to work on either onshore or offshore basis as allowed by Decree 78. The respective scopes of activities for onshore and offshore services are different, as indicated in Figure 3.5.

- **Establishment of local entity**

- Registered capital
- Procedure of setting up a FIDE
- Fixed time for governing authority to respond

- **Application for SQC:**

- Personnel requirements
- Track record

Figure 3.5 FIDE's Choice on Entry Mode and the Respective Business Scope

The above summarized aspects are key changes and improvement made to all the Regulations after China's WTO accession. They are the most important aspects that foreign engineering design firms have to be aware of after entering China's construction industry. From the promulgation of Decree 114 (2002) to the *Implementation Regulation* (2007), it can be found that China has been gradually eliminating the limitations on FIDEs to meet the requirements of WTO provisions and to provide national treatment to FIDEs. However, there is still room for these regulations and rules to be further improved.

3.4 Review of Regulation on Foreign-invested Construction and Engineering Service Enterprises (FISEs) (Decree 155)

Regulation on FISEs (Decree 155) has now been formally issued and taken effect on March 26, 2007. This regulation is another element of the MOC's opening-up process, which is required under China's commitment to open up the construction engineering service sector within five years after the WTO accession. In Decree 155, foreign-invested construction and engineering service enterprise refers to either a Sino-foreign construction and engineering service equity JV, or a Sino-foreign

construction and engineering service contractual JV, or a construction and engineering service WOFE. The construction engineering service in Decree 155 refers to construction supervision, tendering agent and cost consultancy services.

Decree 155 sets out the procedures to establish a FISE as well as the specific qualification requirements. The procedure for establishing a FISE in Decree 155 is largely similar to the procedures specified in Decree 113 and Decree 114. Only foreign engineering service firms with suitable track record will be permitted to establish a FISE in China. In a Joint Venture, the China investor must contribute at least 25 percent of the total registered capital, which is similar to Decree 113 and Decree 114. There are unlikely to be many foreign firms wanting to establish FISEs as tendering, supervision, and costing are not areas where foreign firms can add value and compete effectively with Chinese companies.

3.5 Review of Other Regulations with Effect on Foreign AEC Firms

Besides the regulations discussed above, foreign AEC firms also have to follow other laws and regulations governing both Chinese and foreign firms in China's construction industry. In principle, these laws and regulations do not fall within the scope of this research. Nevertheless, certain regulations that greatly affect the way that foreign AEC firms are doing business in China have to be included even though these regulations may not specifically target foreign firms. Four related laws and regulations are reviewed and discussed in this section.

3.5.1 The Interim Measure on Construction Project Management (Decree 200)

The *Interim Measure on Construction Project Management* (Decree 200) is one of the Regulations that has impact on foreign AEC firms even though it applies to both Chinese and foreign companies. Until the end of 2004, the project management market was not significantly regulated. Decree 113 and Decree 114 also do not apply to project management services. When Decree 200 took effect on December 1, 2004,

it requires that project management services be only provided by local entities holding certain construction-related qualifications, including construction, design, surveying, tendering agency, construction supervision and cost consultancy qualifications. However, there is still no regulation governing SQCs for construction tendering agent and cost consultancy. Therefore, foreign firms which want to provide project management service must obtain at least one construction or design SQC while SQCs in other areas are not available now.

Foreign AEC firms have been providing project management services and related expertise to foreign and Chinese developers for many years. Extensive transfer of project management technology has taken place, and Chinese contractors and developers have had the benefit of this expertise. Since project management firms are also required to undergo the formal qualification process, with the registered capital, minimum personnel, and track-record requirements, foreign project management firms are disadvantaged and the transfer of technology to Chinese contractors and consultants will be significantly hampered. This could not have been the intention of Decree 200, as it runs contrary to the MOC's avowed intent to promote project management techniques and international best practices in China.

3.5.2 Qualification-related Regulations for Construction and Design Firms

Decree 113 and Decree 114 have to be read together with the Qualification Regulations and Standards to better understand the detailed requirements of SQC in various classes/grades and areas of specialties in construction and design. *Qualification standards for construction engineering general contracting special Class (Decree 72)*, established in March 2007, abolished the clauses regulating special Class contractor in *Qualification Standards for Construction Enterprises (Decree 82)*. Although the required registered capital remain unchanged, the requirements of minimum 300 professionals were replaced by the personnel requirements for Grade A industry design qualification. In order to obtain the number and the qualification requirements of personnel for Grade A industry design enterprises, *Qualification*

Standards for Construction and Engineering Design Enterprises (Decree 86) has to be reviewed. In an attached form in Decree 86, the minimum number of required technical personnel is specified for AEC firms with different classes of skill qualification and in different industrial sectors. Based on Decree 86 and the form regarding the number of technical personnel, it can be summarized that a construction firm which applies for special Class must have at least 34 technical personnel, including 12 registered technical staff. The previous 300 technical personnel requirements have been abolished. This changeover is favored by foreign construction firms as they do not need to maintain a large number of staff in China. However, they must employ at least 50 first-class project managers instead of 12 in the repealed requirements regarding the number of personnel. All the aforesaid figures are not stated in Decree 113, Decree 114 and any other regulations that specifically govern foreign AEC firms. Therefore, the general Qualification Regulations and Standards have to be included for review and discussion in order to know the detailed standards for SQC.

3.5.3 The National Construction Law

The *National Construction Law* was promulgated in 1997 and became effective in 1998. It is both the first national law specifically governing construction activities, as well as the highest governing legislation for the Chinese construction industry. The *National Construction Law* does not contain any specific provisions relating to the participation of foreign AEC firms in China. Notwithstanding this, foreign AEC firms have to comply with the *National Construction Law* the same way as Chinese companies do. The regulatory risks related to contracting issues identified in the literature review in Chapter 2 involve some provisions in construction contract stipulated in the *National Construction Law*. The relevant provisions have to be located and reviewed as follows:

- *Article 24: "General contracting of construction projects shall be encouraged and dismemberment of contract issuance of construction projects shall be*

prohibited. The contract issuing unit shall not dismember a construction project which should be completed by one single contracting unit into several parts for awarding contracts to several contracting units."

This article prohibits the owner from contracting construction project in parts as discussed in Chapter 2.

- *Article 28: "Subcontracting to others of the entire construction project contracted by the contracting unit shall be prohibited. Subcontracting to others in the name of subcontracting after dismemberment of the entire construction project contracted by the contracting unit shall be prohibited."*

From this article, it can be concluded that the MOC is restricting management contracting which is popular in other countries.

- *Article 29: "The general contracting unit of a construction project may award contracts of parts of the contracted project to subcontracting units with corresponding human quality qualifications; however, except for the subcontracting agreed upon in the general contracting contract, acknowledgement of the construction unit shall be obtained."*

In this article, the main contractor's right to select sub-contractor is restricted by the owner's acknowledgement/consent letter. It is unclear whether the owner needs to consent on either the appointment of sub-contractors or to consent on the works to be sub-contracted. Problem would happen if the owner does not agree with the main contractor's choice of sub-contractor and withhold the acknowledgement (consent letter).

- *Article 29: "The subcontracting unit shall be prohibited to re-subcontract the project it has contracted."*

This prohibition is intended to avoid the safety and quality problem due to the low profit margin prevalent in the sub-sub-contractor system. However, it can

create difficulties for those specialist contractors competing in a unique niche market.

- *Article 29: “The general contracting unit of a construction project shall, pursuant to the agreement in the general contracting contract, be responsible to the construction unit; subcontracting units shall, pursuant to the agreement in the subcontracts, be responsible to the general contractor. The general contracting unit and subcontracting units shall bear joint responsibility to the construction unit in respect of the subcontracted projects.”*

This article creates ambiguity on the liability of subcontractors to the project owner. It is uncertain what responsibility a subcontractor needs to bear and whether the responsibility by the subcontractor to the project owner needs to be written on the subcontracts.

3.5.4 The Administration Measure on Subcontracting of Building Construction and Municipal Infrastructure Construction (Decree 124)

In order to further enhance the quality and safety of construction in China, the MOC issued the *Administration Measures on Subcontracting of Building Construction and Municipal Infrastructure Construction* (Decree 124) on February 3, 2004 in line with the Construction Law, the Bidding Law and the Quality Regulations. Decree 124 came into effect on April 1, 2004. The intention of Decree 124 is to regulate subcontracting activities related to building construction and municipal infrastructure construction, maintaining order in the construction market and ensuring project quality and construction safety.

It is stipulated by Article 6 in Decree 124 that “*the construction unit shall not directly designate a sub-contractor for the construction project*”. The article appears to make the process of project owner’s nomination of subcontractors effectively illegal in China.

3.6 Chapter Summary

Through reviewing and comparing the regulations, this chapter deepens the understanding of the construction laws and regulations that have impact on foreign AEC firms in China. It also compares the regulatory risks identified in Chapter 2 with the respective articles in laws and regulations to understand the risks that may be encountered by foreign AEC firms. It can be concluded that the regulations that specifically target foreign AEC firms only regulate the market entry, establishment of local entity and the application for SQC. For contracting and operation, foreign AEC firms are provided with the national treatment and are regulated under the same regulatory regime as Chinese enterprises. However, due to the unique nature of the foreign firms, they are still facing more problems than Chinese enterprises in contracting and post-contract operations. The main laws and regulations which can result in those contracting and operational issues were listed and discussed in Section 3.5. The conceptual model and research hypotheses will be developed in the next chapter by exploring the theories on how the regulations would affect firms' performance and how the negative regulatory effect can be minimized to enhance their performance through strategies and capabilities considerations.

Chapter 4 Theoretical Foundation and Conceptual Framework

4.1 Introduction

This chapter aims to establish the impact of construction regulatory framework on foreign AEC firms and their responsiveness to such impact. Extant literatures and theories are reviewed to identify the research variables and the relationship among them. Arising from that, a conceptual framework and hypotheses are developed for this purpose.

4.2 Impact of the Regulatory Framework on Firm's Performance

An important issue in international business concerns the interaction between multi-national corporations (MNCs) and the host government. A host government's intervention policy imposes severe constraints on an MNC's strategies and operations within the host country (Moon and Lado, 2000). According to Moon and Lado (2000), the resource-based view places at center stage idiosyncratic, hard-to-copy resources as the drivers of firm's strategy and performance.

4.2.1 Relationship between Government and Business Firms

The literature on business' political activity considers the relationship of business to government, especially the interests and activities of corporations and trade associations in legislative and regulatory processes (Shaffer, 1995). Figure 4.1 shows a highly simplified model of the interdependence of business and government. According to Shaffer (1995), when government uses its authority to implement public policies through processes of legislation and regulation, the main response of firms is adaptation. Conversely, when government develops public policies, firms act as interest groups and attempt to influence policy development.

Figure 4.1 The Interdependence of Business and Government (Shaffer, 1995)

At the firm-level, the effects of government on competitive position are an important determinant of profitability. Thus firms may support legislation and regulations that benefit their positions vis-a-vis rivals, entrants, substitute products, buyers, and suppliers. This may be termed the strategic use of public policy for the purpose of gaining competitive advantage (Mitnick, 1981; Wood, 1986). In addition, regulations often have asymmetric effects on competing firms (Leone, 1986). As a result, firms with superior capabilities for adapting to regulatory dictates may also attain a position of competitive advantage over their rivals (Shaffer, 1995). As legislation and regulations cannot always benefit firms' competitive position, they have to use their specific capabilities and strategies to minimize the impediments imposed by the legislation and regulations. Therefore, firm-level capabilities and strategies are important in better adapting to the governing regulatory framework. In other words, firms with superior capabilities and strategies tend to encounter less regulatory problems or difficulties which are normally considered as the negative effects of government intervention. Therefore, it can be concluded that the regulatory problems/difficulties that firms encountered are associated with their profitability or business performance.

When a firm's capabilities and strategies are involved, the relationship between the

government and the firm can be demonstrated as in Figure 4.2. As the effects of government on firms are an important determinant of their profitability, the impact of the government on firms' profitability is inevitable. The capabilities and strategies of a firm can be aligned to adapt to the public policy and regulations to minimize the negative impact on their profitability or business performance.

Figure 4.2 The Relationship between Government and Firms' Capabilities, Strategies and Profitability (Summarized by Author)

In this research, emphasis shall be put on the impact of government regulations on the foreign firms and how these firms would adapt to the government regulations through strengthening their capabilities and enhancing their strategies. The business firms' influence on the formulation of public policy and regulations, i.e. business political activities (Figure 4.1), will not fall within the scope of this research.

4.2.2 The Impact of Government Regulations on Firm's Performance

The nature and scope of government regulations have a direct impact on a firm's strategies, choices and performance, by influencing their costs, risks and barriers to competition (Qureshi and Velde, 2007). Kerr (2002) argues that a quagmire of regulation imposes high costs on business and deters productive investment. These

costs arise not only from compliance but also from resource-misallocation and a lack of competition, especially if the designed regulation is bad. Dollar et al. (2005) use firm-level survey to reveal that the total factor productivity of firms in developing countries is systematically related to the investment climate indicators. Factors, such as wages and rate of profit, are higher where investment climate is better. The investment climate refers to the institutional, policy and regulatory environment in which firms operate. Scarpetta et al. (2002) observed that the entry of new small firms in the market is discouraged by strict regulations on entrepreneurial activity and high cost of adjusting the workforce. In addition, Harriss (2006) argues the importance of government policies and regulations to be implemented in a consistent and reliable way. Otherwise, they will not command credibility and confidence of private capital.

It can be concluded from the above literatures that government policies and regulations have a great impact on the regulated firms in many aspects, such as productivity, competitiveness and the costs they have to incur. All these aspects are related to the firm's performance. Subramanian et al. (2005) investigated the impact of investment climate on firm's economic performance in China and Brazil and found significant adverse effects of a poor investment climate and poor institutions on total factor productivity. Stern (2002b) also highlighted that it is the policy, institutional and behavioral environment that influences the investment returns. Hallward-Driemeier et al. (2006) conducted a firm-level analysis to prove that firm performance is positively correlated with foreign and domestic ownership, light regulatory burdens, limited corruption, technological infrastructure and labor market flexibility. It is demonstrated that lower regulatory burden and less corruption increases firm growth, one of the measurements of firm's performance. It is found that reducing the regulatory burden would increase the sales growth rate of a firm. Snow and Hrebiniak (1980) also found the regulated environment to influence firm's performance.

In China's construction industry, foreign AEC firms face extra regulatory risks as reported by various articles as discussed in Chapter 2. Besides these articles, other

academic research results also show that most of the risks faced by foreign firms in China's construction industry arise from the complex construction regulatory system (Chua et al., 2003; Ling and Low, 2007). The review results of construction regulations governing foreign AEC firms that the latter have to fulfill have been presented in Chapter 3. For example, wholly foreign-owned AEC firms have to contribute the same amount of registered capital as local Chinese firms but are only entitled to undertake a small portion of projects in China. In addition, they also need to maintain a large number of registered personnel to secure the license. All these requirements are increasing the transaction cost of foreign AEC firms operating in China. As such, it is envisaged that foreign AEC firms facing lesser impact of construction regulations will have greater performance than those heavily affected by the regulations. The hypothesis for the relationship between the construction regulatory risks and the performance of foreign AEC firms in China is developed as follows:

***Hypothesis:** The severity of the impact of the construction regulatory risks faced by foreign AEC firms is negatively associated with firm performance.*

4.3 Firm's Strategic Adaptation to the Regulatory Framework

Studies of international business behavior are built around the fact that crossing borders through trade and investment bring a firm into different environments that require various types of adaptations in order to survive (Rosenzweig and Singh, 1991). Drawing on the literatures from strategic management and organizational behavior, Pfeffer and Salancik (1978) theorize that corporations are in fact constrained and even controlled by their environment, and note that certain strategies and tactics can be employed to moderate or lessen that control.

4.3.1 Relationship between Firm's Capability and Regulatory Environment

Valuable capabilities are attributes that help a firm exploit opportunities and neutralize

threats in its external environment, which allow the firm to either reduce costs or further differentiate itself relative to competitors by improving quality or enhancing attractive features (Grant, 2002). Generally speaking, firm resources and capabilities that make it difficult for a firm to exploit opportunities or mitigate environmental threats can be considered as weaknesses (Barney, 1997). Firm resources are commonly controlled by the firm that enable it to conceive and implement strategy and improve its efficiency (Daft, 1983; Penrose, 1959). Sustainable competitive advantage comes from the utilization of both tangible and intangible resources that are heterogeneous, difficult to substitute and imitate, and less mobile (Barney, 2000; Peteraf, 1993).

Firms operating within a regulated environment are subject to regulatory constraints not faced by firms in unregulated environments. Specifically, regulated firms operate in industries where returns may be limited by regulations (Geiger and Hoffman, 1998). Thus, to maintain shareholder satisfaction, managers may find ways to increase the overall returns earned by the firm. As industries globalize, firms begin to go beyond their borders and face new regulatory environment where they have to compete. Those who can develop strategies and strategic capabilities/resources under different home government's regulatory environments are likely to bring differential advantages to the new competitive environment (Reger et al., 1992).

This research will identify foreign AEC firms' capabilities that would match the opportunities and threats of the regulatory environment and moderate the negative effects of construction regulations. Based on the above discussion, the hypothesis on the relationship between foreign AEC firms' capabilities and the severity of the impact from the construction regulatory risks is developed as below:

Hypothesis: *Foreign AEC firm's capabilities are negatively associated with the severity of the impact of the construction regulatory risks.*

4.3.2 Relationship between Firm's Strategy and Regulatory Environment

Numerous studies have suggested the importance of the relationship between the strategy of a firm and the environment in which it operates (Bettis, 1981; Christensen and Montgomery, 1981; Hannan and Freeman, 1977; Hrebiniak and Joyce, 1985; Lawless and Finch, 1989). Prior studies indicate that the constraints of regulation do affect the strategic choices of firms in regulated environments (Ramaswamy et al., 1994; Reger et al., 1992; Russo, 1992). This presents the regulated firms with special problems when evaluating the allocation of resources (Geiger and Hoffman, 1998).

Naughton (1995) argues that emerging economies such as China have a highly complex economic structure and complicated institutional environment during structural transformation. Within the framework, different policies are imposed to different firms. This complexity represents a prominent difference between advanced market economies and transitional ones. Firms, whether local or foreign, are hardly able to avoid the impact of such dynamics. It would require a superior ability to respond quickly to environmental changes if a firm seeks economic benefits from vast market demand or national advantage such as cheaper labor (Luo, 2001). Such contingency heightens the liability of foreign entity and requires more adaptation if a foreign business seeks long-term growth.

The field of strategic management rests on the premise that top managers match their firms' strategies to the characteristics of the environments and that super-matching firms will enjoy a superior competitive positions in the environment (Reger et al., 1992). In this research, several strategies employed by foreign AEC firms in China will be studied to identify if they are able to moderate the severity of the impact of construction regulatory risks. Therefore, the hypothesis can be developed as follows:

Hypothesis: *The severity of the impact of construction regulatory risks varies significantly between foreign AEC firms using different strategies in China.*

4.4 Resource-based View to Enhance Firm's Performance within a Dynamic Regulatory Environment

The resource-based view (RBV) of a firm emphasizes on the firm's internal resources and capabilities, rather than market structures (Barney, 2000). 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, 2000).

The resource-based view has evolved into a distinctive body of knowledge that constitutes a "strategic theory of the firm" (Rumelt, 1984). It draws on well-established scholarly traditions in industrial organizational economics (Conner, 1991), institutional (and institutionalization) theory (North, 1990; Oliver, 1997), and the sociological theory of "embeddedness" (Granovetter, 1985a; Granovetter, 1985b; Uzzi, 1996). Arguably, resource-based theory provides a more robust theoretical foundation for explaining strategic phenomena.

Within the area of international business, the logic of the resource-based view has been employed to analyze the formation, management, and control of international strategic alliances (Hamel, 1991), global strategy-performance (Collis, 1991), and MNC political behavior (Boddewyn and Brewer, 1994).

4.4.1 Firm's Capability and Performance

The resource-based view begins with the basic strategic management premise that the reason to set up a firm is the ongoing search for and sustainability of economic rents (Bowman, 1974; Mahoney, 1995). Within the resource-based view, it is generally used to mean returns accruing to hard-to-copy, firm-specific resources and capabilities

(Castanias and Helfat, 1991; Peteraf, 1993, 1994; Rumelt, 1987). The resource-based view 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, 2000; 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). These internal choices and resources interact with the competitive environment to determine the firm's economic performance.

The RBV stresses that the efficient use of firm-specific resources and capabilities can create sustained performance differentials within industries. In a study of relationship between business-level strategy and performance, the results indicate that, in the regulated context, a significant portion of performance is explained by the management of strategic resources (Ramaswamy et al., 1994).

In order to form the basis of sustainable competitive advantage, such resources and capabilities must be valuable, rare, imperfectly imitable, and nonsubstitutable (Barney, 2000). Firm resources and capabilities that have been examined within the resource-based view are generally grouped under: (a) physical resources, including the firm's physical technology, plant and equipment, geographic location, and access to raw materials and components (Barney, 2000); (b) human resources, including knowledge, skills, abilities of the firm's workforce; (c) organizational resources, including routines, reporting relationships, and other integrating and differentiating mechanisms; and (d) financial resources, including the firm's credit rating, debt/equity ratio, ratio of net cash to capital expenditure, and retained earnings (Grant, 1995).

Based on the above discussion, the hypothesis on the relationship between firms'

capabilities and their performance is developed as follows:

***Hypothesis:** Under China's current construction regulatory framework, foreign firm's capabilities in China are significantly related to firm's performance.*

4.4.2 Firm's Strategy and Performance

Proper application of strategies should lead to improved performance (Hsu, 2003). 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). 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). Child (1972) argues that managers have choices about strategy and that those strategies affect firm performance. In analyzing the strategies of firms, the Porter framework has been the dominant tool for the past two decades. Porter's (1985) model of the five relevant forces in an industry and his generic strategies are still popular concepts.

In the context of China's construction industry, the construction regulatory risks affect the strategic choice of foreign AEC firms. Under the construction regulatory framework, different strategic choice or behavior of foreign AEC firms can result in a different firm performance. In this research, the strategies that foreign AEC firms adopted in China's construction industry are identified through literature review and a pilot survey study. The hypothesis on the relationship between firm's strategy and performance is proposed as follows:

***Hypothesis:** Under China's current construction regulatory framework, foreign AEC firm's performance varies significantly between those foreign AEC firms using different strategies in China.*

4.5 Conceptual Framework and Hypothesis Development

Based on the analysis in the previous sections in this chapter, a preliminary conceptual model consisting of four constructs is presented in Figure 4.3 and the five hypotheses are listed below the conceptual framework. As postulated, government regulations affect firm’s performance. Firm’s capabilities can neutralize or mitigate the threats from the environment, such as the negative impact from the construction regulatory risks. Firm’s strategies can mitigate the problems of the environment which pertain to construction regulations, so that the impact severity of the construction regulatory risks would be lower or nullified. Furthermore, firm’s capabilities and strategies can also improve their performance under the complicated regulatory framework governing them.

Figure 4.3 The Preliminary Conceptual Framework with Hypotheses

Hypothesis 1: *The severity of the impact of the construction regulatory risks faced by foreign AEC firms is negatively associated with firm performance.*

Hypothesis 2: *Under China’s current construction regulatory framework, foreign firm’s capabilities in China are significantly related to firm’s performance.*

Hypothesis 3: *The foreign AEC firm’s capabilities are negatively associated with the severity of the impact of the construction regulatory risks.*

***Hypothesis 4:** Under China's current construction regulatory framework, foreign AEC firm's performance varies significantly between foreign AEC firms using different strategies in China.*

***Hypothesis 5:** The severity of the impact of construction regulatory risks varies significantly between foreign AEC firms using different strategies in China.*

4.5.1 Identification of Research Variables and the Measurements

The research variables for each of the four constructs in Figure 4.3 are identified in the following four sub-sections. Next, the detailed hypothesis and research framework will be presented.

4.5.1.1 Regulatory Risks

In China, foreign AEC firms have to go through five stages before they can access the construction industry as a local entity. Based on the construction regulations governing foreign AEC firms presented in Chapter 3, foreign AEC firms have first to choose the entry mode with the respective business scope, then establish a local entity, apply for the skill qualification certificate (SQC) and enter into a contract before starting their business in operation stage in China. As identified in Chapter 2, there are 28 regulatory risks under the five stages. Therefore, drawing from the review and discussion in previous chapters of this study, the 28 regulatory risks will be categorized into five groups depending on the stage that foreign AEC firms have to experience in China. Each group consists of some regulatory risks under a specific stage. As listed below, these five groups will serve as the regulatory risk variables for statistical analysis and hypothesis testing in Chapter 6.

- **Entry mode and business scope**

Entry mode in this research refers to either wholly-owned foreign firms or joint ventures. These two types of firms have different business scope.

Wholly-owned foreign firms are restricted to undertake only four categories of projects in China while joint ventures are not.

- **Establishment of local entity**

If on-shore service is provided, foreign AEC firms have to register a local entity under the approval of relevant government authorities, with paid-up capitals while fulfilling other requirements.

- **Application for SQC**

Upon registration, foreign AEC firms are not allowed to undertake any projects unless they have obtained one or more skill qualification certificates on the relevant fields of their services. The specified amount of registered capital, number and qualification of personnel, and some other requirements would be applied to foreign AEC firms.

- **Contracting issues**

After obtaining the SQC, foreign AEC firms will enter into a contract with either foreign or Chinese project partners. The contract practices in China are quite different from the international norm. Foreign AEC firms are likely to encounter problems in identifying the complicated contractual relationship among project owner, general contractor, sub-contractor, etc. The liability of general contractor and sub-contractor are not clearly stated in the laws and regulations. The restriction on contract modes also affects foreign AEC firms' practice of project contracting in China.

- **Code and standard issues**

After signing the contract, foreign AEC firms can start their business operations in China. There are no specific construction regulations in this stage governing foreign AEC firms. They have to follow the same regulations

as other Chinese firms. However, as highlighted in Chapter 2, the code and standard in China's construction industry would cause some problems for foreign AEC firms as they are not consistent with the international practice.

The regulatory risk variables that have a significant influence on the firm's performance will be identified through the research methodology discussion in Chapter 5. The entry stage where foreign AEC firms would face the most severe impact have to be given special attention even before they make the entry decision.

4.5.1.2 Firm-specific Capabilities

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 organizational phenomena. Resources are classified into tangible and intangible resources. Tangible resources include financial resources, physical resources, human resources and organizational resources. Intangible resources include technological resources, resources for innovation and reputation (Barney, 1991; Hall, 1992; Grant, 1991). Capability refers to an integration of resources and is the source of firm competitiveness.

In a study on the basis of awarding construction contracts in China by Shen et al. (2004), a model incorporates seven skills/abilities as the sources of firm competitiveness is proposed under the complicated construction regulations of China. They include management skill, technical ability, financing ability, organization structure, marketing ability, social influence, and contribution to project objectives. This sophisticated set of skills/abilities is used for project developer to choose the successful bidder and it is also suggested for contractors to strengthen their competitiveness under the complicated regulatory framework in the industry (Shen et al., 2004). The existing construction regulatory framework will remain for at least a few years as they were promulgated shortly after 2002. Therefore, all the seven skills/abilities are essential for foreign firms which venture into China and compete

under the complicated construction regulatory framework.

