

Article

Institutional Factors Impacting on International Construction Market Selection: Evidence from Chinese Contractors

Liping Li ^{1,2}, Igor Martek ³ and Chuan Chen ^{1,*}¹ Business School, Sichuan University, Chengdu 610065, China; lilp@cqupt.edu.cn² School of Economics and Management, Chongqing University of Posts and Telecommunications, Chongqing 400065, China³ School of Architecture and Built Environment, Deakin University, Geelong 3220, Australia; igor@deakin.edu.au

* Correspondence: chuanc2012@126.com



Citation: Li, L.; Martek, I.; Chen, C. Institutional Factors Impacting on International Construction Market Selection: Evidence from Chinese Contractors. *Buildings* **2022**, *12*, 543. <https://doi.org/10.3390/buildings12050543>

Academic Editors: Srinath Perera, Albert P. C. Chan, Dilanthi Amaratunga, Makarand Hastak, Patrizia Lombardi, Sepani Senaratne, Xiaohua Jin and Anil Sawhney

Received: 22 March 2022

Accepted: 22 April 2022

Published: 24 April 2022

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Abstract: Institutions can be understood as the mechanism by which the rules societies operate under are formulated. As such, the international construction market is heavily affected by institutional factors. International market selection (IMS) is a fundamental decision that project contractors must make when entering the overseas arena. A variety of clues show that institutional factors have a complex impact on contractors' IMS, but papers in this field tend to cover just one or two institutional factors or even ignore their role. Institutional factors exist in a multi-level social system, and the role of broader institutional factors in contractors' IMS needs to be systematically explored. This study extensively collects institutional factors predicted to impact contractors' IMS by literature review, selects 10 specific institutional factors from different perspectives, theoretically deduces their effects on contractor's IMS, and takes international Chinese contractors' IMS practice as the empirical research material and collects data for logistic regression analysis to test the assumptions. The results show that the IMS of contractors is affected by institutional factors from different levels and the effect of some factors on IMS must be weighted in a specific context. Specifically, IMSs of Chinese contractors are negatively affected by institutional distance but are not sensitive to the institutional environment. The results also confirm that if the host country and China have signed a trade agreement, belong to the same regional organization, or if China has provided foreign aid to a host country, Chinese contractors are more willing to choose the host market and central enterprises become more active in IMS than other firms. These findings can be expected to supplement IMS decision-making, with the empirical data presented affording an extension to the body of knowledge on contractors' IMS process.

Keywords: construction market; international market selection (IMS); institutional factors; Chinese contractors; logistic regression analysis

1. Introduction

In the construction market, the production organization is centered on the project location, the main transaction mode is tendering and bidding, governments are often the main purchaser of giant projects, and project participants come from multiple sources. These characteristics determine that the construction market needs more rules and regulations to regulate and restrict the behavior of all participants in the project than other markets based on general production and sales. Thus, the international construction market exhibits unique qualities, characterized by both intense institutional regulation and strong market competition, while the industry stands out as project-based, requiring mobility of the means of production. Moreover, the stages of the construction project—bidding, design, procurement, financing, construction, delivery, maintenance, and concessionaire operations—are all subject to various, sometimes conflicting rules, overseen by a range of ministries and government institutions.

When contractors expand offshore, international market selection (IMS) is the principal problem to be faced and is inevitably predicated on institutional considerations, such as how to obtain local institutional knowledge, whether they can integrate into the local institutional environment, and how to ensure legitimacy in the whole process of project implementation. The ‘institution-based view’ provides strong theoretical explanatory power regarding the many issues impacting IMS and complements the two other predominant theoretical lenses, the industry-based and resource-based view [1]. Researchers have invested a great deal of attention in developing market-entry decision-making models, knitting together influential factors about the economy, technology, geography, culture, etc. However, despite the overwhelming impact institutions have over construction projects, papers in this field tend to cover just one or two institutional factors or even ignore their role. The decision-making quality of IMS affects the long-term development of contractors in the international market. The factors considered as comprehensively as possible in the decision-making model are the basis of success. Institutional factors exist in complex social systems, thus the role of broader institutional factors in a contractor’s IMS presents an urgent topic for investigation. In this vein, this study aims to explore more comprehensive institutional factors affecting contractors’ IMS and clarify their impact.

This aim is achieved in five steps. First, institutional factors that may influence contractors’ IMS were identified by way of a thorough, systematic literature review. Second, hypotheses related to the impact of institutional factors on IMS are proposed based on theoretically informed deductions. Third, data collection and variable measurements are carried out. In this stage, the IMS of 54 Chinese contractors across 80 countries were observed, with data collected from multiple sources. Fourth, statistical analysis models are constructed and validated, and logistic regression analyses are conducted. Because the dependent variable is binary, logistic regression analysis is used in this study which is a mature and frequently used method in research on international market entry strategies. Finally, the results of the logistic regression analysis are compared to the hypotheses and conclusions are drawn out.

This study sorts out the institutional factors that may affect contractors’ IMS and clarifies the role of specific institutional factors empirically, which can encourage researchers and contractors to consider more institutional factors in the research and practice of IMS. The findings can be used in the IMS decision-making model to improve its quality and can also be used as an important reference for contractors’ IMS practice.

2. Literature Review

2.1. Institutional Theory and International Market Strategy

Institutional theory can generally be viewed from the perspective of economics and organizational sociology. Institutions are the ‘rules of the game’ in society, with their major role being to reduce uncertainty, by establishing and maintaining a stable (though not necessarily efficient) structure for the facilitation of human interaction [2]. Institutions can be parsed into formal and informal types [2], or regulatory, normative, and cognitive [3]. Regulatory institutions constitute formal regimes as they wield incentives while also being able to impose sanctions on individuals or organizations. They emerge out of government or other authorities empowered to regulate and constrain behaviors. On the other hand, normative and cognitive institutions are essentially informal, being typically long-standing social platforms, considered to be objective and naturally formed by stakeholders, rather than artificially developed [4]. Formal institutions develop political, judicial, and economic rulings, mandated by the constitution, statute law, common law, or specific bylaws, which ultimately give force to civil contracts [2]. However, laws in one country may be vastly different from laws in another, making for the problematic interpretation of acceptable codes of conduct and professional practice. Institutional distance, therefore, is defined as the difference between the institutional environments of any two countries and remains a matter of great concern in cross-border interactions [5,6].