The above-mentioned seven skills/abilities are consistent with Liu (2007)'s research on international strategic management on Chinese construction firms. Liu (2007) identified eight firm-specific capabilities by incorporating the research findings of Seymour (1987), Ekeledo (2000), Cheah (2002), Cuervo and Low (2003a), Claver and Quer (2005) and Kang (2006) on resources and capabilities for global engineering and construction firms. The eight firm-specific capabilities are technology and innovation capability, financial capability, marketing capability, project management capability, HR management capability, reputation/brand, organizational structure and organizational culture. These capabilities identified and employed by Liu (2007) were all covered in the the skills set in Shen et al. (2004)'s model based on the definitions of each skill/ability made by the latter. For instance, project management capability identified by Liu (2007) is considered to be included in management skill in Shen et al. (2004)'s research findings according to the definition in Table 4.1. Therefore, the set of skills/abilities identified by Shen et al. (2004) is used in this research as firm-specific capabilities to study the relationship between capabilities, regulatory risks and firm's performance. All the seven skills/abilities identified by Shen et al. (2004) and their definitions are summarized in Table 4.1.

Table 4.1 Seven Skills/Abilities and Their Definitions Summarized from Shen et al. (2004)

Skills/Abilities	Definition
Management skill	Includes management performance in quality, time, cost, contract, co-ordination, safety, environment, and risks
Technical ability	Includes the equipped technology capacity, research & development (R&D) ability, technology innovation ability, and the application of information technology (IT)
Financing ability	Includes creditability grade, financial status, capital added ability, and procuring ability
Organization structure and culture	Indicated by the performance of using human resources, development programs of human resources, organization operation and by the level of attention to details, outcome orientation, people orientation, team orientation, aggressiveness and stability
Marketing ability	Includes marketing coverage for business, marketing information, bidding and pricing, and public relationship
Social influence	Indicated by business qualification grade, qualification grade of the key managerial staff, business coverage and market share, and organization image and reputation
Contribution to project objectives	Indicates a contractor's planned contributions to project objectives set by client. Measured by considering tender price, contract time, quality plan, safety plan, and environmental protection plan

4.5.1.3 Firm's Strategies

Numerous variables have been offered as possible operationalizations of strategic choice (e.g. Hambrick, 1980; Hofer and Schendel, 1978; Snow and Hambrick, 1980). In fact, it has been noted that determining the key strategic choices within an industry is a difficult but crucial task (Harrigan, 1985). In this research, six specific strategies were selected for foreign AEC firms to enter and operate in China's construction industry. They are: Entry Mode, Services Provided, Market Segment (Project Types), Skill Qualification Certificate (SQC), Contract Modes and Target Client.

Entry Mode

Selecting an entry mode is the first strategic choice for market entry that foreign AEC firms adopt to enter China's construction market. "Entry mode" refers to the way a firm registers a business (or invests) and operates in a foreign market. From the perspective of regulations, wholly foreign-owned firm and joint venture are the only two forms that foreign AEC firms can choose to register. The firms that only set up representative office in China and provide off-shore services are not the target of this research. Wholly-owned subsidiary, JV (EJV and CJV) are the most commonly used market entry modes by researchers to study their impact on firm's performance or to compare their importance (Chen and Hu, 2002; Mansumitrachai et al., 1999).

With China's WTO membership, wholly foreign-owned AEC firms were allowed to establish in China. However, there is non-national treatment, which restricts these firms to only projects funded by foreigners and multi-lateral international financial organizations. In a study of entry and business strategies of foreign AEC firms in China, wholly foreign-owned subsidiary is an entry mode that has a good chance of success (Ling et al., 2005). Based on their survey findings, this is the most commonly used entry mode, notwithstanding that it is a more expensive mode due to a high level of foreign investment and presence of more threats. For Sino-foreign construction joint ventures, Luo (2001) reports that Sino-foreign construction joint ventures performed well, despite incurring a significant degree of risk due to the difference in management systems, technological practice, and cultural background between partners (Shen et al., 2001).

Services Provided

The main services that foreign AEC firms provide in China are construction and consultancy services. Most of the large foreign AEC firms provide both construction and consultancy services for projects in China, whereas other smaller firms emphasize consultancy service only. Based on the construction regulations discussed in Chapter

3, regulations governing foreign-owned firms which provide construction services are more restrictive than the regulations governing those engaged in consultancy services. For example, the registered capital for Class 1 construction certificate is much higher than the corresponding engineering design certificate for consultancy firms. Therefore, it is easier for foreign AEC firms which mainly provide consultancy services to enter China's market. Foreign AEC firms whose primary service is construction in their home countries would prefer to register a consultancy firm first to circumvent the restriction on construction services.

Market Segment (Project Types)

According to Bennett (2003), the construction industry can be broken down into two broad categories, general building construction and engineering construction. Projects within general building construction include residential, commercial, institutional and industrial buildings. In this research, industrial building construction is categorized separately from general building construction due to their large scale and the high degree of technical complexity. Owners of these projects are usually large and for-profit industrial corporations. These corporations can be found in such industries as medicine, petroleum, chemical, power generation, manufacturing, etc. Processes in these industries require highly specialized expertise in planning, design, and construction. Unlike the general building projects, such projects are capital intensive and require considerable amount of planning and construction time. Therefore, the international AEC firms are more competitive in the sub-market of industrial construction projects than Chinese companies due to their financing ability and project management ability.

Engineering construction, i.e. heavy civil construction, is usually related to the public infrastructure and thus owned by public-sector entities. Heavy construction includes projects such as highways, mass transit systems, tunnels, bridges, most of which are publicly owned in China. It is not easy for foreign AEC firms to access these markets, especially for those wholly foreign-owned AEC firms in China.

Skill Qualification Certificate (SQC) Application

The MOC requires all construction and engineering design firms to apply for skill qualification certificate (SQC) before they can carry out the projects within the scope of the certificate. Based on the review of construction regulations in Chapter 3, the requirements of paid-up capital and qualified personnel in the SQC application are more rigid for foreign AEC firms to apply for construction SQC than those applying for design SQC. To circumvent these daunting requirements on construction SQC, some foreign firms choose to register as consultancy firms for which the SQC is not required. Although these consultancy firms cannot be engaged as general contractors due to an absence of construction SQC, they would participate in projects in a role which is similar to management contractor by collaborating with other parties of the projects. Under such circumstances, foreign firms become more flexible as they avoid investing a large amount of capital on fixed asset and engaging a number of professionals for SQC application. A disadvantage of such circumventing method is that a foreign consultancy firm may wield lesser control on the whole project than a general contractor.

As highlighted in Chapter 3, foreign consultancy firms are allowed to provide conceptual design (schematic design) without any design SQC. In this case, these foreign firms can choose not to apply for any certificate by providing only conceptual design service. For detailed design service, obtaining SQC is a must for foreign firms in order that their endorsement for detailed design can be legally effective. Foreign consultancy firms should collaborate with Chinese design institutes, which possess design SQC, to secure more opportunity on design service.

It appears that applying for SQC for foreign AEC firms is a strategic choice and not a necessary procedure to undergo as stipulated in the regulations. Considering the difficulties encountered by foreign AEC firms in SQC application as discussed in Chapter 2, they prefer to reduce their costs and circumvent the barriers by collaborating with Chinese design institutes, especially during the early stage of

operation after market entry.

Contract Modes

“Contract mode” refers to the type of contracts the firm uses to undertake the projects. The contract modes can be categorized into sophisticated contract modes and traditional contract modes.

- Sophisticated contract modes:
 - Build-operate-transfer (BOT); public private partnership (PPP) contract, etc. (financing and operation-related)
 - Design and Build (D&B), Engineering, Procurement and Construction (EPC), architecture, engineering and construction (AEC) contract (engineering-related)
- Traditional contract modes:
 - Construction Management (CM) and Project Management (PM) (management-focused)
 - Construction main-contracting (construction-focused)
 - Subcontracting (construction-focused)

Vertical integration in the structuring 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). The analysis of contracting modes, especially those on EPC and BOT contracts, had been presented in previous literatures (Meng and Zhao, 2004; Wang, 2005). A number of recent researches also stressed the strategic choice of sophisticated contracting modes (Lu, 2005; Tan, 2005; Xu et al., 2005a). It was agreed

that sophisticated contracting is highly influenced by the developmental trends of international construction. Compared to Chinese companies, foreign AEC firms have superior financing capability, project management capability, technology and innovation capability to meet the requirements of sophisticated contracting. Besides, strategic alliances should be considered when sophisticated contracting modes are adopted. Therefore, it is advantageous for foreign AEC firms to employ the sophisticated contracting mode rather than the traditional contracting modes, such as CM, PM, general contracting or sub-contracting.

Target Client

Currently most of the projects undertaken by foreign AEC firms in China are secured from foreign investors. As discussed in Chapter 3, wholly foreign-owned construction firms are only allowed to undertake projects wholly or partially owned by foreign investors or those that cannot be undertaken by Chinese companies due to their technical complexity. On the other hand, foreign design consultancy firms and Sino-foreign joint venture construction firms are allowed to undertake China projects while competing with local companies. However, most of the foreign AEC firms would prefer to work with foreign project owners. There are basically three reasons. Firstly, by working with foreign project owners in China, foreign AEC firms could avoid certain problems in contract and other legal and regulatory risks because both parties are familiar with the international practice. Furthermore, some of the projects invested by international organizations, such as World Bank or Asian Development Bank, are not restricted by the Chinese bidding and tendering system. Secondly, many foreign AEC firms entered China market because their clients nominated them to work for their China projects. Therefore, their good relationship with the foreign investors has landed them with the job in China. Thirdly, foreign AEC firms are able to produce superior project quality, safety and advanced technology in construction. In contrast, cost leadership strategy is not suitable for them as they are not cost-competitive as the local Chinese firms. Furthermore, foreign project owners tend to pay more attention to quality, safety and technology rather than the cost. Therefore,

it is easier for foreign AEC firms, especially wholly foreign-owned firms, to win the contracts from foreign project owners.

4.5.1.4 Firm's Performance

In Hallward-Driemeier et al. (2006)'s paper on ownership, investment climate and firm performance, four items are used to measure firm's performance: sales growth, investment rate, productivity and employment growth. In other related studies, where regulatory effects on firm-level performance are investigated, performance is defined as financial performance (Smith and Grimm, 1987). In this research, financial performance is measured using growth in international sales and growth in net profits of foreign AEC firms in China. The sales and profit performance indicators have been widely adopted by researchers (Kale, 1999; Kang, 2006; Li, 1998).

4.5.2 Conceptual Framework

Drawing from the above identification and analysis and by incorporating the research variables, the conceptual framework for this research is postulated and shown in Figure 4.4. Based on this framework, the detailed hypotheses are proposed and the hypothesis testing will be carried out and discussed in Chapter 6.

4.5.3 Hypothesis Development and Summary

Based on the conceptual framework in Figure 4.4, detailed hypotheses are developed in the following sections to state the relationship among the constructs.

Figure 4.4 The Conceptual Framework with Hypotheses and Research Variables

4.5.3.1 Construction Regulatory Risks and Foreign AEC Firms' Performance

Pursuant to the discussion in Section 4.2, to find out which regulatory risks significantly affect firm's performance, the following sub-hypotheses are postulated:

***Hypothesis 1:** The severity of the impact of the construction regulatory risks encountered by foreign AEC firms is negatively associated with firm's performance.*

- Hypothesis_{1.1}: The severity of the impact of entry mode and business scope is negatively related with foreign AEC firms' sales growth, profit growth and the overall performance.
- Hypothesis_{1.2}: The severity of the impact of establishment of local entity is negatively related with foreign AEC firms' sales growth, profit growth and the overall performance.
- Hypothesis_{1.3}: The severity of the impact of skill Qualification application is negatively related with foreign AEC firms' sales growth, profit growth and the overall performance.
- Hypothesis_{1.4}: The severity of the impact of contracting issues is negatively related with foreign AEC firms' sales growth, profit growth and the overall performance.
- Hypothesis_{1.5}: The severity of the impact of code and standard in operation are significantly negatively related with foreign AEC firms' sales growth, profit growth and the overall performance.

4.5.3.2 Foreign AEC Firms' Capabilities and Their Performance

From the resource-based view (RBV) perspectives, firm's capabilities are important in improving their performance. Under the regulated environment in China's construction industry, foreign AEC firms must develop a set of capabilities/skills in the long term to enhance their firm performance. To investigate which firm capabilities/skills significantly

contribute to the firm's performance under China's current regulatory framework, the following detailed hypotheses are developed.

Hypothesis 2: Under China's current regulatory environment, foreign firm's capabilities in China are significantly related to firm's performance.

- Hypothesis_{2.1}: Foreign AEC firm's management skill is positively related to their sales growth and profit growth.
- Hypothesis_{2.2}: Foreign AEC firm's technical ability is positively related to their sales growth and profit growth.
- Hypothesis_{2.3}: Foreign AEC firm's financing ability is positively related to their sales growth and profit growth.
- Hypothesis_{2.4}: Foreign AEC firm's marketing ability is positively related to their sales growth and profit growth.
- Hypothesis_{2.5}: Foreign AEC firm's organizational structure is positively related to their sales growth and profit growth.
- Hypothesis_{2.6}: Foreign AEC firm's social influence is positively related to their sales growth and profit growth.
- Hypothesis_{2.7}: Foreign AEC firm's contribution to project objectives is positively related to their sales growth and profit growth.

4.5.3.3 Foreign AEC Firms' Capabilities and the Impact of Construction Regulatory Risks

As discussed in this chapter, firm's capabilities can neutralize the threats from the business environment. By incorporating the research variables under Capabilities, to investigate which ability or the combination of several abilities could moderate the negative impact by each construction regulatory risk, the following detailed hypotheses are developed:

Hypothesis 3: The severity of the impact of construction regulatory risks can be moderated by one or more capabilities of foreign AEC firm.

- Hypothesis_{3,1}: The severity of the impact of Entry mode and business scope can be moderated by one or more firm capabilities, including management skill, technical ability, financing ability, organization structure, marketing ability, social influence, and contribution to project objectives.
- Hypothesis_{3,2}: The severity of the impact of Establishment of local entity can be moderated by one or more firm capabilities, including management skill, technical ability, financing ability, organization structure, marketing ability, social influence, and contribution to project objectives.
- Hypothesis_{3,3}: The severity of the impact of Skill qualification application can be moderated by one or more firm capabilities, including management skill, technical ability, financing ability, organization structure, marketing ability, social influence, and contribution to project objectives.
- Hypothesis_{3,4}: The severity of the impact of Contracting issues can be moderated by one or more firm capabilities, including management skill, technical ability, financing ability, organization structure, marketing ability, social influence, and contribution to project objectives.
- Hypothesis_{3,5}: The severity of the impact of Code and standard in operation can be moderated by one or more firm capabilities, including management skill, technical ability, financing ability, organization structure, marketing ability, social influence, and contribution to project objectives.

4.5.3.4 Foreign AEC Firms' Strategies and Their Performance

In the regulated environment of China's construction industry, a proper choice of strategies is important, especially for foreign firms, in improving firm performance in sales growth and profit growth. To understand which strategies can make a difference in performance for foreign AEC firms, the following detailed hypotheses are proposed.

***Hypothesis 4:** Under China's current regulatory environment, firm's performance varies significantly between those foreign AEC firms using different strategies in China.*

- Hypothesis_{4.1}: Firm performance in sales growth and profit growth vary significantly between wholly foreign-owned AEC firms and joint venture AEC firms in China.
- Hypothesis_{4.2}: Firm performance in sales growth and profit growth vary significantly between foreign AEC firms with emphasis on construction service and those on consultancy services in China.
- Hypothesis_{4.3}: Firm performance in sales growth and profit growth vary significantly between foreign AEC firms with industrial projects as their target projects and those firms that never contract any industrial projects.
- Hypothesis_{4.4}: Firm performance in sales growth and profit growth vary significantly between foreign AEC firms without any skill qualification certificates (SQC) and those with one or more SQCs.
- Hypothesis_{4.5}: Firm performance in sales growth and profit growth vary significantly between foreign AEC firms without sophisticated contract modes and those with sophisticated contract modes.
- Hypothesis_{4.6}: Firm performance in sales growth and profit growth vary significantly between foreign AEC firms contracting less foreign-invested projects and those contracting more foreign-invested projects.

4.5.3.5 Foreign AEC Firms' Strategies and the Impact of Construction Regulatory Risks

As discussed earlier in this chapter, regulatory environment affects firm's strategic choice. In China's construction industry, foreign AEC firms employ some strategies to circumvent the negative impact arising from the construction regulatory risks. To find out

which strategies can successfully moderate the severity of the impact of the regulatory risks, the following detailed hypotheses are developed.

Hypothesis 5: The severity of impact from five regulatory risk variables varies significantly between foreign AEC firms using different strategies in China.

- Hypothesis_{5.1}: The severity of impact from five regulatory risk variables vary significantly between wholly foreign-owned AEC firms and joint venture AEC firms in China.
- Hypothesis_{5.2}: The severity of impact from five regulatory risk variables vary significantly between foreign AEC firms with emphasis on construction service and those on consultancy services in China.
- Hypothesis_{5.3}: The severity of impact from five regulatory risk variables vary significantly between foreign AEC firms with target on industrial projects and those foreign firms which target on other types of projects.
- Hypothesis_{5.4}: The severity of impact from five regulatory risk variables vary significantly between foreign AEC firms without any skill qualification certificates (SQC) and those with one or more SQCs.
- Hypothesis_{5.5}: The severity of impact from five regulatory risk variables vary significantly between foreign AEC firms using simple traditional contract modes and those using sophisticated contract modes.
- Hypothesis_{5.6}: The severity of impact from five regulatory risk variables vary significantly between foreign AEC firms targeting foreign-invested projects and those contracting more Chinese-invested projects.

4.6 Chapter Summary

In this chapter, literature concerning business-government relationship and the resource-based view (RBV) were reviewed to identify the impact of government

regulations on firm's performance. In addition, from previous relevant studies, firm's capabilities and strategies were found to be important in moderating the negative impact of the business environment and in improving firm performance. Drawing from the literature review, a conceptual framework was constructed with the research variables identified. Finally, the detailed research hypotheses were developed based on the relationship among the constructs in the conceptual framework. The hypotheses will be tested through survey and interview in Chapter 5 and 6 to explore the relationship among the constructs in the conceptual framework.

Chapter 5 Research Methodology

5.1 Introduction

Chapter 4 discussed the theoretical foundation of this research and hypotheses were developed from the conceptual framework. This chapter will discuss the methodologies used in determining the impact of construction regulatory framework on foreign AEC firms in China and the strategic adaptation of foreign AEC firms. A mixed methodology of both quantitative and qualitative research will be used to gauge the attitudes and perceptions of industry professionals from foreign AEC firms in China.

5.2 Research Process

Research process is concerned with how the research is being conducted and what methods are to be used. To achieve the research objectives stated in Chapter 1, a number of steps has been identified and organized into a complete research process. This research is mainly based on the research process model proposed by Sekaran (2000) who converted vague ideas into testable hypotheses designed specifically for the research questions, as illustrated in Figure 5.1. This process has also been documented by Chan et al. (2001) and Chan (2004).

In this study, the research process starts with a review of literatures for the background information of the broad area of the research topic and the detailed research questions are identified (Chapter 2), as shown in Figure 5.2. The review and comparative studies on construction regulations are then conducted to develop a list of regulatory risks for further investigation (Chapter 3). The conceptual framework on the relationship between construction regulatory risks and foreign AEC firms in China is developed (Chapter 4), followed by the scientific research design on questionnaire and tools of data collection and analysis (Chapter 5). An empirical study with industry professionals in foreign AEC firms will be conducted to test the hypotheses derived from the conceptual framework (Chapter 6). Finally, the conclusions are drawn from the data analysis results and contribution of the research will be summarized (Chapter

7).

Figure 5.1 Sekaran’s Research Process (2000)

Figure 5.2 Research Process for this Study

This chapter focuses on the design of questionnaire, methods of data collection and analysis (box ⑥ in Figure 5.2) as the boxes from ① to ⑤ have been covered by the previous chapters.

5.3 Empirical Data Collection

There are five important research methods adopted in construction management research, namely action research, ethnographic, survey, case study and experimental (Bell, 1993; Fellow and Liu, 1997). Among the five research methods, surveys operate on the basis of statistical sampling through questionnaires and interviews. This method contains both quantitative and qualitative data input. As the quantitative method, survey questionnaires explore the conceptual model and test the hypotheses developed. As the qualitative method, interviews are conducted to illustrate the findings of the questionnaire. Therefore, in this research, a mixed methodology of quantitative and qualitative is chosen to investigate the complex nature of the research questions.

5.3.1 Pilot Study

Prior to sending out the final version of the questionnaire to respondents, the questionnaire was pre-tested to ensure the appropriateness of the questions in terms of rhetoric and understanding of meanings. Such a pilot study is essential in providing a focus mechanism to establish the research direction more clearly (Walker, 1997). This pilot research was conducted during October 2006. The researcher traveled to China, and interviewed ten senior management staff in foreign AEC firms in China. Profiles of these ten interviewees are shown in Table 5.1. They were presented with the pilot questionnaire and a few open questions regarding the regulatory risks that foreign AEC firms may encounter in China.

These interviewees have sufficient knowledge and extensive experiences on the actual practice and the problems faced by foreign AEC firms in China. This pilot study helps to make the survey questions clearer and channels the research questions to a more focused direction.

Table 5.1 Demographic Data of Interviewees

No.	Designation	Years of experience in construction	Country of Origin	Nature of interviewee's firm
1	Vice President	17	Singapore	Construction and design consultancy
2	Commercial Manager	8	Germany	Architectural and Engineering consultancy
3	Contracts Manager	10	United States	Construction and design consultancy
4	Senior Engineer	17	Australia	Engineering design consultancy
5	Vice President	20	Singapore	Architectural and engineering design consultancy
6	Marketing Manager	11	Australia	Special design consultancy
7	Government Affair Officer	37	United States	Construction and design consultancy
8	Project Manager	15	Austria	Project management and consultancy
9	General Manager	35	Singapore	Construction and design consultancy
10	Vice President	22	Singapore	Construction and design consultancy

5.3.2 Quantitative Stage - Questionnaire Survey

A questionnaire survey constructed to obtain foreign AEC firms' assessment on construction regulatory risks will be designed. Hackett (1981) highlighted the advantages of written questionnaire survey, as follows:

- a) Questionnaires are cost-effective compared to face-to-face interviews when involving large sample sizes and large geographic areas. This is especially true as the number of research questions increases.
- b) Questionnaires are easy to analyze with many computer software packages.
- c) Questionnaires are familiar to most people. Nearly everyone has had some experience completing questionnaire forms and they generally do not make people apprehensive.
- d) Questionnaires reduce bias. The uniform question without the researcher's own

opinions will not influence the respondent's manner answering questions.

- e) Questionnaires are less intrusive than telephone or face-to-face interviews. A respondent can complete the questionnaire on his own time-table and will not be interrupted by the research instrument.

5.3.2.1 Population of Research Participants

The survey participants in this study are preferably in the senior management level of foreign AEC firms in China. Therefore, the unit of analysis is the individual participants. Nonetheless, the researcher is trying to reach the potential participants from as many foreign firms as possible instead of numerous participants from one or two foreign firms. At most two participants are invited from the same foreign AEC firms to join in the questionnaire survey. This limiting criterion allows the research to better study the relationship between the regulatory risks and the performance of various foreign firms with different capabilities and strategies.

As there is no list of foreign AEC firms available on any official publications of Chinese authorities, the potential participants for the questionnaire can only be gathered from several other sources. The first source is a list of foreign AEC firms working in China from Engineering News Record (ENR) in 2000. This is the only list with 58 foreign AEC firms that were undertaking projects in China's construction industry in recent years. Another list of top 225 international contractors published by ENR in 2007 was also employed to complement the above-mentioned list in 2000. By searching from the website of the 225 international contractors, it was found that 65 foreign AEC firms had projects in China. The second source is the business chamber members of foreign countries in China. A list of 90 foreign AEC firms in China's construction industry is obtained from the Business Chambers of America, Australia, Britain, European Union, Germany and Italy. The third source is a list of attendees and speakers of international conferences and congresses held in China. In this list, the contacts of nine professionals from foreign AEC firms were obtained.

Consolidating the above three sources, a contact list of 125 potential participants in foreign AEC firms was obtained, as 32 foreign AEC firms were found to be duplicated between the first and the second source. Besides, the researcher also uses personal

contacts to reach another 22 potential respondents working as senior managers in foreign AEC firms. There are 147 contacts of individuals and firms in total. For each firm, the contact information of one professional in senior management level is located. This final list provides a comprehensive representation of foreign AEC firms operating in China, which serves as the basis for data collection for this research.

5.3.2.2 Questionnaire Design

A) Questionnaire Structure

The design of the questionnaire is largely based on the results of literature review and comparative studies in previous chapters. The questionnaire, which is shown in Appendix C, is divided into three sections:

- Section 1 solicits feedback from respondents on various construction regulatory risks related to foreign AEC firms in China. There are 28 regulatory risks that have been categorized into five groups, including entry mode and business scope, establishment of local entity, application of SQC, contracting issues, and code and standard issues. In this section, respondents are required to provide their perceptions based on their experience in industry and the foreign AEC firm that they are working for.
- Section 2 gathers information on foreign AEC firms' capability and performance, which are to be rated according to the knowledge of respondents on their firm. As discussed in Chapter 4, firm's capability is measured by management skill, technical ability, financial ability, organization structure, marketing ability, social influence, and the contribution to project objectives. Foreign firms' performance in China is measured by sales growth and profit growth.
- Section 3 gathers information both on the respondents and their firms regarding some strategies of entry and operation in China's construction industry. Part A in this section contains questions on respondent's firm regarding the country of origin, years of operation and services provided in China, entry mode, contract modes and major project types carried out. In addition, respondents are also requested to indicate the firm's scale, foreign-invested project's proportion and the skill qualification certificate (SQC) of their firm. Part B of this section

presents queries on respondent's designation and years of working experience in China's construction industry.

At the last page of the questionnaire, there are two open-ended questions which encourage the respondents to identify any other regulatory risks which are not covered by the closed questions in previous sections. There may also be risks which the respondents want to provide more details about than the structured questions allow. Thus such general open-ended questions may act as a 'safety net' which help the researcher to identify new risks and obtain in-depth perceptions from the respondents (O'Cathain and Thomas, 2004).

B) Assessment and Rating Scales

The main purpose of this research is to study the construction regulatory risks faced by foreign AEC firms in China. Thus, the assessment of the regulatory risks is critical to the result of this research. The method for assessing the significance of these risks can be adapted from various risk assessment tools in construction research. One approach adopted by previous researchers is to consider two attributes for each risk: the probability level of the risk occurrence; and the degree of impact or the level of loss if the risk occurs (Fang et al., 2004; Shen et al., 2001; Kaming et al., 1998; He, 1995). They suggested combining risk probability analysis with risk impact assessment as follows:

$$R = P \times I$$

where R is the degree of risk, P is the probability of the risk occurrence, I is the degree of the impact of the risk. The larger the value of R, the more severe the factor is. Finally, R will be used to rank the severity of all the factors and act as the final ratings of each regulatory item.

Based on research by He (1995), this definition of risk would be more realistic for construction practice. In overseas construction projects, the risk factors with a high probability and a high impact are not difficult to identify, but oftentimes, many risk factors with a medium probability or a medium impact have been neglected. They may present a considerable severity of risk and can be significant to a project. Therefore, in order to accurately assess a risk factor, it is necessary to cover both its

probability and the level of impact.

William (1993) suggests using probability-impact grids to assess risks and the weight of each risk are easily quantified. According to the probability and impact value, the risks can be classified into four groups, as indicated in Figure 5.3.