For multinational enterprises, institutions act as a background against which competition plays out and directly influence which strategies should be invoked to enhance firm competitiveness [1]. The influence of institutional factors on an enterprise's international market strategy can be explained by transaction cost theory [4]. Access to foreign markets requires overcoming the institutional barriers of the host country, such as market entry barriers stipulated by the host country's laws and regulations [7]. Then, having entered, transnational corporations need to adapt and respond to the formal system of laws and regulations of the host country [8,9]. The quality of formal institutions in a country can be differentiated according to the extent to which they contribute to local development [10,11]. High institutional quality signifies a stable and regulated operating environment, which can reduce transaction costs for multinational operators in the host country [10], and confers legitimacy [7,12,13]. Contrarily, institutional differences between countries create a 'liability of foreignness' for transnational operators who lack local institutional knowledge, leading to a handicap in having to undergo a costly learning curve [13–15].

Scholars argue that institutional analysis of international market strategies should consider both domestic and host country institutional contexts in order to systematically deconstruct their impact on a company's decision-making [16]. Applications of institutional theory within multinational corporations range from conceptualization of institutional environments to explanations of market strategy choice and organizational practices [17].

2.2. Institutional Theory Applied in the Construction Industry

Construction is project-based, with practitioners and scholars alike prioritizing the acquisition and implementation of projects [18,19]. This is evidenced by representative journal papers in engineering management, principally reflecting on institutional theory as it applies at the project level [20]. Representative themes are: how to influence construction safety management strategies [21]; how to handle institutional complexity in mega project organizations [22]; how to manage mega projects in the light of institutional environments [23]; how a host country's institutions shape infrastructure projects [24]; and how to understand the mutual constitution and dynamics of projects and institutions [25]. Orr and Scott, for example, investigated how firms engaged in large-scale global projects respond to unforeseen costs after failing to comprehend cognitive-cultural, normative, and/or regulative institutions in an unfamiliar host societal context [14]. Ling and Zhang explored the impact of cultural intelligence on the performance of international construction projects and the moderating effect of institutional distance and compared the differences between Chinese contractors and Korean contractors [26].

Certain studies have applied institutional theory at the enterprise level. Examples include the role of institutional norms in construction partnering [27]; how firms acquire local institutional knowledge during internationalization [28]; and how institutional and task environment relationships influence the performance of construction firms [29]. Broadly, the findings support the perception of strong industry norms promoting partnering [27], while under highly stringent conditions, institutional relations are shown to be associated significantly with performance [29]. Ye and Lu explored the roles of institutional distance and host country contexts on the corporate social responsibility practices of international construction companies [30].

There are also studies examining the role of institutional factors at the construction market and industry levels. Lee and Han evaluated construction market risks across various countries, with consideration given to the institutional environment. They found that countries with advanced institutional systems show relatively low growth rates in the construction market [31]. Stricker and Baruffini estimated the impact of the application of the bilateral agreement of the Free Movement of Persons between Switzerland and the EU-15 countries on the labor market outcomes in the Swiss main construction sector [32].

From the literature, it can be found that the role of institutional factors in international construction exists in a multi-faceted context. However, relevant studies have selected only

one or two indicators for research and have not tried to incorporate more comprehensive and multi-dimensional institutional factors.

2.3. Institutional Factors Related to Contractors' International Market Selection

The outcome of an international market selection decision for a specific country can be simply 'enter' or 'don't enter' [18]. In arriving at this decision, contractors must consider comprehensive factors, including the international and domestic environment, the market environment of the target country, evaluating a firm's resource conditions, and predicting the probability of host-country project acquisition along with the feasibility of implementation and expected profitability to be derived from the target market [33,34]. Various institutional factors may affect the contractor's market choice. Papers applying institutional theory in international market strategy [7,9,16] and even foreign direct investment [10,35,36] have been published. Moreover, there is a body of work that refers to the market strategies of international construction majors [19,37–40]. These point out that the construction industry is characterized by both intense institutional regulation and strong market competition [29], and is, therefore, subject to institutional environments; though none address the problem from an institutional-based view [14,41].

In these papers, culture, institutions (often representing formal institutions), cultural distance, and institutional distance are the most studied factors, followed by legal entry restrictions or entry barriers. Other factors include country risk, political risk, political culture, the existence of strict quality requirements, host-home country relationship, colonial links, the attitude of the host government, and the firm's endowments of property, assets, and political support. Most studies descriptively note these factors as influencing international market strategy or project contracting, but they do not go further to test the impact of these factors through empirical methods [18,41].

Though the concepts and connotations of these factors often overlap and definitions blur across studies, the elements that constitute the institutional environment related to international engineering market selection decision-making can be clarified as follows: (1) institutional environment, which for formal institutions manifests as stability, and which for informal institutions manifests as industrial culture; (2) institutional difference between home and host country, including institutional distance and culture distance; (3) links between home and host country, including colonial legacies, bilateral agreements, regional organizations, and foreign aid; (4) vestiges of embodied attitude of the host government and its people arising from nationalist or other elements; (5) restrictions on foreign activities, such as capital, employment or resource utilization requirements, trade barriers and tariffs, and limits on repatriation of profits; and finally, (6) the nature of firm ownership, combined with political ties that will determine the degree of support afforded by the home country government. The range of institutional factors that may affect the IMS of engineering contractors are summarized in Table 1.

Table 1. Institutional factors potentially impacting a contractor's international market selection.

Institutional Factor	Relevant Description Examples	Sources
Institutional stability/Institutional quality	The quality of the institutional system can impact project performance and international expansion; countries with mature and stable institutional systems show relatively low growth rates in the construction market.	[12,14,31,33–35,39,40,42,43]
Institutional distance/Cultural distance	The institutional distance can impact market choice and entry modes by causing trouble for firms across it. A high institutional distance deters the firm's performance.	[10,15,26,30,44–47]
Country risk/Politic risk/Institutional risk	Country risks include economic, political, and institutional risks. Institutional risks can impact project costs and schedules.	[41,48,49]

Table 1. Cont.

Institutional Factor	Relevant Description Examples	Sources
Politic culture/Cultural characteristic	Different characteristics of countries' business systems, economic, financial, and administrative practices will affect managerial decisions.	[15,24,33,41,50]
Institutional restrictions	Legal entry restrictions; the existence of strict quality requirements. These barriers make it hard for firms to enter or operate in international markets.	[12,31,33–35]
Host-home country relationship	Colonial link, regional economical organization, bilateral agreements, foreign aid, and political ties/support. These relations can change the competitive advantage by offering reciprocal conditions and knowledge resources.	[10,15,32,36,38,41,50–55]
Attitude of the host government	Attitude toward foreign investors and profit can impact project performance.	[42,48]
Firms' ownership property	Chinese SOEs can create a specific ownership advantage by deriving benefits from the domestic capital market.	[41,53,56–58]

3. Hypotheses

Institutional factors exist at different levels including international, country, industry, and enterprise. In order to explore the impact of institutional factors on contractors' IMS, 10 specific institutional factors from four levels were selected for further analysis within the scope of empirical capacity. The factor categories and selected institutional factors are shown in Figure 1. This section infers the impact of selected factors and hypotheses were proposed based on theoretical derivations.