Figure 5.3 William’s Probability-Impact Grid (1993)

In this research, such method is employed to recognize the severity of construction regulatory risks and the R score of each regulatory risk can be used in statistical analysis to test the hypotheses developed from the conceptual model. Since the survey questions are subjective, a Likert-type scale design is appropriate (Babbie, 2001). In the questionnaire, respondents were requested to rate the probability and impact of each regulatory risks on a 5-point Likert scale, as illustrated in Table 5.2. Holt (1997) suggested that when dealing with the non-existence of a phenomenon, zero Likert scales would be more suitable. As a result, a zero score representing “Not Applicable” was introduced to mark the occurrence probability as another option besides the 5 scales from “1: very low” to “5: very high”. The relative impact of each risk is rated from “1: negligible” to “5: extreme”.

A mean was calculated for both probability and impact of each regulatory risk. After multiplying the value of probability and impact, the severity of each risk can be ranked according to the result. The researcher believes that this process can effectively reflect the meaningful and practical risks faced by the foreign AEC firms in China.

Table 5.2 Illustration of the Ratings Scale Employed by the Questionnaire

Scale	Probability	Relative Impact
NA	Never heard about or Never happened before	
1	Very Low probability and occurs in only exceptional circumstances (<10%chance)	Negligible and routine procedures sufficient to deal with the consequences
2	Low chance and unlikely to occur in most circumstances (10% <chance <30%)	Minor and would threaten an element of the function
3	Medium chance and will occur in most circumstances (30% <chance <60%)	Moderate and would necessitate significant adjustment to the overall function
4	High chance and will probably occur in most circumstances (60% <chance <80%)	Significant and would threaten goals and objectives; requires close management
5	Very High chance and almost certain and expected to occur (80% or greater chance of occurrence)	Extreme and would stop achievement of functional goals and objectives

5.3.2.3 Procedure of Conducting Questionnaire

Leedy (1985) described the principles of conducting general questionnaire and recommended establishing a formal procedure to assure quality control and maintain the chain of evidence. Following Leedy’s recommendation, a formal procedure of conducting questionnaire will be employed in this research. The mechanics that supports the procedure in this research was established by Dillman (1978).

As this research involves cross-border correspondence and communication, the researcher sent out questionnaire by e-mail instead of surface mail to reduce the response time. As stated earlier, a pilot questionnaire was sent out for comments and suggestion, the feedback of which was incorporated into the final questionnaire. After an invitation was sent to all potential participants with known E-mail address, the final questionnaire was e-mailed to the 147 contacts identified in Section 5.3.2.1 with a covering letter describing the survey and its significance. This covering letter allows the participants to have an overview of the survey before responding to the questionnaire. A closing question inquired if the respondents would like to know the results of the questionnaire. Offering the results of the questionnaire is one of the few tangible rewards to bestow on the participants (Dillman, 1978).

To further encourage participation, a follow-up e-mail of reminder, including a softcopy of the original questionnaire, was sent to those who had not returned the first mailing of the questionnaire within twenty days after the first e-mail request. This follow-up mailing ensures a continued effort to obtain as high an overall response rate as possible (Dillman, 1978). A second and final reminder with the questionnaire was sent to those who had not responded after the last two attempts. As a last resort, telephone calls were made to those who had not responded, which aim to facilitate the return of outstanding questionnaires.

5.3.3 Qualitative Stage - Personal Interviews

Personal interviews provide an open conversation with freer expression of ideas and opinions between respondents and the researcher in a one-on-one setting. Through interviews, researchers can obtain insights, new hypotheses, and understanding through the process of interaction. Interviews allow analyses of thoughts, attitudes, behaviours, and opinions that have a high level of content validity (Babbie, 2001). They also allow for extensive probing, follow-up questions, discussion, and observation of emotional reaction not possible in a quantitative study such as a telephone or mail survey. However, this method is usually more expensive than survey.

The personal interviews aim to have a deeper understanding on the impact of the regulatory risks on foreign AEC firms in China. The interviews help to gauge the perceptions of industry professionals on the construction regulations, as well as their experience in circumventing the problems by ways of emphasizing firm capability and using different strategies, among others. The interview results will be incorporated in the discussion of the statistical analysis on the survey data to further elaborate the regulatory impact.

5.3.3.1 Subjects of Personal Interviews

The subjects of this qualitative stage research are a subset of questionnaire participants in the above quantitative study. Questionnaire participants were inquired in the survey whether they are willing to participate in a face-to-face interview regarding the survey questions. Those who answered “yes” to this question in the quantitative research are invited for the personal interviews.

Interviewees must fulfil two criteria in this qualitative study. Firstly, they should have substantial experience in China's construction industry. They would then be able to share their in-depth perceptions on the impact of construction regulations on businesses, especially foreign AEC firms. Secondly, the interviewees must also have firsthand experiences on managing a foreign AEC firm in China so that they have the best knowledge of their firm's strategy and capability.

5.3.3.2 Procedure of Conducting Personal Interviews

After the participants replied and agreed to the interview request, a confirmation letter was emailed to them and a written consent was sent back to the researcher by the agreed participants. These participants were contacted through telephone by the researcher in June 2007 to confirm a convenient time and location to conduct the interview. The initial telephone contact included the introduction by the researcher, a brief of the research purpose, an explanation of the task that the respondent will be involved, and a statement of the confidentiality, etc. As requested by the interviewees during the initial contact, the interviews would not be tape-recorded to preserve the privacy of the interviewees and their companies. The researcher only took notes during the whole interview process. Before the interview starts, respondents will be asked to discuss their feelings and beliefs on the construction regulations governing them as comprehensively as possible. Since the interview was carried out after the questionnaire survey, interview questions were prepared according to the questionnaire answers of each respondent. Regulatory risks that were rated 3 or above out of 5 in both the probability and impact attributes were discussed. Interviewees were encouraged to provide information or detailed examples on why and how these regulatory risks affect their firm in China, and how this can be related to the strategy and capability perspectives. Under such circumstances, there are no standardized interview questions. Instead, interview questions are different for each interviewee as they have different ratings in the questionnaire.

5.3.3.3 Demographic and Other Information

During a trip to China in July and August of 2007, the researcher conducted interviews in several cities of China, including Shanghai, Suzhou, Guangzhou, Beijing, and Tianjin. Demographically, the total sample for this qualitative research

comprises 22 senior management professionals with a mean of 15 years' experience. 12 out of 22 interviewees are foreign expats working as senior manager or chief representative of their company. The rest are native Chinese in senior management position of foreign AEC firms. To enhance the credibility of the findings in the quantitative research, interview results will be quoted in the discussion part of the research.

5.4 Quantitative Data Analysis

Analysis of data is an important stage to turn raw data into useful information by qualitative and quantitative methods so that conclusion can be drawn. Data from questionnaire were first input into the computer database and the Statistical Package of Social Science (SPSS) was employed to analyze all the variables. Various statistical techniques were used in this study including Cronbach's Alpha coefficients, multiple regression analysis and the nonparametric Mann-Whitney U test.

5.4.1 The Reliability Coefficient

One of the most commonly used reliability coefficients is Cronbach's Alpha, which is to test the internal consistency among alternative items used to measure the same underlying construct (Cronbach, 1951). It can also test the reliability of the likert-type scale. The range of the Cronbach's Alpha is between 0 and 1. The larger the value is, the better the reliability in each component. The technique was employed to examine the internal consistency among various regulatory items in different groups.

5.4.2 Multiple Regression Model

Regression analysis is by far the most widely used and versatile dependence technique, applicable in every facet of business decision-making, ranging from the most general problems to the most specific (Hair et al., 1995). Multiple regression analysis is a statistical technique that can be used to analyze the relationship between a single dependent (criterion) variable and several independent (predictor) variables. One of the objectives of this research is to identify the significant regulatory factors that are related to the performance of foreign AEC firms. Multiple regression technique can best achieve this objective and is therefore chosen to be the principal instrument for

this study. The multiple linear regression equation of dependent variable (y) upon the independent variables ($x_1, \dots, x_p$) is expressed as follows:

$$y = \beta_0 + \beta_1(x_1) + \beta_2(x_2) + \dots + \beta_p(x_p) + e$$

Where y represents the dependent variable, $x_1, \dots, x_p$ are the independent variables; the parameters $\beta_1, \beta_2, \dots, \beta_p$ are the partial regression coefficients; the intercept β_0 is the regression constant; and e is the error term.

To determine whether or not the model with its independent variables is a significant predictor of the dependent variable, a statistical significance test is performed using the F-statistic. The R^2 value in SPSS analysis result is statistically significant, or different from zero, if the computed F-statistic is greater than the F-critical value for the defined probability level. For the output interpretation, if the obtained significance level (p-value) associated with the F-statistic is less than 0.05 (at 95 percent confidence), the R^2 is statistically significant. To minimize the variation from the increased number of predictor, the adjusted R square is employed to evaluate the model. The higher adjusted R square is, the better the predictors can explain the variation in dependent variable.

5.4.4 Non-parametric Mann-Whitney U Test

Another important objective of this research is to identify the differences in the business performance and the severity of the regulatory risks between foreign AEC firms which have already employed a certain strategy and those which have not employed the same strategy in China. Due to the unknown data distribution, a nonparametric method is preferred in this analysis. Furthermore, upon comparison, the research participants will be categorized into two groups and the number of participants in each group would be reduced at least in half. Therefore, the nonparametric Mann-Whitney U test suitable for small sample size is chosen as the other statistical tool for this research.

The Mann-Whitney U test is one of the best-known non-parametric significance tests. It was proposed initially by Wilcoxon (1945), for equal sample sizes, and extended to arbitrary sample sizes and in other ways by Mann and Whitney (1947). It is often

viewed as the non-parametric equivalent to the t test that allows comparisons of samples which are not normally distributed (Wheater and Cook, 2000). Like many non-parametric tests, all calculations are performed on the rank position of each data point rather than the actual numbers. Two values of U are calculated as follows:

$$U_1 = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - \sum R_1$$

and

$$U_2 = n_1 n_2 + \frac{n_2(n_2 + 1)}{2} - \sum R_2$$

where n_1 and n_2 are the numbers of data points in samples 1 and 2 respectively; $\sum R_1$ and $\sum R_2$ are the sums of the ranks in samples 1 and 2. The smaller of the two U values is chosen for comparison with the appropriate statistical table. The whole analytical process can be done by SPSS.

5.5 Chapter Summary

This chapter introduced the research process and the various approaches which meet the research objectives. The processes of conducting quantitative and qualitative study were presented. A mixed methodology was used because the advantages and disadvantages of each method complement each other. In other words, the questionnaire will provide data to be generalized into a population but does not answer those important questions of “why” and “how”, whereas quantitative research provides statistics, the numbers do not have the color and depth of a qualitative approach. On the other hand, qualitative research cannot be generalized into a population but examines the meanings and social experiences encountered by its participants, whereas quantitative research can be generalized. Nevertheless, both methodologies are useful tools in answering the main thrust of this research. The results of data analysis will be presented and discussed in the next chapter.

Chapter 6 Research Findings and Discussion

6.1 Introduction

The preceding chapter outlined the research process, the techniques of quantitative and qualitative study, and the statistical analysis methods employed in this study. This chapter focuses on presentation and discussion of the data analysis results. It starts with a descriptive statistics on the demographic information on the survey respondents and their companies after the coding of the questionnaire returns. The reliability test and the descriptive analysis of variables are also presented. The hypotheses developed in Chapter 4 are then restated and tested. The results of the hypotheses testing are presented in discussion where the perceptions of interviewees are also quoted to complement the survey data to provide an in-depth understanding on the research questions.

6.2 Profiles of Respondents and Their Firms

The population surveyed pertains to the 147 foreign AEC firms from various sources as stated in Chapter 5. The final questionnaire was sent out in May 2007, followed by reminders to those contacts who had not replied. Forty-six responses were received by the end of 2007, with another six responses received in mid 2008. Four responses were eliminated due to a high degree of incompleteness. The response rate was 32.7%. Hence, this study was based on the 48 valid replies from respondents who had been involved with foreign AEC firms in China.

6.2.1 Respondents

The questionnaire included the respondents' profile and their firms' information. As shown in Table 6.1, more than 80 percent of the respondents are senior managers,

vice presidents and presidents of foreign AEC firms in China, while 16.7 percent are senior engineers. The only one that falls into “Others” is the government affair specialist, who deals with the construction regulations and policies issued by the construction authorities and has special insights into the research problems. Both the senior management professionals and the specialist in government affairs were deemed to be able to identify and assess the regulatory risks and provide the experiences and perspectives of their company to overcome them.

Table 6.1 Respondents’ Designation

Respondents’ Designation	Frequency	Percent (%)	Cumulative Percent (%)
President	3	6.3	6.3
Vice president	5	10.4	16.7
Director	2	4.2	20.8
General manager	13	27.1	47.9
Project manager	9	18.8	66.7
Department manager	7	14.6	81.3
Senior engineer	8	16.7	97.9
Others (Government Affair Specialist)	1	2.1	100.0
Total	48	100.0	

The respondents also had an average of almost ten years’ experience in China’s construction industry, as shown in Table 6.2. The high-level position and the extensive experience of the respondents were essential for this study to enhance the reliability of the survey results.

Table 6.2 Respondents’ Working Experience in China’s Construction Industry

Years of experience in China’s construction	No. of Respondents	Percent (%)	Average
<5	9	18.8	9.94
5-10	21	43.8	
11-15	10	20.8	
16-20	6	12.5	
>20	2	4.2	
Total	48	100.0	

6.2.2 Respondents’ Firms

In this survey, each respondent represents a foreign AEC firm where he is affiliated. Besides the ratings of respondents’ perception on regulatory risks, information of their firms is also essential in exploring the interaction between regulatory impact and firm’s strategy and capabilities. On average, the foreign AEC firms where the respondents are working have been established in China for more than 13 years, as shown in Table 6.3.

Table 6.3 Years that the Respondents’ Firms Have Been Established in China

Years of experience in China’s construction	No. of Firms	Percent (%)	Average
<8	8	16.7	13.4
8-14	23	47.9	
15-21	10	20.8	
22-28	2	4.2	
29-35	5	10.4	
Total	48	100.0	

Interestingly, almost 75 percent of these firms are wholly-owned foreign firms (WOFEs). The rest are Sino-foreign equity or cooperative joint ventures, as indicated in Table 6.4. In China Statistical Yearbook 2006 and 2007, the foreign investment as wholly foreign-owned enterprises takes up an average of 73 percent of the total foreign direct investment in 2005 and 2006. This indicates that more and more foreign firms prefer to establish WOFEs instead of joint ventures with local firms.

Table 6.4 Entry Mode of the Respondents’ Firms in China

Entry mode	Frequency	Percent (%)
wholly foreign-owned firm	36	75
Sino-foreign joint venture	12	25
Total	48	100.0

The home countries of the respondents’ firms are mainly from Asia (37.5%), North America (33.3%) and Europe (29.2%). As presented in Table 6.5, US, UK,

Singapore and Hong Kong are ranked as the top four sources of investment in China’s construction industry. As stipulated in China’s construction regulations (Decree 113 and 114), Hong Kong and Taiwan-invested construction and consulting firms are also considered as foreign-invested firms.

Table 6.5 Sources of Foreign Investment in China’s Construction Industry

Country		Frequency	Summary	Percent (%)
Asia	Singapore	7	18	37.5
	HK	6		
	Japan	2		
	New Zealand	1		
	Australia	1		
	Malaysia	1		
North America	US	14	16	33.3
	Canada	2		
Europe	UK	5	14	29.2
	France	3		
	Austria	1		
	Germany	2		
	Netherland	1		
	Norway	2		
Total		48	48	100

Table 6.6 summarizes the numbers of permanent employees in respondents’ firms, which can be used to measure the size of these firms. Around 60 percent of the respondents’ firms have less than 200 permanent employees. Most of these employees are technical and managerial staff. The average number of employees is 246 for the respondents’ firms and it is much lower than the average size of local construction and consulting firms. This is consistent with the China Statistic Year Book that the average number of employed persons of foreign-invested construction enterprises is 200 (CSYB, 2006).

Table 6.6 Numbers of Permanent Employees in Respondents’ Firms

Firm Size by Employment	No. of Firms	Percent (%)	Average number of Employees
<100	15	31.3	246
100-200	14	29.2	
201-300	6	12.5	
301-400	7	14.6	
>400	6	12.5	
Total	48	100.0	

6.3 Research Variables

As discussed at the end of Chapter 3, all the regulatory risks are categorized into five groups, which are considered as the five research variables in this chapter to perform statistical analysis. Therefore, the regulatory risks act as the basis of further analysis and have to be scored first before the research variables can be computed.

6.3.1 Descriptive Analysis on Regulatory Risks and Research Variables

The responses to the ratings on probability and impact of regulatory risks provided the perceptions of respondents with experiences in foreign AEC firms in China. All the regulatory risks are ranked according to their R score as discussed in Chapter 5. The calculation of the average R score for each regulatory risk can be expressed as:

$$R^i = \frac{\sum_{j=1}^{48} P_j^i \times I_j^i}{48}$$

where, R^i = risk score for the regulatory risk i ; P_j^i = probability of occurrence assessed by respondent j for regulatory risk i ; I_j^i = degree of impact of regulatory risk i assessed by respondent j . Following the above equation, the R score of all 28 regulatory risks were calculated and ranked, as shown in Table 6.7. Results of this ranking are briefly discussed next.

Table 6.7 The Rankings of All Identified Regulatory Risks on Their R Score

Rank	Code of the Regulatory Risks	Mean of Occurrence Probability	Mean of Impact Degree	R Score
1	C5	2.87	3.51	11.8
2	D2	3	3.51	11.4
3	E3	3.15	3.27	11.14
4	A1	2.83	3.43	10.91
5	A4	2.8	3.47	10.8
6	E1	2.88	3.11	10.52
7	C2	2.85	3.17	10.38
8	A2	2.65	3.23	10.05
9	C1	2.73	3.08	9.82
10	A3	2.42	3.42	9.66
11	B1	2.49	3.43	9.43
12	D3	2.67	3.12	9.41
13	D9	2.71	2.91	9.09
14	D10	2.63	3.05	9.04
15	E4	2.67	2.84	8.99
16	D7	2.61	3.1	8.83
17	D4	2.53	2.9	8.47
18	D1	2.25	3.25	8.2
19	C6	2.24	3.06	8
20	D5	2.16	3.11	7.46
21	C3	2.27	2.53	7.07
22	D6	2.07	2.79	6.71
23	B4	1.91	2.91	6.6
24	B3	1.82	2.68	6.11
25	C4	1.95	2.54	5.89
26	E2	1.9	2.45	5.83
27	D8	2.04	2.42	5.82
28	B2	1.7	2.81	5.47

In the top 10 regulatory risks in Table 6.7, three risks are from group C in the list which pertains to the SQC application. Group of market entry mode (group A) is the only one group from A to E with all risks included in the top 10 problems ranked. Additionally, two risks in design code and standard (group E) also fall within the top 10 of the rankings. It can be seen that the establishment of local entity (group B) may not be a major problem for foreign AEC firms in China. Three items out of four

in this group are ranked within the last ten items by the respondents.

The regulatory risk C5, namely the requirement on numbers of qualified personnel, occupies the first place with the highest R score. It has the highest mean of impact degree and the forth highest mean of probability. This requirement is stipulated in the *Qualification Standard of Construction Enterprises established* in July 2001. Although this requirement applies to all construction firms in China including foreign firms, to maintain such a big number of qualified staff is much more difficult for foreign construction firms than for local firms. From the ratings of item C1 and C2, it also can be seen that application of SQC is deemed as an obstacle for foreign AEC firms.

Regulatory risks under market entry mode (group A) are ranked by respondents as the top concerns from foreign AEC firms. “Registered Contractor System” was repealed by Decree 113 on FICEs since 2002. Currently, foreign AEC firms which intend to provide construction service must register a local entity and apply for SQC before they can undertake any projects in China. The repeal of “Registered Contractor System” definitely adds more cost of time and money to the foreign firms. On the other hand, foreign AEC firms which only provide design consultancy are not subject to a very high entry requirement as compared to those providing construction services. However, foreign design consulting firms have to find and cooperate with a Chinese design institute if the design works go beyond the conceptual stage. Selecting and cooperating with a Chinese design institute is not easy for foreign design consulting firms. In addition, the project scope and project size of FICEs are limited in Decree 113.

Due to China’s unique construction contracting practice, foreign AEC firms must clarify all the details in contracts between various parties involved in a project. Design code and standard (group E) in China may not be able to remain consistent with the international standard. To carry out projects in China, foreign firms need to follow the local design code and standard to conform to the rules and regulations.

Because of the language barrier and the short responding time set by the MOC, it is difficult for foreign AEC firms to participate or even influence the process of designing the code and standard.

Seven other risks in contracting issues (group D) fall within the next group of ten risks. Most of the contracting issues arise from the previous centrally-planned economy. Although China has adapted the open policy and moved towards the market economy, the construction contracting system still lags behind the international practice. The main difficulty can be attributed to the contract document and the practice of main contracting and subcontracting. To avoid disputes and operational problems, foreign AEC firms must study carefully all the articles in their contract documents and the relevant construction laws to properly deal with the contractual relationship among the parties.

For the risks ranked in the bottom-eight, their R scores are not high compared with the ones discussed above. Nevertheless, risks with an impact of above the rating of 2.5 still warrant the attention of foreign firms although they may not likely happen.

According to William's probability-impact grid model discussed in Chapter 5, a probability-impact matrix as shown in Figure 6.1 is produced to identify the level of severity of each regulatory risk before categorizing them into groups. To clearly identify the level of severity, two reference lines are drawn at the middle point of each axis to divide the area into four boxes (Figure 6.1). Since the impact of regulatory risk is rated from 1 (negligible) to 5 (extreme), the middle point is located at 3 in the horizontal axis. Similarly, the probability is rated from 0 (N.A.) to 5 (very high) so that the middle point is located at 2.5 in the vertical axis. It can be observed that 12 regulatory risks with the top R score rankings in the upper right zone (high risk zone) have relatively high probability and more impact, while the 8 items with the lowest R score rankings in lower left zone (low risk zone) with lower probability of occurrence and less impact. The medium risk zone contains another 8 regulatory risks with high probability and low impact or high impact and low probability. This

matrix is consistent with the R score rankings of regulatory risks in Table 6.7.

Figure 6.1 Probability-Impact Matrix of All Regulatory Risks

Although all the regulatory risks identified have to be given attention by foreign AEC firms, those risks which fall into the high risk zone require priority attention and aggressive response strategies to minimize the effect. Risks in the medium risk zone have to be placed under monitoring any time at the stage they may appear. Even though the regulatory risks in the low risk zone may not require proactive management action, they are probably still affected by other regulatory risks with high rankings and need to be watched closely. Therefore, it is better to analyze the regulatory risks based on the five groups as variables. For the convenience of statistical analysis, the 28 regulatory risks were consolidated into five regulatory risk variables: (a) entry mode and business scope; (b) establishment of local entity; (c) application of SQC; (d) contracting issues, and (e) code and standard issues. The consolidation was done by computing the sum of each regulatory risk under the same variable category. The mean value and standard deviation of each regulatory risk variable and category are presented in Table 6.8 and they serve as the basis for

the following statistical analysis.

Table 6.8 Summary of Regulatory Risk Variables

Code of the Regulatory Risks	Regulatory Risk Variables	Mean	Std. Deviation
A1-A4	Entry mode & business scope	10.3536	6.12527
B1-B4	Establishment of local entity	6.9034	5.86332
C1-C6	Application of SQC	8.8263	5.53794
D1-D10	Contracting issues	9.0606	3.56307
E1-E4	Code and standard issues	9.1213	5.51605

As indicated, entry mode (group A) is ranked as the most risky regulatory issue by the survey respondents, while the establishment of local entity (group B) is ranked as the lowest among the five regulatory groups. The contracting issues (group D) and code and standard issues (group E) have the similar mean value of R score and are both slightly higher than application of SQC (group C).

6.3.2 Reliability Assessment

Reliability refers to the “the degrees to which measures are free from error and therefore yield consistent results” (Peter, 1979). According to Bagozzi (1980), there are four traditional methods used to estimate reliability: test-retest, split-halves, alternative forms, and internal consistency. Since all the constructs in the study adopted multi-item scales, as Green *et al.* (1988) suggested, the coefficient alpha should be used as a measurement of the internal consistency because the alpha measures the degree of co-variation that exists among the scale items.

In this study, Cronbach’s coefficient alpha was used to measure the degree of co-variation among these regulatory variables and the firm’s capabilities as well. Table 6.9 shows the number of items under each variable and the values of coefficient alpha for them. In early stages of basic research, it has been suggested that reliabilities of 0.50 and 0.60 should suffice (Churchill, 1979; Nunnally, 1978). Thus, 0.60 was set as the minimum acceptable value for this study. As indicated,

Cronbach’s alpha of the variables ranged from 0.62 (Entry mode and business scope) to 0.77 (Application of SQC). Thus the measures for capability and the categorization of regulatory risks in this research have shown a satisfactory level of internal consistency and they can be used for further analysis.

Table 6.9 Variables and Their Reliability

Variables		No. of items	Reliability (Cronbach Alpha)
Categories of Regulatory Risks	Entry mode and business scope	4	0.62
	Establishment of local entity	4	0.73
	Application of SQC	6	0.77
	Contracting issues	10	0.68
	Code and Standard issues	4	0.72
Firm-specific resources & capability		7	0.71

6.4 Hypothesis Testing and Discussion

Hypothesis testing was conducted by multiple statistical methods using SPSS, following the sequence of research questions and hypothesis development. At this stage, the data were stratified to get a better idea on the association and interaction among construction regulatory risks, foreign firms’ strategies, capabilities and performance. The interview results are expected to complement the interpretation of statistical analysis to provide a practical understanding on how foreign AEC firms are affected by these regulatory risks.

6.4.1 Hypothesis 1: Construction Regulatory Risks and Foreign AEC Firms’

Performance

In order to test $H_{1.1}$ to $H_{1.5}$, a multiple regression analysis was conducted based on three related models: Model 1a, Model 1b, and Model 1c. The independent variables in the three models are entry mode and business scope, establishment of local entity,

application of SQC, issues of contracting and code and standard. The dependent variables are foreign firm’s performance measured by sales growth, profit growth and the overall performance. The regression equations take the following forms, and the analytical results are shown in Table 6.10.

Model 1a: $Sales\ growth = \alpha_{0a} + \beta_{1a}ES + \beta_{2a}EL + \beta_{3a}SQ + \beta_{4a}CI + \beta_{5a}CS$

Model 1b: $Profit\ growth = \alpha_{0b} + \beta_{1b}ES + \beta_{2b}EL + \beta_{3b}SQ + \beta_{4b}CI + \beta_{5b}CS$

Model 1c: $Overall\ Performance = \alpha_{0c} + \beta_{1c}ES + \beta_{2c}EL + \beta_{3c}SQ + \beta_{4c}CI + \beta_{5c}CS$

Where, ES=Entry mode and business scope

EL=Establishment of local entity

SQ=Application of SQC

CI=Contracting issues

CS=Code and standard issues

Table 6.10 The Impact of Regulatory Risk Variables on Foreign AEC Firms’ Performance

Regulatory Variables	Sales Growth (Model 1a)	Profit Growth (Model 1b)	Overall Performance (Model 1c)
Entry mode and business scope	-0.508****	-0.032	-0.310***
Establishment of local entity	-0.213**	-0.032	-0.140*
Application of SQC	-0.229**	-0.527****	-0.399****
Contracting issues	-0.058	-0.232***	-0.151**
Code and standard issues	-0.074	-0.385****	-0.238****
R ²	0.805	0.855	0.892
Adjusted R ²	0.782	0.838	0.879
F-Value	34.714****	49.460****	69.232****

Note. * P<0.10; ** P<0.05; *** P<0.01; **** P<0.001

The results are presented as standardized regression coefficients in Table 6.10. As indicated, all the three Models were significant at the level of p<0.001. For Model 1a, the independent variables explained 80.5 percent of variance in foreign AEC firms’

sales growth ($R^2=0.805$, Adjusted $R^2=0.782$). For Model 1b, the independent variables explained 85.5 percent of variance in the foreign AEC firms' profit growth ($R^2=0.855$, Adjusted $R^2=0.838$). For Model 1c, the independent variables explained 89.2 percent of variance in the foreign AEC firms' overall performance ($R^2=0.892$, Adjusted $R^2=0.879$). As mentioned in Chapter 5, the higher the adjusted R square, the better the predictor can explain the variation in dependent variable. Thus, the values of adjusted R^2 in the three models are acceptable for evaluating Model 1a, Model 1b and Model 1c.