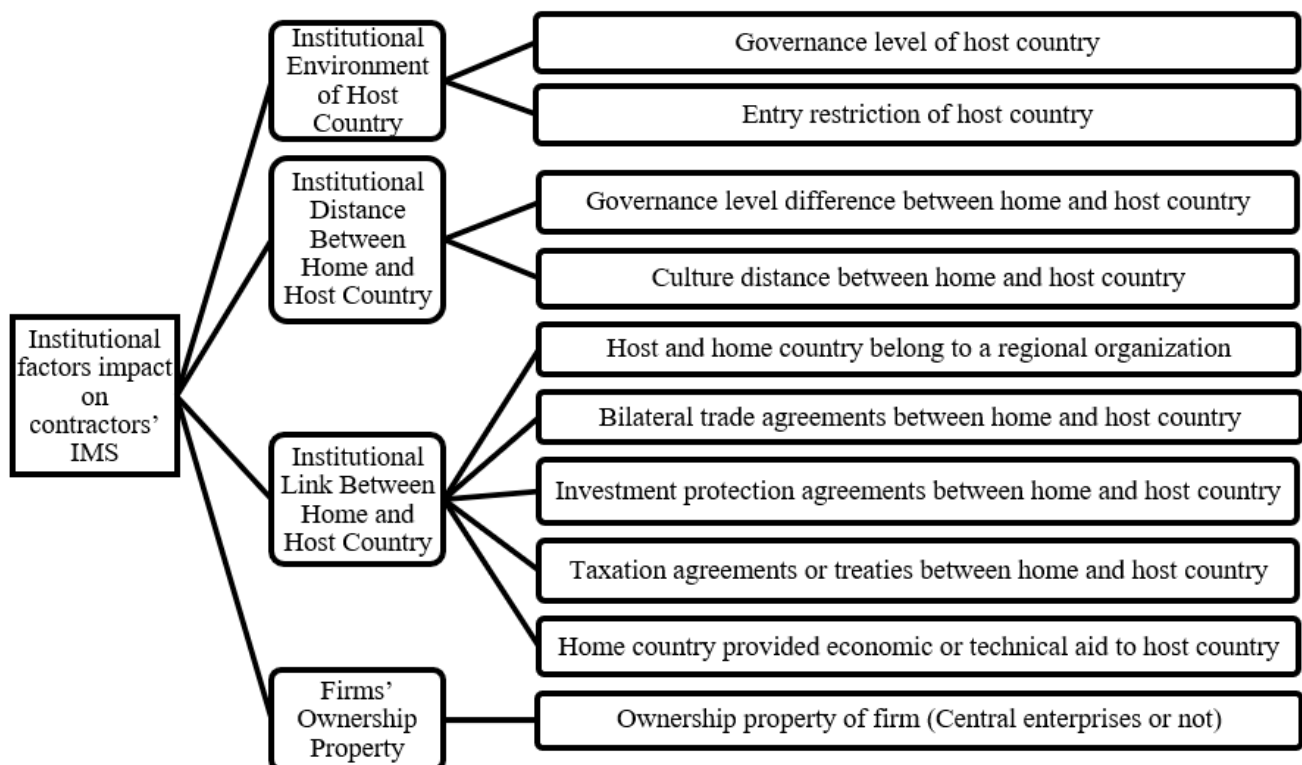


Figure 1. Selected institutional factors from multiple levels for analysis.

3.1. Institutional Environment of Host Country

Institutional environments reflect the overall context of the formal and informal institutions of a host country. Nevertheless, it is hard to define the kinds of institutions that may be considered ideal in all contexts. Scholars rank formal institutions according to governance efficiency, maturity, and stability [10,12]. Higher institutional quality means a stable and efficient institutional environment, which is generally associated with advanced economies, while lower institutional quality may generate obstacles to firm growth and higher transaction costs and exacerbate the risks to project profitability [31]. However, high-quality institutions are often complex and may lead to the imposition of significant costs if they are to be achieved and maintained [7,12,13,24]. For international contractors, institutions thus function as a ‘double-edged sword.’ Hence, it is supposed that:

Hypothesis 1a. *The higher the institutional quality of a host country, the more contractors tend to enter the host country.*

Market entry barriers are used to protect the domestic market in many countries. These barriers may manifest as ownership requirements, capital requirements, local-content requirements, local-employment requirements, quality standards, permit systems, rating systems, and licensing systems. These restrictions create an ‘invisible wall’ for foreign contractors attempting to access a country’s market. Foreign contractors may jump the fence by adopting particular entry strategies, such as through joint ventures, but it becomes more difficult for foreign contractors to find an acceptable entry strategy where there are greater restrictions and they are less likely to enter the market [18,33,39,40]. Thus, the following hypothesis is developed:

Hypothesis 1b. *The more entry restrictions of a host country, the fewer contractors tend to enter the host country.*

3.2. Institutional Distance between Home and Host Country

Informal institutions mainly refer to culture, and since it is hard to determine which forms of the informal institution are preferable, a more useful proxy in measuring this variable, as is the precedent used in most studies, is cultural distance.

Institutional distance is a measure of cross-country differences with respect to the similarity or dissimilarity that exists between the regulatory, normative, and cognitive institutions of two countries [6]. The regulatory environment comprising elements such as constitutions, laws, and property rights, varies in different countries, leading to ‘regulative distance’ or ‘formal institutional distance’ between home and host countries. Countries also vary significantly across normative and cognitive dimensions that include elements such as informal norms, values, shared beliefs, imperatives to action, mental modes, and practices that guide behavior and decisions [44,45]. The cognitive and normative dimensions of a country’s institutional context are conceptually close to culture [17]. So, institutional distance is usually divided into two distinct parts: formal institutional distance and cultural distance [18,59].

When foreign contractors first enter an unfamiliar country, they lack local institutional knowledge, such as legal requirements, traditional practice, and so on. This kind of deficiency imposes a relative weakness as compared with local contractors, which scholars have dubbed the ‘liability of foreignness’ [15]. Generally speaking, the greater the institutional distance between home and host country, the more conspicuous the liability of foreignness imposed on foreign contractors, and the greater the cost of establishing legitimacy, communication, and understanding [13,14]. Contractors are assumed to be reluctant to choose markets that have a greater institutional distance [60]. Therefore, it is proposed that:

Hypothesis 2a. *The greater the formal institutional distance between home and host country, the fewer contractors tend to enter the host country.*

Hypothesis 2b. *The greater the cultural distance between home and host country, the fewer contractors tend to enter the host country.*

3.3. Link between Home and Host Country

From an institutional perspective, the link between the home and host country is fundamentally embodied in cooperation agreements or reciprocal treaties. Globalization and bilateral and multilateral free trade agreements have facilitated increased business opportunities for construction firms across the globe [43]. These agreements set out the cooperation framework and enable enterprises to garner certain institutional advantages when operating offshore [61]. Close linked economies serve transnationals by reducing operational costs, such as transaction costs, communication costs, and financial costs. For example, regional trade agreements among member countries [62], bilateral trade agreements, taxation treaties, and investment treaties [36] are evident institutional pull factors [51]. A conducive attitude exhibited by the host government provides a positive inducement to foreign contractors, which in turn facilitates greater opportunities to gain contracts while reducing conflict and political risk in the delivery of local projects [54,55]. Although a heavy investment in relationship building is the norm when currying favor with local governments, the economic and technical assistance provided by the home government to the host country is certainly an effective contributing factor [52,63]. Thus, close links between the home and host country promote more active cooperation. Therefore, it is proposed that:

Hypothesis 3a. *If the home and host country belong to the same regional economic organization, more contractors tend to enter the host country.*

Hypothesis 3b. *If the home and host country have signed trade agreements, more contractors tend to enter the host country.*

Hypothesis 3c. *If the home and host country have signed taxation agreements, more contractors tend to enter the host country.*

Hypothesis 3d. *If the home and host country have signed investment protection agreements, more contractors tend to enter the host country.*

Hypothesis 3e. *If the home country has provided foreign aid to the host country, more contractors tend to enter the host country.*

3.4. Firms' Ownership Property

Some specific international contractors enjoy more resource advantages related to institutional factors than other enterprises. For example, Bechtel Reston, VA, USA, Hyundai E&C Seoul, South Korea, and ENKA Istanbul, Turkey have received abundant funds and project resource support from their home governments in their international development. The most representative case occurs in China, which is dominated by the public-owned economies. Most Chinese project contractors active in the international market are state-owned enterprises [37,38]. Although SOEs are known to underperform relative to private competitors [56], they have a greater advantage when it comes to obtaining subsidized loans, and given state support, rarely succumb to bankruptcy [57]. Moreover, Chinese international SOE contractors have greater political and economic resources at their disposal and, consequently, enjoy a greater capacity to mitigate foreign marketplace risks [41]. This leads them to gravitate to countries serving China's political aims, places with plentiful natural resources, while not shying from dubious political environments; whereas private firms will clearly remain normative market seekers [58].

Chinese state-owned contractors are directed by the central or local governments. Chinese central enterprises are controlled by the State-owned Assets Supervision and Administration Commission (SASAC). The SASAC was established by the State Council

in 2003 as the primary government institution charged with managing the state-owned assets embedded in non-financial sectors. SASAC is China's biggest investor and owner of China's non-financial SOEs and serves as the leading managing agency for these assets. The commission has wide-reaching responsibilities, resources, and power [53]. Central enterprises are positioned as an important catalyst for national economic development. It is to be expected, therefore, that central government enterprises receive more support from the home country than from the host government when operating abroad. Therefore, it is proposed that:

Hypothesis 4. *Central enterprises are more active in the international construction market than other enterprises.*

4. Methodology

In order to test whether the role of institutional factors on contractors' IMS decision-making practice conforms to theoretical assumptions, empirical research is conducted based on historical cross-sectional data.

4.1. The Materials

Over the past 20 years, Chinese contractors have been the fastest growing force in the international construction market. Based on data supplied by ENR's top 250 international contractors list, Chinese contractors' market share has risen to first place, displacing Spain's 13.10%, with 17.20%, in 2014, and reaching a record of 25.6% in 2020 [64–68]. A total of 78 Chinese enterprises comprise ENR's top 250 list. This gives legitimacy to the choice of Chinese contractors as the sample set for IMS observation. Meanwhile, as a developing country, China's large international contractors are mainly state-owned enterprises. In this special context, selecting Chinese contractors for observation has more potential to find interesting phenomena related to institutional factors.

Average data for a continuous five-year period are collected to reduce the impact of accidental factor fluctuations. The ENR 'Top 250 International Contractors' (hereinafter referred to as TIC) annual report ranks contractors based on the previous year's international revenue, and tables relevant data on 'Where the Top 250 International Contractors Worked-by Country' (hereinafter referred to as TIC-WTW). This data source is utilized for measuring the dependent variable. This study began with an idea in 2017. However, the ENR TIC 2016 report omitted the TIC-WTW component, and consequently, the research period was constrained to 2010–2014 [64–68].

In order to ensure representativeness, the sample is restricted to those Chinese contractors with continuous operation experience in international markets. Companies qualified for sampling if they appeared on the TIC list at least three times over the research period. That precondition supplied a sample of 54 Chinese contractors who were collectively active across 80 countries. As a result, a total of 4320 (54×80) data points were generated by matching the sampled contractor's IMS across sampled countries. The sampled contractors list is summarized in Table 2.

Table 2. The number of sampled Chinese contractors by listed times on ENR TIC 2011–2015.

Listed Times on ENR TIC 2011–2015	Number of Sampled Firms
3	9
4	11
5	34
Total	54

4.2. Variables Measure

4.2.1. Dependent Variables

The dependent variable—International Market Selection (IMS_{ij})—is a dummy variable indicating whether the i contractor has entered the j market. In the TIC-WTW reports from

2011 to 2015, if i is active in j country for at least one year, the IMS_{ij} is 1. The form of IMS can be projected by contracting or investment. This is confirmed by retrieving publicly available data from company websites and the overseas enterprises (agencies) activities summary recorded by the Ministry of Commerce of China. If i contractor has established a local agency in the j market, i is considered to have entered the j market, and the value of IMS_{ij} is 1. Otherwise, the IMS_{ij} is 0.

4.2.2. Explanatory Variables

- Governance level of the host country (GL_j)

In light of previous research [7,10], the World Governance Indicators (WGI) developed by World Bank were used to measure the formal institutional quality of a host country. According to the Worldwide Governance Indicators Methodology and Analytical Issues, governance was defined as the traditions and institutions by which authority in a country is exercised [11]. The WGI index includes six sub-indicators: (1) transparency and accountability; (2) political stability; (3) government effectiveness; (4) regulatory quality; (5) legal system; and (6) corruption control. Collectively, these comprehensively reflect the institutional quality of a country, including its administration and judicature. The detailed data on the six sub-indicators of the WGI from the years 1996 to 2015 are given on the World Bank's website, at: <http://info.worldbank.org/governance/wgi/index.aspx#home> (accessed on 24 February 2017). Consistent with the research period, data from 2010 to 2014 is used.