Besides, all the standardized regression coefficients are negative (Table 6.10). Therefore, the relationship between the independent variable and dependent variables in each model is also negative. The followings are the results concerning each of the hypotheses ($H_{1.1}$ to $H_{1.5}$).

In $H_{1.1}$, Entry mode and business scope was hypothesized to be negatively related with foreign AEC firms' sales growth, profit growth and the overall performance. In the three models, the results demonstrated a significant negative relationship between this independent variable and sales growth ($\beta=-0.508$, $p<0.001$) and overall performance ($\beta=-0.310$, $p<0.01$). But it is not negatively related with firms' profit growth ($\beta=-0.032$, $p>0.1$). So $H_{1.1}$ is partially supported.

Based on the above analysis result for $H_{1.1}$, more negative impact from the regulatory risks on entry mode and business scope can result in less sales growth and overall performance for foreign AEC firms. As mentioned in Section 6.3.1, the variable of "entry mode and business scope" consists of four regulatory risks (A1 to A4) (Table 6.8). Firstly, direct contracting is not allowed for foreign AEC firms providing construction service in China, and they have to register a local entity before carrying out any projects in China. The business registration will increase their overhead cost and reduce the profit as a result, compared with the previous "Registered Contractor System" under which the foreign firms only need to apply for a construction license. In addition, as highlighted by a US-invested AEC firm in the interview, business

registered in one province will face problem when contracting projects in another province due to the local protectionism. The restriction on business scope of construction WOFEs also inevitably affects their sales as the potential clients become less while the cost in securing projects within the restricted scope would be higher than before. Even though the foreign design consulting firms are allowed to work on an offshore basis, it is still difficult for them to find an appropriate Chinese partner if they want to undertake design works beyond the conceptual stage.

In $H_{1,2}$, establishment of local entity was hypothesized to be negatively related with foreign AEC firms' sales growth, profit growth and the overall performance. In the three models, there is a significant negative relationship between this independent variable and sales growth ($\beta=-0.213$, $p<0.05$) and overall performance ($\beta=-0.140$, $p<0.1$). But it is not significantly related with firms' profit growth ($\beta=-0.032$, $p>0.1$). So $H_{1,2}$ is partially supported.

Based on the above analysis result for $H_{1,2}$, foreign AEC firms have less sales growth and the overall performance when they encounter more severe impact from regulatory risks in establishing a local entity. As discussed in Section 6.3.1, the variable of "establishing a local entity" consists of four regulatory risks (B1 to B4) (Table 6.8). The registered capital is a major problem to prevent foreign AEC firms from easily accessing China's construction industry. The registered capital of RMB300 millions for special grade construction qualification is considered very high by 60 percent of the interviewees, even though the special grade qualification imposes no restriction on contract amount. For any lower grade construction qualification, the contract amount is limited to five times the registered capital. This restriction on contract amount prevents foreign AEC firms from contracting large sophisticated infrastructure projects.

In $H_{1,3}$, application of SQC was hypothesized to be negatively related with foreign AEC firms' sales growth, profit growth and the overall performance. In the three models, the results present a significant negative relationship between this

independent variable and sales growth ($\beta=-0.229$, $p<0.05$), profit growth ($\beta=-0.527$, $p<0.001$) and overall performance ($\beta=-0.399$, $p<0.001$). Thus this hypothesis is fully supported.

Based on the above analysis result for $H_{1.3}$, foreign AEC firms have less sales growth, profit growth and the overall performance when they encounter greater regulatory risks in SQC application. As mentioned in Section 6.3.1, the variable of “application of SQC” consists of six regulatory risks (C1 to C6) (Table 6.8). The skill qualification requirements are the same for foreign firms and for Chinese enterprises. Nevertheless, foreign AEC firms still face more difficulties in satisfying the SQC requirements on track record, number of technical personnel and managers, and the qualification of each technical personnel and managers. These difficulties are the main concerns as pointed out by all of the interviewees in top management level of foreign AEC firms. To maintain a large number of the technical personnel and managers in China, the operational cost of foreign firms would be greatly increased. Consequently, their project quotation/price would not be competitive. Therefore, the overall performance in sales and profit will be even worse than before for these foreign firms. In addition, a foreign AEC firm normally provides more than one service in one project, for example, construction and engineering design consultancy. In such a case, they have to apply two SQCs with one in construction and another in engineering design. Feedback from the interviewees indicated that only one third of their firms have two SQCs in construction and design. The rest of them with one SQC will only be able to provide the service within the SQC scope even though they have good resources for other services as well.

In $H_{1.4}$, contracting issues were hypothesized to be negatively related with foreign AEC firms’ sales growth, profit growth and the overall performance. In the three models, the results demonstrated a significant negative relationship between this independent variable and profit growth ($\beta=-0.232$, $p<0.01$) and overall performance ($\beta=-0.151$, $p<0.05$). But it is not significantly related with firms’ sales growth ($\beta=-0.058$, $p>0.1$). So $H_{1.4}$ is partially supported.

Based on the above analysis result for $H_{1.4}$, foreign AEC firms have less profit growth and the overall performance when they encounter greater regulatory risks in contracting issues. As mentioned in Section 6.3.1, the variable of “contracting issues” consists of ten regulatory risks (D1 to D10) (Table 6.8). The contracting risks occur after the foreign AEC firms have secured a project and are ready to start the work. Therefore the contracting issues do not affect the sales performance but do influence the profit due to the higher cost incurred during the contracting period. The contracting practice for construction projects in China is different from the international standards. For instance, contracting problems may arise from the ambiguity of subcontractor’s liability to project owner. Management contracting and sub-sub-contracting are also prohibited. Foreign AEC firms have to find another way to circumvent these restrictions. Based on the interviews, most of the interviewees’ firms have already known how to bypass the restrictions but additional cost has to be incurred.

In $H_{1.5}$, code and standard issues were hypothesized to be negatively related with foreign AEC firms’ sales growth, profit growth and the overall performance. The results of the three models demonstrated a significant negative relationship between this independent variable and profit growth ($\beta=-0.385$, $p<0.001$) and overall performance ($\beta=-0.238$, $p<0.001$). But it is not negatively related with firms’ sales growth ($\beta=-0.074$, $p>0.1$). So $H_{1.5}$ is partially supported.

Based on the above analysis result for $H_{1.5}$, foreign AEC firms have less profit growth and the overall performance when they encounter greater regulatory risks in code and standard issues. As highlighted by a design engineer from a UK-invested firm in China, design code and standard are not consistent among local authorities. In addition, design code and standard are not consistent among central authorities, such as Ministry of Construction, Ministry of Transportation and the Ministry of Land and Resources. Foreign AEC firms have to invest additional resources to clarify with relevant government departments on the consistency of the codes and standards. The language barrier further complicates the process and possibility of foreign AEC firms

participating in the establishment of codes and standards. Within the short period given for public consultation, foreign AEC firms have to firstly translate the codes and standards from Chinese into English or other languages for their top management to review. All these problems result in additional cost incurred by foreign AEC firms.

6.4.2 Hypothesis 2: Foreign AEC Firms' Capabilities and Their Performance

In order to test $H_{2.1}$ to $H_{2.7}$, a multiple regression analysis was conducted based on three related models: Model 2a, Model 2b, and Model 2c. The independent variables in the three models are seven firm-specific capabilities, namely management skills, technical ability, financing ability, marketing ability, organization structure, social influence, and contribution to project objectives. The dependent variables are foreign firm's performance measured by sales growth, profit growth and the overall performance. The regression equations take the following forms, and the analytical results are shown in Table 6.11.

$$\text{Model 2a: Sales growth} = \alpha_{0a} + \beta_{1a}MS + \beta_{2a}TA + \beta_{3a}FA + \beta_{4a}MA + \beta_{5a}OS + \beta_{6a}SI + \beta_{7a}CO$$

$$\text{Model 2b: Profit growth} = \alpha_{0b} + \beta_{1b}MS + \beta_{2b}TA + \beta_{3b}FA + \beta_{4b}MA + \beta_{5b}OS + \beta_{6b}SI + \beta_{7b}CO$$

$$\text{Model 2c: Overall Performance} = \alpha_{0c} + \beta_{1c}MS + \beta_{2c}TA + \beta_{3c}FA + \beta_{4c}MA + \beta_{5c}OS + \beta_{6c}SI + \beta_{7c}CO$$

Where, MS = Management skills

TA = Technical ability

FA = Financing ability

MA = Marketing ability

OS = Organization structure

SI = Social influence

CO = Contribution to project objectives

Table 6.11 Regression Coefficients for Firm-Specific Capabilities and Performance

Firm-Specific Capabilities	Sales Growth (Model 3a)	Profit Growth (Model 3b)	Overall Performance (Model 3c)
Management skill	0.044	0.277**	0.160*
Technical ability	0.254*	0.240	0.247**
Financing ability	0.393****	-0.059	0.167***
Marketing ability	0.395****	0.410***	0.402****
Organization structure	-0.086	-0.076	-0.081
Social influence	0.193*	-0.020	0.086
Contribution to project objectives	-0.002	0.282***	0.140**
R ²	0.852	0.765	0.873
Adjusted R ²	0.826	0.724	0.851
F-Value	32.834****	18.605****	39.312****

Note. * P<0.10; ** P<0.05; *** P<0.01; **** P<0.001

As indicated in Table 6.11, all the three related Models are statistically significant at the level of $p=0.001$. The values of the adjusted R^2 for Model 3a, 3b and 3c are 0.826, 0.724 and 0.851 respectively, which are deemed acceptable. It shows that the seven capability/resource variables can explain 83%, 72% and 85% of the variance in the sales growth, profit growth and overall performance of foreign AEC firms in China. The results of hypotheses ($H_{2.1}$ - $H_{2.7}$) testing are presented below.

$H_{2.1}$ stated that management skill is positively related to the performance of foreign AEC firms in China. The results (Table 6.11) showed that the regression coefficients of this independent variable had a significantly positive relationship with both profit growth ($\beta=0.277$; $p<0.05$) and overall performance ($\beta=0.160$; $p<0.1$). Thus, this hypothesis is supported.

This result agrees with Shen's assertion that good management skill can enhance the performance in project quality, time, cost, contract, co-ordination, safety,

environment and risks (Shen et al., 2004; Yao, 1998). Under the existing regulatory framework, developing management skill is still an effective method for foreign AEC firms to minimize unexpected cost and increase profit.

H_{2.2} proposed that technical ability is positively related to the performance of foreign AEC firms in China. The results showed that the regression coefficients of technical capability variable had a significantly positive relationship with both sales growth ($\beta=0.254$; $p<0.1$) and overall performance ($\beta=0.247$; $p<0.05$). Hence, H_{2.2} is also supported.

This result is consistent with the consensus reached by the interviewees on the importance of technical ability. The Chinese government has been attracting foreign firms with advanced technology to promote the efficiency and performance of the entire construction industry in China because technology transfer is a crucial and dynamic factor in social and economic development. Hence foreign AEC firms with specially advanced technical ability will be highly encouraged by Chinese government and can win more projects in the highly competitive environment in China.

H_{2.3} proposed that financing ability is positively related to the performance of foreign AEC firms in China. As indicated, the results (Table 6.11) showed that the regression coefficients of financing ability variable had a significantly positive relationship with both sales growth ($\beta=0.393$; $p<0.001$) and overall performance ($\beta=0.167$; $p<0.01$). Hence, H_{2.3} is supported.

Compared with Chinese enterprises, foreign AEC firms are more capable of financing project through diversified channels (Shen et al., 2006). A sound funding and financing ability is a most important factor in project procurement, e.g. tendering and negotiation. Based on the interview to a project manager in a France-invested firm, foreign AEC firms with better financial credit than that of Chinese enterprises have higher chance to be financed by international financial institutions, which

finally lead up to a better performance in sales.

H_{2.4} predicted that marketing ability is positively related to the performance of foreign AEC firms in China. The results showed that the regression coefficients of marketing ability variable had a significantly positive relationship with sales growth ($\beta=0.395$; $p<0.001$), profit growth ($\beta=0.410$; $p<0.01$) and overall performance ($\beta=0.402$; $p<0.001$). As a result, H_{2.4} is also supported.

This result agrees with the study of Luo and Chen (1997) and Liu (2007) which discussed marketing ability from the perspective of relationship (guanxi). In China's business culture, it is very important to build up relationship (guanxi) which constitutes a key strategic factor that positively impacts the efficiency and growth of foreign investors (Luo and Chen, 1997). Liu (2007) argued that marketing ability contribute to the sales growth of Chinese construction firms in overseas, instead of the profitability. According to an interviewee in this research, the cost of establishing relationship in China can largely be covered by the increased profit arising from it. It concurs with this research result that marketing ability also contributes to the profit growth of foreign AEC firms. Foreign AEC firms must recognize the peculiarities of Chinese societies while structuring their marketing plans (Low, 1997). Good marketing ability in China can assist foreign firms to secure construction projects and reduce the likelihood of dispute between different parties in a project through a good relationship among project owner, contractor and consultants.

H_{2.5} stated that organization structure is positively related to the performance of foreign AEC firms in China. The results showed that the regression coefficients of this independent variable had no positive relationship with the three dependent variables at the significant level of 0.1. Therefore, H_{2.5} is not supported.

Organization structure is not proved to be significantly related to performance in sales and profit. This result is consistent with the findings of Kale (1999), Kang (2006) and Liu (2007) which indicated the least relevance of organization structure

to the performance of construction firms. According to Kang (2006), the formalisation of organization structure had a positive impact on project management capability. It only has indirect impact on firm's performance which cannot be proved by the research methodology.

H_{2.6} proposed that social influence of foreign AEC firms is positively related to their performance in China. The results showed that the regression coefficients of social influence variable had a significantly positive relationship only with sales growth ($\beta=0.193$; $p<0.1$). There is no significant relationship between social influence and profit growth and overall performance at the significant level of 0.1. Therefore, H_{2.6} is not supported.

Social influence consists of organization image, reputation, business qualification, market share. In this research, it was agreed by a number of interviewees that brand effect can help foreign AEC firms to win more projects in China. This is especially true for those famous foreign firms providing design consultancy service to commercial or residential building construction projects. Project owner tends to engage internationally renowned design firms and utilize their brand name for marketing strategy in promotion. Therefore, social influence can contribute to foreign firms' sales growth. However, social influence cannot contribute to profit growth and overall performance. Most Chinese clients are very cost-conscious and are less concerned with project quality and safety; it is hard for foreign AEC firms with a long-established brand name to maintain their profit growth. The overall performance will also be affected due to the poor profit growth. Foreign AEC firms would have to incur higher cost on overhead and business operation to ensure quality of their services, especially in their early presence in China, so that they can maintain their social influence. As indicated by an interviewee, the CEO of a US-invested AEC firm in China, foreign firms have to localize their operation by employing local technical professional and using local materials to become more cost-competitive against other Chinese enterprises.

H_{2.7} stated that foreign AEC firms' ability of contributing to project objectives is positively related to their performance in China. As indicated in Table 6.11, the regression coefficients of this independent variable had a significantly positive relationship with both profit growth ($\beta=0.282$; $p<0.01$) and overall performance ($\beta=0.140$; $p<0.05$). Therefore, H_{2.7} is also supported.

Contribution to project objectives is demonstrated by the ability to consider tender price, contract time and quality plan, safety plan and environmental protection plan (Shen et al., 2004). It is a result-oriented ability to reach the objectives set by the clients. This finding is supported by the interviewees' view that contribution to project objectives can enhance the profitability by minimizing the unexpected cost incurred through a planned system or procedure. Consequently, client satisfaction and better project performance can be achieved.

6.4.3 Hypothesis 3: Firms' Capabilities and the Construction Regulatory Risks

In order to test H_{3.1} to H_{3.7}, a multiple regression analysis was conducted based on five models: Model 3a, Model 3b, Model 3c, Model 3d and Model 3e. The dependent variables in the five models are regulatory variables, namely entry mode and business scope, establishment of local entity, application of SQC, contracting issues, and code and standard issues. The independent variables are foreign firm's seven capabilities, including management skill, technical ability, financing ability, marketing ability, organization structure, social influence, and the ability of contributing to project objectives. The regression equations take the following forms, and the analytical results are shown in Table 6.12.

$$\text{Model 3a: } ES = \alpha_{0a} + \beta_{1a}MS + \beta_{2a}TA + \beta_{3a}FA + \beta_{4a}MA + \beta_{5a}OS + \beta_{6a}SI + \beta_{7a}CO$$

$$\text{Model 3b: } EL = \alpha_{0b} + \beta_{1b}MS + \beta_{2b}TA + \beta_{3b}FA + \beta_{4b}MA + \beta_{5b}OS + \beta_{6b}SI + \beta_{7b}CO$$

$$\text{Model 3c: } SQ = \alpha_{0c} + \beta_{1c}MS + \beta_{2c}TA + \beta_{3c}FA + \beta_{4c}MA + \beta_{5c}OS + \beta_{6c}SI + \beta_{7c}CO$$

$$\text{Model 3d: } CI = \alpha_{0c} + \beta_{1c}MS + \beta_{2c}TA + \beta_{3c}FA + \beta_{4c}MA + \beta_{5c}OS + \beta_{6c}SI + \beta_{7c}CO$$

$$\text{Model 3e: } CS = \alpha_{0c} + \beta_{1c}MS + \beta_{2c}TA + \beta_{3c}FA + \beta_{4c}MA + \beta_{5c}OS + \beta_{6c}SI + \beta_{7c}CO$$

Where, MS = Management skills

TA = Technical ability

FA = Financing ability

MA = Marketing ability

OS = Organization structure

SI = Social influence

CO = Contribution to project objectives

ES=Entry mode and business scope

EL=Establishment of local entity

SQ=Application of SQC

CI=Contracting issues

CS=Code and standard issues

As indicated in Table 6.12, all the five related models are statistically significant from $p=0.1$ to $p=0.001$. The values of the adjusted R^2 for Model 3a, 3b, 3c, 3d and 3e are 0.577, 0.354, 0.555, 0.334 and 0.226 respectively, which are deemed acceptable. It shows that the seven capability variables can explain 58%, 35%, 56%, 33% and 23% of the variance in the five construction regulatory variables faced by foreign AEC firms in China. The results of hypotheses ($H_{3.1}$ - $H_{3.5}$) testing are presented below.

Table 6.12 Regression Coefficients for Firm-Specific Capabilities and the Regulatory Risk Variables

Firm-Specific Capabilities	Entry mode & business scope (Model 4a)	Establishment of local entity (Model 4b)	SQC (Model 4c)	Contracting issues (Model 4d)	Code & standard (Model 4e)
Management skill	-0.772	-0.564	-0.558	-1.470**	-0.518
Technical ability	-2.193*	-0.955	-0.240	-0.713	-0.796
Financing ability	-1.449**	-1.938**	0.073	-0.950*	-0.007
Marketing ability	-0.828	-0.473	-2.531***	0.051	-0.977
Organization structure	0.840	0.095	0.489	0.207	0.071
Social influence	-1.650*	-1.428	-1.259	0.693	-0.132
Contribution to project objectives	0.324	0.633	-0.991	-0.750	-1.687**
R ²	0.640	0.450	0.622	0.433	0.342
Adjusted R ²	0.577	0.354	0.555	0.334	0.226
F-Value	10.177****	4.675***	9.386****	4.369***	2.966**

Note. * P<0.10; ** P<0.05; *** P<0.01; **** P<0.001

H_{3.1} stated that the severity of the impact of entry mode and business scope can be moderated by one or more of the firm’s seven capabilities, including management skill, technical ability, financing ability, organization structure, marketing ability, social influence, and contribution to project objectives. The results (Table 6.12) showed that the severity of impact of Entry mode and business scope had a significantly negative relationship with technical ability ($\beta=-2.193$; $p<0.1$), financing ability ($\beta=-1.449$; $p<0.05$) and social influence ($\beta=-1.65$; $p<0.1$). Thus, this hypothesis is supported.

As stipulated in Decree 113, wholly foreign-owned AEC firms can only undertake five categories of the projects. These projects are funded by international financial institutes or foreign organizations or cannot be completed by Chinese enterprises due to the technical complexity. Therefore, foreign AEC firms with strong technical

ability and financing ability can easily win the tendering of these projects and have the advanced technical background to complete the projects which may be difficult for Chinese enterprises.

Social influence can also ease the entry barrier in China. This is especially true for foreign AEC firms providing consultancy services, e.g. design and engineering consultancy. Chinese design institutes or design enterprises with design certificate are always looking for international renowned foreign design firms to form partnership or even JV. Utilizing the brand name of their foreign partner in marketing their design service is one of the strategies. As stipulated by regulations, foreign design consultancy firm is not required to register a local entity as that for a construction firm but they have to find a local partner in order to provide design service beyond the conceptual stage. Therefore, foreign design consultancy firms can benefit from their good social influence in compliance with regulations on market entry mode and business scope.

H_{3.2} stated that the impact severity of Establishment of local entity can be moderated by one or more of the firm's seven capabilities. The results showed that the impact severity of Establishment of local entity had a significantly negative relationship with financing ability ($\beta=-1.938$; $p<0.05$). Thus, this hypothesis is supported.

Foreign AEC firms with strong financing ability will not likely be affected by the regulatory requirements on establishment of local entity, especially the requirement on registered capital. Since registered capital must be paid in full and bonding or financial guarantees are not recognized, foreign AEC firms have to seek financing from their parent company overseas or from international financial organization, e.g. Asian Development Bank (ADB) or Word Bank (WB).

H_{3.3} stated that the severity of the impact of SQC can be moderated by one or more of the firm's seven capabilities. The results showed that the severity of impact of SQC had a significantly negative relationship with marketing ability ($\beta=-2.531$;

$p < 0.01$). Thus, this hypothesis is supported.

As discussed in Section 6.4.2, strong marketing ability can establish relationship (Guanxi) which is very important for foreign firms to win projects and run their business in China. Marketing ability and the impact of SQC requirements may not have direct relationship. However, the relationship (Guanxi) built up by the strong marketing ability is the key factor to circumvent the rigid requirements on SQC. As remarked by an interviewee from a Germany-invested firm, good relationship with government authority can greatly ease the SQC application process and shorten the processing time. By forming a project consortium with Chinese enterprises, foreign AEC firms without SQC can also work as management contractor as long as the Chinese enterprises in the consortium have the required SQC. Some interviewees' firms have already operated in this way in China. Thus the requirements of SQC have less impact on them since they have strong marketing ability and good relationship with government agencies and local enterprises.

H_{3.4} stated that the severity of the impact of Contracting issues can be moderated by one or more of the firm's seven capabilities. The results (Table 6.12) showed that the severity of impact of Contracting issues had a significantly negative relationship with management skills ($\beta = -1.470$; $p < 0.05$) and financing ability ($\beta = -0.950$; $p < 0.1$). Thus, this hypothesis is supported.

Management skill is the most important in handling contracting issues among different contractual parties, e.g. project owner, general contractor, sub-contractor, and engineering design consultants. Strong management skill and coordinating ability can help foreign AEC firms to minimize the problems arising from the contracting issues. Therefore, the project performance in time, cost, quality and safety can be quite easily achieved. For foreign AEC firms as general contractor, strong financing ability can also reduce the possibility of payment delay to sub-contractors which may result in project delay.

H_{3.5} stated that the severity of the impact of Code and standard can be moderated by one or more of the firm's seven capabilities. The results showed that the severity of impact of Code and standard had a significantly negative relationship with contribution to project objectives ($\beta=-1.687$; $p<0.05$). Thus, this hypothesis is supported.

Code and standards issues normally occur during the project operational period. China's codes and standards are not kept abreast with the international standards. As pointed out by a senior manager in a Singapore-invested AEC firm, certain construction materials used in overseas projects may not exist in China's construction codes and standards. Therefore, they have to adapt to the Chinese standards and find out other materials with similar quality for substitution. Such a problem is often encountered by foreign AEC firms in construction and engineering design consultancy services and can result in project delay and concerns in project quality, safety and environmental impact. The foreign AEC firms with strong ability of contribution to project objectives can successfully address the above-mentioned concerns and subsequently minimize the negative impact from codes and standards issues.

6.4.4 Hypothesis 4: Foreign AEC Firms' Strategies and Their Performance

In this section, non-parametric methods (which treat the response variable as an ordinal variable) were conducted to find the relationship between foreign AEC firms' strategies and their performance. These strategies include entry mode, service provided, market segment (project types), skill qualification certificate (SQC), contract modes and target clients (Figure 4.4). The rationale for using non-parametric methods was the difficulty of satisfying the normality assumption and equal variance assumption in each factor level. Foreign firms' performance, namely sales growth and profit growth, under the six strategies are compared to identify those strategies that made a difference on the performance. The Mann-Whitney U test (for comparison between two factor levels) was conducted to

test the null hypothesis that there is no significant difference on sales growth and profit growth among firms with difference strategies.

6.4.4.1 Entry Mode and Performance

Based on the construction regulations, foreign AEC firms can use two entry modes, i.e., wholly foreign-owned enterprises (WOFEs) and joint ventures (JVs), when they enter the China’s construction market. In this research survey, 75 percent of the respondents’ firms are WOFEs and the remaining are JVs (Table 6.4). The results of comparison on the sales growth and profit growth between wholly foreign-owned firms and Sino-foreign joint ventures are presented in Table 6.13. Mann-Whitney U test shows that Sino-foreign joint venture AEC firms have a significantly better performance both in sales growth and profit growth than that of wholly foreign-owned AEC firms at alpha level of $P<0.01$ and $P<0.05$. Therefore, the null hypothesis is rejected.

Table 6.13 Entry Mode of Foreign AEC Firms and Their Performance

Entry mode of foreign AEC firms	Performance- Sales growth				
	Counts (Percent)	Mean	Std. Dev.	Grouped Median	Mann-Whitney Significance
Wholly foreign-owned firm	36 (75)	3.5	1.06	3.63	0.096
Joint venture	12 (25)	4.08	1.08	4.25	
Total	48	3.65	1.08	3.75	
	Performance- Profit growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Wholly foreign-owned firm	36 (75)	3.5	0.97	3.62	0.014
Joint venture	12 (25)	4.25	0.62	4.27	
Total	48	3.69	0.95	3.79	

The above results are consistent with a large number of papers on Sino-foreign JVs in China. Local Chinese partner in a JV make huge contribution in local business knowledge, labor and good working relationships with governments (Luo et al.,

2001). With the help of Chinese partner, joint venture would have better performance in sales growth and profit growth than WOFEs. As discussed in Chapter 3, projects that can be undertaken by wholly foreign-owned AEC firms are limited to foreign-invested projects or projects that might not be carried out by local companies due to technical complexity; but there is no such restriction for Sino-foreign joint ventures. From this perspective, wholly foreign-owned firms do not have a very broad target market compared to joint ventures. Furthermore, Sino-foreign joint ventures are found to be good at reducing cost in business entry and operation, which results in a higher profit than that of WOFEs.

In this research, 75 percent of the foreign firms in the survey still chose to establish a WOFE instead of JV, notwithstanding that JVs performed better in sales and profit than that of WOFEs. This could be explained from the perspective of internal profit and responsibility shared between the local and foreign parties in a JV. The foreign party in a JV is found to be less profitable compared to the Chinese party. According to a managing director of a US-invested AEC firm, the foreign party in a JV always undertakes more responsibility than what has been prescribed in the contract. When problems occur, clients always look for the foreign party instead of the Chinese party for resolution because clients traditionally believe that the foreign party would be more responsible for the project, particularly in areas of safety and quality, than the Chinese party. Clients failed to realize that the nature of a JV is highly complex and the responsibility should be shared among all the parties. Although the Chinese party is also responsible for problem solving, they normally do not face the problems directly and intend to transfer the responsibility to the foreign party. This may put the foreign party into a very awkward position. If most of the problems have to be resolved by the foreign party, the profit gained by the foreign investor in the JV would definitely be diminished. More than 60 percent of the interviewees opined that establishing a JV can give rise to numerous problems to the foreign party on management and collaboration. Therefore foreign AEC firms preferred the mode of WOFEs over JVs to avoid all the difficulties and complications of the latter, even as

it means lower sales and profit performance for the former.

6.4.4.2 Services Provided and Performance

According to the survey response, all the respondents’ firms are providing more than one service in China’s construction industry, including construction, design and engineering consultancy, project management, etc. As indicated in Table 6.14, 39.6 percent of the respondents’ firms are involved in delivering construction services as general contractor, specialist contractor or design & build contractor, etc., while 60.4 percent of the respondents’ firms are mainly providing consultancy services covering design and engineering consultancy, project management, etc.

Table 6.14 Services Provided by Foreign AEC Firms and Their Performance

Services Provided by foreign firms	Performance- Sales growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Construction services	19 (39.6)	2.89	0.88	3	0.000
Consultancy services	29 (60.4)	4.14	0.92	4	
Total	48	3.65	1.08	4	
	Performance- Profit growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Construction services	19 (39.6)	3.47	1.02	4	0.172
Consultancy services	29 (60.4)	3.83	0.89	4	
Total	48	3.69	0.95	4	

To test the difference of performance between the two groups of foreign firms, Mann-Whitney U test was carried out and the result is demonstrated in Table 6.14. Foreign firms with construction in their service lists and those without construction service have significantly different performance in sales growth, which is indicated in the shaded areas (Table 6.14). It shows that under the current regulatory framework, foreign firms that provide consultancy services perform better in sales growth than those firms which mainly provide construction services. The null hypothesis that there is no difference on sales growth between foreign firms

providing construction services and those providing consulting services is rejected at $P=0.001$. However, the hypothesis on services provided and profit growth cannot be rejected as there is no significant difference in profit growth between the two groups of foreign firms.

As discussed in Chapter 3, China's construction regulations are more restrictive on foreign construction firms than on construction-related consultancy firms, which add more cost especially to foreign firms that work as general contractor. Notwithstanding this, foreign AEC firms are advantageous in managerial and technical skills compared with local Chinese enterprises. This can benefit foreign firms in construction-related consultancy services, instead of engaging solely in construction services. In China, the construction industry is still a labor-intensive industry where the local contractors are more competitive in cost, manpower and relationship than foreign firms (Shen et al., 2006). According to a number of senior managers in personal interviews, there are two sub-sectors which are advantageous for foreign firms to compete. The first is sub-contracting for foreign specialist contractors with specialized technical skills. Another option is in management and consultancy services, such as management contracting, project management, engineering design and mechanical and engineering consultancy, in which foreign firms are well established.

6.4.4.3 Market Segment (Project Types) and Performance

In the questionnaire survey, the respondents are required to indicate the major project types among general building construction, industrial construction and heavy civil construction, as their company's target market segments. Prior to the hypothesis testing, the respondents' firms are categorized into two groups. 79.2 percent of the respondents are undertaking industrial projects as their target market sector, while the rest 20.8 percent undertakes non-industrial projects, i.e. general building construction and engineering construction. Mann-Whitney U test was conducted to test the difference in the performance between the two groups of respondents' firms

and the results are presented in Table 6.15. As indicated, both the sales growth and profit growth of the foreign firms undertaking industrial projects are higher than those foreign firms undertaking non-industrial projects. However, the statistical analysis shows that only the difference in sales growth between two groups is significant at the specific alpha level ($P < 0.05$), as emphasized in the shaded box. Therefore, the H_0 is partially rejected as the difference in profit growth between two groups is not significant.

Table 6.15 Market Segment (Project Types) and Foreign AEC Firms' Performance

Market Segment (Project types)	Performance- Sales growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Industrial projects	38 (79.2)	3.82	1.04	4	0.037
Non-industrial projects	10 (20.8)	3	1.05	3	
Total	48	3.65	1.08	4	
	Performance- Profit growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Industrial projects	38 (79.2)	3.79	0.87	4	0.212
Non-industrial projects	10 (20.8)	3.3	1.16	3.5	
Total	48	3.69	0.95	4	

As discussed in Chapter 3 and Chapter 4, industrial construction projects can provide more opportunities for foreign AEC firms to compete under the regulatory restrictions in project scope and scale. To obtain better sales performance, foreign firms with technical specialty may enter industrial construction sector, where their competitive advantages are more obvious compared with Chinese enterprises.

6.4.4.4 Skill Qualification Certificate (SQC) and Performance

Nearly 42 percent of the respondents' firms have not received any SQC for carrying out business activities in the construction industry and the remaining 58 percent have received one or more SQCs. Based on the interview results, some of the

interviewees' firms are in the process of applying SQC, while the others are not going to apply unless the regulations are revised to be less restrictive, especially on the personnel requirements. As stipulated in the regulations, foreign AEC firms cannot contract any construction projects in China without any SQC.

As observed from Table 6.16, the foreign AEC firms that have obtained at least one SQC have a higher performance in sales growth and profit growth than firms without SQC. However, it can be found that only the difference in sales growth between the two groups is significant ($P<0.05$). There is no such significant difference in profit growth between the firms with and without SQC. Thus, the null hypothesis is partially rejected by the result of Mann-Whitney U test.

Table 6.16 SQC and Firms' Performance

Obtain any SQC?	Performance- Sales growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Yes	28 (58.3)	3.93	0.98	4	0.025
No	20 (41.7)	3.25	1.12	3	
Total	48	3.65	1.08	4	
	Performance- Profit growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Yes	28 (58.3)	3.86	0.85	4	0.154
No	20 (41.7)	3.45	1.05	4	
Total	48	3.69	0.95	4	

Elicited from the personal interviews, most of the foreign AEC firms without SQC are still profitable as they have stable project clientele and well-established relationship with partners, who can help them to overcome the problems brought by regulatory requirements on SQC. Therefore, no significant difference exists in profit performance between foreign firm with and without SQC, even though the profit growth of firms with SQC is still higher than those without SQC. However for the latter, their profit will greatly depend on the relationship with their client and partners. This dependent relationship adds more risk to these firms and reduces the

degree of freedom in competition; this is the reason why most of the interviewees from firms without SQC felt that owning a SQC is still the objective of their firms in the future. Once their firms grow up and are able to meet the requirements of the regulations, they will consider applying the certificate. Additionally, the foreign firms without SQC certificate do not have a broader scope of projects to be carried out than firms that own at least one SQC certificate. After obtaining a SQC, foreign firms will definitely have more opportunities in the areas that they are specialized in. The interview results are consistent with the statistical results in Table 6.16.

6.4.4.5 Contract Modes and Performance

As discussed in Chapter 4, sophisticated contracting is one of the strategies that foreign AEC firms are employing in China. In the research questionnaire, respondents are required to choose the main contract modes that their companies are using. According to their answers, the respondents' firms are categorized into two groups. One group includes 35 firms which selected sophisticated contract modes as their main contract modes with clients. These sophisticated contract modes include build-operate-transfer (BOT)/ public private partnership (PPP) contract, design and build (D&B) contract, architecture, engineering and construction (AEC) contract and engineering, procurement and construction (EPC) contract. Another group includes 13 firms mainly adopt traditional general contract, sub-contract, construction management (CM) or project management (PM) contract. The Mann-Whitney U test was conducted to test the null hypothesis that there is no significant difference in performance of sales growth and profit growth between foreign AEC firms with and without sophisticated contract modes. As shown in Table 6.17, foreign AEC firms that employed one or more sophisticated contract modes with their client have significantly higher performance in sales growth ($P < 0.05$) and profit growth ($P < 0.05$) than firms only used traditional contract modes.

Table 6.17 Foreign AEC Firms’ Contract Modes and Their Performance

Contract Modes	Performance- Sales growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Sophisticated contract modes	35 (72.9)	3.94	0.76	4	0.016
Traditional contract modes	13 (27.1)	2.85	1.4	3	
Total	48	3.65	1.08	4	
	Performance- Profit growth				
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance
Sophisticated contract modes	35 (72.9)	3.91	0.74	4	0.017
Traditional contract modes	13 (27.1)	3.08	1.19	3	
Total	48	3.69	0.95	4	

As project contracting modes are becoming more complex, foreign AEC firms should adopt sophisticated contracting modes to increase their market shares. As most of the infrastructure projects are normally large-scaled which demand multi-disciplinary expertise, they could not be completely undertaken by one service provider. Foreign AEC firms can obtain competitive advantages in sophisticated project contract by strengthening their managerial and technical expertise, engaging high-quality professionals, and increasing their financial strength. However, in the area of traditional project contract, foreign firms would not be competitive compared with Chinese enterprises, especially in their cost.

Under the current regulations, firms that enter into a sophisticated project contract must own one or more SQCs in the relevant services. Interestingly, there are only 28 firms in this survey that have obtained one or more SQCs in design or construction (Table 6.16), while 35 firms have already entered one or more sophisticated project contracts (Table 6.17). It means that 7 foreign AEC firms without any kind of SQC are still employing sophisticated contract modes; but this is not a violation of the relevant regulations as it is a real practice in China. An expert from a US-invested AEC firm pointed out that his company does not own any SQC but they can still sign sophisticated contracts by establishing a temporary entity with other local or

international firms which own one or more SQCs. There was consensus about such practices among a few interviewees whose firms do not own SQC. They felt that collaborating with other qualified firms in a sophisticated contract can bring them more opportunities and gain more profit while avoiding the cost on SQC application and maintenance. However, this kind of collaboration also incurs risks and the success depends largely on the management of various parties in the contract. Only foreign firms which can successfully deal with such relationship complexity can thrive and have better performance either in sales or in profit.

6.4.4.6 Target Client and Performance

Most of the interviewees in this research agreed that their firms tend to undertake more foreign-invested projects than projects owned by Chinese entities. Most of their projects contain some elements of foreign investment. This is consistent with the statistical analysis on the survey data presented in Table 6.18. The average percentage of foreign-invested projects among all the projects the respondents' firms have undertaken is approximately 68 percent based on the 48 survey responses. The survey responses were categorized into two groups with the percentage of above 68 percent and below in order to identify the impact of foreign firms' client on their performance. The statistical results in Table 6.18 show that among 31 survey responses out of 48, more than 68 percent of the projects that their firms have undertaken are foreign-invested projects. These projects are normally financed by international organizations, such as World Bank (WB), Asia Development Bank (ADB), or invested directly by foreign firms. Besides, projects with both China and foreign stakeholders are also their target according to some senior managers of foreign AEC firms in the personal interviews. The remaining 17 firms undertook less foreign-invested projects. A managing director from a Singapore-invested firm in China remarked that foreign firms would have secured more local clients if they are focusing on architecture or engineering design services, notwithstanding that the sales and profit performance may not be higher than those providing sophisticated

services.

Null-hypothesis was tested by Mann-Whitney U test and the result shows that foreign AEC firms undertaking more foreign-invested projects (above 68%) have a significantly higher performance in sales growth ($P<0.01$) and profit growth ($P<0.05$) than those with less foreign-invested projects (below 68%).

Table 6.18 Foreign AEC Firms’ Target Clients and Their Performance

Target clients (Percentage of foreign-invested projects)	Performance- Sales growth					
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance	
	Above average of 68%	31 (64.6)	4.06	0.77	4	0.001
	Below average of 68%	17 (35.4)	2.88	1.17	3	
Total	48	3.65	1.08	4		
	Performance- Profit growth					
	Counts (Percent)	Mean	Std. Dev.	Median	Mann-Whitney Significance	
	Above average of 68%	31 (64.6)	3.97	0.75	4	0.015
	Below average of 68%	17 (35.4)	3.18	1.07	3.5	
Total	48	3.69	0.95	4		

As stipulated in the construction regulations (Decree 113), wholly foreign-owned construction firms can only undertake four categories of projects, which include projects financed entirely by foreign investment, projects funded by international financial organizations, Sino-foreign joint venture projects and local projects in which Chinese contractors are unable to undertake due to technical reasons. Such stipulations explain why most of the respondents’ firms undertook more foreign-invested projects than local projects. However, when asked whether it is desirable to undertake local projects if permitted, most of the interviewees in wholly foreign-owned firms replied that their firms would rather choose foreign-invested projects than local projects from the perspective of sales and profit. To further explain this question, at least four interviewees indicated that their firms would have more chances to win foreign-invested projects than Chinese projects as foreign project owners normally pay more attention on safety, quality, management, and

technology whereas Chinese project owners often consider cost first. Furthermore, foreign AEC firms are having fewer problems with foreign project investors/owners than those with Chinese project owners. Foreign project investors/owners can share the common understanding of international practice with foreign AEC firms in China, resulting in lesser cost and risk than contracting with Chinese project owners.

Nevertheless, foreign AEC firms would still wish to undertake more large-scale infrastructure projects in China, as emphasized by the president of a US AEC firms. Therefore foreign AEC firms would have to localize their operations by employing local professionals and building up relationship with government authorities, as emphasized by a number of researchers on relationship (Guanxi) in doing business of China.

6.4.5 Hypothesis 5: Foreign AEC Firms' Strategies and the Construction Regulatory Risks

In this section, non-parametric methods were conducted again to find the relationship between foreign AEC firms' strategies and the construction regulatory risk variables. The respondents' firms were categorized into two groups under each of the six strategies which were discussed in Section 6.4.4. The scores of the five construction regulatory risk variables were compared between the two groups of respondents to identify the strategies which can moderate the negative impact from the regulatory risks they are facing. The Mann-Whitney U test was conducted to test the null hypothesis that there is no significant difference on regulatory problems between firms with difference strategies.

6.4.5.1 Entry Mode and Regulatory Risks

In Section 6.4.4.1, the 48 respondents' firms were categorized into two groups according to their entry mode in China, i.e., either WOFE or JV. In this section, the severity of five regulatory risk variables is compared based on these two groups of

firms to identify the effect of their entry mode. Mann-Whitney U test is conducted to test the null hypothesis that there is no significant difference on the severity of five regulatory risk variables between the above two groups of foreign AEC firms.

The result in Table 6.19 shows that Sino-foreign joint venture AEC firms encounter significantly less regulatory risks in entry mode and business scope ($P < 0.1$), application of SQC ($P < 0.05$) and code and standard issues ($P < 0.01$) than those wholly foreign-owned AEC firms. It can be found that the null hypothesis is rejected for three regulatory variables out of five.

Table 6.19 Foreign AEC Firms' Entry Modes and Regulatory Risk Variables

Entry mode of foreign AEC firms		Wholly foreign-owned firm	Joint venture	Total	Mann-Whitney Significance
Regulatory Risk variables					
Entry mode & business scope	Mean	11.42	7.17	10.35	0.051
	Std. Dev.	5.76	6.31	6.13	
	Median	10.87	5.25	10.38	
Establishment of local entity	Mean	7.78	4.29	6.9	0.105
	Std. Dev.	6.29	3.3	5.86	
	Median	6.38	2.71	6.13	
SQC	Mean	9.73	6.1	8.83	0.045
	Std. Dev.	5.4	5.25	5.54	
	Median	9.08	4.67	7.52	
Contracting issues	Mean	9.12	8.9	9.06	0.821
	Std. Dev.	3.79	2.9	3.56	
	Median	8.91	9.82	9.26	
Code and standard issues	Mean	10.54	4.86	9.12	0.002
	Std. Dev.	5.34	3.58	5.51	
	Median	11.5	4	8	

This result concurs with some of the existent research which indicated the importance of foreign firm's collaboration with Chinese enterprises (Luo, 2001; Xu et al., 2005). According to Xu et al. (2005), foreign firms may not be able to sustain their business without collaboration with Chinese design or construction enterprises. It is also agreed by Luo (2001) that forming JVs with local Chinese enterprises is the best way of doing business in the unfamiliar business environment of China. The

Chinese government has been encouraging the establishment of JVs since the Chinese enterprises in the JV can learn from their foreign partner the technology and management skills in a more efficient way. Therefore, under the existing regulatory framework, the regulatory requirements on JVs are less restrictive than those on WOFEs.

For entry mode and business scope, wholly foreign-owned AEC firms providing construction services can only undertake five categories of project as stipulated by Decree 113 (see Chapter 3) while there is no similar restriction for JV. For SQC application, most of the interviewees from wholly foreign-owned AEC firms commented negatively on the number and qualification requirements of technical and managerial personnel when applying for SQC. JVs are less affected because the Chinese party in a JV normally has more than enough qualified personnel and they have also good relationship with other government agencies to easily access manpower resources in the market. For code and standard issues, foreign AEC firms face more difficulties than JVs in interpreting and responding to the latest codes and standards in construction industry. The Chinese party in a JV always has a better understanding on the local codes and standards and then discusses it with the foreign party to have a faster reaction to any new codes and standards.

6.4.5.2 Services Provided and Regulatory Risks

In Section 6.4.4.2, the respondents' firms were categorized into two groups according to the services that foreign AEC firms are providing in China, i.e., either construction or consultancy services. In this section, the severity of five regulatory risk variables is also compared based on these two groups of firms to identify the effect of the services foreign firms are providing. Mann-Whitney U test is conducted to test the null hypothesis that there is no significant difference on the severity of five regulatory risk variables between the above two groups of foreign AEC firms.

The result in Table 6.20 shows that foreign AEC firms mainly providing consultancy

services encounter significantly less impact of regulatory risks in entry mode and business scope ($P < 0.001$), establishment of local entity ($P < 0.01$), application of SQC ($P < 0.1$) and contracting issues ($P < 0.05$) than those foreign firms which mainly provide construction services. It can be found that the null hypothesis is rejected for four regulatory risk variables out of five.

Table 6.20 Foreign AEC Firms' Services Provided and Regulatory Risk Variables

Services provided by foreign firms Regulatory risk variables		Construction services	Consultancy services	Total	Mann-Whitney Significance
Entry mode & business scope	Mean	14.52	7.62	10.35	0.000
	Std. Dev.	5.74	4.72	6.13	
	Median	14.25	7.5	10.38	
Establishment of local entity	Mean	9.94	4.92	6.9	0.003
	Std. Dev.	6.52	4.47	5.86	
	Median	7.11	4.43	6.13	
SQC	Mean	10.61	7.65	8.83	0.063
	Std. Dev.	5.17	5.54	5.54	
	Median	10.33	7	7.52	
Contracting issues	Mean	10.55	8.08	9.06	0.020
	Std. Dev.	4.49	2.41	3.56	
	Median	10.74	7.81	9.26	
Code and standard issues	Mean	8.38	9.61	9.12	0.337
	Std. Dev.	5.21	5.74	5.51	
	Median	6.82	8.25	8	

The above results are consistent with the reviewing on literatures and regulations in Chapter 2 and Chapter 3, in which the Chinese government set more restricted regulatory requirements on construction firms than on consultancy firms. There is a consensus regarding this statement among almost all interviewees. Construction firms are not allowed to contract directly while consultancy firms can carry out project without setting up a local company of JV or WOFE. The capital requirement is apparently much higher for construction firms than consultancy firms. The construction skill qualification is also more difficult to obtain in the case of

construction firms. Compared to the regulatory requirements on consultancy contracts, there are much more rules to regulate the contracting issues relating to construction firms, which include general contractors, specialist contractors and sub-contractors. Therefore, foreign firms carrying out construction services or work in the role of contractor face more regulatory risks than those foreign firms which provide consultancy services in China.

6.4.5.3 Market Segment (Project Types) and Regulatory Risks

In Section 6.4.4.3, the respondents' firms were categorized into two groups based on their market segment (project types), i.e. industrial projects and non-industrial projects. In this section, the severity of five regulatory risk variables is compared based on the two groups of firms to identify the effect of their market segment on project types. Mann-Whitney U test is conducted to test the null hypothesis that there is no significant difference on the severity of five regulatory risk variables between the above two groups of foreign AEC firms.

The result in Table 6.21 shows that foreign AEC firms undertaking industrial projects encounter significantly less impact of regulatory risks in application of SQC ($P < 0.05$) than those foreign firms that undertake non-industrial projects in China. It can be found that the null hypothesis is rejected for only one regulatory risk variable out of five.

Table 6.21 Foreign AEC Firms’ Market Segment (Project Types) and Regulatory Risk Variables

Market segment (Project types)		Industrial projects	Non-industrial projects	Total	Mann-Whitney Significance
Regulatory risk variables					
Entry mode & business scope	Mean	9.59	13.24	10.35	0.126
	Std. Dev.	6.1	5.6	6.13	
	Median	8.5	12.59	10.38	
Establishment of local entity	Mean	6.36	8.97	6.9	0.274
	Std. Dev.	5.7	6.32	5.86	
	Median	6.09	6.38	6.13	
SQC	Mean	7.94	12.18	8.83	0.030
	Std. Dev.	5.4	4.94	5.54	
	Median	7.33	12.41	7.52	
Contracting issues	Mean	8.63	10.69	9.06	0.102
	Std. Dev.	3.4	3.89	3.56	
	Median	8	10.78	9.26	
Code and standard issues	Mean	8.93	9.85	9.12	0.990
	Std. Dev.	4.68	8.26	5.52	
	Median	8	7.75	8	

In the industrial construction sector, foreign AEC firms are more competitive than Chinese enterprises due to their advanced technical expertise and management skills. According to a few interviewees in senior management level, foreign AEC firms are highly encouraged in this market segment by the Chinese government, especially the provincial government. Even though the foreign AEC firms may not own any SQC, they can still undertake projects by partnering with Chinese enterprises as their consultant. Such arrangements are always undertaken with the support and assistance from the government. This is especially true for foreign AEC firms which provide engineering design consultancy services in China. As indicated in Table 6.21, the appropriate strategy on market segment can only moderate the severity of impact from SQC application. Although industrial projects can bring foreign firms a higher performance in sales growth, it still cannot moderate the effect of most regulatory risks that foreign AEC firms may encounter.

6.4.5.4 Skill Qualification Certificate (SQC) and Regulatory Risks

In Section 6.4.4.4, the respondents' firms are categorized into two groups according to whether they own SQCs or not in China. Hence the severity of the five regulatory risk variables is compared based on the two groups of firms to identify the effect of the SQC. Mann-Whitney U test is conducted to test the null hypothesis that there is no significant difference on the severity of five regulatory risk variables between foreign AEC firms with and without SQC.

The result in Table 6.22 shows that foreign AEC firms with one or more SQCs encounter significantly less impact of regulatory risks in entry mode and business scope ($P<0.5$), establishment of local entity ($P<0.1$), application of SQC ($P<0.1$) than those foreign firms without any SQC. It can be found that the null hypothesis is rejected for the three regulatory risk variables out of five.

Table 6.22 Foreign AEC Firms' SQC and the Regulatory Risk Variables

SQC obtained? Regulatory risk variables		Yes	No	Total	Mann-Whitney Significance
Entry mode & business scope	Mean	8.54	12.89	10.35	0.027
	Std. Dev.	5.4	6.3	6.13	
	Median	8.25	11.5	10.38	
Establishment of local entity	Mean	4.88	9.73	6.9	0.050
	Std. Dev.	3.52	7.28	5.86	
	Median	5	6.5	6.13	
SQC	Mean	7.79	10.28	8.83	0.086
	Std. Dev.	5.58	5.26	5.54	
	Median	6.42	10.17	7.52	
Contracting issues	Mean	8.33	10.09	9.06	0.221
	Std. Dev.	2.68	4.4	3.56	
	Median	9.26	9.18	9.26	
Code and standard issues	Mean	8.31	10.26	9.12	0.408
	Std. Dev.	4.83	6.31	5.51	
	Median	7.25	11.25	8	

In China's construction industry, SQC is a basic licensing requirement before firms,

both foreign and local, can undertake projects. It can be found that only 59 percent of the respondents' firms have already owned one or more SQC (Table 6.16). Based on the interviewees' feedback, most of the large foreign AEC firms with good financial background and social influence would choose to apply for SQCs while small firms would not. The small foreign AEC firms would like to find a local partner or acquire a local enterprise which already has SQCs. This is the way that small foreign firms tackle the qualification requirement in China. It can be observed that large foreign AEC firms with one or more SQCs normally are less affected by the regulatory risks in entry mode, establishment of local entity and SQC application than those small foreign firms which cannot afford to satisfy the qualification requirements by themselves. However, obtaining an SQC does not moderate the regulatory risks foreign firms may encounter in contracting issues and code and standard issues. Foreign AEC firms that have already obtained one or more SQCs will still face potential risks in contracting issues and code and standard issues.

6.4.5.5 Contract Modes and Regulatory Risks

As discussed in Section 6.4.4.5, the respondents were categorized into two groups according to the contract modes they have adopted. The severity of the five regulatory risk variables is compared between one group which adopts traditional contract modes and another group which adopts sophisticated contract modes. Mann-Whitney U test is conducted to test the null hypothesis that there is no significant difference on the severity of the five regulatory risk variables between the two groups of foreign AEC firms.

The result in Table 6.23 shows that foreign AEC firms with sophisticated contract modes encounter significantly less impact of regulatory risks in entry mode and business scope ($P < 0.1$), establishment of local entity ($P < 0.05$), application of SQC ($P < 0.05$), and contracting issues ($P < 0.05$) than those foreign firms which adopt traditional contract modes. It can be found that the null hypothesis is rejected for four regulatory variables out of five.

Table 6.23 Foreign AEC Firms’ Contract Modes and the Regulatory Risk Variables

Contract modes Regulatory risk variables		Sophisticated contract modes	Traditional contract modes	Total	Mann-Whitney Significance
Entry mode & business scope	Mean	9.07	13.81	10.35	0.070
	Std. Dev.	5.32	7	6.13	
	Median	8.5	11.25	10.38	
Establishment of local entity	Mean	5.84	9.76	6.9	0.040
	Std. Dev.	5.11	6.96	5.86	
	Median	5.25	6.75	6.13	
SQC	Mean	7.52	12.35	8.83	0.016
	Std. Dev.	4.88	5.84	5.54	
	Median	7.33	11.27	7.52	
Contracting issues	Mean	8.27	11.19	9.06	0.031
	Std. Dev.	2.9	4.38	3.56	
	Median	8.18	10.82	9.26	
Code and standard issues	Mean	8.85	9.87	9.12	0.981
	Std. Dev.	4.77	7.34	5.51	
	Median	7.75	11.5	8	

In China, foreign firms which adopt sophisticated contract modes as main contractor are normally well capitalized, with strong technical and financial background. Therefore, they encounter significantly less risks in entry mode and business scope, establishment of local entity, application of SQC, and contracting issues than foreign firms that only carry out traditional contracts. Their strong financial background can greatly lower the entry barrier set by the regulations, such as the requirements on registered capital and number of qualified personnel in SQC application.