The six sub-indicators are highly correlated. To simplify the original sub-indicators, we refer to the precedent set by Chan [7] in order to conduct a Principal component analysis (PCA) using IBM SPSS version 23 software. The process converts the six sub-indicators into a one-dimension index for measuring the formal institutional quality of a country. That index is nominated as the Governance Level.

- Governance level difference between host country j and China (GLD_j)

Thus, the absolute difference in Governance Level between host country j and China is used to quantify a comparative formal institutional distance.

- Belongs to a regional organization as China (BO_j)

BO_j is a dummy variable. If country j partakes in a regional trade or economic organization where China is also a member, the value of BO_j is 1, otherwise, it is 0. Prior to 31 December 2014, the main regional economic organizations to which China belonged were the Asia-Pacific Economic Cooperation (APEC) and Shanghai Cooperation Organization (SCO). While China joined the World Trade Organization (WTO) in 2001, almost all countries can be counted as WTO members, which nullifies its usefulness as a metric, and therefore the WTO is not considered here.

- Bilateral trade agreements (TA_j), Bilateral investment agreements (IA_j), and Taxation agreements or treaties (TAT_j)

TA_j , IA_j , and TAT_j are dummy variables. The China commerce yearbook, 2015, provides a list of countries or regions that have signed trade agreements, investment protection agreements, tax arrangements, or treaties with China, as of 31 December 2014. If any such agreement exists between China and country j , the corresponding variable TA_j , IA_j , or TAT_j is 1, otherwise, it is 0.

- Foreign aids (FA_j)

FA_j is also a dummy variable. As per the data lodged on the website of the Foreign Aid Department of the Chinese Ministry of Commerce and White Paper on China's Foreign Aid (2014), if records reveal that the Chinese government provided economic or technical aid to country j before 31 December 2014, the FA_j is 1, otherwise, it is 0.

- Entry restriction (ER_j)

The specific measurement method of ER_j follows the precedent set by Chen (page 309–310) and need not be repeated here [37]. The main data sources regarding entry restrictions are the sector-specific commitments for construction and related engineering and technical barriers to trade as a WTO member country. Supplementary data are derived from the Investment Guide to Foreign Countries, issued by the Ministry of Commerce of China.

- Ownership property (OP_i)

OP_i is a dummy variable. Since the sampled enterprises are all state-owned enterprises (SOEs), property ownership is determined on the basis of whether or not the firm is a central enterprise. If firm i is a central enterprise, OP_i has a value of 1, and 0 otherwise. Chinese central enterprises are directly controlled by the State-owned Assets Supervision and Administration Commission of the state council (SASAC). Following strategic restructuring and decentralization, the SASAC released a list of 97 central national state-owned enterprises (SOEs) on 27 December 2017. Central enterprises are regarded as critical drivers of national economic development.

- Cultural Distance (CD_j)

Cultural distance is regarded as arising from informal institutional factors. Certain empirical studies have confirmed its negative effect on international market selection [18]. The measure of cultural distance borrows from the work of Geert Hofstede. Professor Hofstede's measurement of cultural distance comprises four dimensions: Power distance, Individualism/Collectivism, Masculinity/Femininity, and Uncertainty Avoidance. Subsequently, two further dimensions were identified: Long Term Orientation and Indulgence. The scores for each dimension are posted on the website <https://geert-hofstede.com/albania.html> (accessed on 26 June 2016). There are currently data from 101 countries, though data for two new dimensions are not yet available.

If I_{kj} represents the score of country j in the k dimension, I_{kc} represents the score of China in the k dimension, V_k represents the variance of the k dimension, and n_j is the number of dimensions of j country. The following formula is used to determine the cultural distance between China and country j :

$$CD_j = \sum_{k=1}^{4 \sim 6} [(I_{kj} - I_{kc})^2 / V_k] / n_j \quad (1)$$

4.2.3. Control Variables

In addition to the above institutional factors, the market selection of Chinese contractors is also affected by many other factors. According to the existing empirical research, several factors are selected here as control variables.

- Geographic distance (GD_j).

In selecting an international market, the geographic distance between countries is a matter of concern. It is generally believed that an increased distance between home and host countries diminishes the likelihood that a multinational company would enter that country [60]. Country distance is a separate matter from an institutional distance. Here geographic distance is chosen as a control variable that has been studied for its impact on international contracting market selection [18]. Geographic distance is derived from the CEPII GeoDist Database. The distance from the host country's capital to the capital of China, Beijing, is taken to be the geographical distance between the two countries.

- GDP and GDP growth ($\ln GDP_j$ and $GDP Growth_j$).

The market size and market potential of the host country will affect the market selection of international contractors, where international project contractors are more likely to choose markets with a larger size and potential [18,37]. In many studies, the gross domestic product (GDP) of a country is used to reflect the country's market size, and the market potential is reflected in GDP growth. The market size and market potential of the host country can thus be calculated by the average GDP and GDP growth rates, from 2010

to 2014. Since the magnitude of GDP is cumbersome, we use $\ln GDP$ as an alternative to GDP.

- Competition intensity (CI_j).

Competitive intensity within host markets can be expected to increase the entry difficulties of international contractors, and detract from operational profitability. Theoretically, international contractors are more likely to choose markets where competition is lower [18]. This study focuses on the field of international contracting, thus competitive intensity is measured by the entry of international engineering contractors within a target market. Extrapolating from ENR's reports, the number of international contractors operating in various markets on a year-by-year basis is noted, and a total is calculated for the period from 2010 to 2014, to generate the market competition intensity index CI_j .

- Firm size and Multinational experience (FS_i and MNE_i).

Internal construction company characteristics also play into a firm's international market selection. These include considerations such as strategy, firm size, and multinational experience. Strategy is a factor relatively difficult to assess, so the control variables are limited to company size and multinational engineering experience. Firm size (FS_i) is measured by the average of total revenues, as reported by ENR, from 2010 to 2014. Multinational experience (MNE_i) is measured by the sum of different markets entered each year, from 2005 to 2014.

4.3. Logistic Regression Models

When the dependent variable is binary, the logistic regression analysis is a suitable statistical analysis method. The logistic regression analysis has been widely used in research on international market entry strategy and shows merits such as reliable analysis results and strong interpretability. Therefore, this study chooses the logistic regression model as the main vehicle. For the linear relationship between GL and GLD , their effect on the dependent variable will be tested in logistic regression models 1 and 2, respectively.

Model 1:

$$\begin{aligned} \text{Logit}(P_{ij}) &= \log [P_{ij} / (1 - P_{ij})] \\ &= \beta_0 + \beta_1 GL_j + \beta_2 BO_j + \beta_3 TA_j + \beta_4 IA_j + \beta_5 TAT_j + \beta_6 FA_j + \beta_7 ER_j + \beta_8 OR_i + \beta_9 CD_j \\ &\quad + \beta_{10} GD_j + \beta_{11} \ln GDP_j + \beta_{12} GDP Growth_j + \beta_{13} CI_j + \beta_{14} FS_i + \beta_{15} MNE_i \end{aligned} \quad (2)$$

Model 2:

$$\begin{aligned} \text{Logit}(P_{ij}) &= \log [P_{ij} / (1 - P_{ij})] \\ &= \beta_0 + \beta_1 GLD_j + \beta_2 BO_j + \beta_3 TA_j + \beta_4 IA_j + \beta_5 TAT_j + \beta_6 FA_j + \beta_7 ER_j + \beta_8 OR_i + \beta_9 CD_j \\ &\quad + \beta_{10} GD_j + \beta_{11} \ln GDP_j + \beta_{12} GDP Growth_j + \beta_{13} CI_j + \beta_{14} FS_i + \beta_{15} MNE_i \end{aligned} \quad (3)$$

where P_{ij} = probability that Contractor i enters Country j .

Explanatory variables: GL_j , GLD_j , CD_j , BO_j , TA_j , IA_j , TAT_j , FA_j , ER_j , and OP_i = the governance level, the distance of governance level, cultural distance, belonging to the same organization, trade agreements, investment agreements, tax agreements or treaties, foreign aid, entry restriction, and ownership property, respectively.

Control variables: GD_j , $\ln GDP_j$, $GDP Growth_j$, CI_j , FS_i , and MNE_i = geographic distance, Ln of GDP, GDP growth rate, competitive intensity, firm size, and international experience, respectively.

Regarding the interpretation of the model, it can be summarized into three cases: (1) If $\beta_m = 0$, the change of explanatory variable m is irrelevant to P_{ij} ; (2) if $\beta_m > 0$, when other variables remain unchanged, as variable m increases, the value of P_{ij} increases, that is to say, as variable m increases, IMS_{ij} is more likely to be 1; and (3) for the same reason if $\beta_m < 0$, as variable m decreases, IMS_{ij} is more likely to be 0. This study was concerned about the direction of the influence of the variables on IMS , thus the direction of the coefficient β and the significance was interpreted.

5. Data Analysis

5.1. Model Test

Prior to conducting a logistic regression analysis, the correlation of the independent variables was tested to see if there was any sign of multiple collinearities in the data. From the results of the correlation test (see Table 3), *GL* and *GLD* in the correlation matrix prove to be highly significantly correlated. This is due to their inherent relationship. However, and importantly, because they do not occur in the same model, this resolves the problem. Of the other 119 correlation coefficients, 6 were more than 0.5 but less than 0.6, and 2 were close to 0.5. These 8 correlation coefficients were at a medium level, and they do not exceed 7% of the total. Consequently, there is no concern that multicollinearity will significantly tarnish the results.

As a further test, multicollinearity diagnosis was performed on the two models and the tolerance coefficients and variance inflation factors for all independent variables were calculated (see Table 4). Results confirm a minimum tolerance coefficient of 0.3118, with a maximum variance inflation factor of 3.2068. Together, these indicate that any multicollinearity will not seriously affect the analysis results [69].

Amongst scholars, there remains no absolute criterion to judge a model's goodness-of-fit. It is generally accepted that the logistic regression model is significant if the *p*-value of '−2Log likelihood' is less than a given significance level. The Cox and Snell R-Squared and the Nagelkerke R-Squared are usually considered to comprise the total explanatory effect of independent variables. The closer the value is to 1, the better the fit of the model. From the data found at the bottom of Table 4, both models prove to be significant, with a 39% explanatory effect. Therefore, both models exhibit a good degree of fit.

Chatterjee and Hadi suggest that $\max(n_1/n, n_2/n)$ can be taken as a threshold standard when using the 'Correct classification rate' to judge the validity of a logistic regression model [70], where *n* is the sample size, *n*₁ and *n*₂ are, respectively, the numbers of 0 or 1 of the observed values of the dependent variables. If the 'Correct classification rate' is greater than $\max(n_1/n, n_2/n)$, the model can be considered valid. As seen from Table 5, the 'Correct classification rates' 84.7% and 85.1% are bigger than $\max(n_1/n, n_2/n) = 3477/4320 = 80.5\%$.

Thus, the two models can be considered to be valid.

5.2. Logistic Regression Analysis and Hypotheses Test

A binary logistic regression analysis was conducted using SPSS 23. For all dummy independent variables, 0 is used as the reference group. The analysis results of models 1 and 2 are shown in Table 4. Seven of the ten explanatory variables are statistically significant ($p < 0.01$ or $p < 0.05$) which indicates that the corresponding institutional factors have salient impacts on the contractor's IMS. Positive regression coefficients show that the explanatory variables *BSO*, *BTA*, *FA*, and *OP* increase the possibility of IMS. By contrast, negative coefficients show that the explanatory variables *GL*, *GLD*, and *IPA* decrease the possibility of IMS. Three of the ten explanatory variables *TAT*, *ER*, and *CD*, however, are statistically insignificant ($p > 0.05$) which may indicate that Chinese contractors' IMS is not meaningfully influenced either way by those three factors.

Having calculated the statistical impact of the 10 variables, the logistic regression analysis results were compared with the developed hypotheses drawn out of the literature, and the outcomes for the hypotheses were determined (see Table 5).

Both hypotheses regarding the institutional environment—H1a and H1b—are not supported. Although significant, the negative coefficient of *GL* suggests that Chinese contractors tend to choose host countries with lower formal institutional quality, which is contrary to hypothesis H1a. Moreover, the insignificant coefficient of *ER* indicates that Chinese contractors' IMS are not sensitive to the legal entry restrictions of host countries, refuting hypothesis H1b.

Table 3. Correlation matrix and description statistics.