As discussed in Section 6.4.4.5, sophisticated contracts include D&B, AEC, EPC, etc. In most cases, as the main contractor in sophisticated contracts, foreign AEC firms are responsible for the overall control and management, collaborating with other foreign or local companies in their projects. Therefore, the possibility that regulatory risks occur among project owner, consultant, and contractor are greatly reduced. It is consistent with the analysis results in Table 6.23 that the impact severity of

contracting issues encountered by foreign AEC firms adopting sophisticated contracts are less than those firms adopting traditional contracts.

6.4.5.6 Target Client and Regulatory Risks

Most of the interviewees from foreign firms providing construction services believe that working with foreign project owners/investors can help them circumvent some potential regulatory risks. As discussed in Section 6.4.4.6, the respondents were categorized into two groups according to the average percentage (68%) of foreign-invested projects in the overall number of projects they have ever undertaken. Therefore, the impact severity of the five regulatory risk variables is compared between the two groups of firms to identify the effect of this strategy. Mann-Whitney U test is conducted to test the null hypothesis that there is no significant difference on the impact severity of five regulatory risk variables between foreign AEC firms contracting less foreign-invested projects than to those contracting more foreign-invested projects.

The result in Table 6.24 shows that foreign AEC firms undertaking more foreign-invested projects (above 68%) encounter significantly less impact of regulatory risks in entry mode and business scope ($P < 0.01$), establishment of local entity ($P < 0.05$), application of SQC ($P < 0.05$), contracting issues ($P < 0.05$) and code and standard issues ($P < 0.01$) than those undertaking less foreign-invested projects (below 68%). It can be found that the null hypothesis is rejected for all the five regulatory risk variables.

Table 6.24 Foreign Firms’ Target Client and the Regulatory Risk Variables

Target client in % of foreign invested projects		Above average of 68%	Below average of 68%	Total	Mann-Whitney Significance
Regulatory risk variables					
Entry mode & business scope	Mean	8.39	13.94	10.35	0.006
	Std. Dev.	5.29	6.04	6.13	
	Median	7.75	12.75	10.38	
Establishment of local entity	Mean	5.62	9.24	6.9	0.019
	Std. Dev.	5.41	6.10	5.86	
	Median	4.75	7	6.13	
SQC	Mean	7.23	11.74	8.83	0.011
	Std. Dev.	4.94	5.51	5.54	
	Median	7.33	11.67	7.52	
Contracting issues	Mean	7.96	11.07	9.06	0.010
	Std. Dev.	3.02	3.68	3.56	
	Median	7.55	10.18	9.26	
Code and standard issues	Mean	7.55	11.99	9.12	0.008
	Std. Dev.	4.83	5.67	5.51	
	Median	7	13	8	

According to the interviewees, most of the foreign AEC firms contracted their first project in China from foreign client rather than Chinese client. In addition, a number of foreign AEC firms first entered China because they were nominated by the foreign clients to work for projects in China. These foreign AEC firms maintain very good relationship and have strong performance track record with international project owners/investors. It is easier for foreign AEC firms to secure projects from such international clientele rather than from Chinese project owner/investor. If the foreign AEC firms, especially WOFEs, have the ability to secure more foreign-invested projects, they can minimize the severity of impact from Decree 113 which is restricting the scope of projects undertaken by WOFEs.

Foreign AEC firms that undertake more foreign-invested projects tend to encounter less regulatory risks in the establishment of local entity and application of SQC. One of the reasons is that financing is easier for foreign AEC firms contracting with

international clients than with Chinese clients. Accordingly, these foreign AEC firms would face fewer difficulties in satisfying the capital requirement under the regulations upon establishing their company in China; especially when their foreign client nominates them to work on the China's project, their entry and SQC application requirements are much facilitated by their clients. According to a vice president in a UK-invested construction firm, the Chinese government may ease the entry and SQC requirements on foreign AEC firms if they are nominated by foreign project investors. China has been attracting foreign investment in various industries, including construction industry. If the foreign investment falls within the encouraged industry or sector, the Chinese government, especially provincial government, is willing to relax those rigid rules and help these foreign AEC firms to find a nominal local partner which has capital, SQC and strong human resources to establish a partnership.

As mentioned in Section 6.4.4.6, both the foreign project investors/owners and the foreign AEC firms are familiar with and experienced in international practice on contracts and the post-contract operations, which can result in less regulatory risks arising from contracting issues and code and standard issues in post-contract stage.

6.5 Findings from the Open Questions in the Survey

Besides the survey questions on regulatory risk assessment in the questionnaire, there are two open questions in the last page of the survey enquiring if the survey participant's firm encountered other regulatory risks and if they have further comments regarding the survey questions. Three respondents provided their comments and perspectives, which have been summarized and discussed below.

The three survey respondents mentioned that China's construction regulations limit the consortium to undertaking projects within the activity scope of the lowest qualification grade held by the individual consortium members. Article 19 of Decree 113 promulgated that a foreign construction firm contracts for construction projects

in the form of a consortium with other construction enterprises, the consortium shall contract for projects within the permitted scope of the lower qualification grade. From the perspective of the Ministry of Construction, the main objective of this requirement is to prevent some companies without any SQC or with lower qualification level to take advantage of other company's qualification or higher level SQC by entering a construction consortium to undertake projects. However, according to two of the three respondents with experience in construction consortium, their project scope is limited by the above regulation especially when one of the small specialist contractors in the consortium has lower qualification than the others. In this case, the qualification and capability of the whole consortium would be lowered down, which limit the size and scope of future projects they are going to undertake. This finding is consistent with some Chinese articles which pointed out that one of the competitive advantages of construction consortium is to combine the skill qualifications of parties providing different services into the consortium; if only the lowest qualification can be used, establishing a consortium is meaningless for the parties (Zhang, 2001; Peng, 2003).

6.6 Chapter Summary

This chapter presented the statistical analysis results of hypotheses developed in Chapter 4. Descriptions and discussion were provided with each of the hypotheses tested. A summary of the results for all the hypotheses is provided in the following three tables. In Table 6.25, ten sub-hypotheses in Hypothesis 1 and 2 are supported or strongly supported and there is only one sub-hypothesis that is not supported. Table 6.26 suggests that six firm capabilities out of seven are significantly related with one or more regulatory risk variables and only one of the sub-hypotheses in Hypothesis 3 is not supported. Hypothesis 4 and 5 are summarized in Table 6.27, in which all the entry strategies can make a significant difference in firms' sales growth and three of them can produce significant difference in firms' profit growth. In addition, to adopt these strategies or not can result in significant difference of severity level in one or

more regulatory risk variables. In other words, adopting the appropriate strategies can significantly reduce the impact of severity of construction regulatory risks that foreign AEC firms may encounter in China.

Table 6.25 Summary of the Testing Results for Hypothesis 1 and Hypothesis 2

Independent Variables	Dependent Variables			Testing Results
	Sales Growth	Profit Growth	Overall Performance	
Construction Regulatory Risk Variables				
Entry mode and business scope (H _{1.1})	√		√	Supported ¹
Establishment of local entity (H _{1.2})	√		√	Supported
Application of SQC (H _{1.3})	√	√	√	Strongly supported ²
Contracting issues (H _{1.4})		√	√	Supported
Code and standard issues (H _{1.5})		√	√	Supported
Firm's Capabilities				
Management skill (H _{2.1})		√	√	Supported
Technical ability (H _{2.2})	√		√	Supported
Financing ability (H _{2.3})	√		√	Supported
Marketing ability (H _{2.4})	√	√	√	Strongly supported
Organization structure (H _{2.5})				Not supported ³
Social influence (H _{2.6})	√			Supported
Contribution to project objectives (H _{2.7})		√	√	Supported

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

¹ Supported – an independent variable is significantly related to either sales growth or profit growth.

² Strongly supported – an independent variable is significantly related to both sales growth and profit growth.

³ Not supported – an independent variable is not positively related to both sale growth and profit growth.

Table 6.26 Summary of the Testing Results for Hypothesis 3

Independent Variables: Firm-Specific Resources and Capabilities	Dependent Variables: Construction Regulatory Risk Variables				
	Entry mode and business scope (H _{3.1})	Establishment of local entity (H _{3.2})	Application of SQC (H _{3.3})	Contracting issues (H _{3.4})	Code and standard issues (H _{3.5})
Management skill				√	
Technical ability	√				
Financing ability	√	√		√	
Marketing ability			√		
Organization structure					
Social influence	√				
Contribution to project objectives					√
Testing Results	Supported ⁴	Supported	Supported	Supported	Supported

Note: √ denotes that the corresponding dependent and independent variables are significantly and negatively related

⁴ Supported – a dependent variable is significantly related to one or more independent variables.

Table 6.27 Summary of the Testing Results for Hypothesis 4 and Hypothesis 5

Foreign AEC Firm's Strategies		Hypothesis 4: Performance		Hypothesis 5: Construction Regulatory Risk Variables					
		Sales Growth	Profit Growth	Entry mode/ business scope	Establishment of local entity	Application of SQC	Contracting issues	Code & Standards	
Entry mode:	Wholly foreign-owned	Reject H_0	Reject H_0	Reject H_0	Accept H_0	Reject H_0	Accept H_0	Reject H_0	
	Joint venture								
Service provided:	Construction services	Reject H_0	Accept H_0	Reject H_0	Reject H_0	Reject H_0	Reject H_0	Accept H_0	
	Consultancy services								
Market segment (Project types):	Industrial projects	Reject H_0	Accept H_0	Accept H_0	Accept H_0	Reject H_0	Accept H_0	Accept H_0	
	Non-industrial projects								
SQC:	One or more SQCs	Reject H_0	Accept H_0	Reject H_0	Reject H_0	Reject H_0	Accept H_0	Accept H_0	
	No SQCs								
Contract modes:	Sophisticated contracts	Reject H_0	Reject H_0	Reject H_0	Reject H_0	Reject H_0	Reject H_0	Accept H_0	
	Traditional contracts								
Target clients:	Undertake more foreign-invested projects	Reject H_0	Reject H_0	Reject H_0	Reject H_0	Reject H_0	Reject H_0	Reject H_0	
	Undertake less foreign-invested projects								

Chapter 7 Conclusion and Recommendation

7.1 Introduction

This chapter summarizes the findings and contributions made by this research in the light of the initial research questions and objectives presented in Chapter 1. The objectives, the research design and the hypothesis development will first be reviewed. The conclusions of the research findings will then be presented. Thereafter, the contributions to theoretical knowledge and the industry practice are highlighted, followed by the research implications, limitations and the recommendations for future work.

7.2 Review of Research Work

The aims of this research are to study the impact of the construction regulations governing foreign AEC firms and the strategic adaptation carried out by these foreign AEC firms in China's construction industry. The whole research design and methodology is to fulfill the following objectives set out in Chapter 1:

- a) To review and compare the existing construction regulations governing foreign AEC firms with those established before China's WTO entry to identify the major changes;
- b) To summarize the regulatory risks that could be encountered by foreign AEC firms in previous literatures and through comparative studies on regulations;
- c) To determine the significant regulatory risk variables influencing the performance of foreign AEC firms in China;
- d) To investigate the effects of foreign AEC firms' capabilities and strategies in moderating the negative impact of the regulatory risks, thereby promoting the performance of these firms.

The ultimate goal of this research is to help foreign AEC firms to understand and minimize the regulatory risks in China's construction industry. The findings of the research could also be used as reference for government authorities in reviewing and improving the existing construction regulations in future.

In this research, the literatures on China's construction industry, its construction regulatory framework and the foreign participation in this industry were first reviewed. These three subjects, which are closely connected with each other, build up the scope for this research. It was found that there had not been systematic research on the subject of construction regulatory framework governing foreign AEC firms in China, even though this is of great importance to foreign firms in their decision making on market entry and strategies. From the literature reviews, the 28 risks that foreign AEC firms may encounter when complying with China's construction regulations were identified.

Next, the existing construction regulations governing foreign AEC firms were reviewed and compared with the old regulations which have already been repealed. The 28 risks identified in literature reviews were further elaborated and discussed with the detailed regulatory clauses. Based on the theoretical foundation, a conceptual model was postulated and five hypotheses were developed to further explain the impact of regulatory risks on firm's performance and firm's adaptation through strengthening capabilities and employing strategies.

Questionnaire survey and personal interview were carried out from 2007 to 2008 on the foreign AEC firms which have already been in operation in China to collect data for the purpose of hypothesis testing. Multiple regression and Mann-Whitney U test were conducted to test the hypotheses. For the purpose of statistical analysis, the 28 regulatory risks were categorized into 5 regulatory risk variables. The testing result of each hypothesis was interpreted and the possible reasons were given. The perspectives of interviewees were also cited to show the credibility of the data analysis results and to facilitate the interpretation of the interactive relationship among regulatory risks, firm's performance, capabilities and strategies.

7.3 Conclusions from the Research

The findings generated from the research have provided valuable insights on the relationship between construction regulations and the foreign AEC firms. As stipulated in Chapter 1, the research questions are:

- a) What is the impact of China's construction regulatory framework on foreign firms in China's construction industry?*
- b) How can foreign firms respond to the impact of China's construction regulatory framework governing them?*

To answer the above two research questions, the conceptual model was revised based on the hypothesis testing results, as indicated in Figure 7.1. The relationship of regulatory risk variables, 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 relationship of capabilities and strategies on the regulatory risk variables is indicated by the numbers 1 to 5 on the respective relationship linkages, indicating which regulatory risk variable can be significantly moderated by firm's capabilities and strategies.

7.3.1 The Impact of the Regulatory Risk Variables on Foreign AEC Firms

The Chinese government has improved the construction regulatory framework since the country's entry into WTO. Nonetheless, foreign AEC firms still face a number of regulatory risks from market entry to business operations in China. Categorizing from 28 regulatory risks, the five regulatory risk variables include market entry and business scope, establishment of local entity, application of skill qualification certificate (SQC), contracting issues, and codes and standards issues.

Figure 7.1 The Revised Research Model

Summary of hypothesis 1: The impact of regulatory risk variables on foreign AEC firm's performance

Hypothesis 1 concerns the impact of construction regulatory risk variables on foreign AEC firm's performance in sales growth and profit growth. The findings of hypothesis 1 contributed to the body of knowledge by adding new insights into the relationship between the construction regulations and foreign firm's business performance under the backdrop of China's entry into the WTO.

The research findings suggested that all the five regulatory risk variables significantly affect foreign AEC firm's performance, either in sales growth or in profit growth. This result is consistent with numerous studies on public policy and government regulations which indicated that firm's economic performance is significantly affected by the poor investment climate and regulatory burdens (Hallward-Driemeier et al., 2006; Subramanian et al., 2005). Under the existing construction regulatory framework, the requirements on SQC application, contracting issues and code and standard issues can significantly increase the cost of foreign AEC firms' business operations in China. For those sales-oriented foreign AEC firms, attention must be focused on the regulatory risks in the groups of entry mode and business scope, establishment of local entity and application of SQC.

7.3.2 Foreign AEC Firms' Strategic Adaptation to Construction Regulatory Framework

From the resource-based view, foreign AEC firms can moderate or lessen the adverse effect from the regulatory risks by strengthening their capabilities and employing effective market strategies. The strategies and capabilities can also contribute to an improvement of foreign AEC firm's business performance under the existing construction regulatory framework.

Summary of hypothesis 2: The relationship between foreign AEC firm's capabilities and their performance

In this research, six capabilities, i.e. management skill, technical ability, financing ability, marketing ability, social influence and contribution to project objective, were found to contribute to foreign AEC firm's performance, either in sales growth or

profit growth. Under the resource-based view, firm's internal resources/capabilities could interact with the competitive environment to achieve superior economic performance (Wernerfelt, 1984; Barney, 1991; Day, 1994). Therefore, these six capabilities are the most suitable ones for foreign AEC firms governed by the existing restrictive regulatory framework. In contrast, organizational structure has the least relevance to the performance of construction firms (Kale, 1999; Kang, 2006; Liu, 2007). This is consistent with the statistical analysis result presented in Chapter 6. The RBV indicates an indirect impact of organizational structure on firm's performance which cannot be proved by the research methodology in the present study.

Among all the six capabilities, marketing ability is the only one which could contribute to both sales growth and profit growth of foreign firms in China. It is suggested that foreign AEC firms should start to build up good local relations to gain recognition when they first enter China's construction industry. Forging a close relationship with local enterprises or government authorities could help navigate the opaque regulatory framework, besides providing a strong local image underpinned by a wide network of allies.

Summary of hypothesis 3: The relationship between firm's capabilities and the regulatory risk variables

The research findings showed that different capabilities can help foreign AEC firms to moderate the negative effect of the regulatory risks in different stage of their entry. This result is also consistent with the view that valuable capabilities can help a firm to neutralize threats in its external environment (Grant, 1991). Figure 7.2 illustrates the moderating effect of the capabilities on the severity of regulatory risk variables.

As illustrated, strengthening the technical ability and financing ability, and improving the social influence can help foreign AEC firms to reduce the severity of the regulatory risks associated with the entry mode and business scope. Financial ability can also help to lessen the regulatory burdens when foreign AEC firms establish a local entity and business registration. Marketing ability can moderate the obstacles that foreign AEC firms faced in SQC application. Excellent management skill and financing ability can moderate the negative impact on foreign AEC firms from

contractual issues. Strong ability in contribution to project objectives can mitigate the severity of impact from risks associated with code and standard issues.

As one of the capabilities tested in the statistical analysis, organizational structure is proved to have no significant relationship with all the regulatory risk variables. This result shows that organizational structure does not have moderating effect on the severity of impact from any regulatory risk variables. It is consistent with Kang’s (2006) research result indicating no direct relationship between organizational structure and the external environment of the industry, e.g. government intervention and immature regulatory and legal system. Instead, the design of an organizational structure in terms of formalization and centralization is proven to be highly related to project management activities especially in the context of China. Due to the rigid and static nature of organizational structure, it will not exert any significant influence on the regulatory risk variables in the present research. Since the effect of organizational structure is insignificant, it is not included in the capabilities in Figure 7.2.

Figure 7.2 The Moderating Effects of Firm’s Capabilities on Regulatory Risk Variables

Summary of hypothesis 4: The relationship between foreign AEC firm's strategies and their performance

The research findings showed that proper strategies can promote foreign AEC firm's performance under the existing construction regulatory framework. This result is consistent with the resource-based view that proper application of strategies should lead to improved performance (Hsu, 2003; Child, 1972).

As shown in Figure 7.1, all the strategies in italics are associated with better performance either in sales growth or in profit growth. It is suggested that foreign AEC firms work with Chinese partner at the onset of their market entry. They can choose either to establish a joint venture (JV) or register a WOFE by acquiring a local Chinese enterprise with the relevant SQCs. Under the help of local Chinese enterprise, foreign AEC firms can better localize and adapt well to the Chinese practice. Consequently, they would be less affected by the regulatory risks and their performance in sales growth and profit growth would be assured.

For small and medium sized foreign AEC firms, it is suggested that they register as a consultancy firm instead of a construction firm since the former are less affected by the regulatory risks than the latter. Furthermore, consultancy firms perform better in sales growth than construction firms as evidenced from the research finding. Nevertheless, obtaining a SQC can benefit both consultancy firms and construction firms. The SQC can help foreign AEC firms to secure more projects, notwithstanding the costly process of SQC application. Acquisition of a Chinese enterprise with relevant SQCs is thus considered as a shortcut for foreign AEC firms to secure projects as soon as they enter the market.

To circumvent regulatory risks and achieve better performance, foreign AEC firms should target three kinds of projects, i.e. industrial projects, projects with a sophisticated contracting mode and projects invested by foreign investor or financed by international financial institutions. This research showed that sales growth would be increased if foreign AEC firms target these kinds of projects.

Summary of hypothesis 5: The relationship between foreign AEC firm's strategies and the regulatory risk variables

The research findings suggested that foreign AEC firms which have adopted certain strategies face less severe impact from one or more regulatory risk variables. This result is consistent with the studies on relationship between firm's strategies and the environment in which it operates and that the strategies shall match the characteristics of the environment (Reger et al., 1992; Luo, 2001). The firm's strategies that best match the environment will enjoy superior competitive position in the industry.

It can be observed from Figure 7.1 that undertaking foreign-invested projects is the most effective strategy as it can minimize the negative effects of all the regulatory risk variables. Therefore it is suggested that foreign AEC firms work for foreign-invested projects during the initial stage of their market entry. After stabilizing their business operation and familiarizing themselves with the local environment, foreign AEC firms should build up a good relationship with the local authorities and project owners to secure more local projects. The market for local projects has far more potential in growth than that of foreign invested projects, given China's robust development in infrastructure.

Foreign AEC firms which mainly provide consultancy services and those using sophisticated contract modes are less affected by all the regulatory risk variables except the risks in code and standard issues (Figure 7.1). Similar to the results of hypothesis 4, it is suggested that foreign AEC firms register as consultancy firm at the beginning of their market entry. To fully utilize the capabilities/resources and to remain competitive, foreign AEC firms should enter into more sophisticated contract modes rather than traditional contract modes.

Compared to WOFEs, joint venture AEC firms are less affected by the regulatory risks in entry mode and business scope, SQC application and code and standard issues. Furthermore, WOFEs have to pay more attention to and prepare for the construction regulations governing these three aspects before they enter the market. Foreign AEC firms with one or more SQCs encounter less regulatory risks in entry mode and business scope, establishment of local entity and SQC application. For small and medium sized foreign AEC firms, it is good to form joint ventures with local

enterprises with relevant SQCs. Having gained the necessary experiences, these SMEs can then set up a WOFE and apply their own SQCs. Although targeting on industrial projects can only moderate a small amount of regulatory risks, it is nonetheless suggested that foreign AEC firms consider industrial projects as one of their target markets in China. In short, foreign AEC firms in China have to adopt a combination of market strategies to mitigate the negative regulatory impact so as to ensure their business success in China.

7.4 Contribution of the Research

The research initiated a comprehensive study on China's construction regulatory framework governing foreign AEC firms. It carried out an in-depth investigation of the most recent construction regulations which foreign AEC firms have to comply with, and compared that with the old regulations to identify the key improvements and their impact. It has valuable contributions to both the body of knowledge and the industry practice.

7.4.1 Contribution to the Body of Knowledge

This study was an exploratory effort that expands the body of knowledge and research regarding the impact of regulatory framework on foreign architecture, engineering and construction (AEC) firms in China. The research is expected to make a positive contribution to the construction regulatory research in countries of emerging economy. The growth and pace in China's construction markets have not been matched by parallel research and critical discussions or reflection of varied strategic implications now and for the future. Relatively few studies have examined the relationship on regulatory risks, foreign firm's strategies, capabilities and subsequent firm performance. In this research, the thorough review provided a clearer and less-biased picture of the existing construction regulatory framework governing foreign AEC firms. The 28 regulatory risks identified were the most complete and up-to-date list of regulatory risks that could be encountered by foreign AEC firms in China. This complete list of regulatory risks can facilitate foreign firm's decision making and provide a clearer idea of China's construction regulatory requirements that impede the entry and operation of foreign AEC firms.

This research initiated the first large-scaled questionnaire survey on the assessment of construction regulatory risks on foreign AEC firms after China's entry into WTO. Hitherto, there were surveys conducted in 1985, 1987 and 1995 on the general risks faced by Hong Kong contractors and other top international construction firms in China (Chen, 1997; Zhang et al., 1996). These earlier surveys were out-dated and do not cover the newly-established construction regulations governing foreign AEC firms since China entered the WTO. In this research, the findings of the surveys and interviews provided an empirical support to the principles of the resource-based view and the firm-level adaptation to the government regulations by strengthening capabilities and utilizing strategies.

Furthermore, this research was original in the development of a conceptual model on the relationship between government regulations and foreign firm's adaptation by incorporating resource-based view in the local context of China. Based on the results of hypotheses testing, the original conceptual model in Chapter 4 was revised (Figure 7.1). It identified and concluded that foreign AEC firm's capabilities and strategies can alleviate the severity of the impact from the construction regulations. This revised model has provided valuable insights into the moderating effects of firm's capabilities and strategies on the negative impact of the regulated business environment in China.

7.4.2 Contribution to Industry Practice

The research findings have implications for managers from foreign AEC firms in regards to their approach towards the construction regulatory framework in China. The final revised model is also useful for foreign AEC firm's decision making before their entry into China's construction industry. The research contributed to the industry practice in the following aspects:

Firstly, the overview of China's construction regulatory framework and the identified regulatory risks provided foreign AEC firms with a clearer picture of the regulatory environment in China's construction industry. The twenty-eight regulatory risks identified can be used by foreign AEC firms as a checklist of important regulatory requirements that they must comply with before or upon their market entry. It also can provide foreign AEC firms with a focus on what they should be aware of to assure their business performance in China.

Secondly, the analysis of questionnaire survey and personal interviews enabled foreign AEC firms to better understand the local practices to deal with the regulatory risks. As eighty percent of the participants of survey and interviews came from the senior management, with an average of ten-year experiences in foreign AEC firms, their perspectives and experiences provided valuable insights on the regulatory risks and ways to overcome them. Foreign AEC firms can use the research findings as a benchmark for their business practice in China.

Thirdly, six market strategies and six capabilities discussed in this research were recommended to foreign AEC firms to moderate the negative impact of construction regulatory risks thus enhancing firm performance. Firms in a regulated environment could derive great benefits from continually strengthening their capabilities and employing effective market strategies. These recommended strategies and capabilities match well with the context of China's construction regulatory framework.

Overall, this study is expected to serve as a foundation for future research in the area of government regulations and firm-level behavior. It is also hoped that this study will provide foreign AEC firms with insights into the impact of the construction regulatory framework on their performance and their strategic adaptation to the regulatory environment.

7.5 Research Limitations

Although this research has successfully identified the impact of regulatory risks and the effective strategies and capabilities to moderate the negative impact, it is, like any other research, not without limitations. There are several important limitations which are presented as follows.

Firstly, the limitation comes from the difficulty of collecting data in China. As discussed in Chapter 6, establishing a good relationship (Guanxi) is very important for foreign AEC firms to properly access the market and secure more projects. Likewise, this also applies to data collecting by the researcher in China. Without knowing anyone from a firm in China, the chance of getting a response is extremely low. Furthermore, a complete list of foreign AEC firms in China is not publicly available. The researcher could only compile a list of 147 foreign AEC firms with the firm

names and contact persons. It is believed that the actual number of foreign AEC firms operating in China is much larger. If the actual list could be obtained from the government, there would be more effective survey feedback for data analysis, which in turn would provide stronger tests of all the hypotheses and greater confidence in the results.

Secondly, the methods of data collection have their own limitations. This research is primarily based on questionnaire surveys by emails and personal interviews. While there are advantages to use the questionnaire survey, there are also definite limitations. For example, questionnaire survey lacks the depth of information compared to personal interviews. Another problem of questionnaire survey is the likelihood of misinterpretation of survey questions by individual respondent. To minimize such limitation, personal interview is used to elicit further insights from the respondents. However, due to the large geographical areas in China and time constraints, the personal interviews were only conducted on less than half of the survey respondents in five cities in China.

Thirdly, limitation arises from the collection instrument, which assesses the business performance based on a five-point scale, instead of using the actual figures of sales and profit. It is probable that respondents might over-rate their successful experiences and indicated their firms' higher performance than the actual level. In this research, this concern was addressed by mainly targeting senior management personnel for data collection and briefing them on the importance of data reliability. These senior executives have a strong grasp of knowledge on the industry and can provide reliable and valid data on the research problems. In addition, all the survey respondents and interviewees were reminded on the authenticity importance of their feedback before the survey and interviews were conducted.