Variables	GL	GLD	BO	TA	IA	TAT	FA	ER	OP	CD	GD	lnGDP	GDPGrowth	CI	FS	MNE
GL																
GLD	0.969 **															
BO	0.129 **	0.140 **														
TA	0.132 **	0.169 **	0.125 **													
IA	0.245 **	0.190 **	0.114 **	0.493 **												
TAT	0.318 **	0.342 **	0.130 **	0.448 **	0.434 **											
FA	−0.584 **	−0.578 **	0.012	0.109 **	0.023	−0.328 **										
ER	−0.132 **	−0.181 **	0.030 *	0.199 **	0.223 **	0.243 **	0.061 **									
OP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
CD	0.107 **	0.106 **	−0.044 **	0.068 **	0.066 **	0.087 **	0.015	0.213 **	0.000							
GD	−0.111 **	−0.124 **	−0.101 **	−0.321 **	−0.322 **	−0.578 **	0.118 **	−0.134 **	0.000	0.030						
lnGDP	0.372 **	0.418 **	0.392 **	0.311 **	0.201 **	0.574 **	−0.351 **	0.058 **	0.000	0.096 **	−0.221 **					
GDPgrowth	−0.167 **	−0.279 **	0.078 **	−0.149 **	0.035 *	−0.169 **	0.146 **	0.141 **	0.000	−0.068 **	0.075 **	−0.211 **				
CI	−0.116 **	−0.064 **	0.495 **	0.309 **	0.102 **	0.295 **	−0.048 **	0.377 **	0.000	0.035 *	−0.196 **	0.587 **	0.072 **			
FS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.314 **	0.000	0.000	0.000	0.000	0.000		
MNE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.373 **	0.000	0.000	0.000	0.000	0.000	0.578 **	
Mean	0.54	1.48	0.16	0.93	0.83	0.71	0.53	7.29	0.50	2.26	9.06	5.20	0.03	146.09	9.30	117.80
Standard Deviation	1.38	1.26	0.37	0.26	0.38	0.45	0.50	3.99	0.50	2.93	3.82	1.73	0.03	92.82	20.08	136.93

Note: ** Correlation is significant at the 0.01 level (one-tailed). * Correlation is significant at the 0.05 level (one-tailed).

Table 4. Determinants of International Market Selection: Binary Logistic Test ($n = 4320$, entry = 843, no entry = 3477).

Variable	Model 1				Model 2			
	B	Sig.	Tol.	VIF	B	Sig.	Tol.	VIF
Intercept	−6.1020	0.0000			−5.6787	0.0000		
GL	−0.3412	0.0000	0.4249	2.3534				
GLD					−0.3567	0.0000	0.4339	2.3049
BSO	0.2968	0.0269	0.6365	1.5712	0.2636	0.0483	0.6445	1.5515
BTA	2.0305	0.0000	0.5614	1.7814	2.0787	0.0000	0.5542	1.8043
IPA	−0.3302	0.0253	0.6127	1.6320	−0.4354	0.0027	0.6295	1.5886
TAT	−0.2766	0.0818	0.3458	2.8922	−0.2117	0.1846	0.3475	2.8781
FA	0.5060	0.0003	0.4839	2.0665	0.5658	0.0000	0.5060	1.9764
ER	0.0086	0.5203	0.6533	1.5306	−0.0022	0.8705	0.6466	1.5465
OP	0.4794	0.0000	0.8462	1.1818	0.4779	0.0000	0.8462	1.1818
CD	−0.0174	0.2554	0.8990	1.1124	−0.0181	0.2359	0.8974	1.1143
GD	−0.0403	0.0041	0.6153	1.6254	−0.0391	0.0055	0.6152	1.6255
lnGDP	0.1425	0.0028	0.3118	3.2068	0.1269	0.0072	0.3178	3.1465

Table 4. Cont.

Variable	Model 1				Model 2			
	B	Sig.	Tol.	VIF	B	Sig.	Tol.	VIF
GDPgrowth	13.6387	0.0000	0.8374	1.1942	12.0162	0.0000	0.8249	1.2123
CI	0.0049	0.0000	0.3191	3.1341	0.0055	0.0000	0.3440	2.9073
FS	0.0030	0.1823	0.6549	1.5269	0.0030	0.1849	0.6549	1.5269
MNE	0.0068	0.0000	0.6251	1.5998	0.0068	0.0000	0.6251	1.5998
−2 Log likelihood	3048.979 ^a				3055.454 ^a			
Cox and Snell R Square	0.2453				0.2441			
Nagelkerke R Square	0.3909				0.3890			
Correct Classification rate (%)	84.7				85.1			

Note: ^a Because the change in the parameter estimate is less than 0.001, the estimate is terminated at the sixth iteration.

Table 5. Explanatory variable description and hypotheses test results.

Explanatory Variables	Description	Hypotheses	Effects Assumed	B Value in Model 1	B Value in Model 2	Support or Not
GL	Governance level of the host country	H1a	+	−0.3412 **		contrast
ER	Entry restriction of the host country	H1b	−	0.0086 #	−0.0022 #	no
GLD	Governance level difference between the host country and China	H2a	−		−0.3567 **	yes
CD	Cultural distance between the host country and China	H2b	−	−0.0174 #	−0.0181 #	no
BO	The host country and China belong to a regional organization	H3a	+	0.2968 *	0.2636 *	yes
TA	Bilateral trade agreements between the host country and China	H3b	+	2.0305 **	2.0787 **	yes
IA	Investment protection agreements between the host country and China	H3c	+	−0.3302 *	−0.4354 **	contrast
TAT	Taxation agreements or treaties between the host country and China	H3d	+	−0.2766 #	−0.2117 #	no
FA	China provided economic or technical aid to the host country	H3e	+	0.506 **	0.5658 **	yes
OP	Ownership of property of firm (central enterprises or not)	H4	+	0.4794 **	0.4779 **	yes

Note: * $p < 0.05$; ** $p < 0.01$; # $p > 0.05$.

As for hypotheses related to institutional distance, H2a was well confirmed by the significant negative coefficient of *GLD*. This suggests that Chinese contractors tend to choose host countries with less formal institutional distance to China. However, the insignificant coefficient of *CD* reveals that cultural distance does not influence Chinese contractors' IMS, and so does not support H2b.

More positively, three of the five hypotheses concerning country link—H3a, H3b, H3e—are confirmed. The significant positive coefficients of *BO*, *TA*, and *FA* mean that these three types of linkages between the two countries do increase the probability that contractors will enter the host country: regional trade or economic organizations, bilateral trade agreements, and foreign aid coming from China. On the other hand, the negative coefficient of *IA* is significant at the 0.05 level. This shows bilateral investment agreements reduce the possibility of Chinese contractors' IMS and refutes hypothesis H3c. The coefficient of *TAT* is not significant, and thus hypothesis H3d is not supported.