Lastly, the construction regulations discussed in this research did not include the regional regulations and implementation measures established by provincial and regional authorities. The regulations promulgated by Ministry of Construction (MOC) provide a generic guideline and represent the central-government level's perception over foreign firms' participation in China's construction industry. As depicted in Figure 2.1, there are provincial-level and local-level construction authorities which issued much more detailed regulations and implementation rules governing foreign

AEC firms. These lower-level regulations and rules from each province or city are also important for foreign AEC firms to make market entry decision, especially on their office location. Such impacts are not captured in this research.

7.6 Recommendations for Future Work

This research has explored the essential regulatory risks faced by foreign AEC firms and the strategic adaptation that these firms can utilize to facilitate their market entry and operations in China. The following recommendations are made for future research on construction regulations governing foreign AEC firms.

Firstly, data collection is difficult in China as discussed in research limitations. An effective way to collect data is to establish a cooperative relationship with institutions, universities or even government agencies. These organizations often conduct seminars, conferences and other public events where the questionnaire survey would be easily disseminated with good response rate assured. Through participating in these events, researchers can build up their relationship with the foreign AEC firms and even the government authorities. It could enable researchers to meet with managers and senior engineers of foreign AEC firms to conduct further personal interviews.

Secondly, the nature of decentralization of the Chinese economy and of policy-making results in the local diversification of business practices in China (Yeung, 2000; Hitt et al., 2004). For years, regional governments have been given different degrees of discretion in setting economic policy. Arising from the regional differences, strong regional protectionism is also one of the top concerns of foreign firms operating in China. Therefore, a sub-national level analysis on the impact of construction regulations and policies governing foreign AEC firms needs to be conducted in future research. A study on the regional variation on construction regulations and policies would become very pertinent and is an important reference for foreign AEC firms on their market entry decision making.

Thirdly, it is recommended a comparative study to be conducted between China's construction regulations on foreign firms and those construction regulations in other emerging economies. Such a study entails in principle a cross-cultural comparison of laws and regulations. In order to enhance and accelerate the development of

construction regulatory framework in China, it is important to study and learn from the regulatory framework of other countries (Zhu et al., 2001). Therefore, a comparative study can be conducted in future research to gather the experiences of other developing countries on regulating foreign AEC firms in their respective construction industry.

Lastly, it is also suggested to conduct case studies in future research to further illustrate and reinforce the conceptual model developed from questionnaire survey and interviews in this research. The method of case study is appropriate for the present research because one of the research questions asked “how” and the problem under study is a contemporary phenomenon. Multiple case studies shall be adopted as they allow cross-case analysis and provide a full variety of evidence which can address the multi-facets of research problems. Specific cases focusing on firm’s culture, organization types and organizational arrangements can be explored to identify the impact of firm’s heterogeneity in the present study. Through the analysis of individual cases, the applications of business strategies and capabilities in the conceptual model can be further elaborated.

7.7 Chapter Summary

The research met the objectives stated in Chapter 1. The main conclusions and the value of the research were summarized. More studies on this topic can be conducted and future research directions have been suggested. This research not only provides insights on the existing knowledge but makes practical applications to the regulations governing foreign AEC firms in China’s construction industry.

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APPENDIX

Appendix A Construction laws and regulations discussed in this thesis

Appendix B A list of top 225 international contractors worked in China from Engineering News Record (ENR) in 2000

Appendix C Questionnaire

- Appendix C1 Questionnaire (English Version)

- Appendix C2 Questionnaire (Chinese Version)

Appendix D Regulations on Administration of Foreign-Invested Construction Enterprises (Official Translation by Ministry of Construction, China)

Appendix E Regulations on Administration of Foreign-Invested Construction and Engineering Design Enterprises (Official Translation by Ministry of Construction, China)

Appendix A Construction laws and regulations discussed in this thesis

Level	Titles of Laws and Regulations (Decree No.)	Date of Promulgation	Date with Effect
Law	National Construction Law	1 Nov 1997	1 Mar 1998
Departmental Regulations	Regulations on Administration of Foreign-invested Construction Enterprises (113)	27 Sep 2002	1 Dec 2002
	Regulations on Administration of Foreign-invested Construction and Engineering Design Enterprises (114)	27 Sep 2002	1 Dec 2002
	Supplementations on Regulations on Administration of Foreign-invested Construction Enterprises (121)	19 Dec 2003	1 Apr 2004
	Supplementations on Regulations on Administration of Foreign-invested Construction and Engineering Design Enterprises (122)	19 Dec 2003	1 Apr 2004
	Regulations on Administration of Foreign-invested Construction Services Enterprises (155)	22 Jan 2007	26 Mar 2007
	Regulations on Administration of Skill Qualifications of Construction Enterprises (159)	26 Jun 2007	1 Sep 2007
	Regulations on Administration of Skill Qualifications of Construction and Engineering Design Enterprises (160)	26 Jun 2007	1 Sep 2007
Relevant Measures and Circulars	Implementation Measures on Administration of Skill Qualifications in Regulations on Administration of Foreign-invested Construction Enterprises (73)	8 Apr 2003	8 Apr 2003
	Circular on Administration of Foreign Enterprise Skill Qualifications for Contracting Construction Works within the Territory of China (193)	28 Sep 2003	28 Sep 2003
	Tentative Regulations on Administration of Foreign Enterprise for Undertaking Engineering Design Works within Territory of China (78)	10 May 2004	10 Jun 2004
	Circular on Administration of Skill Qualifications of Foreign-invested Construction Enterprises (159)	6 Sep 2004	6 Sep 2004
	Implementation Rules to the Administrative Regulations on Foreign-invested Construction and Engineering Design Enterprises (18)	5 Jan 2007	5 Jan 2007
	Skill Qualifications Standards of Construction Enterprises (82)	1 Jul 2001	1 Jul 2001

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	Skill Qualification Standards on the Special Grade of General Contractor (72)	13 Mar 2007	13 Mar 2007
	Qualification Standards for Construction and Engineering Design Enterprises (86)	29 Mar 2007	29 Mar 2007
	Interim Measures on Construction Project Management (200)	16 Nov 2004	1 Dec 2004
	The Administration Measures on Subcontracting of Building Construction and Municipal Infrastructure Construction (124)	3 Feb 2004	1 Apr 2004

Appendix B A list of top 225 international contractors worked in China from Engineering News Record (ENR) in 2000

Area	Country	Top 225 International Contractors	Ranking (in 2000)
North America	Canada	1. AECON Group Inc., Scarborough, Ont.	98
	United States	1. BE&K Inc., Birmingham, Ala	155
		2. Bechtel Group Inc., San Francisco, Calif.	3
		3. Kellogg Brown & Root, Houston, Texas	7
		4. Washington Group International Inc., New Orleans, La.	32
		5. McDermott International Inc., New Orleans, La.	38
		6. Parsons Corp., Pasadena, Calif.	47
		7. Black & Veatch, Kansas City, Mo.	51
		8. Earth Tech, Long Beach, Calif.	65
		9. Fluor Corp., Aliso Viejo, Calif.	10
		10. Foster Wheeler Corp., Clinton, N.J.	15
		11. Parsons Brinckerhoff Inc., New York, N.Y.	108
		12. VECO Corp., Anchorage, Alaska	134
		13. B.L. Harbert International LLC, Birmingham, Ala.	147
		14. Jacobs, Pasadena, Calif.	48
Europe	Britain	1. Bovis Lend Lease, London	6
		2. AMEC PLC, London	12
		3. Balfour Beatty PLG, London	28
	France	1. Vinci, Rueil-Malmaison	4
		2. Bouygues, Guyancourt	5
		3. TECHNIP, Paris	11
		4. EIFFAGE, Issy les Moulineaux Cedex	36
		5. SOLETANCHE BACHY, Paris	52
	Germany	1. Hochtief, Essen	1
		2. Philipp Holzmann AG, Frankfurt/Main	8
		3. Bilfinger + Berger Bau AG, Mannheim	13
		4. STRABAG AG, Cologne	24
		5. Walter Bau AG, Augsburg	31
		6. Zublin AG, Stuttgart	67
	Italy	1. IMPREGILO SpA, Milan	25
		2. CMC di Ravenna, Ravenna	100
		3. Salini Costruttori SpA, Rome	143
	Spain	1. Grupo, Dragados, Madrid	22
	Netherlands	1. HBG, Hollandsche Beton Groep, Ryswyk	9
	Sweden	1. Skanska AB, Stockholm	2
		2. NCC, Stockholm	16
	Belgium	1. Tractebel Engineering, Brussels	127
	Australia	1. Leighton Holdings Ltd., St. Leonards, NSW	55
		1. China State Const. Engineering Corp., Beijing	19

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Asia/ Pacific	China	2. China Harbour Engineering Co. Group, Beijing	42
		3. China Road & Bridge Corp., Beijing	74
		4. China National Chemical Engineering Corp., Beijing	76
		5. China Railway Engineering Corp., Beijing	88
		6. China Metallurgical Const. (Group) Corp., Beijing	103
		7. Dongfang Electric Corp., Chengdu, Sichuan Prov.	109
		8. China Shanghai SFECO, Shanghai	119
		9. China Wanbao Engineering Corp., Beijing	125
		10. China Wu Yi Corp., Fuzhou City	135
		11. Zhejiang Construction Engineering Group, Hangzhou, Zhejiang	150
		12. China Dalian International Cooperation Holdings Ltd., Dalian	158
		13. China Tianjin International Eco. & Tech. Cooperation Corp., Tianjin	161
		14. Beijing Chang Cheng Construction Corp., Beijing	193
		15. TEC China, Chengdu, Sichuan	196
		16. Paul Y. – ITC Construction Holdings Ltd., Kowloon, Hong Kong	44
		17. CTCI Corp., Taipei, Taiwan	170
	Japan	1. JGC Corp., Yokohama	23
		2. Obayashi Corp., Tokyo	30
		3. Shimizu Corp., Tokyo	37
		4. Yakenaka Corp., Osaka	45
		5. Chiyoda Corp., Yokohama	58
		6. Nishimatsu Construction Co. Ltd., Tokyo	62
		7. Taikisha Ltd., Tokyo	63
		8. Taisei Corp., Tokyo	64
		9. Sumitomo Construction Co. Ltd., Tokyo	93
		10. Kinden Corp., Tokyo	97
		11. Toda Corp., Tokyo	120
		12. Mitsui Construction Co. Ltd., Tokyo	124
		13. Kumagai Gumi Co. Ltd., Tokyo	165
	Korea	1. Hyundai Engineering & Construction Co. Ltd., Seoul	14
		2. Samsung Corp., Seoul	49
		3. POSEC, Seoul	180
	Singapore	1. M.E.I. Project Engineers Pte Ltd.	224

Appendix C1 Questionnaire (English Version)

Nanyang
Technological University
50 Nanyang Avenue, Singapore

Survey on Construction Regulatory Framework on Foreign AEC Firms in China

Dear Sir/Madam,

This questionnaire survey is an important part of a research undertaken by the School of Civil and Environmental Engineering, Nanyang Technological University, Singapore. Through this survey, we seek to better understand the problems and difficulties faced by foreign AEC (Architectural, Engineering, and Construction) firms regarding regulatory issues in China. We believe our survey will give you the opportunity to express your views on the existing construction policy, laws and regulations, and any other regimes governing foreign AEC firms in China. Suggestions will be made at the end of the study to foreign AEC firms to overcome these problems; this research will also help the Chinese government to identify the relevant issues to further improve the regulatory framework.

Your responses to the questions will be treated with strictest confidentiality. Please do not hesitate to express your views freely. This survey will take about 20 minutes to complete. Kindly reply to the following questions and send it back by e-mail or surface mail to the address below. If you wish to comment on any questions or qualify your answers, please feel free to use the space in the margins provided. Your comments will be greatly appreciated. If you need a summary of the survey findings, please fill in the return slip at the end of the questionnaire and send it back to us.

Thank you for your participation and contribution.

Yours Sincerely,

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Section 1: Identification and Assessment on Regulatory Items

Please give your opinion on the following items of government policy and regulations that may affect you and other foreign participants in China’s construction market. **Step 1:** Please read the regulatory-related item in the left column; **Step 2:** Please decide the probability/likelihood that each item may result in problem or difficulty to foreign firms in China according to your experience and knowledge; **Step 3:** Please assess the impact brought by each regulatory item to your company. If you feel that any of the items are *not applicable*, you can mark it at “N.A.” box.

CATEGORY Element/Item	Probability of problem occurrence (P)					Potential Impact (I)					
		Very low → Very high				Negligible → Extreme					
	N.A.	1	2	3	4	5	1	2	3	4	5
I. MARKET ENTRY & BUSINESS SCOPE											
1. Direct contracting ¹ is not allowed for foreign contractors, who have to establish a Chinese entity as the first step of entry into China's market.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. Direct contracting is allowed for foreign design consulting firms under the condition that they must select at least one Chinese design institute as partner.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. Wholly foreign-owned company in construction is limited to four types of projects ² .	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. Except for foreign construction firms with special Class qualification, the contract amount is limited to five times the registered capital.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

¹ Direct contracting refers to the way of doing business by foreign contractors in China before its entry into WTO and the promulgation of new regulations in 2002. Under such system, a foreign contractor can register as “project branch” in China on a project-by-project basis and did not require injection of paid-up capital into China or full compliance with local qualification requirements.

² The four types of projects refer to: 1) Projects financed or funded entirely by foreign investment or grants; 2) Projects funded by international financial organizations and awarded through international tendering in accordance with provisions of the funding documents; 3) Sino-foreign joint venture projects in which the foreign investment is 50 percent or more or in which the foreign investment is less than 50 percent but, because of technical difficulties, Chinese contractors are unable to undertake the projects independently; 4) Domestically financed projects that, because of technical difficulties, Chinese contractors are unable to undertake independently and so long as such projects are jointly undertaken with wholly foreign-owned construction firms.

	Probability of problem occurrence (P)					Potential Impact (I)					
	Very low → Very high					Negligible → Extreme					
	N.A.	1	2	3	4	5	1	2	3	4	5
II. ESTABLISHMENT OF LOCAL ENTITY											
1. Foreign-owned firms who want to apply for special Class construction qualification (an unlimited qualification to undertake projects of all types and values) must pay at least RMB300 million (US\$44 million) as registered capital.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. Foreign equity ownership in Sino-foreign JV is limited to less than 75% of the registered capital.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. Registered capital in full must be paid before obtaining the construction license.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. Bonding or financial guarantees from the parent company outside of China are not recognized as registered capital.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
III. APPLICATION OF SKILL QUALIFICATION CERTIFICATE (SQC)											
1. Firms engaged in project management must obtain at least one SQ certificate from any of the following areas: construction, design, surveying, construction supervision, tendering agent and cost consulting.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. Firms must obtain the relevant SQ certificate in construction, design, supervision, survey, costing advisory and tendering agency to offer the respective service.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. Residency requirement: foreign staff in a foreign-owned construction firm must stay for at least 3 months per year in China.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. Foreign-invested engineering design firms have to maintain at least 500 technical personnel to apply for Grade-A General/Comprehensive Engineering Design qualification.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5. Foreign-owned construction firms are required to maintain at least 200 to 300 professionals, and 12 to 20 project managers registered with the relevant construction authorities to apply for Class 1 SQC of main contractor; at least 50 registered project managers are required for special Class construction qualification.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

	Probability of problem occurrence (P)					Potential Impact (I)				
	N.A.	Very low → Very high				Negligible → Extreme				
		1	2	3	4	5	1	2	3	4
6. For foreign construction and design consultancy firms, overseas track record can be taken into account only if the experience involves a project co-contracted with or sub-contracted to a Chinese enterprise.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
IV. CONTACT RELATED ISSUES										
1. Inconsistency between contract documents for official registration and for other purposes.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. Ambiguity in construction law and contract document over the liability of subcontractor to project owner	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. Problem arising from the use of standard form of contract issued by Chinese government	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. Prohibitions on owner to “divide up” a construction project which is supposed to be undertaken by a general contractor	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5. Problem arising from the contract dispute resolution governed by China Law and presided by the People’s Court in China	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6. Restriction on a main contractor’s right to select his sub-contractor by owner’s consent letter.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7. Ambiguity over the owner’s consent on appointment of sub-contractors or the works to be sub-contracted.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8. Owner’s delay in issuing consent letter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9. The requirements of general contractors to complete the main part of the construction project by himself (restriction on management contracting)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10. Prohibitions of sub-sub-contracting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

	Probability of problem occurrence (P)					Potential Impact (I)					
	Very low → Very high					Negligible → Extreme					
	N.A.	1	2	3	4	5	1	2	3	4	5
V. OPERATIONAL ISSUES (CODE AND STANDARD ISSUES)											
1. China's prescriptive building materials standards and design codes do not stay current with the level of product innovation.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. Difficulty for foreign firms to obtain information on the various standards in construction	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. Difficulty for foreign firms to participate in or influence the establishment of the standards	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. Architectural and M&E firms are not allowed to specify products by name in their design.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Section 2: Assessment of Company Capabilities and Performance

A) Company’s Capabilities

Please rate the strength of your company’s capabilities in China’s construction industry.

	Very Low ————→ Very High				
	1	2	3	4	5
Management Skill	☐	☐	☐	☐	☐
Technical Ability	☐	☐	☐	☐	☐
Financing Ability	☐	☐	☐	☐	☐
Organization Structure	☐	☐	☐	☐	☐
Marketing Ability	☐	☐	☐	☐	☐
Social Influence	☐	☐	☐	☐	☐
Contribution to Project Objectives	☐	☐	☐	☐	☐

B) Business Performance

Please indicate the growth rate of sales and profit within the last three years.

	1 (< -5%)	2 (-5% ~0)	3 (0~5%)	4 (5%-10%)	5 (>10%)
Sales Growth	☐	☐	☐	☐	☐
Profit Growth	☐	☐	☐	☐	☐

Section 3: Background Information

A) Company’s Information

1. In which country is the headquarters of your company located? _____
2. Your company has been operating for _____ years in China’s construction industry.
3. The core business or services that your company is providing is (Tick more than one if appropriate):

☐ Construction (as Contractor or Sub-contractor)

☐ Architectural Consultancy

☐ Engineering Design Consultancy

☐ Project Management

☐ Any others, please specify _____
4. What are the main types of construction projects undertaken by your company (Tick more than one if appropriate)?

☐ (1) General building construction projects (commercial buildings, offices, stores, education, etc.)

☐ (2) Industrial building construction projects (construction projects for industries of

- medicine, petroleum, chemical, power generation, manufacturing, etc.)
- ☐ (3) Engineering Construction (heavy civil construction/public infrastructure projects such as highway, bridge, port, etc)
- ☐ (4) Others, please specify _____
5. In China, your company is a ☐ Wholly foreign-owned firm
☐ Sino-foreign joint venture (Equity or Cooperative)
☐ Others, please specify _____
6. Has your company obtained the Skill Qualification Certificate (SQC) in China? ☐ Yes ☐ No
If yes, please fill in the following table to list out each Skill Qualification Certificate that your company has obtained and the relevant information on the grade and the date they were obtained.
	SQC	Grade (Special/A/B/C)	Date
E.g.	General contractor in building construction	A	Sep 2002
1			
2			
3			
7. Please choose the main contract modes that have been employed between your company and the client?
- ☐ Sophisticated contract modes – Build-operate-transfer (BOT); public private partnership (PPP) contract; design and build (D&B) contract; architecture, engineering and construction (AEC) contract; engineering, procurement and construction (EPC) contract; etc.
- ☐ Traditional contract modes – Traditional general contract; sub-contract; construction management (CM); project management (PM) contract; etc.
- ☐ Others, please specify _____
8. The number of permanent employees in your company in China? _____
9. _____% of the projects executed by your company within the territory of China was involving foreign investment.

B) Respondent's Profile:

1. What is your designation? (Please tick as appropriate)
- ☐ President ☐ Vice President ☐ Director ☐ General Manager

- ☐ Project Manager
- ☐ Department Manager
- ☐ Senior Engineer
- ☐ Others, please specify _____

2. How many years have you been working in China’s construction industry? _____

Thank you for taking time to complete this survey.
Your comments are also welcome on the following aspects.

Are there any other important legal aspects that can affect foreign AEC firms which are not mentioned in this survey? If so, list them and briefly explain how each would affect foreign AEC firms in China?

1.

2.

3.

4.

Do you have any further comments regarding the legal environment facing foreign AEC firms in China? If so, list them down as follows:

1.

2.

3.

4.

★End of the Questionnaire★
※ Thank you for your contribution ※

Return Slip (Optional)

If you wish to receive a summary of the research findings please enter the details below:

Name:

Organization:

Address:

Telephone number:

Fax number:

Email:

Appendix C2 Questionnaire (Chinese Version) **中国建筑市场外商投资企业法规政策的问卷调研**

尊敬的先生/女士：

这份问卷是新加坡南洋理工大学土木及环境工程学院一项研究课题的重要组成部分。通过调研，我们试图更好的了解外商投资建筑业企业在中国所遇到的法律法规相关方面的问题和他们所面对的阻碍。我们相信这项调查将会给外商投资者提供一个宝贵的机会来表达对当前政策法规的意见和看法。该研究分析的结果会使即将进入中国的外国建筑业企业更清楚的认识中国的法规政策体系和存在的问题，帮助已经在中国建筑业投资的外国企业应对和克服这些困难和障碍，同时也有助于中国政府更有效的改进相关法规政策。

您的所有回答将会被严格保密，只用做数据分析和研究的用途，在任何情况下都不会泄漏给第三方。所以请自由的表达您对下列问题的真实观点。完成这份问卷大约仅需占用您 20 分钟左右的时间，将结果用电邮反馈给我们，或邮寄到下面的中国地址。如果您对任何一个问题或答案有额外的补充意见，可以充分利用问卷页边或最后一页的空白处来填写，您的宝贵意见是对我们研究的最大支持。如果您对此项研究的结果感兴趣，请填好问卷结尾处的回执单，连同问卷一同寄回给我们。

非常感谢您的协助，并预祝您工作顺利，鸿图大展！

此致

敬礼

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Nanyang Avenue, Singapore 639798

第一部分：建筑市场法规政策的识别及评价

下面表格的左侧列出了几类主要规范建筑业外商投资企业的法规政策及其具体规定，这些内容可能影响贵公司及其他在中国建筑领域服务的外资公司。**步骤一：**请首先阅读左侧的每一项的具体条目；**步骤二：**针对表格中列出的每一条目，请评价该条目给在中国的相关外资建筑行业造成困难或带来阻碍的可能性(P)；**步骤三：**根据您在贵公司的经验和项目经历，请评价每一条目对于贵公司的影响(I)。如果您认为某一条规定不适用，请标记在“N.A.”栏下。

类别 具体条目	出现问题的可能性 (P)					潜在影响 (I)				
	最低		最高		可忽略的	可忽略的		严重的		
	1	2	3	4		5	1	2	3	4
I. 市场准入以及工程承包范围										
1. 外国建筑公司不能在中国直接承包项目 ³ ，必须先注册为本地公司才可进行商业运营。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. 外国设计咨询公司必须找到至少一家中国设计机构合作，才可以在中国直接承接项目而不用注册成为本地公司。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. 建筑业外商独资公司只允许在其资质等级许可的范围内承包四大类工程 ⁴ 。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. 对于除了特级资质建筑公司之外的其他公司，承包工程的合同额不得超过注册资本的五倍。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
II. 新公司的设立										
1. 外国公司要申请特级资质（拥有特级资质的企业可以承接任意数额的项目）房屋建筑承包企业的最低注册资本要达到3亿元人民币（4400万美元）。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

³直接承包项目指中国进入世界贸易组织以及指定 2002 年新法规之前外国承包商在中国参与承包项目的方式。该体制使得外国承包商只需在中国注册成为项目分公司，不需要注册成为本地公司和支付注册资本，同时也不需要满足建筑企业的资质要求。

⁴四大类工程指的是：（一）全部由外国投资、外国赠款、外国投资及赠款建设的工程；（二）由国际金融机构资助并通过根据贷款条款进行的国际招标授予的建设项目；（三）外资等于或者超过 50% 的中外联合建设项目；及外资少于 50%，但因技术困难而不能由中国建筑企业独立实施的建设项目，经省、自治区、直辖市人民政府建设行政主管部门批准的中外联合建设项目；（四）由中国投资，但因技术困难而不能由中国建筑企业独立实施的建设项目，经省、自治区、直辖市人民政府建设行政主管部门批准，可以由中外建筑企业联合承揽。

	出现问题的可能性 (P)						潜在影响(I)				
	最低 ———→ 最高						可忽略的 ———→ 严重的				
	N.A.	1	2	3	4	5	1	2	3	4	5
2. 中外合资建筑业公司以及中外合作建筑业公司中，外国合营者的出资总额不得高于注册资本的75%。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. 全额的注册资本必须在拿到建筑行业从业许可之前付清。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. 外资公司的海外母公司的股票债券及财务担保不可作为注册资本。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
III. 申请从业资质											
1. 项目管理公司应当具有工程勘察、设计、施工、监理、造价咨询、招标代理等一项或多项资质。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. 外资公司要提供建筑施工、工程设计或项目管理等多项服务，就必须分别申请多项资质证书。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. 外资建筑业公司中的外籍员工必须每年在中国住满三个月。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. 外资工程设计咨询公司要申请一级综合建筑设计资质必须保持至少500名专业技术人员。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5. 外资建筑业公司要申请一级建筑总承包商资质必须保持至少200—300名专业人员，以及12—20名在建设管理部门注册的项目经理；申请特级资质至少需要50名注册的项目经理。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6. 外资公司申请资质时海外项目承包记录不可以用，除非该项目合同中有中国企业参与共同承包或分包。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

	出现问题的可能性 (P)					潜在影响(I)					
	最低 —————→ 最高					可忽略的 —————→ 严重的					
	N.A.	1	2	3	4	5	1	2	3	4	5
IV. 建设合同相关问题											
1. 工程管理中的黑白合同问题（实际的工程合同与在政府部门备案的合同不一致）导致建筑纠纷。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. 分包商对于项目业主的责任义务在建筑法和合同法中不明确。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. 外资公司在与本地企业合作中应用中国政府颁布的合同范本所产生的问题	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. 应该由总包商承接的项目，业主不可以自行分解项目分别承包。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5. 涉及外商投资或有外资公司参与的合同引起的纠纷，若按照中国的法律由中国法院裁决所产生的问题	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6. 总承包商不可以自由选择分包商，必须由业主出具关于选定分包商的同意书。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7. 项目业主对于分包的同意书是针对分包的工作内容的认可还是针对指定的分包商的认可，并没有明确的规范。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8. 项目业主拖延出具同意书。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9. 总承包商必须独立完成工程项目的主体部分。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10. 层层转包是不允许的。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

	出现问题的可能性 (P)					潜在影响(I)					
	最低 —→ 最高					可忽略的 —→ 严重的					
	N.A.	1	2	3	4	5	1	2	3	4	5
V. 合同后期运营（工程建设标准）											
1. 中国当前的建筑材料标准以及设计规范较陈旧，和国内外的产品创新水平无法保持一致——致。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. 外资建筑业公司不容易获取规范性标准的相关信息	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. 外资建筑业公司不容易参与并影响标准的制定过程	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. 建筑设计及机电工程公司在其设计中不可以指定所需设备或材料的品牌名称。	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

第二部分：公司业绩评价

A) 贵公司在中国市场的能力评价

请您评价对贵公司在如下各方面能力的满意程度。

	最低 —————→ 最高				
	1	2	3	4	5
管理水平	☐	☐	☐	☐	☐
技术水平	☐	☐	☐	☐	☐
融资能力	☐	☐	☐	☐	☐
组织结构	☐	☐	☐	☐	☐
市场营销能力	☐	☐	☐	☐	☐
社会影响力	☐	☐	☐	☐	☐
实现项目目标的能力	☐	☐	☐	☐	☐

B) 公司业绩评价

请指出贵公司过去三年中销售额以及利润的增长率。

	1 (< -5%)	2 (-5% ~0)	3 (0~5%)	4 (5%-10%)	5 (>10%)
销售额增长	☐	☐	☐	☐	☐
利润增长	☐	☐	☐	☐	☐

第三部分：背景信息

A) 公司资料

1. 贵公司的总部位于哪个国家？（外商合作/合资伙伴来源于哪个国家？）_____
2. 贵公司在中国建筑行业经营运作了多少年？_____
3. 贵公司提供的核心业务服务包括（多选）

☐ 建筑施工（作为总承包商或分包商）
☐ 建筑设计咨询
☐ 工程设计咨询
☐ 项目管理
☐ 其他，请注明： _____
4. 贵公司承接的主要建设项目类型（多选）：

☐ (1) 普通建筑项目（商业楼宇，办公楼，商店，教学建筑等）
☐ (2) 工业用建筑项目（工业园，石化厂，造纸厂，炼钢厂，制造业厂房等）
☐ (3) 大型基础设施建设（机场，桥梁，高速公路，公路等）
☐ (4) 其他，请注明： _____

5. 在中国，贵公司是一个 ☐ 外商独资企业
☐ 中外合资或合作企业
☐ 其他，请指明：_____

6. 贵公司是否在中国已获得建筑设计或承包的资质证书？ ☐是 ☐否
如果贵公司已经获得了资质证书，请填写下表列出贵公司获得的是什么类型的资质证书，等级和颁发时间。

	资质证书类型	等级	颁发时间
例如	房屋建筑总承包	一级	2002年9月
1			
2			
3			

7. 请选择贵公司承包项目使用的主要的合同模式：

- ☐ 复杂多样的合同承包模式 – 建造—运营—移交（BOT）；公私合伙制（PPP）；设计和建造合同（D&B）；建筑设计，工程设计和建造合同（AEC）；工程，采购和建设合同（EPC）等。
- ☐ 传统单一的合同承包模式 – 建造总承包合同；专业分包合同；劳务分包合同；建设管理（CM）或项目管理合同（PM）等。
- ☐ 其他，请指明：_____

8. 贵公司在中国有 _____ 个员工（临时员工不计算）。
9. 贵公司在中国境内承接的项目中，有外商投资的项目占项目总数的_____％。

B) 问卷填写人背景资料：

1. 您的职务：

- ☐总裁 ☐副总裁 ☐主管 ☐总经理 ☐项目经理 ☐部门经理
- ☐高级工程师 ☐其他，请指明 _____

2. 您在中国的建筑行业有多少年的工作经验？ _____

非常感谢您完成这份问卷调研！

请对如下问题提出宝贵的意见！

<p>是否还有其他规范建筑业外商投资企业的重要法规政策条目没有在本问卷中涉及并且对建筑业外商投资企业有重要影响的？请指出并解释这些条款是如何影响在中国建筑业中的外资投资企业的。</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>
<p>您若有任何针对外商投资建筑业的法律政策环境的意见，请自由阐述。</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>

★ 问卷结束 ★

※ 感谢您的合作与支持 ※

<p>回执单</p> <p>如果您想收到一份问卷调研的分析结果，请填好下面的内容：</p> <p>姓名（选填）：</p> <p>单位：</p> <p>电话：</p> <p>传真：</p> <p>电子邮件：</p>
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Appendix D Regulations on Administration of Foreign-Invested Construction Enterprises (Official Translation by Ministry of Construction, China)

Regulations on Administration of Foreign-Invested Construction Enterprises

The Ministry of Construction of the People's Republic of China

The Ministry of Foreign Trade and Economic Cooperation of the People's Republic of China

Decree No. 113

Regulations on Administration of Foreign-Invested Construction Enterprises approved respectively at the 63rd Executive Meeting of the Ministry of Construction on 9 September 2002 and at the 10th Ministerial Meeting of the Ministry of Foreign Trade and Economic Cooperation on 17 September 2002 are now issued and shall go into effect on 1 December 2002.