The hypothesis on the property ownership of firms, H4, was also confirmed. The significantly positive coefficient of *OP* indicates that central enterprises are more active than local enterprises in the international contractor market.

6. Findings and Discussion

In summary, five of the ten hypotheses are confirmed. This shows that the Chinese contractor IMS conforms to a range of theoretical expectations that derive from an institutional-based view of international construction management. At the same time, however, two hypotheses refute theoretical expectations, as predicted by institutional theory. While a range of firm behavioral patterns is here shown to endorse an institutional theory view of international construction, the fact that two reasonable predictions have not panned out should give international management theorists some pause. Moreover, three of the hypotheses were simply unconfirmed. That again is a reason to rethink the impact institutions have on international construction activity, specifically in regard to Chinese contractors. This study can therefore be expected to provoke and reignite discussion on the explanatory power of institutional theory.

Statistical analysis results show that Chinese contractors prefer international markets with lower formal institutional quality. This finding supports certain earlier research which concludes that Chinese contractors tend to enter countries with high country risk [18]. Such high-risk markets are generally characterized as having low institutional quality. In turn, low institutional quality is associated with high costs and scheduling overruns, quality issues, and other difficulties. In fact, certain studies have previously asserted that Chinese enterprises behave irrationally with regard to IMS [16,49]. By contrast, this study offers an explanation of this phenomenon by way of taking an institutional distance perspective. Chinese contractors' preference for host countries offering closer institutional distances results in market entry choices that preference those countries with lower formal institutional quality. Consider that China's GL score is -0.83 , which is nearly a standard deviation below the average value of the other sampled countries. The institutional quality of a country may have different impacts on contractors coming from different countries. For contractors who are accustomed to so-called 'low institutional quality', possibly higher institutional quality confers a greater 'liability of foreignness' that more than offsets operational efficiency.

Additionally, it appears that Chinese contractors' IMS is insensitive to the entry barriers of the host market. The reason for this result may lie in the measurement of entry restriction which reflects not an absolute prohibition of entry, but rather a threshold. Therefore, Chinese contractors can overcome this entry barrier by adjusting their entry mode. For example, joint-venture configurations with local partners can be used when foreign contracting is not permitted.

Chinese contractors' IMS is not sensitive to cultural distance. This contradicts the theoretical hypothesis and refutes an abundance of existing research [18]. The reason may lie in the fact that 15 independent variables were used in each model in this study, while

only 7 factors were considered in the study undertaken by Chen. The correlation between variables can be expected to weaken some effects as the number of variables employed rises. Incidentally, the control variable FS is not significant, which is also inconsistent with Chen's findings. The explanation may be similar, since FS exhibits a strong correlation with OP and MNE, while China's central enterprises are usually large, capital sound, and well-resourced in the multinational context.

As for institutional links, Chinese contractors' IMS is insensitive to bilateral taxation agreements, especially bilateral investment protection agreements, which do show significant unanticipated negative effects. Possibly this is because bilateral investment protection agreements and taxation treaties differ from country to country and are dynamic over time. Consequently, their positive or negative impacts are specific, conditional, and fluid. For instance, in the 1980s, China signed investment protection agreements with most developed countries, with most of these treaties being initiated by developed countries in order to protect their investments in China. By the 1990s, however, China began to seek out investment protection agreements with developing countries, this time in order to protect its investments abroad [51].

7. Conclusions and Limitations

Institutional factors constitute an indispensable consideration in a contractor's international market entry strategy [27]. Yet, the role of the institutional factors on contractors' IMS decision-making has hitherto not been comprehensively assessed. To address this gap, this study comprehensively reviews institutional factors affecting contractors' IMS and makes assumptions and empirical analyses on the effects of 10 specific institutional factors at different levels. The following conclusions can be drawn:

- (1) The results show that 7 of the 10 institutional factors have a significant impact on Chinese contractors' IMS. These factors cover all four categories in the empirical research, which manifests that the IMS of contractors is affected by institutions from different levels. It is necessary to consider institutional factors comprehensively in IMS decision-making research and practice.
- (2) All the hypotheses of this study are based on universal theories. The five hypotheses confirmed include: the contractor's IMS is negatively affected by the institutional distance and positively affected by the link between home and host countries (bilateral trade agreements, regional organization, foreign aid) and the ownership property of central enterprises. Although the empirical evidence takes Chinese contractors as the sample, these conclusions have important reference value for the IMS practice of global contractors, the development of the IMS decision-making model by academic researchers, and even the policymaking adopted by governments to promote domestic contractors to go abroad.
- (3) It is interesting to find that the institutional quality of the host country and bilateral investment agreements play a significant role in Chinese contractors' IMS, but are contrary to the hypotheses. The reason for this phenomenon lies in the current situation of China's institutional quality and the history of bilateral investment agreements. For international contractors from other countries, the role of these two institutional factors may be different due to different home country backgrounds. This reminds scholars and managers that specific historical and practical backgrounds must be weighed when applying institutional factors in IMS.

This study fills an overlooked gap regarding the role multi-dimensional institutional factors play in contractors' IMS. Moreover, it enriches the input information that lends support to IMS decision-making. The research results can be utilized by stakeholders, managers, government, and interested parties. However, there are still some limitations in this study that need to be settled in future research.

First, this study only discusses the impact of institutional factors on the IMS of construction contractors at a broader level. Future research can also be subdivided on the basis

of detailed data, such as studying the similarities and differences of the effects of institutional factors in different engineering fields such as civil engineering, bridge construction, road construction, and high-speed railway construction.

Second, the empirical part of this study is based on historical data, but the global institutional environment and market have changed dramatically with COVID-19. According to institutional change theory, institutions are often developing in a gradual process and substantive changes often take a long time to accumulate if outbreaks do not happen. In basing a study on panel data, or comparing data before and post COVID-19, more enlightening findings are expected to be explored.

Finally, this study discusses respective roles under the assumption that all institutional factors are independent. However, institutional factors may interact in practice. Under the premise of interaction, the comprehensive role of institutional factors on contractor IMS needs further discussion.

Author Contributions: Conceptualization, C.C.; Data curation, L.L.; Funding acquisition, C.C.; Investigation, L.L.; Methodology, L.L.; Resources, L.L.; Supervision, I.M.; Writing—original draft, L.L.; Writing—review and editing, I.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the National Natural Science Foundation of China, grant number 71971147, and the Chongqing University of Posts and Telecommunications, grant number XJG18209.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data used and analyzed during this study are available from the corresponding author by request.

Conflicts of Interest: The authors declare no conflict of interest.

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