Minister of the Ministry of Construction: Wang Guangtao

Minister of the Ministry of Foreign Trade and Economic Cooperation: Shi Guangsheng

27 September 2002

Regulations on Administration of Foreign-Invested Construction Enterprises

Chapter 1 General provisions

Article 1 These Regulations hereof are formulated to further the opening up to the outside and standardise the administration of foreign-invested construction enterprises in accordance with such laws and regulations as the Construction Law of the People's Republic of China, the Tendering and Bidding Law of the People's Republic of China, the Law of the People's Republic of China on Sino-foreign Equity Joint Ventures, the Law of the People's Republic of China on Sino-Foreign Cooperative Joint Ventures, the Law of the People's Republic of China on Wholly Foreign-Owned Enterprises and the Regulations on Administration of Construction and Engineering Quality.

Article 2 These regulations shall apply to the establishment of foreign-invested construction enterprises within the territory of the People's Republic of China, the application for construction enterprise qualifications and the administration and supervision of foreign-invested construction enterprises.

The term 'foreign-invested construction enterprise' mentioned in these regulations refers to a wholly foreign-owned construction enterprise, or a Sino-foreign equity construction joint venture or a Sino-foreign

cooperative construction enterprise established within the territory of the People's Republic of China in accordance with Chinese laws and regulations.

Article 3 A foreign investor, which intends to establish a foreign-invested construction enterprise within the territory of the People's Republic of China and conduct construction business, shall, in accordance with laws, obtain the approval certificate from the relevant foreign trade and economic cooperation administration department and register with the State Administration of Industry and Commerce or its authorised administration of industry and commerce at local levels, and the qualification certificate from the relevant construction administration department.

Article 4 Foreign-invested construction enterprises which engage in construction business within the territory of the People's Republic of China shall abide by the laws, regulations and rules of the People's Republic of China.

The lawful operation of foreign-invested construction enterprises and their legal rights and interests within the territory of the People's Republic of China shall be protected by Chinese laws, regulations and rules.

Article 5 The foreign trade and economic cooperation administration department of the State Council shall be responsible for the administration of the establishment of foreign-invested construction enterprises. The construction administration department of the State Council shall be responsible for the administration of the qualifications of foreign-invested construction enterprises.

The foreign trade and economic cooperation administration departments of the people's government of provinces, autonomous regions or directly administered municipalities shall be responsible for the administration of the establishment of foreign-invested construction enterprises within their authorised jurisdiction; the construction administration departments of the people's government of the provinces, or autonomous regions or directly administered municipalities shall, in accordance with these Regulations, be responsible for the administration of qualifications of foreign-invested construction enterprises within their administrative regions.

Chapter 2 Application for and Examination and Approval of Establishment of Foreign-invested Construction Enterprises and their Qualifications

Article 6 The application for and the examination and approval of the establishment of foreign-invested construction enterprises and their qualifications shall be managed by a grading and categorization system.

Where an applicant is to apply to establish a contractor with Super Grade or Grade A qualifications or to establish a specialised contractor with Grade A qualifications, the establishment of the foreign-invested construction enterprise shall be examined and approved by the foreign trade and economic cooperation administration department of the State Council and its qualifications shall be examined and approved by the construction administration department of the State Council; where an applicant is to apply to establish a contractor or a specialised contractor with Grade B or lower qualifications or any of the subcontractor qualifications, the establishment of the foreign-invested construction enterprise shall be examined and approved by the foreign trade and economic cooperation administration department of the people's government of the province, the autonomous region or the directly administered municipality and its qualifications shall be examined and approved by the construction

administration department of the people's government of the province, the autonomous region or the directly administered municipality.

Where the Chinese investor to a proposed Sino-foreign equity construction joint venture or a Sino-foreign cooperative construction enterprise is an enterprise administered by the central government, the establishment of the joint venture shall be examined and approved by the foreign trade and economic cooperation administration department of the State Council and its qualifications shall be examined and approved by the construction administration department of the State Council.

Article 7 The procedures for the establishment of a foreign-invested construction enterprise as a contractor with Super Grade or Grade A qualifications or a specialised contractor with Grade A qualifications are:

(1) The applicant shall submit an application to the foreign trade and economic cooperation administration department of the people's government of the province, the autonomous region or the directly administered municipality where the proposed foreign-invested construction enterprise is to be established.

(2) The foreign trade and economic cooperation administration department of the people's government of the province, the autonomous region or the directly administered municipality shall complete the preliminary examination within 30 days of receiving the application, and shall, if it grants the preliminary approval, submit the application to the foreign trade and economic cooperation administration department of the State Council for further approval.

(3) Within 10 days of receiving the application for further approval, the foreign trade and economic administration department of the State Council shall forward the application to the construction administration department of the State Council for review and comments. The construction administration department of the State Council shall provide its opinion in writing within 30 days of receiving the request. Within 30 days of receiving the response, the foreign trade and economic cooperation administration department of the State Council shall decide whether or not to approve the application and express such a decision in written form. If the application is approved, a foreign-invested enterprise certificate shall be granted; if the application is not approved, reasons for the disapproval shall be given in written form.

(4) Within 30 days of receiving the approval certificate, the applicant shall register with the relevant registration department.

(5) After obtaining the business license for the legal entity, the application by the foreign-invested construction enterprise for qualification approval shall be conducted in accordance with Regulations on Administration of Construction Enterprise Qualifications.

Article 8 The procedures for the establishment of a foreign-invested construction enterprise as a contractor or a specialised contractor with Grade B or lower qualifications or any of the subcontractor qualifications shall be administered by the construction administration department and the foreign trade and economic cooperation administration department of the people's government of the province, the autonomous region or the directly

administered municipality based on local conditions with reference to Article 7 of these Regulations and Regulations on Administration of Construction Enterprise Qualifications.

Examination and approval of qualifications of the foreign-invested construction enterprise by the construction administration department of the people's government of the province, the autonomous region or the directly administered municipality shall be filed with the construction administration department of the State Council within 30 days after the approval is given.

Article 9 The application by a foreign-invested construction enterprise for upgrading its qualifications or adding additional qualifications in addition to major items shall be made to the relevant construction administration department in accordance with relevant regulations.

Article 10 An applicant which intends to establish a foreign-invested construction enterprise shall submit the following documents to the relevant foreign trade and economic cooperation administration department:

(1) Application forms to establish a foreign-invested construction enterprise signed by the investor's legal representative;

(2) The feasibility study report prepared or accepted by the investors;

(3) The contract for the establishment of a foreign-invested construction enterprise and the articles of association signed by the investor's legal representative (only the articles of association is required for the establishment of a wholly foreign-owned construction enterprise);

(4) The notification on pre-verification of the name of the enterprise;

(5) Documentary evidence of legal entity registration and bank credential letter of the investor;

(6) Appointment letters and documentary evidence of the investor's designated chairman and members of the board of directors, managers and technical managers etc.; and

(7) Balance sheets and profit and loss accounts of the investor over the past three years audited by a certified accountant or an accounting firm.

Article 11 The applicant applying for foreign-invested construction enterprise qualifications shall submit the following documents to the relevant construction administration department:

(1) Application forms for the foreign-invested construction enterprise qualifications;

(2) The approval certificate for the establishment of the foreign-invested construction enterprise;

(3) The business licence for the legal entity;

(4) The bank credential letter of the investor;

(5) Appointment letters and documentary evidence of the investor's designated chairman and members of the board of directors, the enterprise's financial manager, operations managers and technical managers etc.; and

(6) Balance sheets and profit and loss accounts of the investor over the past three years audited by a certified accountant or an accounting firm.

(7) Other documents required

Article 12 The total capital contribution of the Chinese party to a Sino-foreign equity construction joint venture or a Sino-foreign cooperative construction enterprise shall not be less than 25% of the registered capital.

Article 13 Qualifications of Sino-foreign equity construction joint ventures and Sino-foreign cooperative construction enterprises established prior to the issuance of these Regulations are required to be re-examined and ratified in accordance with these Regulations and Regulations on Administration of Construction Enterprise Qualifications.

Article 14 All documents required to be submitted by an applicant under these Regulations shall be in Chinese. If the original documentary evidence is in a foreign language, a Chinese translation shall be provided.

Chapter 3 Scope of Contracting

Article 15 Wholly foreign-owned construction enterprises may only undertake the following types of construction projects within the scope of their qualifications:

(1) Construction projects funded totally by foreign investments, foreign grants or foreign investments and grants;

(2) Construction projects financed by international financial organisations and awarded through international tendering process in accordance with the provisions of the loan agreement;

(3) Sino-foreign jointly constructed projects where the foreign investment is equal to or greater than 50%; Sino-foreign jointly constructed projects where the foreign investment is less than 50% but which Chinese construction enterprises cannot undertake independently due to technical difficulties subject to the approval of the construction administration departments of the people's government of provinces, or autonomous regions or directly administered municipalities;

(4) China-invested construction projects which Chinese construction enterprises cannot undertake independently due to technical difficulties. Such projects may be jointly undertaken by Chinese and foreign construction enterprises subject to the approval of the construction administration departments of the people's government of provinces, or autonomous regions or directly administered municipalities.

Article 16 Sino-foreign equity construction joint ventures and Sino-foreign cooperative construction enterprises shall undertake construction projects within the permitted scope of their grades of qualifications.

Chapter 4 Supervision and Administration

Article 17 The criteria of grading of qualifications of foreign-invested construction enterprises shall be in accordance with the criteria of grading of construction enterprise qualifications formulated and issued by the construction administration department of the State Council.

Article 18 Where a foreign-invested construction enterprise undertakes a construction project as the contractor, it shall itself complete the main structure of the project.

Article 19 Where a foreign-invested construction enterprise contracts for construction projects in the form of a consortium with other construction enterprises, the consortium shall contract for projects within the permitted scope of the lower qualification grade.

Article 20 Where a foreign-invested construction enterprise contracts for construction projects beyond the permitted scope of its qualifications in violation of Article 15 of these Regulations, a fine at an amount between 2% to 4% of the construction contract price shall be collected. An order to suspend its business operation and to correct the wrongdoings may also be issued and its qualification certificate may be demoted. In serious situations, the qualification certificate shall be revoked and any proceeds illegally obtained shall be confiscated.

Article 21 Where a foreign-invested construction enterprise carrying out construction business violates the Construction Law of the People's Republic of China, the Tendering and Bidding Law of the People's Republic of China, Regulations on Administration of Engineering Construction Quality and Regulations on Administration of Construction Enterprise Qualifications and other relevant laws, regulations and rules, it shall be penalised in accordance with relevant provisions.

Chapter 5 Supplemental Provisions

Article 22 For a foreign enterprise which has already obtained a Foreign Enterprise Qualification Certificate for Contracting for Construction Projects prior to these Regulations come into force, it may apply for a construction enterprise qualification of an appropriate grade based on its track record of project contracting within the territory of the People's Republic of China when establishing a foreign-invested construction enterprise.

Where a foreign enterprise which has already established a foreign invested construction enterprise within the territory of the People's Republic of China as stated in Paragraph 1 of this Article is to establish a new foreign-invested construction enterprise, the qualification grade of the new foreign-invested construction enterprise shall be determined in accordance with Regulations on Administration of Construction Enterprise Qualifications.

Article 23 Investors from Hong Kong Special Administrative Region, Macao Special Administrative Region or Taiwan shall establish construction enterprises and carry out construction businesses in other provinces, autonomous regions or directly administered municipalities in accordance with these Regulations, unless it is otherwise provided by laws, regulations or the State Council.

Article 24 The construction administration department of the State Council and the foreign trade and economic cooperation administration department of the State Council shall be responsible for interpretation of these Regulations in accordance with their respective functions.

Article 25 These Regulations shall come into force on 1 December 2002.

Article 26 The Tentative Measures on Administration of Foreign Enterprise Qualifications for Contracting for Construction Projects Within the Territory of China issued by the Ministry of Construction (Decree No. 32 of the Ministry of Construction) shall be repealed as of 1 October 2003.

Article 27 Provisions on Establishment of Foreign-invested Construction Enterprises (File No. 533, 1995) jointly issued by the Ministry of Construction and the Ministry of Foreign Trade and Economic Cooperation shall be repealed as of 1 December 2002.

Appendix E Regulations on Administration of Foreign-Invested Construction and Engineering Design Enterprises (Official Translation by Ministry of Construction, China)

Regulations on Administration of Foreign-Invested Construction and Engineering Design Enterprises

The Ministry of Construction of the People's Republic of China

The Ministry of Foreign Trade and Economic Cooperation of the People's Republic of China

Decree No. 114

Regulations on Administration of Foreign-Invested Construction and Engineering Design Enterprises approved respectively at the 63rd Executive Meeting of the Ministry of Construction on 9 September 2002 and at the 10th Ministerial Meeting of the Ministry of Foreign Trade and Economic Cooperation on 17 September 2002 are now issued and shall come into force on 1 December 2002.

Minister of the Ministry of Construction: Wang Guangtao

Minister of the Ministry of Foreign Trade and Economic Cooperation: Shi Guangsheng

27 September 2002

Regulations on Administration of Foreign-Invested Construction and Engineering Design Enterprises

Article 1 These Regulations hereof are formulated in order to further the opening up to the outside and standardise the administration of foreign-invested construction and engineering design enterprises in accordance with such laws and regulations as the Construction Law of the People's Republic of China, the Law of the People's Republic of China on Sino-Foreign Equity Joint Ventures, the Law of the People's Republic of China on Sino-Foreign Cooperative Joint Ventures, the Law of the People's Republic of China on Wholly Foreign-Owned Enterprises, the Regulations on Administration of Construction Engineering Quality and the Regulations on Administration of Reconnoitring and Designing of Construction Projects.

Article 2 These Regulations shall apply to the establishment of foreign-invested construction and engineering design enterprises within the territory of the People's Republic of China, the application for construction and engineering design enterprise qualifications and the administration and supervision of the foreign-invested construction and engineering design enterprises.

The term 'foreign-invested construction and engineering design enterprise' mentioned in these Regulations refers to a wholly foreign-owned construction and engineering design enterprise, or a Sino-foreign equity construction and engineering design joint venture or a Sino-foreign cooperatively construction and engineering design enterprise established within the territory of the People's Republic of China in accordance with Chinese laws and regulations.

Article 3 A foreign investor, which intends to establish a foreign-invested construction and engineering design enterprise within the territory of the People's Republic of China and carry out construction and engineering design business shall, in accordance with laws, obtain the foreign-invested enterprise approval certificate from the relevant foreign trade and economic cooperation administration department and register with the State Administration of Industry and Commerce or its authorised administration of industry and commerce at local levels, and also obtain the qualification certificate of construction and engineering design enterprise from the relevant construction administration department.

Article 4 Foreign-invested construction and engineering design enterprises shall abide by the laws, regulations and rules of the People's Republic of China when carrying out construction and engineering design activities within the territory of the People's Republic of China.

The lawful operation of foreign-invested construction and engineering design enterprises and their legal rights and interests within the territory of the People's Republic of China shall be protected by Chinese laws, regulations and rules.

Article 5 The foreign trade and economic cooperation administration department of the State Council shall be responsible for the administration of establishing foreign-invested construction and engineering design enterprises. The construction administration department of the State Council shall be responsible for the administration of the qualifications of foreign-invested construction and engineering design enterprises.

The foreign trade and economic cooperation administration departments of the people's government of provinces, autonomous regions or directly administered municipalities shall be responsible for the administration of establishment of foreign-invested construction and engineering design enterprises within their authorized jurisdiction ; the construction administration departments of the people's government of provinces, autonomous regions or directly administered municipalities shall, in accordance with these regulations, be responsible for the administration of the qualifications of the foreign-invested construction and engineering design enterprises within their administrative region.

Article 6 The application for and the examination and approval of the establishment of a foreign-invested construction and engineering design enterprise and the qualifications shall be managed by a grading and categorization system.

Where an applicant is to apply for Grade A qualifications for construction and engineering design or other Grade A or Grade B qualifications for construction and engineering design, the establishment of the foreign-invested construction and engineering design enterprise shall be examined and approved by the foreign trade and economic

cooperation administration department of the State Council and its qualifications shall be examined and approved by the construction administration department of the State Council. Where an applicant is to apply for Grade B qualifications for construction and engineering design or other Grade C or lower qualifications for construction and engineering design, the establishment of the foreign-invested construction and engineering design enterprise shall be examined and approved by the foreign trade and economic cooperation administration department of the people's government of the province, the autonomous region or the directly administered municipality and its qualifications shall be examined and approved by the construction administration department of the people's government of the province, the autonomous region or the directly administered municipality.

Article 7 The procedures for the establishment of a foreign-invested construction and engineering design enterprise and the application for construction and engineering design qualifications or other Grade A or B engineering design qualifications shall be:

(1) The applicant shall submit an application to the foreign trade and economic cooperation administration department of the people's government of the province, the autonomous region or the directly administered municipality where the proposed foreign-invested construction and engineering design enterprise is to be established.

(2) The foreign trade and economic cooperation administration department of the people's government of the province, or the autonomous region or the directly administered municipality shall complete the preliminary examination within 30 days of receiving the application, and shall, if it grants the preliminary approval, submit the application to the foreign trade and economic cooperation administration department of the State Council for further approval.

(3) Within 10 days of receiving the application for further approval, the foreign trade and economic cooperation administration department of the State Council shall forward the application to the construction administrative department of the State Council for review and comments. The construction administration department of the State Council shall provide its opinion in writing within 30 days of receiving the request. Within 30 days of receiving the response, the foreign trade and economic cooperation administration department of the State Council shall decide whether or not to approve the application and express such a decision in written form. If the application is approved, a foreign-invested enterprise certificate shall be granted; if the application is not approved, reasons for the disapproval shall be given in written form.

(4) Within 30 days of receiving the approval certificate, the applicant shall carry out enterprise registration with the relevant registration department.

(5) After obtaining business license for the legal entity, if the foreign-invested construction and engineering design enterprise is to apply for the construction and engineering design enterprise qualifications, the application shall be carried out in accordance with the Regulations on Administration of Construction and Engineering Design Enterprise Qualifications.

Article 8 The procedures for the establishment of a construction and engineering design enterprise and the application for Grade B qualifications and Grade C or lower qualifications for engineering design shall be administered by the construction administration department and the foreign trade and economic cooperation administration department of the people's government of the province, or the autonomous region or the directly administered municipality based on local conditions with reference to Article 7 of these Regulations and Regulations on Administration of Construction and Engineering Design Enterprise Qualifications.

Examination and approval of the qualifications of foreign-invested construction and engineering design enterprises by the construction administration departments of the People's government of provinces, autonomous regions or directly administered municipalities shall be put on file with the construction administration department of the State Council within 30 days after the approval is given.

Article 9 The application by a foreign-invested construction and engineering design enterprise to upgrade its qualifications or to add additional engineering qualifications shall be made to the relevant construction administration department in accordance with relevant regulations.

Article 10 An applicant which intends to establish a foreign-invested construction and engineering design enterprise shall submit the following documents to the relevant foreign trade and economic cooperation administration department:

- (1) Application forms to establish a foreign-invested construction and engineering design enterprise signed by the investor's legal representative;
- (2) The feasibility study report prepared or accepted by the investor;
- (3) The contract for establishment of foreign-invested construction and engineering design enterprise and the articles of association signed by the investor's legal representative (only the the articles of association are required for the establishment of a wholly foreign-owned construction and engineering design enterprise);
- (4) The notification of pre-verification of the name of the enterprise;
- (5) Documentary evidence of legal entity registration of the investor to carry out construction and engineering design in its home country or region and its bank credential letter;
- (6) Appointment letters and documentary evidence of the investor's designated chairman and members of the board of directors, managers and technical managers etc.; and
- (7) Balance sheets and profit and loss accounts of the investor over the past three years audited by a certified accountant or an accounting firm.

Article 11 The applicant applying for foreign-invested construction and engineering design enterprise qualifications shall submit the following documents to the relevant construction administration department:

- (1) Application forms for the qualifications for a foreign-invested construction and engineering design enterprise;
- (2) The approval certificate for the establishment of the foreign-invested construction and engineering design enterprise;
- (3) The business license for the legal entity;
- (4) Documentary evidence of legal entity registration of the investor to carry out construction and engineering design in its home country or region and its bank credential letter;
- (5) Professional qualification certificate issued by his home country or region and the individual or enterprise construction and engineering design track record and documentary evidence of its reputation issued by the relevant governmental department or professional institution, association or notary public; and
- (6) Other documents as required by Regulations on Administration of Construction and Engineering Design Enterprise Qualifications.

Article 12 All materials required to be submitted by an applicant under these Regulations shall be in Chinese. If the original documentary evidence is in a foreign language, a Chinese translation shall be provided.

Article 13 The foreign investor or the foreign service provider of a foreign-invested construction and engineering design enterprise shall be an enterprise engaged in construction and engineering design or a certified architect or a certified engineer in his or her home country.

Article 14 The total capital contribution of the Chinese party to a Sin-foreign equity construction and engineering design joint venture or a Sino-foreign cooperatively construction and engineering design joint venture shall not be less than 25% of the registered capital.

Article 15 The criteria of grading of qualifications of foreign-invested construction and engineering design enterprises shall be in accordance with the requirements of grading of qualifications of construction and engineering design enterprise issued by the construction administration department of the State Council.

Where a wholly foreign-owned construction and engineering design enterprise applies for the construction and engineering design enterprise qualifications, its foreign service providers who have been qualified as certified architects or certified engineers in China shall not be less than 1/4 of the total certified professionals required under the qualification grading criteria, and the foreign service providers who have the relevant design experience shall not be less than 1/4 of the total key technical personnel required under the qualification grading criteria.

Where a Sin-foreign equity construction and engineering design joint venture or a Sino-foreign cooperatively managed construction and engineering design enterprise applies for the construction and engineering design enterprise qualifications, its foreign service providers who have been qualified as certified architects or certified engineers in China shall not be less than 1/8 of the total registered professionals required under the qualification

grading criteria, and its foreign service providers who have the relevant design experience shall not be less than 1/8 of the total key technical staff required under the qualification grading criteria.

Article 16 Each of the architects and engineers certified in China and the key technical personnel of the foreign service provider in a foreign-invested construction and engineering design enterprise shall reside within the territory of the People's Republic of China for no less than a cumulative period of 6 months each year.

Article 17 Where a foreign-invested construction and engineering design enterprise carrying out construction and engineering design activities within the territory of the People's Republic of China violates the Construction Law of the People's Republic of China, Regulations on Administration of Construction Engineering Quality, Regulations on Administration of Prospecting and Designing of Construction Projects and Regulations on Administration of Construction Engineering Prospecting Design Enterprise Qualifications and other relevant laws, regulations and rules, it shall be penalized in accordance with relevant provisions.

Article 18 Investors from Hong Kong Special Administrative Region, Macao Special Administrative Region or Taiwan shall establish construction and engineering design enterprises and carry out businesses in other provinces, autonomous regions or directly administered municipalities in accordance with these Regulations, unless it is otherwise provided by laws, regulations and the State Council.

Article 19 The timing for accepting and processing the application for establishment of foreign-invested construction and engineering design enterprises shall be determined by the construction administration department of the State Council and the foreign trade and economic cooperation administration department of the State Council.

Article 20 The construction administration department of the State Council and the foreign trade and economic cooperation administration department of the State Council shall be responsible for interpreting these Regulations in accordance with their functions.

Article 21 These Regulations shall go into force on 1 December 2002. Regulations on Administration of Establishment of Sino-Foreign Project Design Joint Venture (File No. 180, 1992) shall be repealed at the same time.